STATE OF THE ENVIRONMENT REPORT – SLOVAK REPUBLIC

2018

25th anniversary of annual reports

MINISTRY
OF ENVIRONMENT
OF THE SLOVAK REPUBLIC

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REPORT – SLOVAK REPUBLIC
2018
Extended Assessment
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Dear readers,

You once again hold in your hands the regular **State of the Environment Report of the Slovak Republic, this time for 2018 (the Report)**. It bears the subheading **Extended Assessment**. Other than the annually published data and information, its objective is to provide a more comprehensive overview, not only of the quality of the environment in Slovakia, but also of assessment of selected tools used to care for the environment and also activities in the field of international collaboration.

Another new feature in publication of this document will be its availability on the respective website as an **interactive version**. This will allow you to obtain additional information which the document is unable to include due to the limited scope of the printed version in a user-friendly manner. We have also chosen a new approach for elaboration of the interactive version. It will be open to incentives for providers of verified data and information with an offer for them to serve as a means of interconnection between available sources of information, not only within the Ministry of the Environment, but also within other authorities and organisations concerned.

The main findings of the Report confirm that the greatest challenges facing the environment in Slovakia are waste management, air quality and protection of habitats and species, above all in forest, meadow and wetland ecosystems. Another challenge I could mention is the quality of surface water and groundwater. In order to address the above-mentioned and other environmental challenges, intensive work was performed over the course of 2018 on preparation of a new strategic document defining Slovak environmental policy until 2030. The document entitled **A Greener Slovakia – Strategy for the Environmental Policy of the Slovak Republic until 2030 (Envirostrategy 2030)** was approved by the government of the Slovak Republic in February 2019. In doing so, the government at the same time expressed its continuing support for consistent environmental protection in Slovakia as defined in the adopted **programme declaration**.

The basic **vision** of Envirostrategy 2030 is to achieve a better quality of environment and sustainable circular economy based on consistent protection of environmental components and use of the minimum possible non-renewable natural resources and hazardous substances, leading towards improvement of public health. We would thus like to achieve a state of affairs in which both the public and the policy makers have a general awareness of environmental protection and sustainable consumption. By preventing and adapting to climate change, its impact on Slovakia should be as low as possible.

Despite certain persisting problems, I would like to emphasise the fact that we are exerting a considerable amount of effort and spending a significant amount of funds on environmental protection from national and foreign resources. From the point of view of **positive developments**, I would like to give a few examples.

Our country is meeting its commitments arising from the UNECE Convention on Long-range Transboundary **Air** Pollution and its protocols. We are not exceeding the emission ceilings which regulate limit values for emission of selected pollutants into the air until 2020 for any of the monitored substances. We have over the long term enjoyed a consistently high quality of **drinking water** supplied to consumers via the public water mains. The volume and level of pollution in **waste water** which is released is decreasing. Almost a quarter of the territory of Slovakia is included in the national **system of protected areas** dedicated to nature conservation. The **NATURA 2000** system covers approximately a third of the territory of Slovakia. However, its consistent protection and targeted care in line with international requirements remain a problem. It is expected that the reduction targets relating to **emission of greenhouse gases** determined until 2020 will be met. The Slovak Republic has supported the idea of climate neutrality and has also set itself some ambitious reduction targets until 2030, meeting of which will require adoption of further specific measures.

Other than correctly determined policies, targets and tools, progress in the field of environmental care will also require the involvement of all key groups in our society. Each and every one of us must also play an active part in this. We can all support the efforts of state administration and local government authorities to make a positive change in the environment with our attitude and actions. I would here like to provide a specific example illustrating this claim using one of the above-mentioned challenges, this being **waste management**. We are not managing to meet the targets for recycling of municipal waste and reduction in the share of waste stored in landfill sites. We are thus losing valuable sources of secondary raw materials, increasing demands on exhaustible natural resources and imposing demands on energy sources. However, even the very best system put into place by the responsible authorities will not work if the general population does not participate actively in it. Failure to do so will mean that we will continue to be unable to meet the set targets.

As regards the poor **quality of air**, I would also like to mention an important fact in relation to the public in general. The most important problem in recent years has been air pollution by dust particles, nitrogen dioxide and ozone. The main causes of pollution today include emissions from household heating as well as emissions from traffic. These are again areas which each and every one of us can have an impact on through our actions. For example, by correct heating and use of means of transport other than cars in cities.

While forming environmental awareness and appreciating the consequences of our actions on the environment, but also the options open to us to ensure a positive impact on the environment, a major role is played by education, edification and provision of high-quality and relevant **information about the environment**. This **State of the Environment Report for the Slovak Republic 2018** is just one of the tools used by the Ministry of the Environment for this purpose. I hope that it will be possible via this Report to fulfil the intention of the authors, but also that of all of our colleagues who contribute towards acquiring, collecting and assessing data and information about the environment, without whom the Report itself could not have been created. This intention is to raise awareness and to provide motivation for us to all redouble our joint efforts to protect the environment in our country.

Ing. László Sólymos
Deputy Prime Minister and Minister of the Environment
of the Slovak Republic

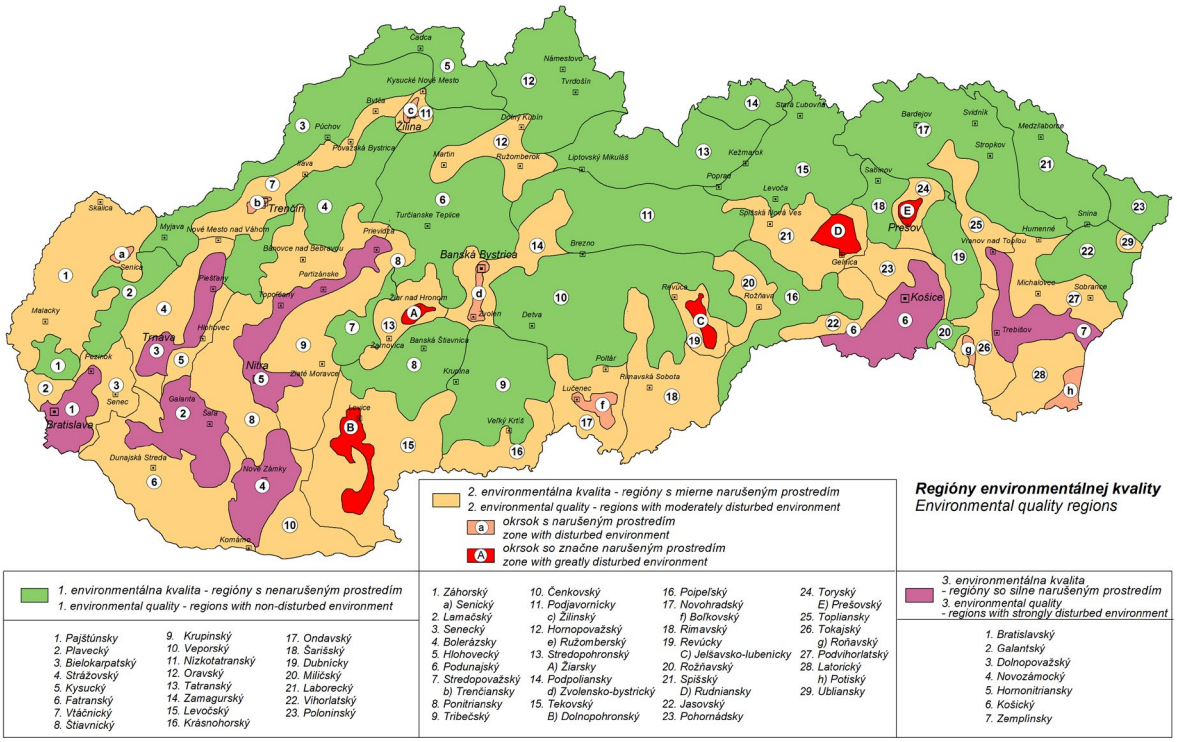
BASIC INFORMATION ABOUT THE SLOVAK REPUBLIC

Table 001 I The SR in selected figures (2018)

FOUNDATION OF THE INDEPENDENT SR		1 JANUARY 1993
CHARACTERISTICS (2018)		
AREA	49 034 KM²	
Land types in percentages	AGRICULTURAL LAND	48.5 %
	FORESTS	41.3 %
	WATER BODIES	1.9 %
	BUILT-UP AREAS	4.9 %
	OTHER AREAS	3.4 %
HEIGHT ABOVE SEA LEVEL	95 M (MOUTH OF THE BODROG RIVER) / 2 655 M (GERLACHOVSKÝ ŠTÍT (GERLACHOV PEAK))	
POPULATION (AS OF 31 DECEMBER 2018)		
TOTAL POPULATION	5 450 421, OF WHICH 48.8% MEN AND 51.2% WOMEN	
LIVE BIRTHS	57 639	
DEATHS	54 293	
NATURAL INCREASE	3 346	
INCREASE THROUGH IMMIGRATION	3 955	
TOTAL INCREASE	7 301	
LIFE EXPECTANCY AT BIRTH	MEN	73.71
	WOMEN	80.35
AVERAGE AGE (YEARS)	MEN	39.21
	WOMEN	42.36
POPULATION DENSITY	111.1 INHABITANTS/KM²	
GROSS DOMESTIC PRODUCT AT CURRENT PRICES	EUR 89.72 BILLION	
INFLATION	2.5%	
REGISTERED UNEMPLOYMENT RATE	5.04%	
ASSESSMENT OF SELECTED INDEXES		
ENVIRONMENTAL PERFORMANCE INDEX (EPI), YALE 2018	70.6% (28TH OF 180 ASSESSED COUNTRIES)	
GINI INDEX, WORLD BANK 2018	26.1%	
HUMAN DEVELOPMENT INDEX, UNDP 2018	0.855 - VERY HIGH	

The territory of the SR is split into 5 **environmental quality** categories. A comparison of the situation between 2010 and 2015 and the situation in 2018 shows a slight increase in regions with an undisturbed environment. This increase is thanks to the implementation of environmental measures through subsidies allocated to the regions from the Operational Programme Environment in these years, as well as through amendments to laws applying to environment care.

Map 001 I Environment quality regions



Source: Slovak Environment Agency

SUMMARY ASSESSMENT OF THE ENVIRONMENTAL SITUATION IN THE SLOVAK REPUBLIC

In 2018 work was undertaken on the preparation of a new **Strategy of the environmental policy of the Slovak Republic until 2030** (hereinafter referred to as 'Envirostrategy 2030'). This document was adopted by the Government of the SR in February 2019 and replaced the previously valid Strategy, Principles and Priorities of the State Environmental Policy of 1993.

Emissions of pollutants have been falling over the long term. The fall in recent years has however been very low, while a slight year-on-year increase has even been recorded for some pollutants. The SR is not exceeding any emissions ceilings (set limit values to 2020) for any of the monitored substances (nitrogen oxides - NO_x, sulphur oxides - SO_x, ammonia - NH_3, non-methane volatile organic compounds - NMVOC). New, stricter emissions ceilings will come into force in 2020 and $PM_{2.5}$ will be added to the monitored substances (tiny particles or droplets with an aerodynamic diameter of less than 2.5 µm). The SR is meeting the obligations arising from the UNECE Convention on Long-Range Transboundary Air Pollution and its protocols.
Despite the fall in the total amount of pollutant emissions into the air, **air quality** remains one of the most serious environmental problems and Envirostrategy 2030 defines it as **one of the three greatest current problems** in Slovakia. The SR has not yet met all the set limit values, with air pollution through nitrogen dioxide - NO_2, small particulate or droplets with an aerodynamic diameter of less than 10 µm - PM_{10}, and benzo(a)pyrene - BaP - remaining the main problem. Ground-level ozone is also still a problem and its target values are permanently exceeded.
The latest data published by the European Environment Agency (EEA) show that air pollution caused 5 416 premature deaths in Slovakia in 2014. In 2015 this number increased to 5 421.

Slovak water resources are unevenly distributed from the perspectives of both **quantity and quality**. The reason for this is on the one hand the natural conditions but on the other the increasingly significant precipitation conditions, significantly influenced by prolonged periods of drought alternating with short but intense precipitation. Despite this, Slovakia has sufficient water resources and the potential to secure its water needs into the future. However, there are some local areas where it is difficult to secure sufficient quality drinking water.
It has **not yet been possible** to achieve **good status and potential** for all **water bodies**. Although the volume of and level of pollution in discharged waste water have been falling over the long term, one of the most important measures that need to be implemented is to increase the drainage and treatment of waste water in cities and municipalities.
The **high quality of the drinking water** delivered through the public water supply system has been maintained over the long term.

The SR has enough quality **agricultural land** to satisfy the needs of its inhabitants in terms of the production of food, in spite of the continuing slight falling trend in its area. The **contamination** of agricultural land is insignificant and the soil is of satisfactory quality. There is however a problem with increasing **soil acidification**. Together with **water erosion and soil compaction** this is negatively affecting soil productivity. The use of fertilisers and plant protection preparations in relation to agricultural production remains a problem. Around one third of Slovak territory is designated as a nitrate-vulnerable area. The way to reduce these negative impacts is to promote **ecological agricultural production**.

The conservation status of **species and habitats of European importance** is showing gradual improvement, especially in relation to knowledge of them. However, the achievement of the target by 2020 – significant and measurable improvement in their status – remains a long way off. In 2018 around one quarter of species and one third of habitats of European importance were in a favourable status. **The protection of species and habitats, primarily in forest, meadow and wetlands ecosystems**, is **the second of the three** defined **greatest current environmental problems** in Slovakia. Almost a quarter of Slovakia is included in the national **system of protected areas** from the perspective of nature protection. However, their consistent protection and targeted care in accordance with international requirements remain a problem. Approximately one third of the territory of Slovakia is in the Natura 2000 network, while there are overlaps between these two types of protected area.

Greenhouse gas emissions have been falling over the long term, however have been relatively stable from a shorter-term perspective. It is anticipated that the reduction targets set to 2020 will be met. The SR supported the idea of **climate neutrality**, and has also set itself ambitious additional reduction targets to 2030, the fulfilment of which will require the adoption of additional specific measures.
Negative symptoms of climate change continued in 2018, with the year being exceptionally, even extremely warm. Long-term temperature records were broken at many stations. Precipitation was subnormal, manifesting in significant soil drought, especially in the spring. There was an estimated revenue loss of approximately one third due to drought in several districts of Slovakia.

Green growth is understood to mean strengthening economic growth while ensuring that natural wealth can continue to provide the resources and the environmental services on which human wellbeing depends. It brings the economic and environmental contexts together.
The connection between the efficiency of the use of natural resources, production and consumption is expressed through an assessment of environmental and resource productivity. The aim is to achieve so-called bifurcation of the curves, when the growth rate of the environmental burden indicator is lower than that of economic growth, and ensuring the highest possible economic output with the lowest negative impact on the environment.

Carbon productivity characterises the interdependence of the carbon and climate cycles linked to environmental and economic efficiency as a result of policies promoting low-carbon and cleaner technologies when using energy resources. The trend in greenhouse gas emissions and in the development of gross domestic product suggests that the so-called absolute decoupling has been successful so far, which is a positive trend.
Energy productivity has increased over the longer-term, yet the energy intensity of the economy remains high and far higher than the average of EU Member States. There has been a year-on-year fall in the share of renewables and this trend means we cannot guarantee that the binding target for the share of renewables will be met. **Material productivity** has improved, however remains under the EU productivity average.

Slovakia ranks among the **most forested** EU Member States. Although assessments indicate the trend in terms of forest acreage is rising, on the other hand satellite images have shown a fall in forested area. The status of health of the forests has long been considered unfavourable and under the Europe-wide average.

The main aims of the transition to a **circular economy** as a tool to ensure green growth are maintaining the value of products and materials as long as possible, minimising waste and using new resources.
The third-most-serious environmental problem in Slovakia is **waste management.** There has long been a **high level of landfilling and a low level of waste recycling**, including recycling of municipal waste. The level of waste recycling is one of the lowest of all the EU Member States, although the generation of municipal waste per inhabitant is low and under the average for EU Member States. There is a danger that Slovakia will not meet the municipal waste recycling targets set for 2020.

Slovakia's income from environmental taxes remains under the EU average.

Assessment of trends in individual indicators

Icon	Assessment explanation
	Positive trend, improvements prevail.
	Variable trend, ambiguous, without significant changes in either positive or negative directions.
	Unfavourable trend, deteriorations prevail.

Assessment of the status of individual indicators

Icon	Assessment explanation
	Satisfactory status. Limit values and targets are being met with only minimal deviations.
	A status that cannot be unambiguously assigned as satisfactory or unsatisfactory. This may mean, for example, that there are no targets or limits for its assessment, respectively its assessment is not unambiguous.
	Unsatisfactory status. Limit values are usually exceeded, set targets are not being met, or there is a threat to the fulfilment of targets set for future periods.

Air quality

	Emissions of pollutants
Change since 2005	A falling trend in most of the substances under review, and the overall trend can be considered positive.
Last year-on-year change	Compared to 2016, in 2017 there was a fall in emissions of NO_x and CO and also for emissions of PM10 and PM2.5, while SO2 emissions rose only slightly. In 2017 emissions of Cd, Hg and Pb slightly rose year-on-year, while emissions of PCDD/PCDF, PCB and PAH registered a rise.
Status (2017)	The SR is meeting all its commitments arising from relevant international conventions applying to emissions of air pollutants.

Air quality		
Change since 2005		A positive trend despite slight fluctuations.
Last year-on-year change		Compared to the preceding year, a reduction in the exceeding of both limit and target values was recorded.
Status (2018)		Permitted values in relation to human health protection for NO_2, PM10, BaP and ground-level ozone are being exceeded. The exceeding of permitted ground-level ozone values for the protection of plants and forests was also recorded.
Water		
The use of water from the perspective of conservation of water resources		
Change since 2005		A decrease in surface water and groundwater abstraction.
Last year-on-year change		A slight decrease in abstraction of surface water and groundwater.
Status (2018)		The percentage of total abstraction from outflow from the SR reached 6.5%, while the share of groundwater used out of the total documented exploitable amount of groundwater reached 13.93%. Although the positive balance status of groundwater is favourable from the environmental perspective, a further reduction of groundwater abstraction is not however appropriate from the perspective of the health and living standards of the population of the SR.
Surface water quality		
Change since 2005		A significant fall in the number of monitoring sites where water quality requirements were not met. Assessments of the status of water bodies, performed since 2007, recorded a slight fall in the share of water bodies in a better than average environmental status and a slight rise in the share of water bodies in good chemical status.
Last year-on-year change		There was a year-on-year rise in the number of monitoring sites where water quality requirements were not met.
Status (2018)		Water quality requirements were not met at the majority of monitoring sites. The exceeding of limit values in individual groups of indicators, as well as priority substances and some other substances assessed for the maintenance of environmental quality standards, continued.
Groundwater quality		
Change since 2005		A fall in the share of analyses failing to comply with water quality requirements. Assessments of the chemical status of groundwater bodies performed since 2007 showed 2 less groundwater bodies in a bad status.
Last year-on-year change		There were no year-on-year significant changes in the share of groundwater analyses failing to comply with the requirements for drinking water quality.
Status (2018)		In the majority of monitoring sites in the groundwater monitoring network the limit value for drinking water quality was exceeded for at least one indicator. Limit values were most often exceeded for the following indicators: Mn, Fetotal and Fe^{2+}, indicating a continuing unfavourable status of oxidation-reduction conditions.

Waste water		
Change since 2005		The fall in the volume of discharged waste water continued, while a fall was also recorded in the generation of organic pollution. The share of the population connected to a public sewerage system increased.
Last year-on-year change		There was a slight year-on-year fall in the volume of waste water, while the share of the population connected to a public sewerage system also increased slightly.
Status (2018)		The low connection rate of the population to a public sewerage system (68.40%) remains a problem.
Drinking water quality		
Change since 2005		Drinking water quality recorded a positive trend and status.
Last year-on-year change		The share of drinking water analyses complying with hygiene limits rose.
Status (2018)		Drinking water quality has long been at a high level. 99.75% of drinking water analyses complied with hygiene limits.
Rock		
Geological threats		
Change since 2006		The long-term and extreme precipitation has resulted in an increase in the numbers of emergencies with a negative impact on the lives and health of inhabitants and their property. Repeating landslides are the greatest threat.
Last year-on-year change		Year-on-year there have been slight changes in the stabilisation conditions in the territory.
Status (2018)		Slope deformation has been registered over more than 5% of Slovak territory. 9 new slope deformations were added in 2018.
Soil		
Land use		
Change since 2005		The greatest change in the use of land was the expansion of built-up areas and courtyards, primarily at the expense of agricultural land. The expansion of forest land continued, albeit more moderately.
Last year-on-year change		There was another year-on-year reduction in the area of agricultural land, accompanied by growth in forested land and built-up areas and courtyards.
Status (2018)		Its land structure and nature of use means the SR has sufficient agricultural land to meet the needs of its population in terms of food production.
Soil contamination		
Change since 2005		The trend in soil contamination is very gradual, without significant changes. Soil that was already contaminated in the past continues to be contaminated in the present.
Last year-on-year change	—	In 2018, only selected localities were analysed – those in which contamination with at least one contaminant was determined after the assessment of the 4th sampling cycle (sampling year 2007).
Status (2018)		Almost 99% of the agricultural land fund complies with hygiene requirements. The remainder, contaminated soil, is predominantly linked to industrial activity and to so-called geochemical anomalies - mountain and foothill areas.

Soil reaction		
Change since 2005		Although the share of soil with weakly acidic reaction has fallen, the share of soil with acidic reaction rose.
Last year-on-year change		The share of agricultural land with acidic soil reaction continues to rise.
Status (2018)		Almost 60% of agricultural land shows weakly acidic or acidic soil reaction.
Soil erosion		
Change since 2005		Potential water and wind erosion has fallen since 2005.
Last year-on-year change		Year-on-year there has been a reduction in the area of land threatened by potential water and wind erosion.
Status (2018)		Water erosion is a potential threat to 38.5% and wind erosion to 5.5% of agricultural land.
Biodiversity		
Conservation status of species and habitats of European importance		
Change since 2005		Compared to the 1st (2004-2006) and 2nd (2007-2012) reporting periods, in the 3rd reporting period (2013-2018) there was a more significant improvement in knowledge, however in fact their status remains more-or-less the same (insufficient measures).
Last year-on-year change		The conservation status of species and habitats of European importance improved only minimally according to CIMS records.
Status (2018)		The conservation status of species and habitats of European importance is to a large extent unfavourable and the achievement of the 2020 target of a significant and measurable improvement in their status remains remote.
Status and trend in the national network of protected areas and the European Natura 2000 network		
Change since 2005		The share of so-called small-area protected areas slightly rose and the construction of the European Natura 2000 network commenced.
Last year-on-year change		The area of the national system of protected areas did not change year-on-year. Additional documents (care) for specially protected parts of nature and landscape were prepared, processed and approved. A measure on the supplementation of the national list of sites of Community importance (second update – the so-called C stage), increasing their total number by 169 localities, came into effect.
Status (2018)		Despite the high share of protected areas, many deficiencies could be seen in the national system (representativeness, status of endangerment, definition of the target status of protection, implementation of care programmes for small-area protected areas). The European Natura 2000 network is already mostly completed, however the process for declaring sites of Community importance, as well as the preparation of care programmes, is too slow.
Climate change		
Greenhouse gas emissions		
Change since 2005		The quantity of greenhouse gas emissions fell, while CO_2 productivity increased. As CO_2 emissions are falling while gross domestic product is rising, we can speak of absolute decoupling, which is a positive trend.
Last year-on-year change		Although greenhouse gas emissions increased year-on-year, this was only very moderately and the trend is relatively stable from the short-term perspective.
Status (2017)		The SR is meeting all its commitments arising from relevant international treaties relating to greenhouse gas emissions.

Climate change trends		
Change since 2005		Negative manifestations of climate change have been recorded.
Last year-on-year change		The negative manifestations of climate change continued (significant weather variability, above-average temperatures throughout the year, extreme local precipitation).
Status (2018)		The past year was very significant in terms of the negative manifestations of climate change.
Mining and quarrying		
Trends in mining and quarrying		
Change since 2005		The volume of most mined raw materials did not reach the extraction levels of 2000, which we can assess as positive in terms of the exploitation of natural resources.
Last year-on-year change		In 2018 there was a slight increase in raw material extraction on the surface and a slight decrease in deep mining compared to the preceding year.
Status (2018)		The share of mineral extraction to their reserves does not yet indicate a threat they will become exhausted.
Energy		
Gross inland energy consumption (GIEC)		
Change since 2005		GIEC has been falling since 2005.
Last year-on-year change		GIEC increased year-on-year.
Status (2017)		The meeting of energy efficiency targets expressed in absolute primarily energy consumption is anticipated under the assumption of investments in energy efficiency measures on the side of energy conversion, transmission and distribution, along with significant private sector activity.
Electricity generation		
Change since 2005		In the 2005 to 2018 period there was a decrease in electricity generation.
Last year-on-year change		Electricity generation fell year-on-year.
Status (2018)		The electricity supply in Slovakia was reliable in 2018. The SR has a low-carbon mix of electricity sources, while the share of carbon-free electricity generation was around 80%.
Final energy consumption		
Change since 2005		Final energy consumption has fallen.
Last year-on-year change		A significant year-on-year increase in final energy consumption.
Status (2017)		It is assumed that the fulfilment of the energy savings target to 2020 will only be 84% of the overall national indicative energy savings target for final energy consumption as defined in the Energy Efficiency Action Plan 2014-2020.
Energy intensity		
Change since 2005		A significant decline in the energy intensity of the economy.
Last year-on-year change		A year-on-year increase in the energy intensity of the economy.
Status (2017)		Despite positive developments, the economy still has high energy intensity.

Renewables		
Change since 2005		An increase in the share of renewables in gross final energy consumption.
Last year-on-year change		A year-on-year decline in the share of renewables.
Status (2017)		Achieving a binding target for the share of energy from renewables in 2020 is not guaranteed given the current trend.
Greenhouse gas emissions from the energy sector		
Change since 2005		A decline in greenhouse gas emissions.
Last year-on-year change		A year-on-year increase in greenhouse gas emissions from the energy sector.
Status (2017)		In 2017, greenhouse gas emissions from the energy sector were at one of their lowest levels since 1990.
Emissions of pollutants from the energy sector		
Change since 2005		A positive trend was achieved in emissions of all monitored pollutants - SO_2, NO_x, CO, PM_{10}, $PM_{2.5}$ and NMVOC. On the other hand, emissions of POPs except for emissions of PAH increased (PCDD/PCDF, PCB). Regarding heavy metals, there was an increase in Cd, while Pb and Hg emissions decreased.
Last year-on-year change		A fall in emissions of all monitored pollutants, an increase in emissions of all POPs, as well as heavy metals - Cd, Pb and Hg.
Status (2017)		The energy sector's greatest share in total emissions is for SO_2, NO_x, POPs and heavy metals.
Agriculture		
Area of agricultural land		
Change since 2005		Since 2005 there has been a decrease in the area of all types of agricultural land.
Last year-on-year change		Another fall in the area of agricultural land was recorded compared to 2017.
Status (2018)		Agricultural land makes up 48.5% of all Slovak territory.
Consumption of industrial fertilizers and pesticides		
Change since 2005		There has been an increase in the consumption of industrial fertilisers and pesticides since 2005.
Last year-on-year change		The year-on-year consumption of industrial fertilisers and pesticides increased.
Status (2018)		5 403.5 t of pesticides was applied onto agricultural land. The consumption of industrial fertilisers was 102.4 kg of pure nutrients per hectare of soil.
Water demands of agriculture		
Change since 2005		Between 2005 and 2018 there was an increase in the abstraction of surface water but a decrease in the abstraction of groundwater.
Last year-on-year change		The abstraction of surface and groundwater in agriculture fell year-on-year.
Status (2018)		The share of surface and groundwater used in agriculture compared to total water abstraction is negligible.

Nitrogen balance in agricultural land		
Change since 2005		Between 2000 and 2006 the nitrogen balance in agricultural land was mainly neutral. After 2007 its value began to rise to record a positive balance.
Last year-on-year change		There was a year-on-year increase in the positive nitrogen balance in agricultural land.
Status (2018)		There is a surplus of nitrogen in agricultural land, which is undesirable in terms of optimal plant nutrition and environmental protection.
Greenhouse gas emissions and emissions of ammonia from agriculture		
Change since 2005		Since 2005 greenhouse gas emissions have increased slightly while ammonia emissions from agriculture have decreased.
Last year-on-year change		There was a year-on-year decline in greenhouse gas and ammonia emissions from agriculture.
Status (2017)		Agriculture accounts for 6% of all greenhouse gas emissions in the Slovak Republic and is the largest producer of ammonia emissions.
Transport		
Transport performances		
Change since 2005		An increase in freight transport performance, primarily road transport. A decrease in passenger transport performance.
Last year-on-year change		Transport performance recorded a slight year-on-year increase in all modes of passenger transport. In freight transport, there was an increase in transport performance in road and rail transport.
Status (2018)		A high share of road transport in passenger and freight transport as well as a high share of individual passenger transport persists.
Greenhouse gas emissions		
Change since 2005		A decrease in emissions of CH_4, on the other hand an increase in emissions of N_2O and CO_2.
Last year-on-year change		Greenhouse gas and CH_4 emissions recorded slight year-on-year increases.
Status (2017)		The growth of greenhouse gas emissions from transport has failed to stabilize, and the relative share of transport emissions is steadily increasing.
Emissions of pollutants		
Change since 2005		Emissions of basic pollutants decreased with minimal year-on-year swings.
Last year-on-year change		Emissions of basic pollutants recorded a year-on-year decline, except for NOx, PM2.5 and PM10 emissions, which increased. Emissions of heavy metals dropped.
Status (2017)		Transport accounts for the most significant share of emissions of NOx (approximately 46%), heavy metals (approximately 5%), CO (15%), and particulate PM emissions (approximately 9%). Its share of other pollutants is lower.
Forestry		
Forest condition		
Change since 2005		Forest condition indicated through defoliation has continued to deteriorate with occasional fluctuations, peaking in 2014 for the entire reporting period.
Last year-on-year change		There was a year-on-year deterioration in the health of forests.

Status (2018)		Forest condition in Slovakia can still be considered unfavourable, and still worse than the European average.
Timber and carbon stocks in forest ecosystems		
Change since 2005		Timber and carbon stocks bound in forests have been growing for a long time.
Last year-on-year change		There was another slight increase in the stocks of timber and carbon bound in forests.
Status (2018)		Timber and carbon stocks in forest ecosystems are relatively high.
Forest resources utilisation		
Change since 2005		Since 2005, the share of felling in the total current increment (use of forests) has slightly decreased, farming remains sustainable yet still records high values.
Last year-on-year change		The share of felling in the total current increment (TCI) increased year-on-year.
Status (2018)		Forest resources utilisation can still be assessed as sustainable, yet the share of felling in TCI is high.
Tree species composition and natural regeneration of forests		
Change since 2005		The trend in the tree species composition of forests, respectively in the share of natural regeneration of forests, is favourable.
Last year-on-year change		There has been a further improvement in the tree species composition of forests, as well as a positive increase in the share of natural forest regeneration.
Status (2018)		A generally favourable and varied species structure prevails in Slovak forests. The share of natural regeneration is approaching the level in developed, comparable countries.
Recreation and tourism		
Direction of tourism in relation to the environment		
Change since 2005		Ambiguous trends in the direction and development of tourism in relation to the environment.
Last year-on-year change		Evidence of positive (increase in the total number of overnight stays) as well as negative trends in the direction of tourism (e.g. a high share of one-day tourism by foreign visitors) in relation to the environment.
Status (2018)		Since 2005, the highest total number of overnight stays was recorded in 2018. The average number of overnight stays is stagnating.
Visitor statistics for caves		
Change since 2005		Visits to caves are decreasing, there is an insufficient number of information centres in protected areas.
Last year-on-year change		There was a year-on-year decrease in the number of visitors to caves.
Status (2018)		In 2018 more than 630,000 visitors visited the caves managed by the Slovak Caves Administration.
Erosion, endangerment of small-area protected areas and the number of stations		
Change since 2005		A registered increase in erosion and endangerment of the so-called small-area protected areas and the number of stations due to tourism.
Last year-on-year change		A slight year-on-year recorded increase in erosion on cycle routes and marked hiking trails in some areas. A slight rise in endangerment of the so-called small-area protected areas and a fall in the number of stations due to tourism.

Status (2018)		Occurrence of erosion-affected marked trails and cycling trails in national parks.
Environmental economy		
Costs of enterprises and municipalities for environmental protection		
Change since 2005		Environmental protection costs have increased despite volatility.
Last year-on-year change		There was a significant year-on-year increase in environmental protection costs.
Status (2018)		The costs in 2018 were the second highest since monitoring began in 2000. Compared to the previous year the increase was almost 25%.
Material flows		
Resource productivity		
Change since 2005		Since 2005 there has been an increase in resource productivity.
Last year-on-year change		The resource productivity growth trend continued compared to the previous year.
Status (2017)		Despite the recorded growth, resource productivity remains low compared to other EU Member States.
Waste		
Total waste generation		
Change since 2005		Despite fluctuations in individual years, overall waste generation has remained roughly the same.
Last year-on-year change		There has been a year-on-year increase in waste generation.
Status (2018)		The amount of waste generated per capita in the SR is below the EU Member States average.
Generation and management of municipal waste		
Change since 2005		An increase in the amount of municipal waste generated. High landfill rates and low recycling rates persist.
Last year-on-year change		There was a year-on-year increase in municipal waste generation. The total volume of municipal waste landfilled fell only very slightly.
Status (2018)		Although the share of municipal waste per capita of the Slovak population is under the EU average, the unfavourable status of its management (high landfill rate and low recycling rate) persists.
Packaging waste		
Change since 2010		Although total packaging waste generation increased, the rate of recycling and recovery of packaging waste also increased.
Last year-on-year change		A slight decrease in the recovery rate of packaging waste.
Status (2017)		Material recovery for packaging waste was 65.68%. The targets set for packaging waste are being met on an ongoing basis.

COMPONENTS OF THE ENVIRONMENT AND THEIR PROTECTION

AIR

KEY QUESTIONS AND KEY FINDINGS

What is the trend in the generation of pollutants in the Slovak Republic?

Emissions of basic pollutants have significantly decreased over the long term (1990-2017). In 2017 there was a decrease in NO_X, CO, PM_{10} and $PM_{2.5}$ emissions compared to 2016. SO_2 emissions slightly increased. Total NH_3 emissions have continued to decline over the long term after a significant decline between 1990 and 2005.

Emissions of non-methane volatile organic compounds (NMVOC) have fallen over the long term (1990-2017).

When comparing 2000 and 2017, there was a decrease in emissions of Pb, while there was a relatively significant decrease in emissions of Cd and Hg despite their slight increase in 2017 compared to the preceding year.

Emissions of persistent organic pollutants (POPs) significantly decreased in the 1990 to 2005 period. Subsequently, in the 2005 to 2017 period there was a fall in emissions of dioxins and furans (PCDD/PCDF) and polycyclic aromatic hydrocarbons (PAH) and an increase in emissions of polychlorinated biphenyls (PCB). There was an increase in emissions of PCDD/PCDF, PCB and PAH in 2017 compared to 2016.

Are the limit values for air pollutants intended to protect human health being met?

In 2018 the human health protection limit value for 24-hour concentrations was exceeded at 5 PM_{10} monitoring stations and 2 NO_2 monitoring stations. The health protection target value for BaP was also exceeded at 4 monitoring stations.

The reduction in national emissions of ozone precursors did not bring about a decrease in ground-level ozone concentrations in the SR. In 2018 some characteristics of ground-level ozone concentrations remained at their relatively high levels from previous years.

Are the limit values for air pollutants intended to protect vegetation being met?

The limit values of air pollutants (SO_2, NO_X) established for the protection of vegetation were not exceeded. The limit values were exceeded for ground-level ozone.

What is the trend in the status of the ozone layer and the intensity of solar radiation over the territory of the Slovak Republic?

The trend for total atmospheric ozone was below the long-term average of -0.1%, while total daily doses of ultraviolet erythema radiation decreased slightly compared to 2017.

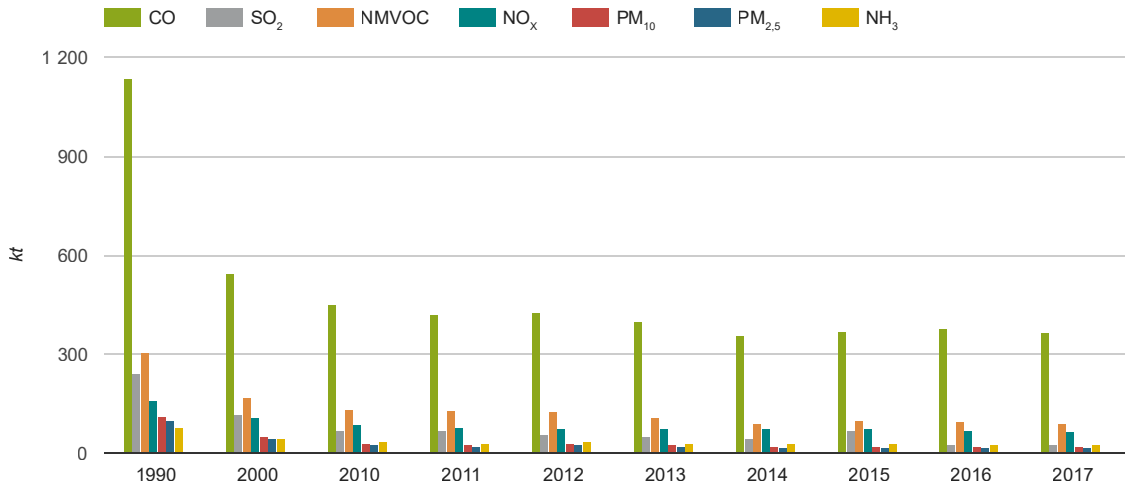
EMISSION SITUATION

Trend in emissions of selected pollutants

Over the long term (1990-2017) a significant decrease in **emissions of basic pollutants** has been recorded. A comparison of the years between 2005 and 2017 shows a **decrease in emissions of SO_2** of **68.6%**, **NO_X** of **36.4%** and **CO** of **34.4%**. The trend in particulate emissions between 2005 and 2017 shows a **decrease of 44%** for **PM_{10}** and **47.4 %** for **$PM_{2.5}$**. A year-on-year comparison (2016-2017) shows a continuation of the slight decrease in emissions, with the exception of SO_2, where a slight rise was recorded.

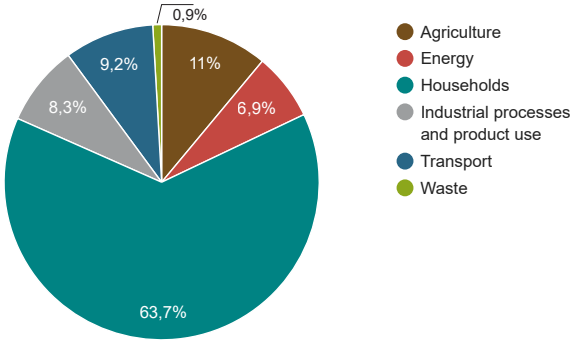
This positive development trend is a result of legislative and technological progress and a change in the fuel base. The trend was also affected by a change in the structure and volume of industrial production.

Chart 001 I Trend in emissions of basic pollutants



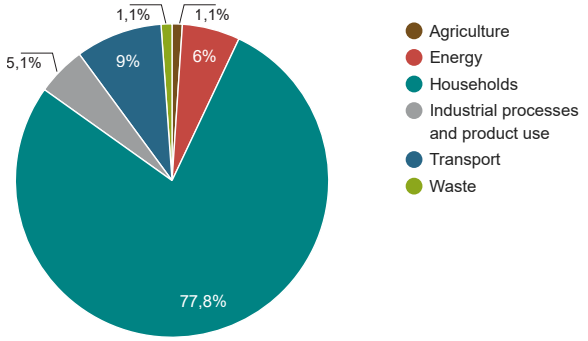
Source: Slovak Hydrometeorological Institute

Chart 002 I Share in emissions of PM_{10} by sector (2017)



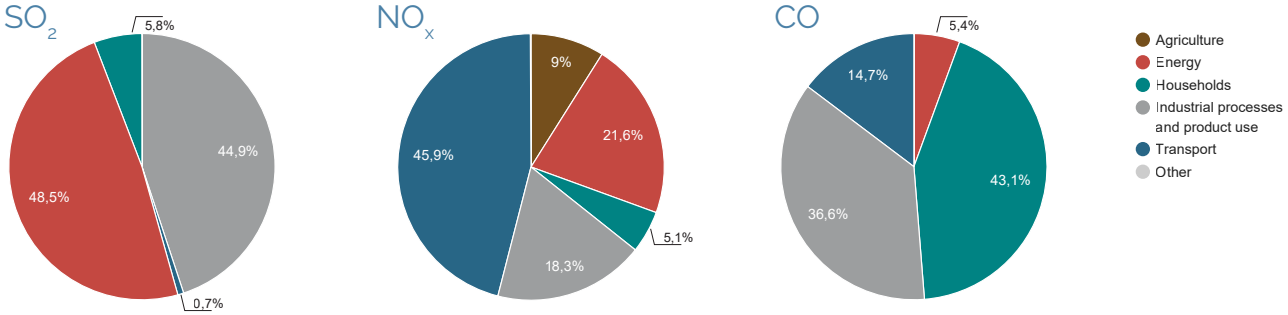
Source: Slovak Hydrometeorological Institute

Chart 003 I Share in emissions of $PM_{2.5}$ by sector (2017)



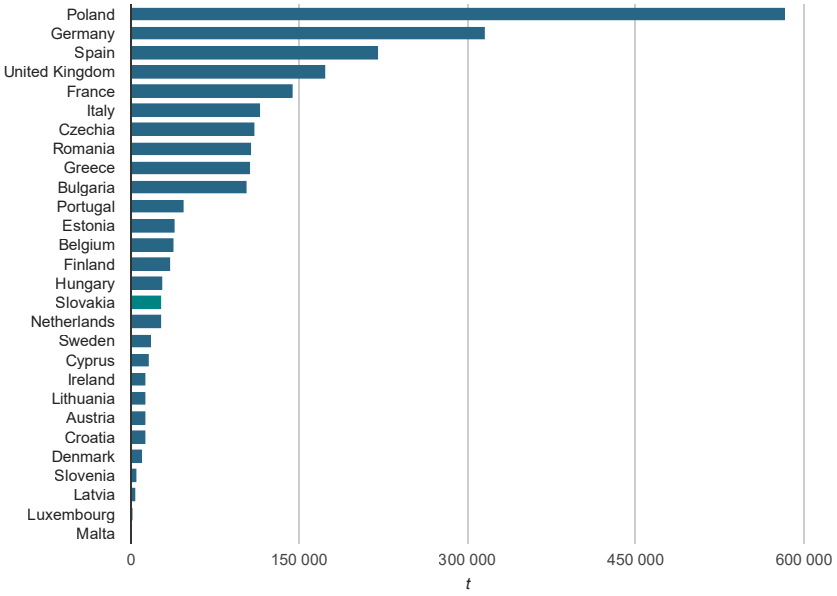
Source: Slovak Hydrometeorological Institute

Chart 004 - 006 I Share in emissions of SO_2, NO_X and CO by sector (2017)



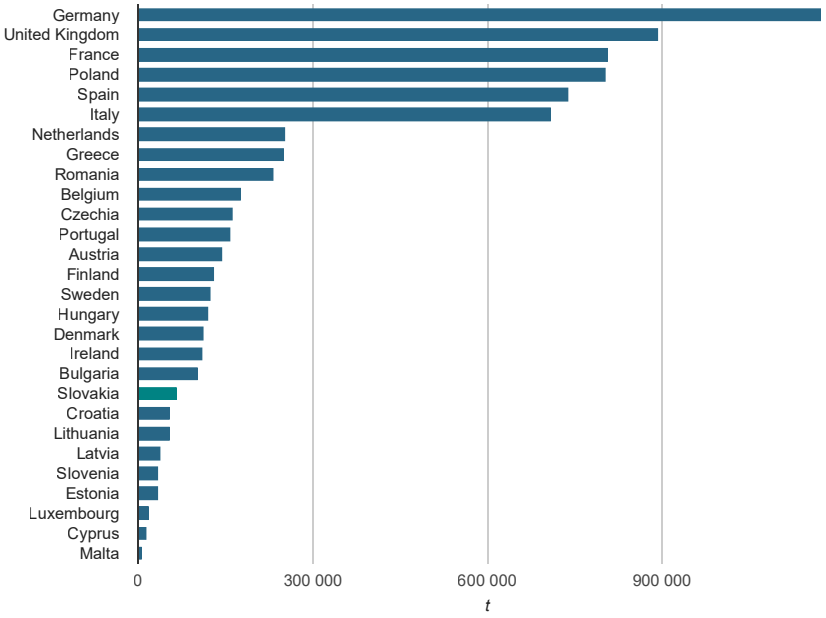
Source: Slovak Hydrometeorological Institute

Chart 007 I International comparison of emissions of SO_2 (2017)



Source: Eurostat

Chart 008 I International comparison of emissions of NO_X (2017)

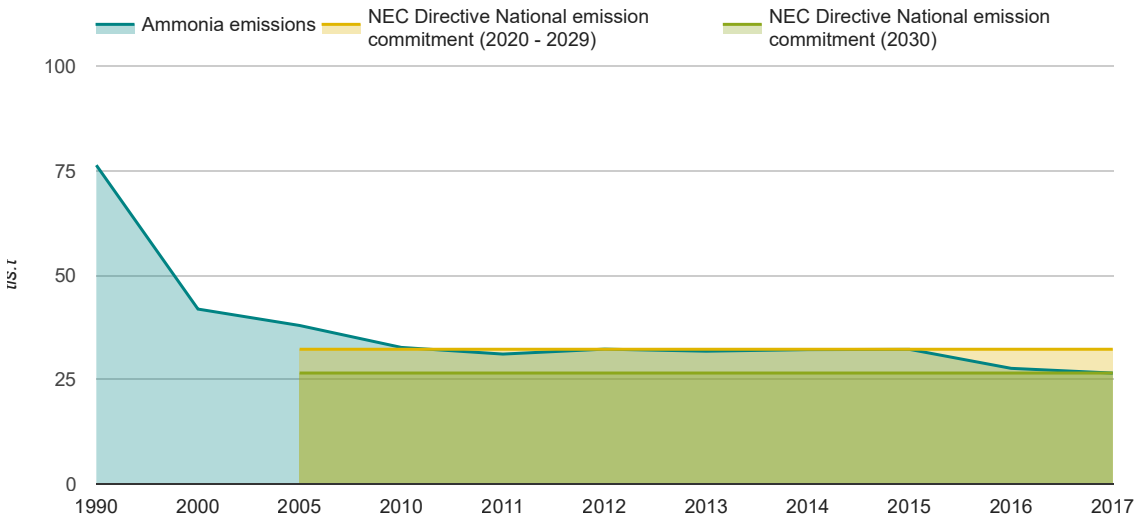


Source: Eurostat

The generation of emissions of **ammonia (NH_3)** in 2017 was 26 545 tonnes, a slight decrease compared to 2016.

From the perspective of the longer-term trend, ammonia emissions **fell in 2017 by 30% compared to 2005**.

Chart 009 I Trend in emissions of ammonia from the perspective of compliance with international commitments

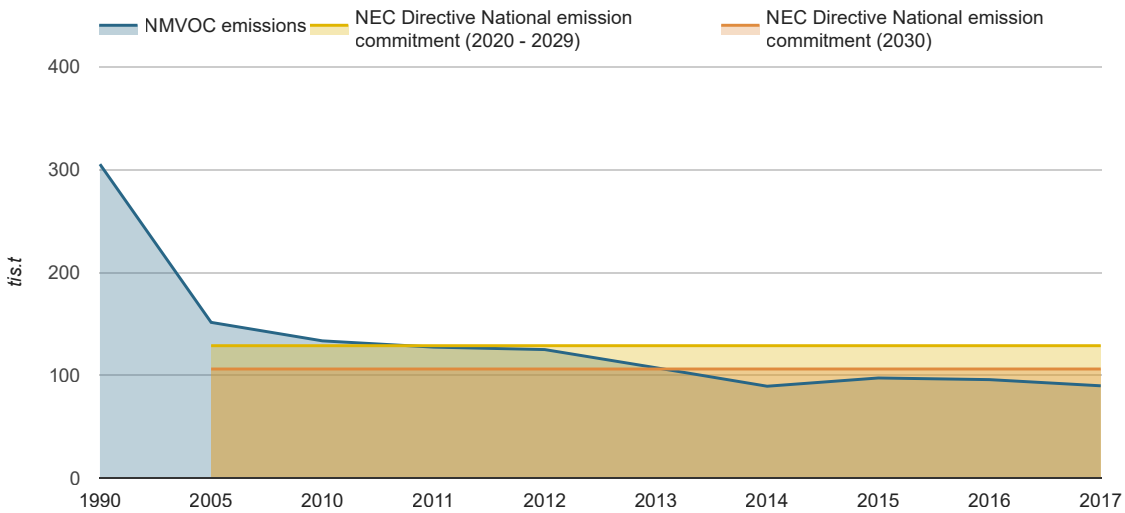


Source: Slovak Hydrometeorological Institute

There has been a long-term decrease in **emissions of non-methane volatile organic substances (NMVOC)**. A comparison of 2005 and 2017 shows a **decrease of 40.8%**.

Since 2000 the trend in NMVOC emissions has been a slight decrease and their quantity is holding at an approximately constant level with slight fluctuations in individual years.

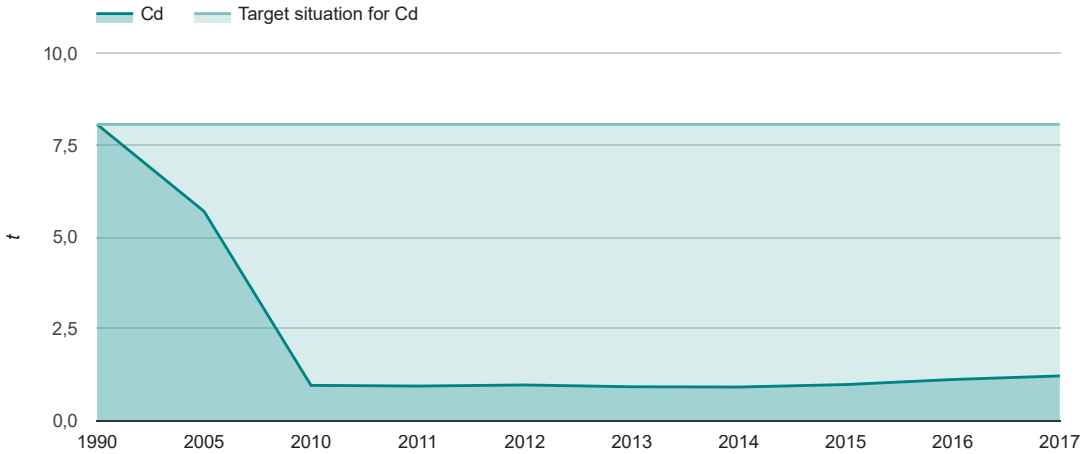
Chart 010 I Trend in NMVOC emissions from the perspective of compliance with international commitments



Source: Slovak Hydrometeorological Institute

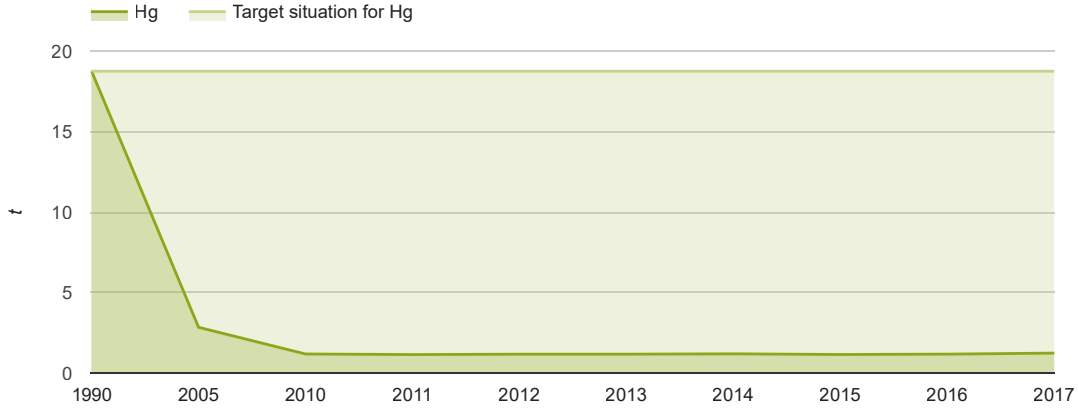
Emissions of heavy metals have significantly decreased compared to their values from 1990. In recent years emissions of heavy metals have been characterised by slight fluctuations. A comparison of 2005 and 2017 shows a **decrease in emissions of Pb of 18.5%, Cd of 78.7% and Hg of 56.2%**. In 2017 a slight rise in emissions of Cd, Hg and Pb was recorded compared to 2016.

Chart 011 I Trend in cadmium emissions into the air from the perspective of compliance with international commitments



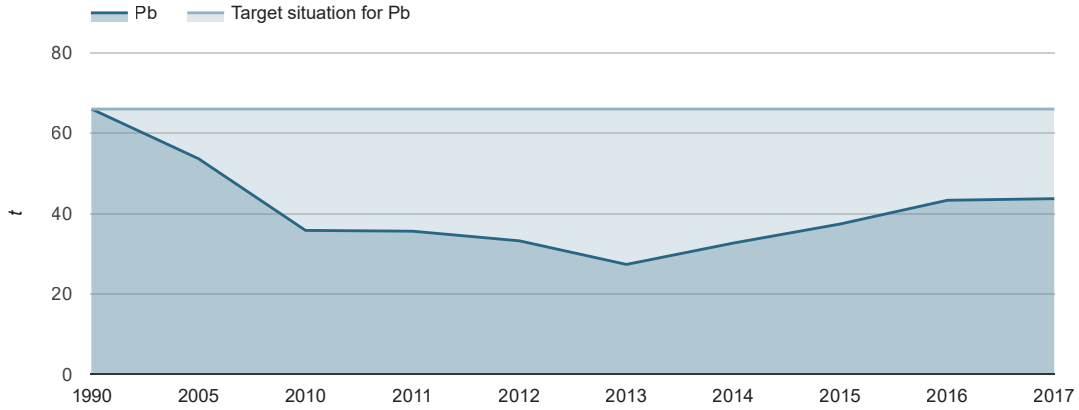
Source: Slovak Hydrometeorological Institute

Chart 012 I Trend in mercury emissions into the air from the perspective of compliance with international commitments



Source: Slovak Hydrometeorological Institute

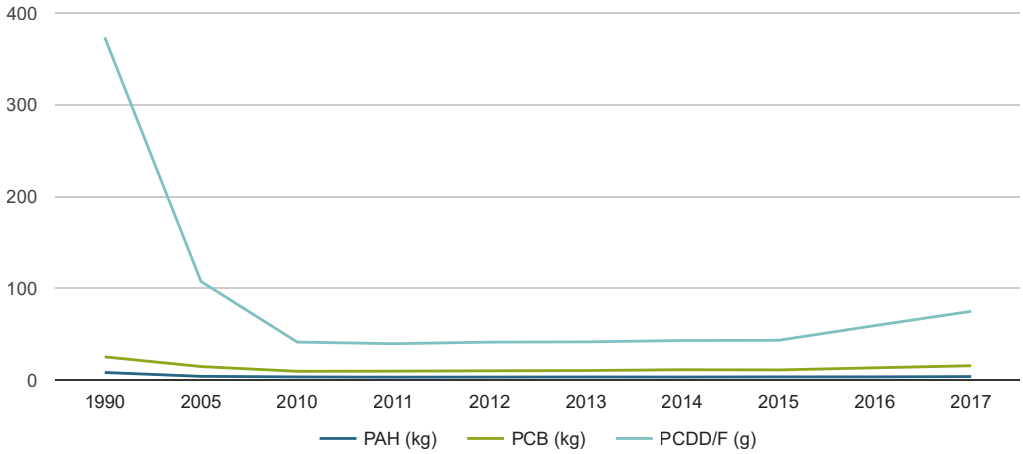
Chart 013 I Trend in lead emissions into the air from the perspective of compliance with international commitments



Source: Slovak Hydrometeorological Institute

Emissions of persistent organic pollutants (POPs) significantly decreased in the 1990 to 2000 period. Subsequently, there was a **decrease in emissions of dioxins and furans (PCDD/PCDF)** between 2005 and 2017 **of 30.2%, and of 5.8% for polycyclic aromatic hydrocarbons (PAH)** accompanied by a **slight rise of 5.9%** in the case of **emissions of polychlorinated biphenyls (PCB)**. There were year-on-year increases in emissions of PCDD/PCDF, PCB and PAH.

Chart 014 I Trend in emissions of persistent organic pollutants

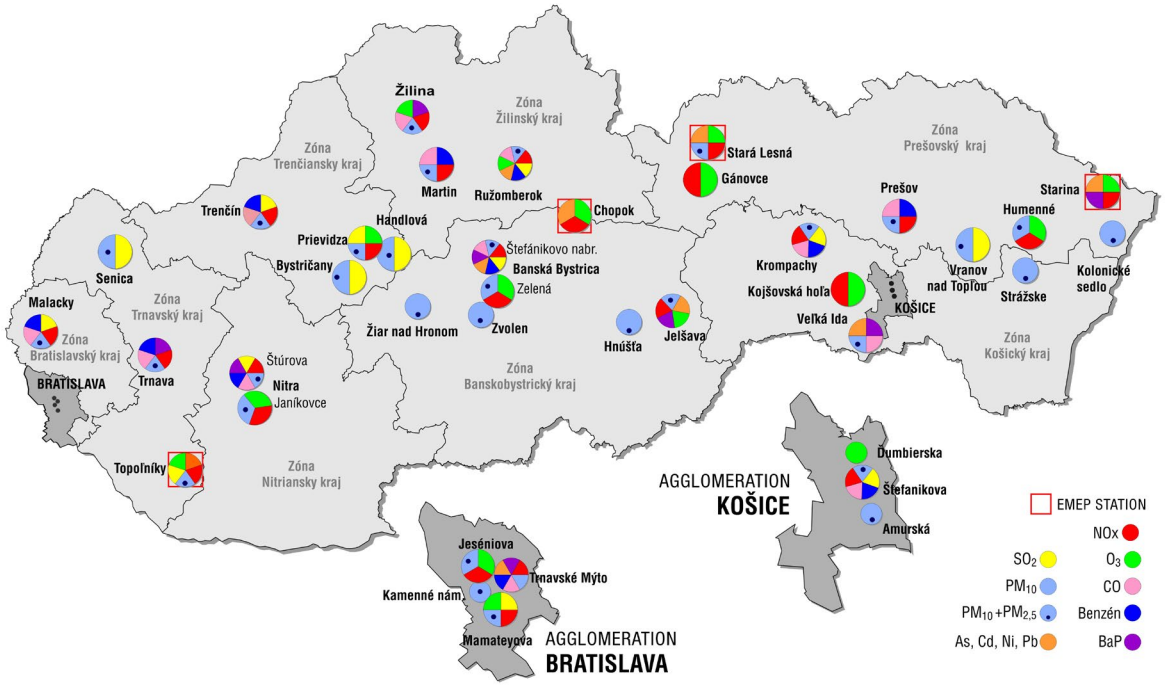


Source: Slovak Hydrometeorological Institute

The **Aarhus Protocol on Persistent Organic Pollutants** was signed in 1998, **an addition to the Geneva Convention on Long-Range Transboundary Air Pollution**, the goal of which is to reduce POPs emissions to 1990 levels. The SR signed this protocol in the same year. The target is still being met.

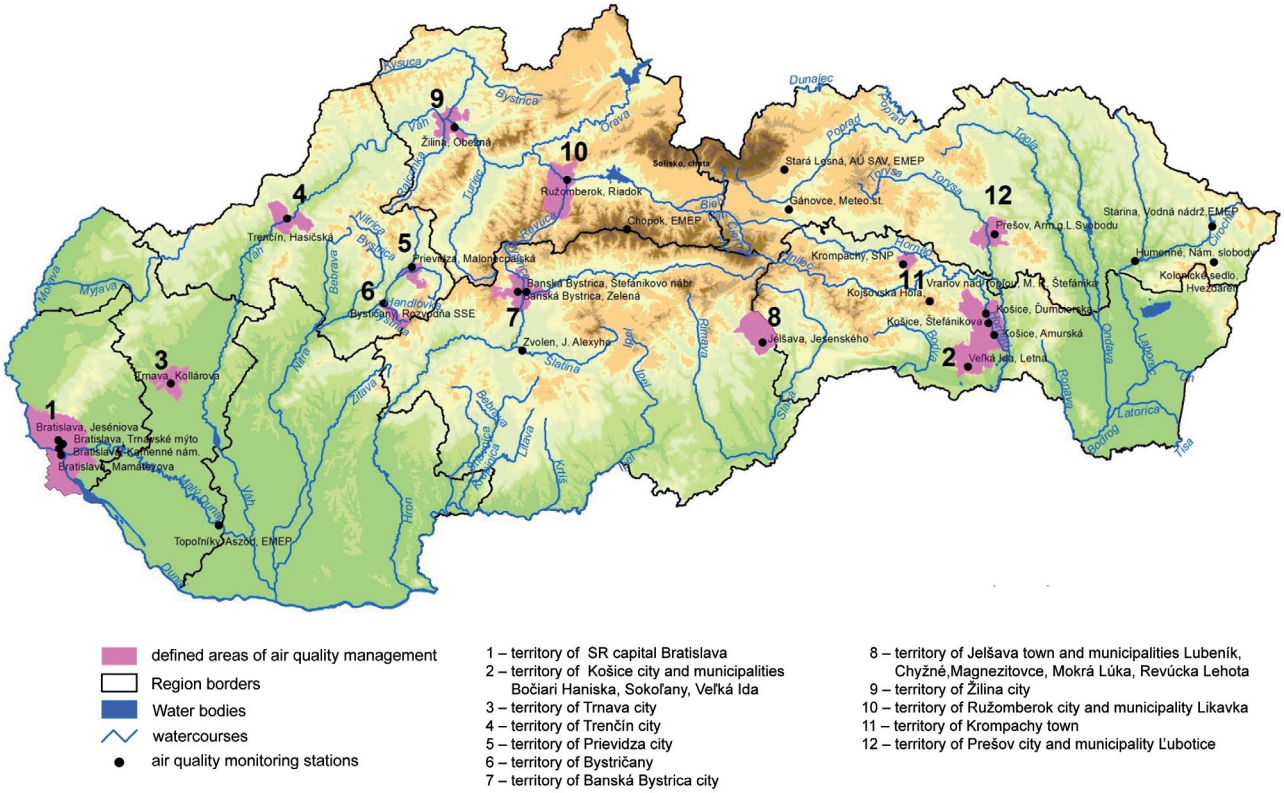
EMISSION SITUATION

Map 002 I National air quality monitoring network



Source: Slovak Hydrometeorological Institute

Map 003 I Air quality management areas



Source: Slovak Hydrometeorological Institute

SULPHUR DIOXIDE

In 2018 the limit value for average hourly and average daily SO_2 values was not exceeded in any agglomeration or zone. Also, no alert thresholds were exceeded at monitoring stations in the Slovak Republic this year.

The critical value for vegetation protection is 20 µg/m³ per calendar year and winter period. This limit value was not exceeded at any EMEP station during 2018, either for the calendar year or winter period. All the values were below the lower limit for vegetation protection.

NITROGEN DIOXIDE

In 2018 the annual limit value for NO_2 was exceeded at the Bratislava, Trnavské mýto and Prešov, Arm. gen. L. Svobodu stations. The limit value for hourly concentrations for human health protection was not exceeded at any monitoring station. In 2018 no alert threshold was exceeded for NO_2.

The critical value for vegetation protection (30 µg/m³ per calendar year expressed as NO_X) was not exceeded at any EMEP station in 2018. Values were well below the lower limit for vegetation protection.

PM_{10}

In 2018 the permitted number of cases of exceeding limit values for average annual PM_{10} concentrations did not occur at any monitoring station. The limit value for 24-hour concentrations for human health protection was exceeded at five AMS: Košice, Štefánikova; Banská Bystrica, Štefánikovo nábr.; Jelšava, Jesenského; Veľká Ida, Letná and Trenčín, Hasičská. PM10 monitoring adequately covers the territory of Slovakia.

$PM_{2,5}$

For $PM_{2.5}$ particles only an annual limit is set, at 25 µg/m³. In 2018 this value was not exceeded at any monitoring station.

The health-related consequences arising from air pollution depend on the size and composition of the particles and are more severe the smaller the particles. European and, since implementation, also Slovak legislation have therefore shifted attention to $PM_{2.5}$. One of the indicators that should characterise the burden on the population through increased $PM_{2.5}$ concentrations is the average exposure indicator (AEI), which is defined for the relevant year as the continuous mean concentration averaged over all sampling sites for the past 3 years. Pursuant to Annex No 11 to Decree 360/2010, a limit value of 20 µg/m³ should be achieved in 2020. The value of the average exposure indicator in 2018 was 18.1 µg/m³.

CARBON MONOXIDE
The limit value for CO was not exceeded at any monitoring stations in Slovakia in 2018, while air pollution for the previous 2012 to 2018 period was also under the lower limit.

BENZENE
The highest benzene level was measured at the Krompachy, SNP station in 2018, however the average annual concentrations were significantly under the limit value of 5 µg/m^3.

Pb, As, Ni, Cd
Neither the limit value nor the target value were exceeded in 2018.
Average annual concentrations of heavy metals measured at National Air Quality Monitoring Network stations are mostly only a fraction of the target, respectively limit, value.

BaP
The average annual concentration BaP at the Veľká Ida, Letná; Banská Bystrica, Štefánikovo nábr.; Žilina, Obežná and Jelšava, Jesenského stations exceeded the target value of 1 ng/m^3. The exceeding of the target value at the AMS at Veľká Ida may be attributed to industrial activity (mainly coke production) and partly to household heating; in Jelšava household heating using solid fuel had a significant impact, while at the other two stations the most significant problem in relation to BaP was road transport. BaP at all stations except Veľká Ida is characterised by significantly higher values in the colder half of the year, partly influenced by unfavourable dispersion conditions.

Ground-level ozone

Annual averages of ground-level ozone concentrations in the SR in 2018 were in the interval of 36 to 95 µg/m^3. The highest average annual ground-level ozone concentration in 2018 was recorded at the Chopok station (95 µg/m^3).

The target value for human health protection for ground-level ozone concentration is 120 µg/m^3 (maximum daily 8-hour value) pursuant to Decree of the Ministry of the Environment of the SR No 244/2016 on air quality. This value must not be exceeded for more than 25 days in a year over an average of three years. An overview of when the target value was exceeded for the 2016 to 2018 period is provided in the following map. Neither the warning threshold (240 µg/m^3) nor the reporting threshold (180 µg/m^3) for alerting the public and for warning the public were exceeded in 2018.

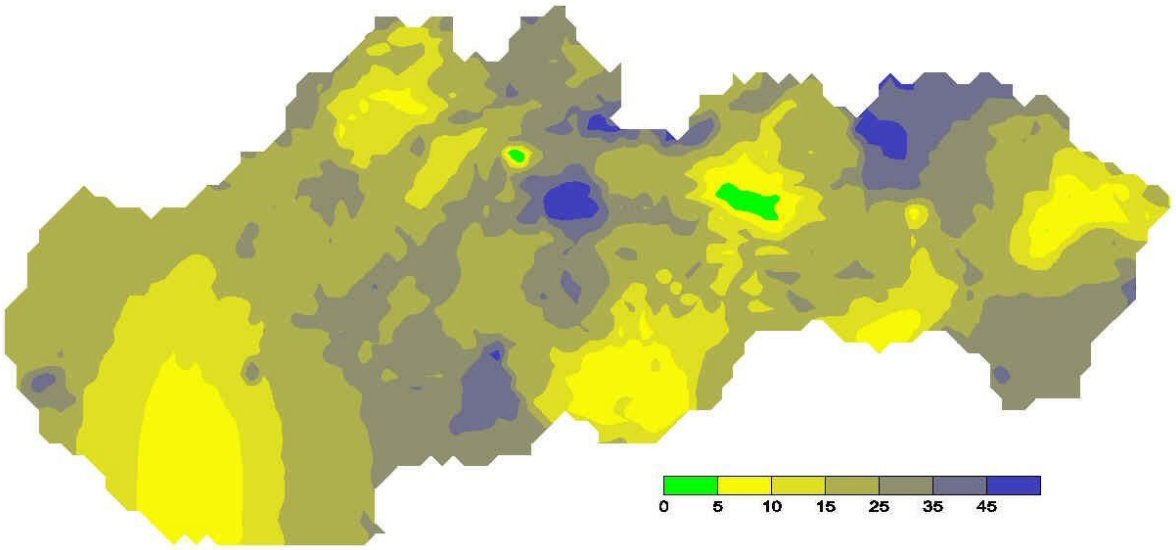
Table 002 I Number of days when the target value for human health protection was exceeded

Station	2016	2017	2018	Average 2015-2018
Bratislava, Jeséniova	11	38	54	**34**
Bratislava, Mamateyova	6	22	33	20
Košice, Ďumbierska	8	10	16	11
Banská Bystrica, Zelená	2	17	20	13
Jelšava, Jesenského	9	11	11	10
Kojšovská hoľa	20	23	41	28
Nitra, Janíkovce	17	42	44	**34**
Humenné, Nám. slobody	3	7	2	**4**
Stará Lesná, AÚ SAV, EMEP	4	3	33	13
Gánovce, Meteo. st.	0	0	4	1
Starina, Vodná nádrž, EMEP	5	3	7	5
Prievidza, Malonecpalská	*0	19	9	14
Topoľníky, Aszód, EMEP	7	8	6	7
Chopok, EMEP	28	*31	82	**55**
Žilina, Obežná	6	3	12	7
Ružomberok, Riadok	0	0	1	0

** this year was not included in the average due to a lack of data in the summer period values*
in bold in red *mean the target value was exceeded.*
Colouring: ■ > = 90 % of required valid measurements

Source: Slovak Hydrometeorological Institute

Map 004 I Number of days in which the target value of ozone for human health protection (120 µg/m³) was exceeded (2016-2018)

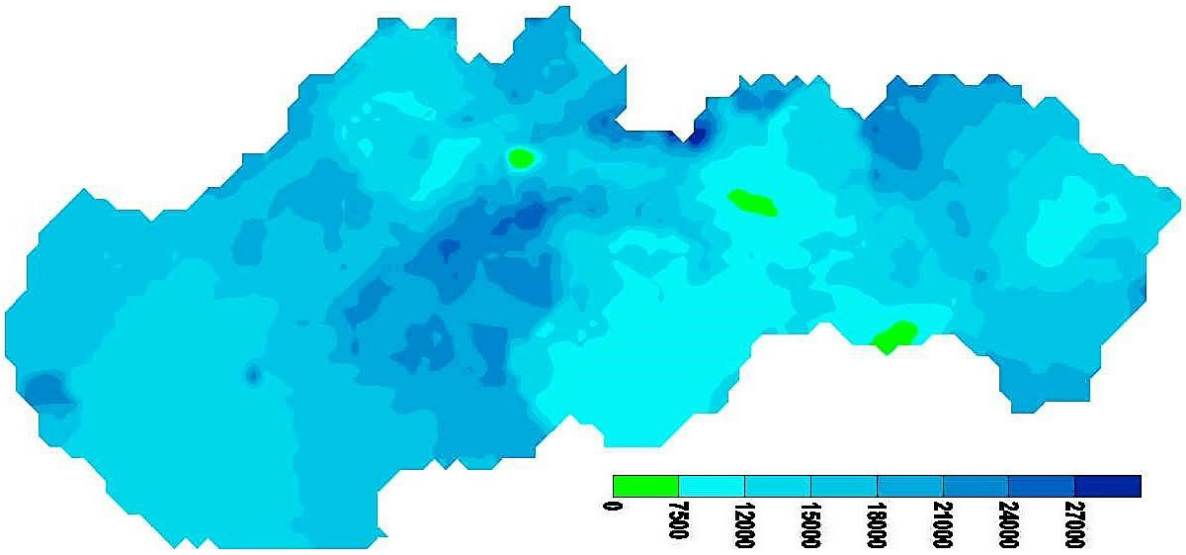


Note: IDWA interpolation results

Source: Slovak Hydrometeorological Institute

The target value of the AOT40 exposure index for the protection of vegetation is 18 000 µg/m³/h. This value refers to concentrations calculated as an average for a five-year period. The average for 2014 to 2018 was exceeded at the Bratislava-Jeséniova, Banská Bystrica-Zelená, Nitra-Janíkovce and Chopok stations.

Map 005 I Average AOT40 values (µg/m³/h) for a five-year period (2014-2018) for the protection of vegetation



Note: IDWA interpolation results

Source: Slovak Hydrometeorological Institute

WATER

KEY QUESTIONS AND KEY FINDINGS

What is the status and trend in the use of water from the perspective of conserving water resources?

The percentage of total abstraction from outflow from the territory of the SR after 2000 did not even reach 10%, with the exception of 2002 to 2004.

Surface water abstraction after 1995 showed a significant fall, despite minimal year-on-year increases and decreases. In 2018 abstraction had fallen by 71% compared to 1995 and, compared to 2005, by 56.0%. Abstraction decreased year-on-year by 4.0% between 2017 and 2018.

Groundwater abstraction also recorded a decrease after 1995, however since 2005 it has shown a balanced character with minimal year-on-year increases and decreases. In 2018 abstraction had decreased by 41.4% compared to 1995 and by 9.5% compared to 2005. There was a year-on-year increase of 1.31%.

Is surface water pollution caused by waste water discharge decreasing?

Since 1995 the volume of waste water discharged into surface water has been decreasing despite year-on-year fluctuations. In 2018 waste water generation had decreased compared to 1995 by 48.9%, by 32.3% compared to 2005 and by 2.4% compared to 2017. In 2018 the amount of pollution characterised by the BOD_5, COD_{Cr} and P_{total} parameters decreased, while N_{total} was at approximately at the same level as the year before.

In 1993 51.5% of the population was connected to a public sewerage system, while this had increased to 56.7% in 2005 and the figure was 68.40% in 2018.

Are the requirements for surface water quality being met?

Groundwater quality at all monitored sites complied with the limits for selected general indicators and radioactivity indicators in 2018. Limits were exceeded primarily for synthetic and non-synthetic substances, hydrobiological and microbiological indicators and for general indicators, primarily nitrite.

Pursuant to the requirements of the framework water directive, water quality is expressed through the ecological and chemical status of surface water bodies. A bad and very bad ecological status of surface water bodies was recorded in 8.94% of the total number of water bodies, which is 2,159.41 km long. 37 surface water bodies (2.4%) did not achieve good chemical status.

Are groundwater quality requirements being met?

Surveillance monitoring and operational monitoring identified cases where established groundwater pollution limits were exceeded in 2018.

There were 11 groundwater bodies in a bad chemical status (14%).

What is the quality of drinking water?

Slovakia has enjoyed a high level of drinking water quality for a long period of time. In 2018 the share of drinking water analyses meeting the limits reached 99.75%, while in 2000 it was 98.64%.

The number of inhabitants supplied through the public water supply reached 89.25% in 2018. In 1993, this figure was 4 138 000 (77.8%) and in 2005 it was already 4 605 000 inhabitants (85.4%).

What is the water quality at natural bathing pools?

The classification of bathing waters within the meaning of Directive 2006/7/EC was performed at 32 natural sites. 18 bathing localities were classified as having excellent bathing water quality, 9 localities had good bathing water quality, one locality was adequate and one inadequate. During the bathing season, the limit value for the intestinal enterococcus indicator was exceeded at the Ružín locality in the Košice district.

REVIEW OF WATER RESOURCES

Water balance

The annual inflow into the SR was 53 795 million m³ in 2018, 7 304 million m³ less than in 2017. **Outflow** from the territory fell compared to the preceding year by 8 702 million m³, while the decrease in the outflow from the SR was 2 203 million m³.

Total water reserves in storage reservoirs as of 1 January 2018 was 1 032.66 million m³, or 89.01% of the exploitable volume of water in the storage reservoirs. As of 1 January 2019 the total exploitable volume of the assessed storage reservoirs compared to 1 January 2018 fell to 726.4 million m³, or 63% of the exploitable volume of water.

Table 003 I Overall water balance of water resources

	Volume (million m³)		
	1996	**2000**	**2018**
Hydrological balance			
Precipitation	41 127	37 500	32 286
Annual inflow to the SR	65 465	77 999	53 795
Annual outflow	79 996	90 629	65 075
Annual outflow from Slovak territory	12 842	12 842	8 823
Water management balance			
Total abstraction in the SR	1 336,80	1 172	573.26
Evaporation from reservoirs	46.89	60.00	58.48
Release into surface water	1 160.31	989.80	599.60
Impact of reservoirs	144.87	32.98	306.40
	Accumulation	**Augmentation**	**Augmentation**
Total reserves in reservoirs as of 1 January of the following year	857.3	757.0	726.4
% of storage volume in accumulation reservoirs in the SR	69	65	63
% of total abstraction from the outflow from Slovak territory	10.4	9.1	6.5

Source: Slovak Hydrometeorological Institute

SURFACE WATER

Precipitation and runoff conditions

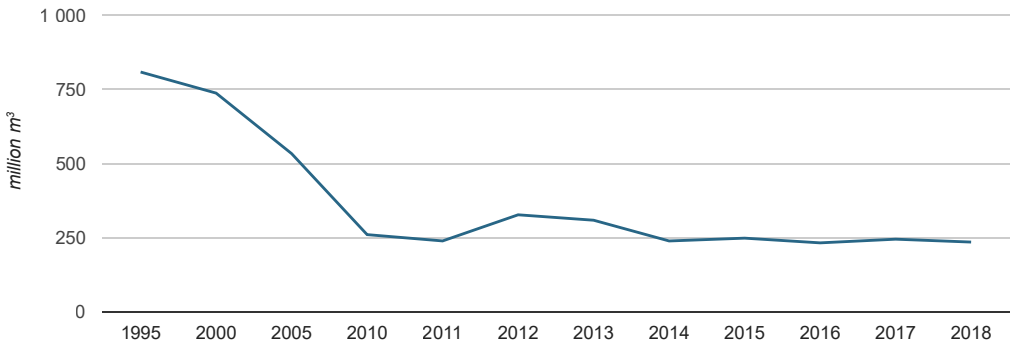
Total precipitation in the SR reached 673 mm in 2018, or 88% of the normal, and the year was assessed as dry in terms of precipitation.

The annual outflow quantity reached 77% of the long-term average in the SR. The values for the outflow quantity in river basins was between 57% and 92% of normal.

Surface water use

In 2018 total abstraction of surface water decreased by 4.0% compared to the preceding year. Abstraction for industry recorded a decrease of 2.5%, while a decrease of 1.2% was recorded for the abstraction of surface water for the public water supply. The abstraction of surface water for irrigation decreased to 12.95 million m³, a decrease of 26.5%.

Chart 015 I Trend in the abstraction of surface water



Source: Slovak Hydrometeorological Institute

Table 004 I Use of surface water (million m³)

Year	Public water supply	Industry	Irrigation	Other agriculture	Total abstraction	Discharge
1995	71.963	661.836	74.325	0.0360	808.159	1 1120.290
2005	53.828	467.957	11.006	0.0110	532.791	871.865
2018	46.940	174.470	12.950	0.0200	234.380	599.600

Source: Slovak Hydrometeorological Institute

Assessment of surface water quality

Surface water quality at all monitored sites complied with the limits for selected general and radioactivity indicators in 2018. The most cases where limit values for general indicators were exceeded (Part A of the Government Regulation) were for the nitrite indicator in all parts of river basins. Surface water quality requirements for synthetic and non-synthetic substances (Part B and C of the Government Regulation) were not met for the indicators As, Zn, Cu, Cr, total cyanides, 4-metyl-2.6-di-terc butylfenol and PCB and its congeners. The annual average of the environmental quality standard (EQS) was exceeded for Cd, Ni, Pb, di (2-ethylhexyl) phthalate (DEHP), fluoranthene, pentachlorophenol, and 4-tert-octylphenol. Of the group of hydrobiological and microbiological indicators (Part E), the following parameters were not met: the saprobic index of biosestone, phytoplankton abundance, chlorophyll a, coliforms, thermotolerant coliforms, intestinal enterococci and cultured microorganisms at 22°C.

Table 005 I Number of monitored sites and indicators not meeting general surface water quality requirements for indicators A and E (2018)

International river basin	Sub-basin	Number of monitored sites in the sub-basin		Indicators that do not meet surface water quality requirements pursuant to Annex No 1	
		monitored	not meeting requirements	general indicators (A)	hydrobiological and microbiological indicators (E)
Danube	Morava	53	36	O_2,COD_{Cr},BOD_5,EC (conductivity),pH,$N\text{-}NH_4$,$N\text{-}NO_2$,$N\text{-}NO_3$, N_{total}, P_{total}, Ca,Al, AOX	abundance of phytoplankton, chlorophyll a, saprobic index of biosestone, cultivable microorganisms at 22°C
Danube	Danube	20	15	O_2, EC (conductivity),pH,$N\text{-}NH_4$,$N\text{-}NO_2$,$N\text{-}NO_3$, N_{total}, Ca, AOX	coliform bacteria, enteric cocci, cultivable microorganisms at 22°C
Danube	Váh	179	148	O_2, BOD_5, COD_{Cr}, pH, EC (conductivity), $N\text{-}NH_4$, $N\text{-}NO_2$, $N\text{-}NO_3$, P_{total}, Fe, Mn, V, FN, N_{total}, Norg., Cl-, SO_4^{2-}, Ca, AOX, Al, DS_{105}, DS_{550}, F^-, TOC	abundance of phytoplankton, enteric cocci, thermotolerant coliform bacteria, saprobic index of biosestone, coliform bacteria, cultivable microorganisms at 22°C
Danube	Hron	47	30	O_2, BOD_5,COD_{Cr}, pH, EC (conductivity),$N\text{-}NO_2$,$N\text{-}NO_3$, $N\text{-}NH_4$, N_{total}, P_{total}, Ca, AOX	saprobic index of biosestone, chlorophyll a, cultivable microorganisms at 22°C
Danube	Ipeľ	33	25	O_2,COD_{Cr}, EC (conductivity), $N\text{-}NH_4$,$N\text{-}NO_2$, $N\text{-}NO_3$, N_{total}, P_{total}, Ca, AOX	cultivable microorganisms at 22°C
Danube	Slaná	15	9	O_2, COD_{Cr}, pH, EC (conductivity), $N\text{-}NO_2$, $N\text{-}NO_3$, $N\text{-}NH_4$, N_{total},P_{total}, Ca,AOX	coliform bacteria, enteric cocci, thermotolerant coliform bacteria, cultivable microorganisms at 22°C
Danube	Bodrog	49	47	O_2, BOD_5, COD_{Cr}, EC (conductivity), $N\text{-}NH_4$, $N\text{-}NO_2$, $N\text{-}NO_3$, N_{total}, P_{total}, Ca, AOX, NPE_{UV}	abundance of phytoplankton, saprobic index of biosestone, thermotolerant coliform bacteria, enteric cocci, coliform bacteria, cultivable microorganisms at 22°C
Danube	Hornád	32	26	O_2, BOD_5, COD_{Cr}, EC (conductivity), Ca, $N\text{-}NH_4$, $N\text{-}NO_2$, $N\text{-}NO_3$, N_{total}, P_{total}, SO_4^{2-}, AOX, F^-, Al, NPE_{UV}	saprobic index of biosestone, abundance of phytoplankton, enteric cocci, thermotolerant coliform bacteria, coliform bacteria, cultivable microorganisms at 22°C
Danube	Bodva	10	9	O_2,COD_{Cr},EC (conductivity), $N\text{-}NO_2$, $N\text{-}NO_3$, $N\text{-}NH_4$, N_{total}, P_{total}, Ca, AOX, NPE_{UV}	enteric cocci, coliform bacteria, thermotolerant coliform bacteria, cultivable microorganisms at 22°C
Visla	Dunajec and Poprad	14	9	O_2, BOD_5, COD_{Cr},$N\text{-}NH_4$,$N\text{-}NO_2$, P_{total}, NPE_{UV}	coliform bacteria, thermotolerant coliform bacteria

Source: Slovak Hydrometeorological Institute

Table 006 I Indicators not meeting the general requirements for surface water quality for Indicators B and C (2018)

International river basin	Sub-basin	Indicators not meeting the general requirements for surface water quality pursuant to Annex No1	
		non-synthetic substances (B)	synthetic substances (C)
Danube	Morava	Ni (AA)	FLU (AA), CN (AA), 4-m-2.6-tBTP (AA), octylphenol (AA), B(a)P (AA) *, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA,MPC)*, Indenopyrene (AA)*, TBT (AA)*
Danube	Danube		B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Váh	As (AA),Cu (AA),Cr (AA)	FLU (AA), 4-m-2.6-tBTP (AA), Octylphenol (AA/AA*), B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA*), B(ghi)perylene (AA,MPC)*, Indenopyrene (AA*), TBT (AA*)
Danube	Hron	As (AA),Cu (AA),Zn (AA),Pb (AA)	PCP (AA*,MPC*), Octylphenol (AA*), TBT (AA*), FLU (AA,MPC), B(a)P (AA*), B(b)fluoranthene (AA*), B(ghi)perylene (AA*), Indenopyrene (AA*)
Danube	Ipeľ	Cd (AA,MPC),Pb (AA),Zn (AA)	FLU (AA), B(a)P (AA*), B(b)fluoranthene (AA*), B(k)fluoranthene (AA*), B(ghi)perylene (AA*), Indenopyrene (AA*)
Danube	Slaná	Pb (AA)	FLU (AA), B(a)P (AA*), B(b)fluoranthene (AA*), B(ghi)perylene (AA*), Indenopyrene (AA*)
Danube	Bodrog		DEHP (AA), FLU (AA), CN (AA), PCB (AA), TBT (AA)*, B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Hornád		CN (AA), Cybutryne (AA), TBT (AA)*, B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Bodva	As (AA)	B(a)P (AA)*, B(ghi)perylene (AA)*
Visla	Dunajec and Poprad		CN (AA), B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*, TBT (AA*)

** potentially does not meet water quality requirements pursuant to Government Regulation of the SR No 269/2010 and Government Regulation of the SR No 167/2015 (< 12 measurements per year)*
AA – annual average exceeded
MPC - maximum permissible concentration exceeded

Source: Slovak Hydrometeorological Institute

Assessment of the status of surface water bodies

The assessment of the ecological status of surface water bodies, performed for the needs of the second river basin management plan currently in force, is based on the monitored 2009 to 2012 period and covers 1 510 surface water bodies.

Very good and good ecological status/potential was recorded in 56.2% of the total number of water bodies with a total length of 8 073.43 km. 34.8% of the water bodies, or a length of 7 565.46 km, were found to be in an average environmental status. Bad and very bad status was determined in around 9% of the water bodies with a length of 2 159.41 km.

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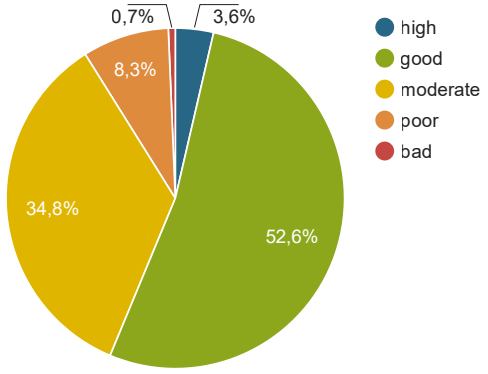
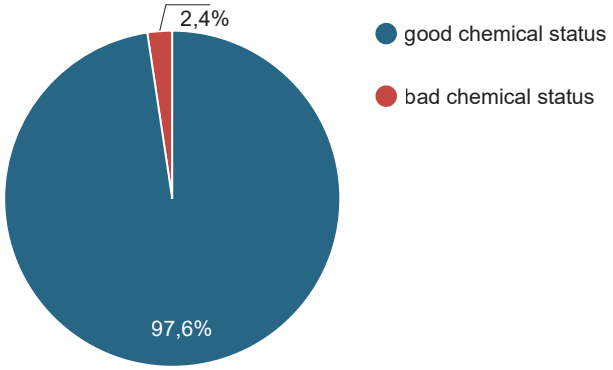
The assessment of the **chemical status** of surface water bodies in the 2009 to 2012 period was performed for 1 510 surface water bodies. Good chemical status was determined for 1 473 of the bodies (97.6%), while 37 (2.4%) surface water bodies did not achieve good chemical status.

Chart 016 I Ecological status/potential of surface water bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

Chart 017 I Chemical status of surface water bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

GROUNDWATER

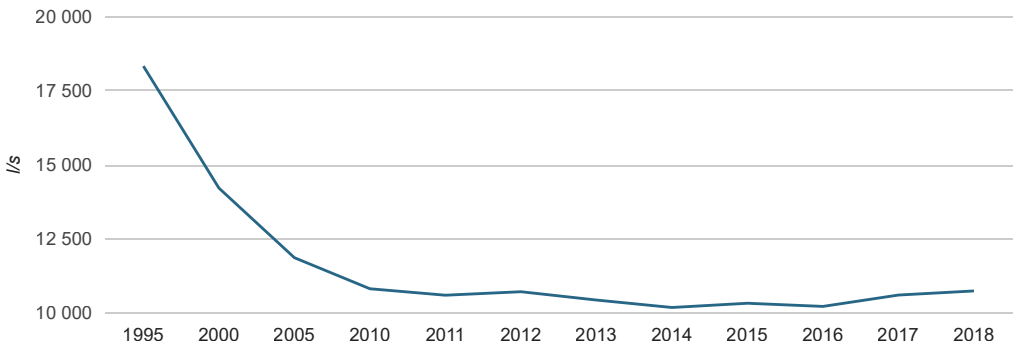
Water resources

In 2018 there was **77 117.8 l/s of exploitable groundwater** in the SR, a slight rise of 0.76% compared to the previous year. In a long-term assessment, there has been an increase in the exploitable amount compared to 1990 of 3.1%. The ratio of the exploitable amount of groundwater to abstracted amount was approximately at the level of 2017, and reached 7.17.

Use of groundwater

In 2018 10 745.8 l/s of groundwater was used on average, or 13.93% of the documented exploitable amount. During 2018 a groundwater abstraction increase of 1.31% compared to 2017 was recorded.

Chart 018 I Trend in the use of groundwater



Source: Slovak Hydrometeorological Institute

There was an increase in water consumption in the majority of industries with the exception of abstraction for public water supply purposes, social purposes, crop production and irrigation, where there was a decrease in the use of groundwater compared to 2017. Groundwater abstraction in the 'other use' category increased most, by 228.7 l/s.

Table 007 I Use of groundwater (l/s)

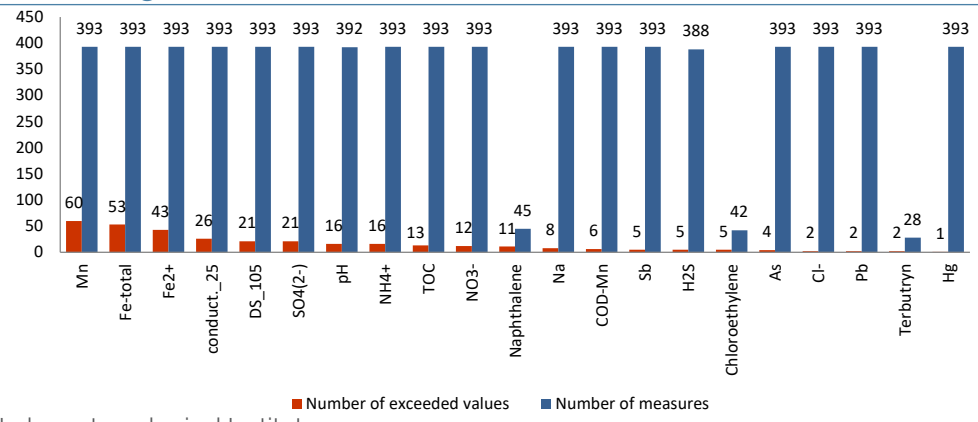
Year	Public water supply	Food industry	Other industry	Agricultural and animal production	Crop production and irrigation	Social purposes	Other uses	Total
1995	14 373.10	390.60	2 327.20	727.10	25.00	286.50	202.70	18 332.20
2005	9 159.87	288.25	856.75	308.82	95.07	279.72	878.98	11 867.46
2018	7 843.90	250.10	831.20	227.80	107.70	192.50	1 292.60	10 745.80

Source: Slovak Hydrometeorological Institute

Groundwater quality monitoring

Groundwater quality is monitored in 176 surveillance monitoring sites. These are sites of the Slovak Hydrometeorological Institute monitoring network or springs not affected by point sources of pollution.

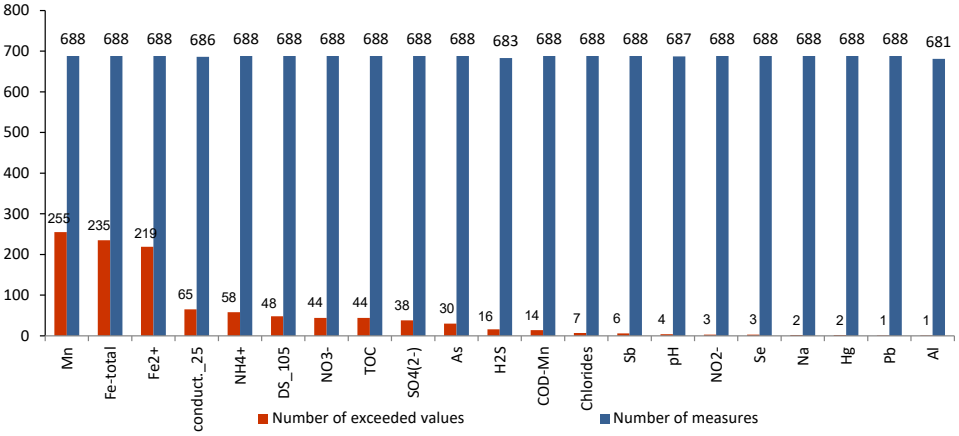
Chart 019 I Frequency of exceeded selected groundwater quality indicators in surveillance monitoring sites (2018)



Source: Slovak Hydrometeorological Institute

Operational monitoring was carried out in all groundwater bodies assessed as threatened from the perspective of failure to achieve good chemical status. 220 sites supposed to detect any penetration of pollution into groundwater from a potential source of pollution or a group of them, were monitored.

Chart 020 I Frequency of exceeded selected groundwater quality indicators in operational monitoring sites (2018)



Source: Slovak Hydrometeorological Institute

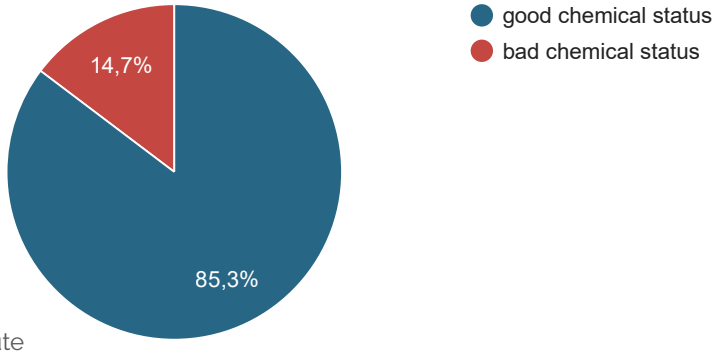
Assessment of the status of groundwater bodies

An assessment of the status of groundwater bodies was carried out for the needs of the second river basin management plan in force and is based on the 2009 to 2012 reference period.

Of the total number of 75 groundwater bodies, the following were assessed:

- 11 groundwater bodies in bad chemical status - 7 quaternary and 4 pre-quaternary
- 64 groundwater bodies in good chemical status

Chart 021 I Chemical status of groundwater bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

Good chemical status was indicated for 85.3% of the groundwater bodies, or a surface area of 46 507 km² (77.9% of the total area of the bodies). Bad status was indicated in 14.7% of the groundwater bodies, or an area of 13 215 km² (22.1% of the total area of the bodies).

In the SR 3 groundwater bodies were assessed as in bad quantitative status.

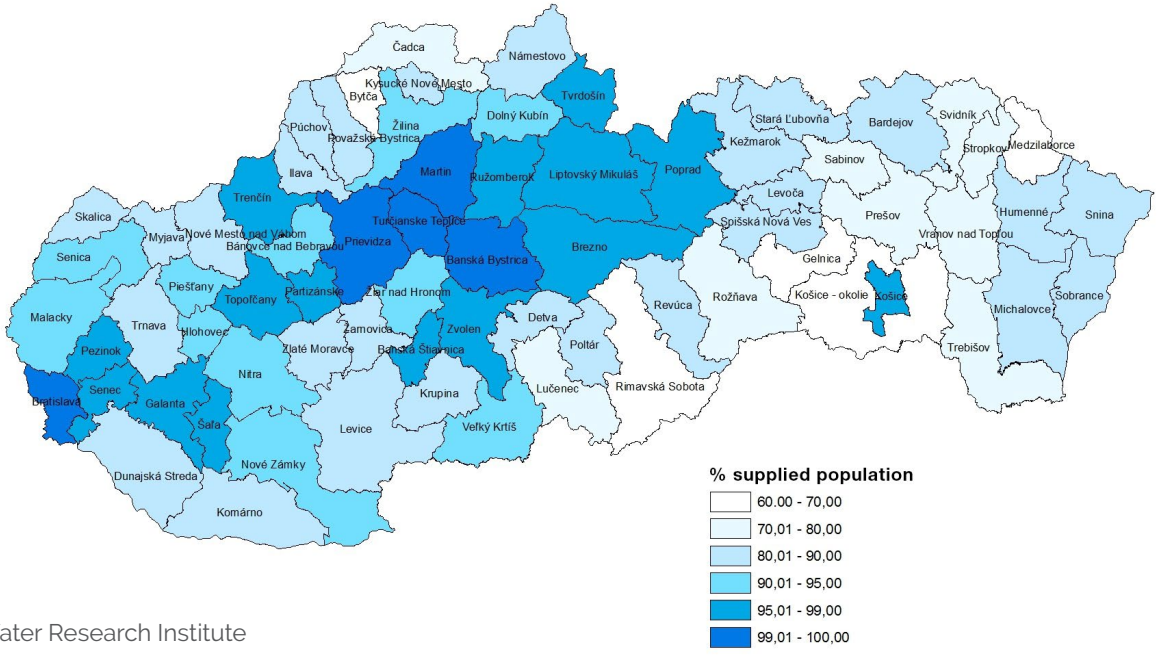
SUPPLYING THE POPULATION WITH DRINKING WATER

Supplying the population with water from the public water supply system

The number of inhabitants supplied with water from the public water supply system in 2018 reached 4 859 940, or 89.25% of the total population. In 2018 there were 2 416 independent municipalities in the SR supplied with drinking water from the public water supply system and their share of the total number of municipalities in the SR was 83.60%.

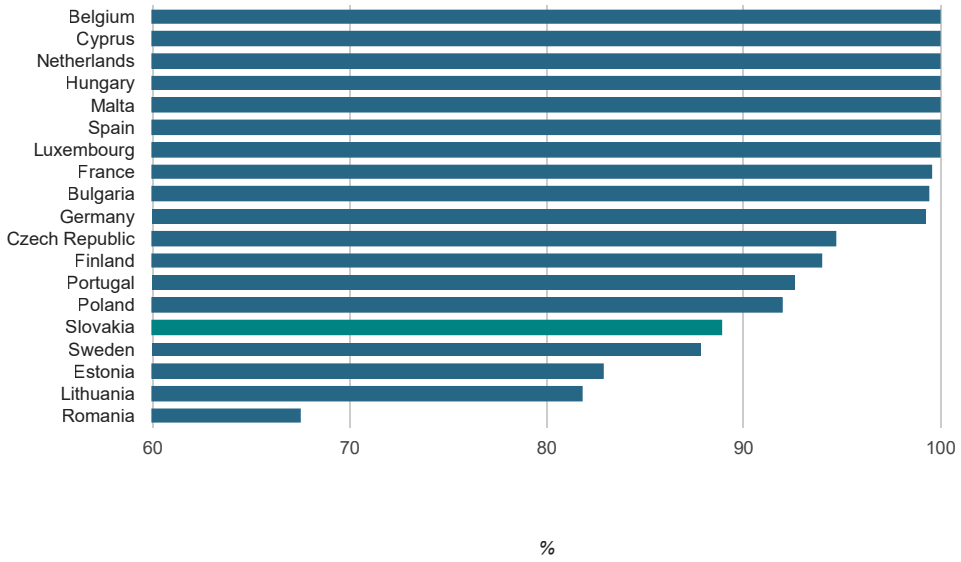
The quantity of drinking water generated reached 291.77 million m³, which was approximately at the level of 2017. Of the total water produced in water management facilities, water losses in the pipeline network were 24.1% in 2018. Specific water consumption in households slightly increased to 77.97 l/person/day.

Map 006 I Share of inhabitants supplied from the public water supply system (2018)



Source: Water Research Institute

Chart 022 I International comparison of population connected to the public water supply system (2017)



Source: Eurostat

Monitoring and assessment of drinking water quality

Indicators for drinking water quality are defined through Decree of the Ministry of Health of the SR No 247/2017, which determines details about drinking water quality, drinking water quality control, and the programme for the monitoring and management of risks relating to the drinking water supply. In addition to a complete analysis of the water, for control and acquisition of regular information about the stability of the water source and the effectiveness of the water treatment, in particular disinfection, about the biological quality and sensory properties of drinking water, a minimum analysis – meaning an examination of 26 water quality and free chlorine, respectively chlorine dioxide, indicators – is performed.

In 2018, 18 942 samples of drinking water were analysed in the operational laboratories of water companies through 486 666 analyses for individual drinking water indicators. The percentage of drinking water analyses meeting hygiene limits reached 99.75% in 2018. The percentage of samples complying with all drinking water quality indicators reached 95.45%. These percentages do not include free chlorine indicators.

The disinfection of drinking water is primarily carried out using the chemical process of chlorination. Decree of the Ministry of Health of the SR No 247/2017 determines a limit value of 0.3 mg/l for the content of free chlorine in drinking water. If water is disinfected using chlorine, the minimum value of free chlorine in the distribution network need not be 0.05 mg/l.

The percentage of analyses that did not comply with Decree of the Ministry of Health of the SR No 247/2017 due their exceeding the 0.3 mg/l value was 1.85% in 2018. The requirement of Decree of the Ministry of Health of the SR No 247/2017 for the minimum content of free chlorine (0.05 mg/l) was not complied with by 12.42% of drinking water samples.

WASTE WATER REMOVAL AND TREATMENT

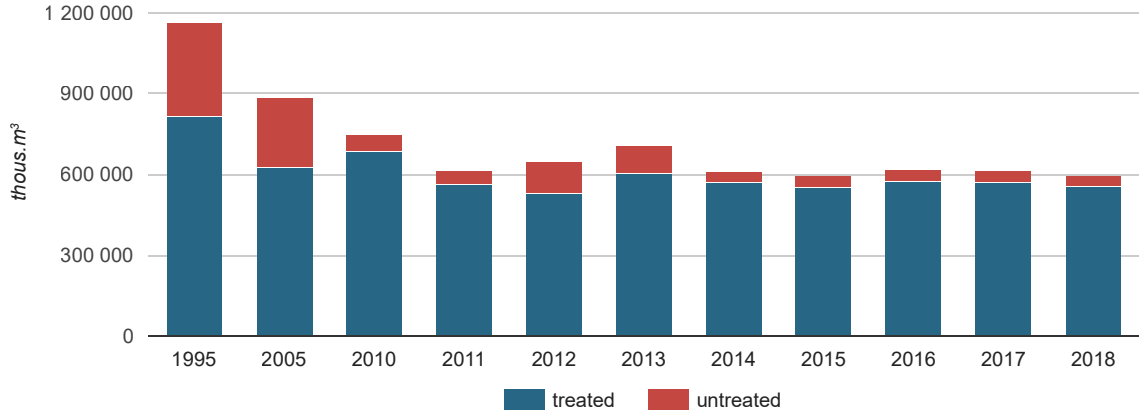
Waste water generation

In 2018 the total quantity of **waste water** discharged into surface water was 597 133 000 m^3 which, compared to the preceding year, was a decrease of 2.4%, while compared to 2005 it was a decrease of 32.3%.

Compared to the preceding year a decrease was recorded in the indicators for the contamination of waste water – chemical consumption of oxygen dichromate (COD_{Cr}) of 933 t/year, biological oxygen demand (BOD_5) of 289 t/year and total phosphorus (P_{total}) of 11 t/year. Total nitrogen (N_{total}) and insoluble substances (IS) were approximately at the level of 2017 and there was only an increase in the indicator for non-polar extractables NPE_{uv} of 2.51 t/year.

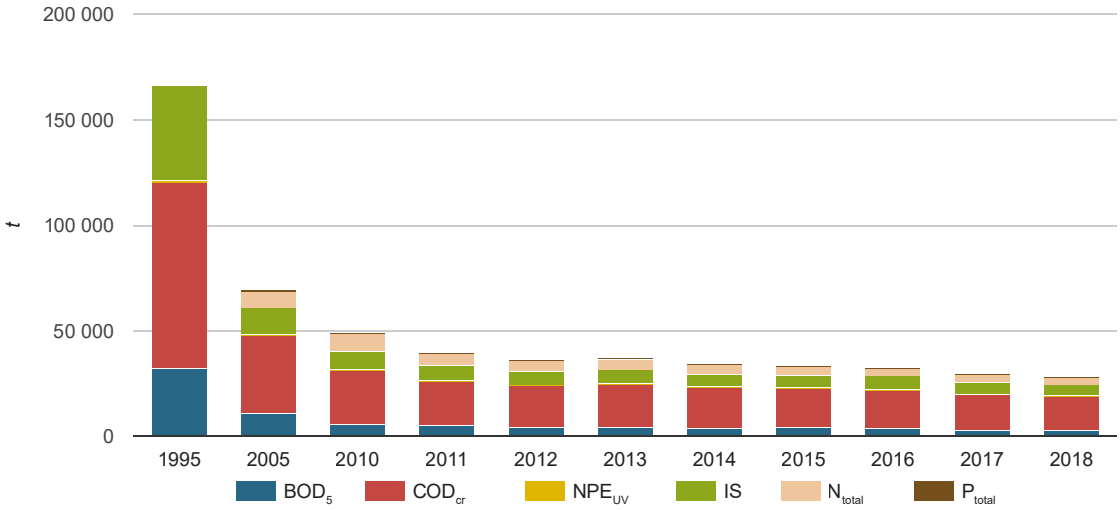
The percentage of discharged treated waste water to the **total quantity of waste water** discharged into watercourses was 93.06% in 2018.

Chart 023 I Trend in the discharge of treated and non-treated waste water into watercourses



Source: Slovak Hydrometeorological Institute

Chart 024 I Contamination of waste water discharged into surface water



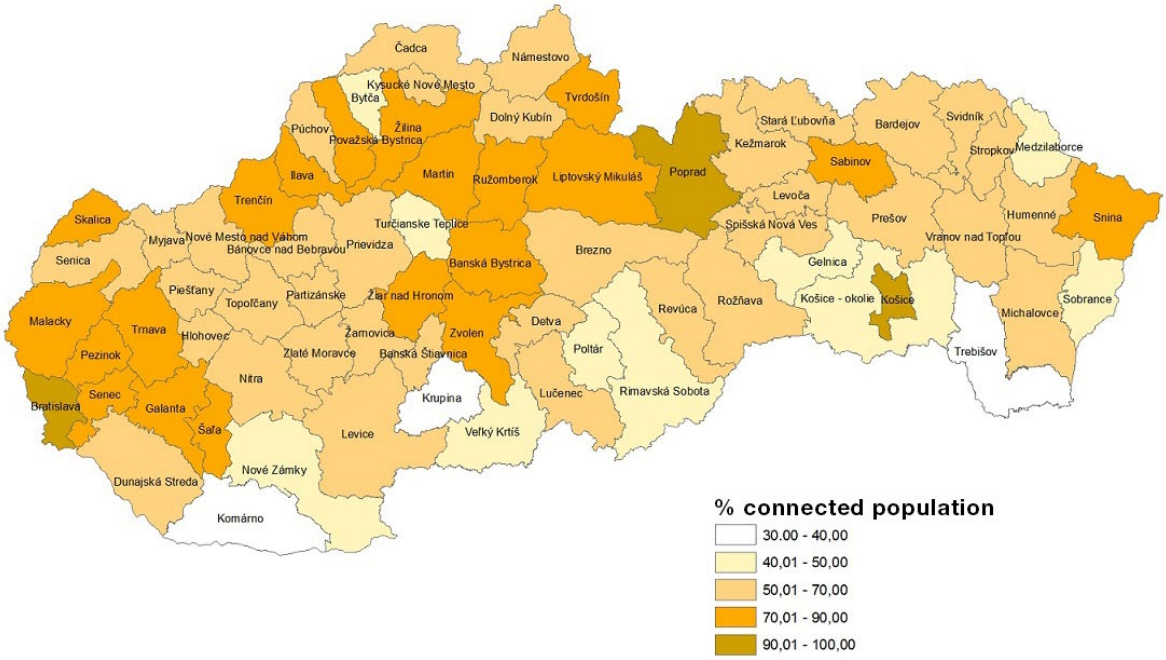
Source: Slovak Hydrometeorological Institute

Waste water collection

The number of people living in houses **connected to a public sewerage system** reached 3 724 000, or 68.40% of the total. 1 128 municipalities (39.03% of the total number of municipalities SR) had constructed a public sewerage system.

One of the goals of **Envirostrategy 2030** is to increase the percentage of treated waste water and achieve 100% collected and treated waste water in agglomerations with over 2 000 population equivalent. For agglomerations with under 2 000 population equivalent, the goal is 50% collected and treated waste water. In 2016, the share of inhabitants connected to a public sewerage system in the 2 047 agglomerations in the size category under 2 000 population equivalent was 26.09%. In the 356 agglomerations in the size category over 2 000 population equivalent the share was 84.12%.

Map 007 I Share of population connected to a public sewerage system (2018)



Source: Water Research Institute

Waste water treatment

In 2018, 706 waste water treatment plants were managed by water companies, municipal authorities and other entities, most of which were mechanical/biological WWTPs. The total capacity of these waste water treatment plants in 2018 was 2 422 200 m^3/day.

Sewage sludge is a necessary by-product of the waste water treatment process. In 2018 the total generation of sludge from treatment plants for municipal waste water was 55 929 t of sludge dry matter, while 44 659 t of sludge dry matter was recovered (79.85%).

Table 008 I Sludge generated in waste water treatment plants (t)

Year	Sludge quantity (tonnes of dry matter)							
	Total	Recovered			Disposed of			Temporarily stored
		application on agricultural land	application on forest land	composting and other recovery	energy recovery	incinerated	stored	
2005	56 360	5 870	0	33 250	0	0	8 530	8 710
2010	54 760	923	0	47 140	0	0	16	6 681
2018	55 929	0	0	32 982	11 677	0	2 451	8 819

Source: Water Research Institute

QUALITY OF BATHING WATER

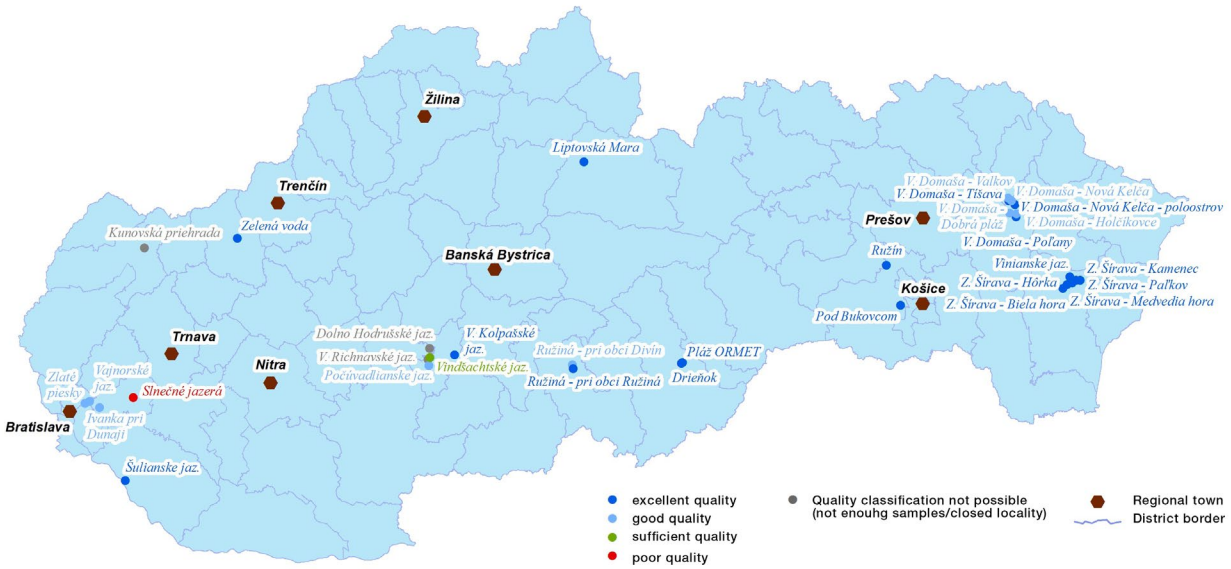
At natural water bodies and artificial bathing pools during the 2018 bathing season, the hygiene situation was monitored by the public health authorities in accordance with **Act No 355/2007, on the protection, promotion and development of public health and on amendments and supplements to some other Acts, as amended, as well as Decree of the Ministry of Health of the SR No 308/2012, on requirements for water quality, water quality control and on the requirements for the operation and equipping of operating areas, premises and facilities at natural and artificial bathing areas, and Decree of the Ministry of Health of the SR No 309/2012, on the requirements for bathing water.**

During the 2018 season, 82 natural water bodies were subject to detailed assessment, with organised recreation taking place in 15 localities, meaning that these water bodies were operated as natural bathing areas. A total of 468 water samples were taken, on which 4 018 examinations of water quality indicators were carried out. The limit value (LV) of the determined indicators was exceeded in 29.27% of the total number of samples (in 2017 this was 25.44%) and for 6.12% of the total number of indicators (in 2017 this was 4.78%). The findings showed a slight deterioration in water quality in natural bathing areas, while the inadequate water quality depended on weather fluctuations in the majority of cases. 65.45% of the total number of unsatisfactory indicators related to health-insignificant physical/chemical indicators (transparency, colour, oxygen saturation, total organic carbon, pH). Of the unsatisfactory microbiological water quality indicators, the most represented was enteric cocci, followed by *Escherichia coli* and coliform bacteria. In the majority of cases this was only short-term contamination.

In 2018 the SR assessed and classified the quality of bathing water pursuant to the requirements of Directive 2006/7/EC. In the 2018 bathing season, 32 natural water localities were assessed and monitored, which had been classified as so-called bathing localities through generally binding legislation from regional environment authorities. 18 bathing localities were classified by the EC as localities with excellent bathing water quality, 9 localities had good quality bathing water, one locality had sufficient water quality and one locality had insufficient bathing water quality. Due to reconstruction and the discharge of water from reservoirs it was not possible to classify three localities - *Kunovská priehrada, Dolno Hodrušské jazero and Veľké Richnavské jazero* - in 2018.

During the 2018 bathing season, no diseases or health-related complications related to bathing at a natural bathing area were recorded.

Map 008 I Quality of bathing water during the 2018 summer tourism season



Source: Public Health Authority SR, European Commision, Slovak Environmental Agency

ROCKS

KEY QUESTIONS AND KEY FINDINGS

What geological risks most threaten the environment and, ultimately, also human beings?

SSlope deformations are one of the most significant geodynamic processes. In the SR, 21 190 slope deformations covering an area of 257 500 ha, or 5.25% of Slovak territory, have been registered. Landslides accounted for the largest share of slope deformations (19 104).

In recent years, as a consequence of unfavourable climatic conditions, the greatest risk is posed by slope deformations that often directly endanger the lives and property of the population. During 2018, there were several situations when the State Geological Institute of Dionýz Štúr reported emergencies ascertained through monitoring, respectively in 12 cases provided an opinion based on requests from municipalities. In 2018, 9 slope deformations were registered.

In 2018, 5 earthquakes were observed macroseismically in Slovakia, of which 4 with an epicentre in Slovakia and 1 with an epicentre in Poland.

What is the status of use of geothermal energy in the SR?

Geothermal energy has significant potential in the SR. At present, geothermal waters are used at 48 localities mainly for recreation, but also for heating. The total thermal energy potential of geothermal energy is estimated at 6 234 MWt.

ENVIRONMENTAL GEOLOGICAL FACTORS

In 2018 the monitoring of measurements within the framework of **PMS-Geological Factors (PMS GF)** continued in the following subsystems:

- **Landslides and other slope deformations,**
- **Tectonic and seismic activity in the territory,**
- **The impact of mining on the environment,**
- **Monitoring of radon volume activity in the geological environment,**
- **The stability of rock massifs under historical sites,**
- **River sediment monitoring.**

Using the monitoring results, we can monitor emerging threats and subsequently adopt measures sufficiently in advance to prevent emergencies, and thus protect people's lives and health and prevent property damage.

In 2013 the **Landslide Risk Prevention and Management** Programme **(2014-2020)** was adopted and subsequently updated in 2018. Its key goal is to reduce the risk of landslides to lives, property and the environment and prevent degradation of the natural environment, ecosystems and their services by 2020. One of the goals of **Envirostrategy 2030** is to effectively monitor and minimize geological hazards and risks.

Landslides and other slope deformations

Table 009 I Fracturing of Slovak territory through registered slope deformations (Atlas, 2006)

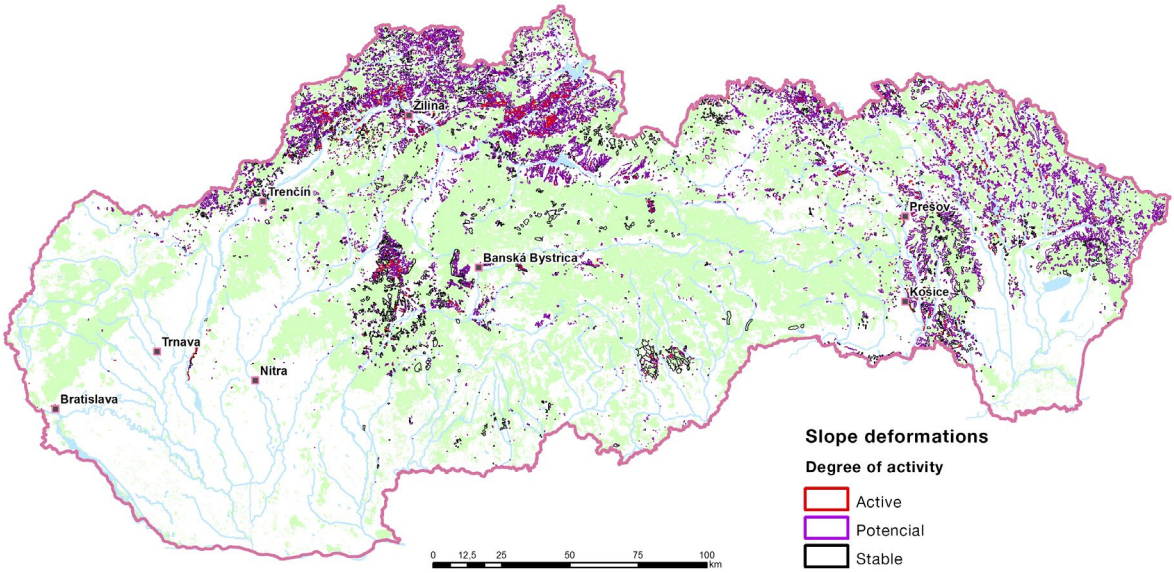
Area	Total area	Area of slope deformations	Fracturing through slope deformations (%)	
	(ha)	(ha)	of the total area	of the damaged area
Total area of the SR	4 903 347	257 591.2	5.25	-
Agricultural land	2 436 876	130 289.9	2.66	50.6
Forests	2 004 100	120 243.3	2.45	46.7
Other area	462 371	7 058.1	0.14	2.7

Source: Ministry of the Environment of the SR

In total, 5.25% of Slovak territory is impacted by slope deformations. 2.66% of the total area of agricultural land is affected, and 2.45% of forest land. However, due to the difficult conditions for machines, some agricultural land affected by slope deformation has ceased to be used for agriculture and is now overgrown, respectively is becoming overgrown, with wild grasses, bushes and even forest growth.

In 2018 a total of 42 localities were monitored. Monitoring of slope movements of the landslide type and indications of tilting activity was carried out.

Map 009 I Map of slope deformations



Source: SGIDS

Tectonic and seismic activity of the area

In 2018 measurements of the movement of the land surface at points included in the EUREF Permanent Network (EPN) were carried out. In addition to the points included in the EPN, on our territory there are other permanent stations suitable for the long-term monitoring of movement. The preliminary processing of the data for 2018 has not indicated significant movement activity at any of the points. 5 earthquakes were observed macroseismically in Slovakia, of which 4 with an epicentre in Slovakia (near Brezno, Komárno, Trenčianske Teplice and Záhorie) and 1 earthquake with an epicentre in Poland.

Neotectonic movements were measured at the Branisko, Demänová, Ipeľ, Banská Hodruša, Vyhne and Dobrá voda localities. The results of measurements taken in 2018 confirmed the long-term trend (since 2000) of a right-hand shear shift in the Branisko tunnel manifesting through the formation of open cracks on both sides of the break. The total shift in the tunnel tube has reached 2.127 mm. At other localities very slow movements, respectively the stagnation of movements between observed blocks, were confirmed.

Impact of mining on the environment

Monitoring of the impact of mining on the environment continued in 2018 at 11 threatened ore mining localities: Pezinok, Štiavnicko-hodrušský rudný obvod, Kremnický rudný obvod, Špania Dolina, Liptovská Dúbrava, Rožňava, Nižná Slaná, Smolník, Slovinky, Rudňany and Novoveská Huta. At these localities the engineering/ecological, hydrogeological and geochemical aspects of the impacts of mining on the environment are monitored through the targeted observation networks of the monitored sites. Within the framework of the monitoring of engineering-geological aspects, the occurrence of new manifestations of surface instability related to undermining and the presence of mining works were recorded at two localities. At the Rudňany-Poráč locality a new roof fall was recorded in the central part of the Banisko roof-fall zone. At the locality Nižná Slaná (the Kobeliarovo deposit), further subsidence was recorded in the crack zone, manifesting through the development of existing, and the origin of new, cracks.

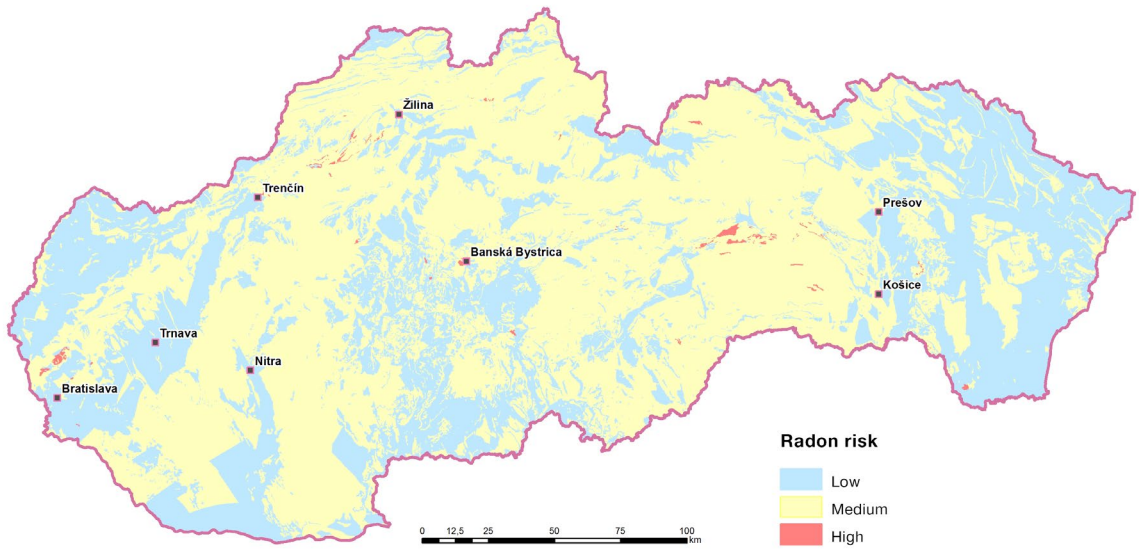
The monitoring of the hydrogeological aspects of the impact of mining on the environment in 2018 also focused primarily on control measurements of the quantity of runoff from the most important drainage sites. Measurements at 10 localities confirmed the sustained hydrodynamically stable runoff regime, closely tied to seasonal changes in total precipitation and air temperature. No changes to the runoff regime caused through human intervention or the collapse of mine corridors were recorded. There is currently a hydrogeologically unstable regime at the Manó siderite deposit in Nižná Slana, where flooding has been occurring since August 2011. A specific drainage status persists at Nová štôlni near Teplička nad Hornádom (Novoveská Huta deposit). Mine water continues to be pumped out with an unchanged regime at the gypsum deposit at Novoveská Huta and at the Mária mine in Rožňava.

In 2018 a persistent status of negative impact on the quality of local surface watercourses through mine waters, drainage waters from tailings ponds and seepage waters from heaps and natural deposit (geochemical) anomalies was documented in the monitored areas. The most unfavourable situation continues to be in the ore deposit areas, primarily Smolník, Liptovská Dúbrava, Špania Dolina, Pezinok, Slovinky and Rudňany.

Monitoring radon volume activity in the geological environment

Localities for measuring soil radon are situated in areas of higher radon risk for residential areas in the larger cities in Slovakia. The monitoring of radon volume activity at fractures was selected based on the results of assessments of basic radon volume activity measurements in soil air at some fracture sites in Slovakia. The monitoring of the concentration of radon in soil air above tectonic dislocations was continued in the Dobrá voda locality in 2018, where the tectonic and seismic activity is monitored. The selection of water sources for radon monitoring is targeted primarily on mineral and thermal springs where high radon values have been recorded in the past.

Map 010 I Map of radon-related risks



Source: SGIDS

The stability of rock massifs under historic sites

In 2018 7 castles – their rocky cliffs – were monitored (Trenčiansky, Pajštúnsky, Uhrovský, Plavecký, Oravský, Spišský and Strečniansky castles), including defects in sites.

Monitoring of river sediments

From the perspective of contamination, streams of the Nitra suffer from long-term pollution (sample sites Chalmová, Lužianky, Nitriansky Hrádok), Štiavnica (mouth), Hron (sample sites Kalná nad Hronom, Kamenica), Hornád (sample site Krompachy) and Hnilec (sample site the inflow to the Ružín reservoir). The polluted Štiavnica, Hron, Hornád and Hnilec streams are geogenic-anthropogenic anomalies tied to the Banská Štiavnica and Spišsko-gemerský ore areas. Anomalous concentrations of some metals (Zn, Pb, As, Sb) indicate a relatively high burden on the area through potentially hazardous substances that persists even after the attenuation of mining in Slovakia. There are also significant levels of mercury and arsenic in the River Nitra originating from the intensive industrial activity in the Horní Ponitrí area. Of the detected content of organic substances, persistent high concentrations of polycyclic aromatic hydrocarbons (PCB) in the river sediments at Laborec (Lastomír site) appear primarily significant. There were repeated findings of high concentrations of polycyclic aromatic hydrocarbons in Kysuce river sediments (Považský Chlmec site) and Latorice (Lelleš site).

GEOTHERMAL ENERGY

In Slovakia there are 27 geothermal areas, respectively sites. These are mainly tertiary basins, or depressions in mountain areas, which are dispersed over a zone created by the Western Carpathians. The medium for the accumulation, transport and exploitation of underground heat from the rock environment is geothermal water, which appears primarily in Triassic dolomites and limestones of inner Carpathian tectonic units, but also in neogene sands, sandstones and conglomerates, respectively in neogeneic andesites and their pyroclastics. The indicated collectors of geothermal waters are located at depths of between 200 and 5 000 m with geothermal water temperatures from 20 to 240°C. The total thermal energy potential of geothermal energy in the defined geothermal areas has been calculated at 6 234 MWt. In these defined areas 152 geothermal wells have already been constructed, which have verified 2 100.4 l/s of water with a temperature at the well mouth of between 18 and 129°C.

Geothermal energy from 62 geothermal boreholes at 48 localities is used with a heat-recovery capacity of 181 MWt, or 1 126.1 l/s of verified geothermal waters. Of the verified amount, an average of 333.6 l/s of geothermal water is abstracted. The use of geothermal waters in Slovakia is focused primarily on recreation and heating.

OLD MINES

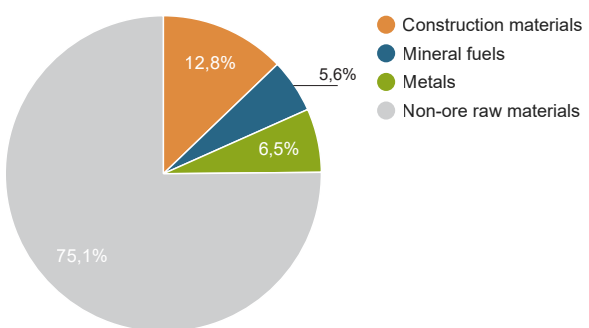
The register of old mining works contains 16 681 old mining works.

BALANCE OF MINERAL DEPOSITS

The Ministry of the Environment of the SR, pursuant to Section 29(4) of Act No 44/1988, on the protection and use of mineral wealth (the Mining Act) as amended, maintains summary records of reserves of reserved deposits and the inventory of mineral reserves in the SR. This deposits register is accessible in the form of an internet application at the website www.geology.sk.

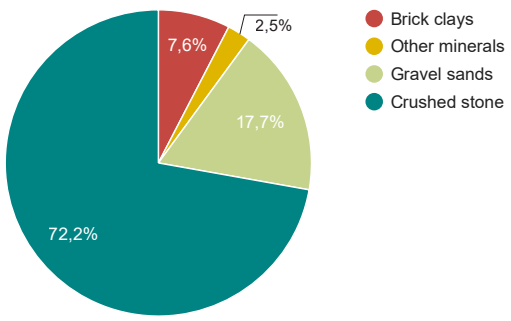
In 2018, geological mineral reserves reached 20 592 million tonnes in reserved deposits with a significant prevalence of non-ore raw materials. Geological reserves in non-reserved deposits were 2 999 million tonnes.

Chart 025 I Reserves of deposits of reserved minerals (2018)



Source: SGIDS

Chart 026 I Reserves of deposits of non-reserved minerals (2018)



Source: SGIDS

SOIL

KEY QUESTIONS AND KEY FINDINGS

What is the status and trends in land use?

The total area of the SR was 4 903 407 ha in 2018, of which agricultural land made up 48.5%, forest land 41.3% and non-agricultural and non-forest land 10.2%. Between 2005 and 2018 there was a decrease in the area of agricultural land of 2.2% (-53 878 ha) to the current 2 379 101 ha. There was an increase recorded in the area of water bodies of 2.1% (+1 915 ha) and forest land of 1% (+20 793 ha), while the highest percentage increase compared to 2005 was for built-up areas and courtyards, of 5.1% (+11 632 ha). The area of agricultural land has continued to fall since 1993, primarily to the benefit of built-up areas and courtyards.

Are limit values for hazardous substances in agricultural land being met?

The development of contaminated soil after 1990 has been very gradual, without significant changes. Soil that was contaminated in the past remains contaminated today. However, almost 99% of the agricultural land fund complies with hygiene requirements. The remainder of the contaminated soil is linked primarily to industrial activity and the so-called geochemical anomalies – mountain and foothill areas. When comparing the 5th monitoring cycle (sampling year 2013) with the preceding 4th monitoring cycle (sampling year 2007) a positive trend was recorded for the monitored contaminated localities in the total content of As and Cd and a negative trend in the case of Co, Cu, Ni and Zn.

Is the area of agricultural land with acidic soil reaction increasing?

The results of agrochemical testing in the cycle periods (1990-1994) and (2012-2017) have shown an increase in the area of agricultural land with acidic (+6.1%), weakly acidic (+9.1%) and alkaline (+1.4%) soil reaction. A decrease was recorded in the area of agricultural land with neutral (-16.6%) soil reaction. The sub-values calculated for 2018 show that the area of agricultural land with acidic or weakly acidic soil reaction is still increasing.

What is the share of agricultural land threatened with erosion, compaction and salination?

In 2018, 38.5% of agricultural land in the territory of the SR was potentially threatened by water erosion and 5.5% by wind erosion. Since the end of the 3rd monitoring cycle (2006) to the present status, potential water erosion has had a falling trend. The area of potential wind erosion is not high and over recent years has not significantly changed. From a long-term perspective, a comparison of the area at the end of the 1st monitoring cycle (1996) and in 2018 showed a decrease in the area of soil affected by water erosion of 374 333 ha and by wind erosion of 44 705 ha, however this reduction is largely the result of the improved elaboration of the erosion model used (USLE).

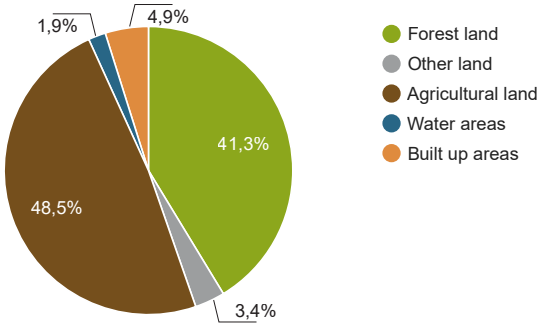
Resistance to compaction increases from heavy to light soils. The risk of compaction, expressed as a percentage of compacted localities to their total quantity within the framework of the given soil type, was 8% for light soils in 2018, 29% for medium soils and 35% for heavy soils. Within the framework of 5 sampling cycles (1996-2013) a negative trend was recorded in the development of compaction for light soils, while more significantly for other textures only from the 3rd monitoring cycle (excluding heavy mollic soil, black soil and fluvisol) and this especially in topsoil, which is probably a consequence of the intensive use of these soils depending on the crop being grown, or the minimising machine activity on the soil.

Soil salinization processes are not very widespread in this country. They apply to warm areas with a prevailing soil evaporation regime, to flat relief elements with high level of strongly mineralized groundwater. At present under 5 000 ha of saline land is registered in the SR, or approximately 0.2% of agricultural land.

SOIL BALANCE

The total area of the SR is **4 903 407 ha.** In 2018 agricultural land covered 2 379 101 ha, forest land 2 026 027 ha and non-agricultural and non-forest land 498 279 ha.

Chart 027 I Share of individual types of land in total Slovak territory (2018)



Source: GCCA SR

Anthropogenic pressure to use land for purposes other than fulfilling its primary production and environmental functions is causing its gradual decrease. The development of the land fund in the SR was marked by a **further decrease of agricultural and arable land** in 2018.

SOIL QUALITY

Soil contamination by hazardous substances

From the perspective of soil contamination, monitoring in 2018 focused on the main hazardous elements Cd, Pb, Cu, Zn, Ni and As which, in the preceding 4th monitoring cycle (sampling year 2007), reached over-limit values within the meaning of the amended Decree No 59/2013, implementing Act No 220/2004, on the protection and use of agricultural land and on amendments to Act No 245/2003, on integrated environmental pollution prevention and control and on amendments and supplements to some other Acts. Within the framework of the assessment of the status of soil hygiene there was, from the 4th monitoring cycle, a change to legislation (addition of aqua regia extract), and so it is not possible to compare the data with previous monitoring cycles. It was, however, found that soils contaminated in the past remain contaminated today, and so it will be necessary to continue to pay increased attention to them.

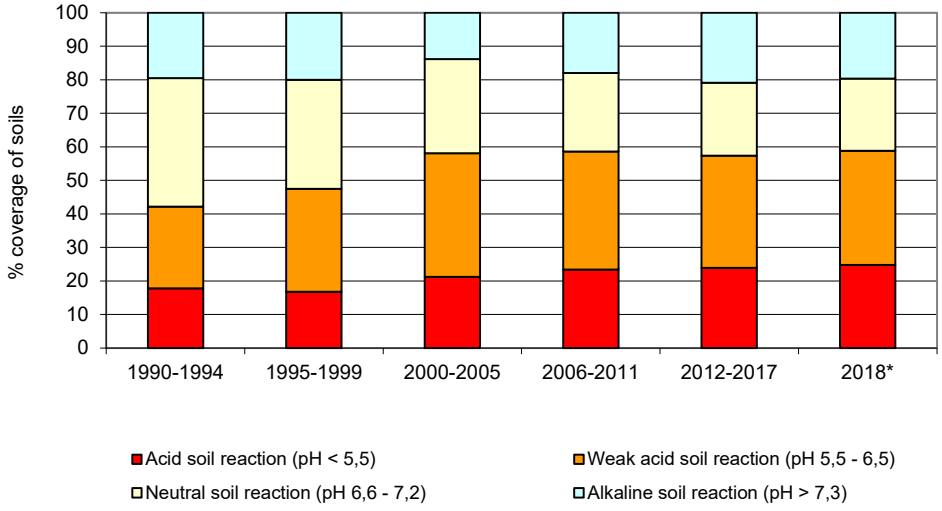
Based on previous observations, when comparing the 5th monitoring cycle (sampling year 2013) with the preceding 4th monitoring cycle, at the monitored contaminated localities **a positive trend in the development of the total content of As and Cd and a negative trend in the case of total content of Co, Cu, Ni and Zn** were recorded.

The last and newest hygiene survey of agricultural land around the aluminium plant in Žiar nad Hronom showed that the area of soil contaminated with fluorine has slightly decreased, as has the concentration of fluorine in the soil, confirming the improved emissions situation in the region. On the other hand, the process of reducing the concentration of monitored and assessed elements in the soil is very slow. Localities that were contaminated in the past (around industrial plants, around geochemical anomalies) remain contaminated today, which means that the soil is maintaining this unfavourable status relatively well and over the long term. The contents of the monitored elements at these localities are above 80% of the set limit, and hence it will be necessary to continue monitoring them.

Soil acidification

The optimal **soil reaction value** is one of the key aspects when evaluating soil. In recent decades, anthropogenic agents have been a major contributor to changes in soil reaction. The use of physiologically acidic fertilizers and acidic atmospheric pollutants have contributed to increased soil acidification. The results of agrochemical soil testing in the cycles period (1990-1994) and the last completed cycle (2012-2017) have shown an **increase in the area of agricultural land with acidic** (+6.1%), **weakly acidic** (+9.1%) **and alkali** (+1.4%) **soil reaction**. On the other hand, a decrease was recorded in the area of agricultural land with neutral (-16.6%) soil reaction.

Chart 028 I Trend in soil reaction in agricultural land based on the results of agrochemical soil testing



*Note: *partial values for the relevant year*
Source: Central Control and Testing Institute in Agriculture

Soils with weakly acidic and acidic soil reaction may result in increased penetration of various pollutants, primarily heavy metals and aluminium, into the food chain. **The status of active aluminium** in agricultural land in the SR is significantly **lower in arable soils than in grassland**, which is a consequence of the relationship between soil quality and its use. Despite this, high maximum values have also been measured in arable soils, which directly correlates with a lower soil reaction value.

Salinization and sodification

A mild to moderate salinization intensity, with a salt content of 0.10 to 0.35% was recorded in 2018 at the locality Kamenín, a high (salt content 0.36 to 0.70%) to extreme salinization (salt content over 0.70%) at the Malé Raškovce and Žiar nad Hronom localities. Weak salinization was confirmed at the Gabčíkovo and Kamenín localities.

A content of exchangeable sodium in the sorption complex in a range of 5 to 10%, indicating weak sodification, was found at the Iža, Zemné and Komárno-Hadovce localities in sub-topsoil horizons. At the Zlatná na Ostrove, Žiar nad Hronom, Kamenín and Malé Raškovce localities the content of exchangeable sodium was in the range of 10 to 20%, which is characteristic for salinized soil. A soil reaction value (pH) as an indicator of soil sodification confirming a strongly alkaline reaction (pH> 8.4) was measured only at the Kamenín locality.

Organic carbon in soil

Climate change and intensive changes in soil use mean that the organic carbon stock in soils is changing quite rapidly. Monitoring results have shown that the average values for the content of organic carbon **in the topsoil horizon of arable soils** (AS) of the same soil types are **significantly lower than for permanent grassland** (PG). This status is a consequence of the intensive mineralization of soil organic matter during ploughing of pastures and the long-term intensive cultivation of arable land. In the AS, the highest value of organic carbon in soil is found in black soil and the lowest in pseudogley and brown soil.

Soil erosion

751 334 ha of agricultural land in the SR is **potentially affected by water erosion** (of differing intensity).

The area of land **potentially affected by wind erosion is 106 851 ha.**

BIODIVERSITY

KEY QUESTIONS AND KEY FINDINGS

What is the conservation status of species and habitats of European importance?

The results of reporting for the 2013 to 2018 period show that, as of 2018, 75% of species and 63.4% of habitats of European importance are in an unfavourable status (unsatisfactory, or bad).

What is the status in terms of the protection of and care for flora and fauna?

11.4% of the lower plants in the SR and 14.6% of higher plants are currently threatened, while 19.7% of higher plants occurring in the SR are protected. As regards fauna, 24.2% of vertebrates are threatened and 6.6% of invertebrates, while over 3% of species are protected.

In 2018 rescue programmes for 6 species and care programmes for 3 species of fauna were implemented.

What is the status and trend in the national network of protected areas and the European Natura 2000 network?

In the SR at present there are a total of 1 097 so-called small-area protected areas and 23 so-called large-area protected areas of the national network classified through protection levels (2 to 5) with a total area of 1 147 060 ha (without overlapping), or 23.4% of the area of the SR.

In 2018 care programmes were approved for 35 so-called small-area protected areas, which are concurrently sites of Community importance, and 7 Special protection areas.

Within the framework of the European Natura 2000 network of protected areas, in 2018 the sufficiency of the updated national list of sites of Community importance was assessed by the EC and the preparation of protection projects for the declaration of sites of Community importance not overlapping with the national protected areas network continued.

MONITORING OF SPECIES AND HABITATS

146 fauna species, 49 flora species and **66 types of habitat** of European importance **are monitored** in Slovakia. Monitoring was carried out in 1 191 permanent monitoring localities (PML) for fauna, 136 PML for plants and 391 PML for habitats. A **comprehensive information and monitoring system** (CIMS) was supplemented with 26 334 zoological, 36 231 botanical and 650 habitat occurrence records, including protected and invasive species.

VEGETATION

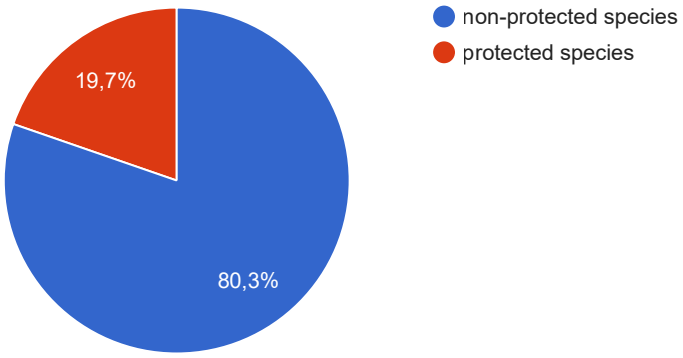
Status of endangerment of wild plants

In the SR at present **1 046 species of lower plants (11.4%)** are **threatened** (in the categories CR – critically threatened, EN – threatened and VU - vulnerable; pursuant to the IUCN), while one third of bryophytes and almost one quarter of lichens are at risk. Of the **higher plants, 527 species are threatened (14.6%).**

Species protection of flora

At present, **823 species** and **subspecies** of plants occurring in the SR are **protected**, of which 713 species of higher (vascular) plants, 23 species of bryophytes, 17 lichen species and 70 species of higher fungi occurring in the SR.

Chart 029 I Share of protected species of higher plants



Source: SNC SR

FAUNA

State of endangerment of wild animals

Pursuant to **current red lists of fauna, 1 636 invertebrates (6.4%)** and **100** taxa **of vertebrates (24.2%)** are threatened (in the categories CR, EN and VU; pursuant to the IUCN). Among **the most threatened invertebrates** are cockroaches (44.4%), mayflies (34.2%), dragonflies (33.3%), as well as molluscs and spiders (up to 30%). Among the **vertebrates,** lamprey (100%) and amphibians with reptiles (over 40%) are most at risk.

Species protection of fauna

The number of **protected fauna** currently includes **1 042 taxa**, of which **816 occur in the SR** (over 3%). A taxonomic group of birds is not included, as all species of naturally occurring birds in the territory of the SR are protected.

Care for protected and threatened fauna species

In 2018 rescue programmes (RP) were approved for the wood grouse (*Tetrao urogallus* Linnaeus, 1758) and **black grouse** (*Tetrao tetrix Linnaeus*, 1758) for 2018 to 2022.
RP have been implemented for **the Danube clouded yellow butterfly** (*Colias myrmidone* Esper, 1781), **mountain Apollo butterfly** (*Parnassius apollo* Linnaeus, 1758), European pond turtle (*Emys orbicularis* Linnaeus, 1758), the **red-footed falcon** (*Falco vespertinus* Linnaeus, 1766), the **western capercaillie** (*Tetrao urogallus* Linnaeus, 1758) and **black grouse** (*Tetrao tetrix* Linnaeus, 1758).

Care programmes were implemented for the grey wolf (*Canis lupus*), the **Eurasian lynx** (*Lynx lynx*) and the **brown bear** (*Ursus arctos*) in Slovakia **in 2018**.

164 nests of 8 species of birds of prey have been **guarded** (Eastern imperial eagle, golden eagle, spotted eagle, migratory falcon, eagle owl, red-footed falcon, black-headed falcon and white-tailed eagle) and a total of **182 nestlings** have successfully hatched in them.

INVASIVE SPECIES

Invasive flora species

The trend in the occurrence and development of invasive alien non-native flora species, but also other non-native flora species with a high invasive potential, **is worsening**. In 2018 the **mapping of invasive species** continued. 57 localities of invasive flora species in protected areas or their buffer zones covering a total area of 18.47 ha and 632 localities outside protected areas (in the 1st level of protection) covering 115.71 ha were mapped. The **removal** of invasive flora species was implemented in 70 localities in protected areas covering 46.97 ha. This involved 6 non-native and invasive flora species (*Asclepias syriaca, Heracleum mantegazzianum, Ambrosia artemisiifolia, Solidago giganthea, Negundo aceroides*, species of the *Fallopia genus*). Outside protected areas, 6 species of invasive plants have been removed in 22 localities over an area of 3.901 ha (*Heracleum mantegazzianum, Asclepias syriaca, Ailanthus altissima, Fallopia japonica, Solidago giganthea, Ambrosia artemisiifolia*).

Invasive fauna species

A list of invasive fauna species is provided in Annex No 2 of Decree of the Ministry of the Environment of the SR No 24/2003 and includes **26 species** (2 molluscs, 3 crustaceans, 9 fish species, 1 amphibian species, 2 reptile species, 1 bird species and 8 mammal species).

SUMMARY INFORMATION ON THE CONSERVATION STATUS OF SPECIES AND HABITATS OF EUROPEAN IMPORTANCE AND THE CONSERVATION STATUS OF BIRDS

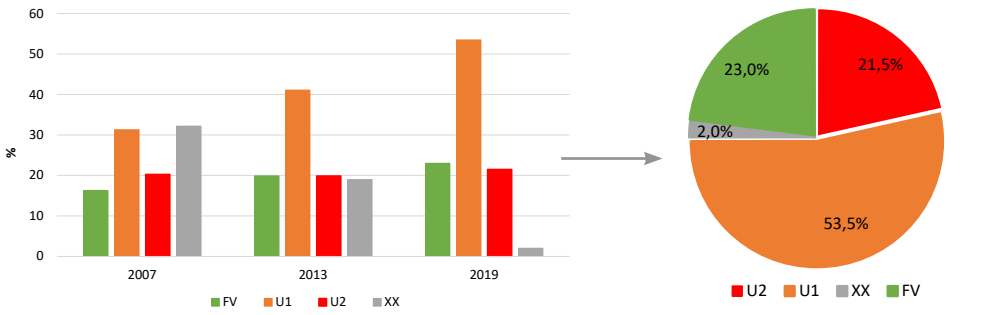
The first Report on the conservation status of habitats and species of European importance pursuant to Art. 17 of the Habitats Directive for the SR was prepared and submitted to the EC **in 2007** (for the 2004 to 2006 period), **the second in 2013** (for the 2007 to 2012 period). **In 2018** the preparation of the **third Report (for the 2013 to 2018 period)** began with an assessment of the monitoring results (submitted to the EC in April 2019), as well as the **second report on the conservation status of birds** pursuant to Art. 12 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation status of wild birds (Birds Directive), submitted to the EC in July 2019.

Overall there has been a deterioration in the conservation status of species and habitats, which is however caused primarily by improved introduction of monitoring system findings, better expert estimates and the identification of previously unknown relevant species and habitat data. The status assessment is therefore **closer to reality than was the case in** the previous reporting periods. I**n fact, therefore, this is not actually a deterioration** compared to the previous periods but rather an improved and more realistic status assessment, while the status is **more or less the same** as in the previous periods.

The quantity of **unknown assessments** has decreased significantly due to the systematic collection of monitoring data in recent years.

Assessment of the conservation status of species of European importance

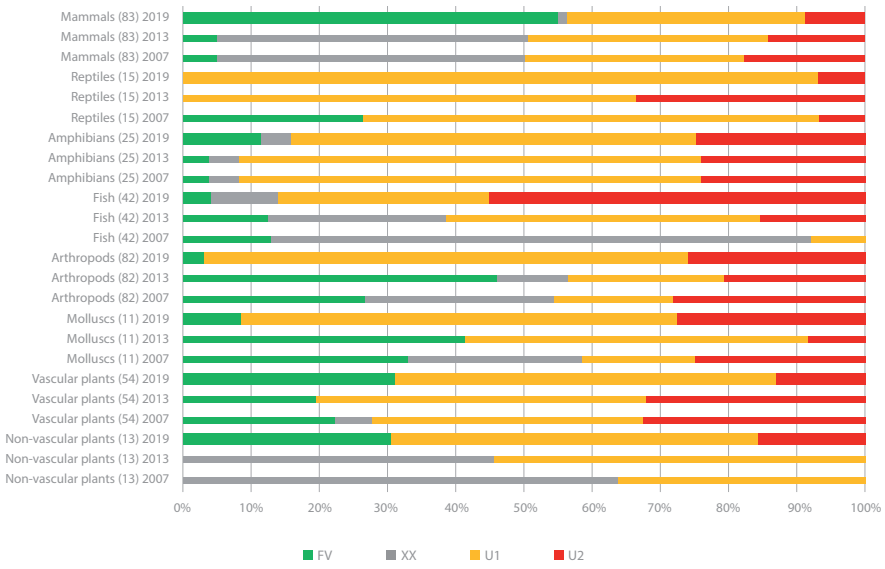
Chart 030 I Comparison of the conservation status of species of European importance



FV – Favourable *XX – Unknown* *U1 – Unfavourable - unsatisfactory* *U2 – Unfavourable - bad*

Source: SNC SR

Chart 031 I Comparison of the conservation status of species of European importance by taxonomic group



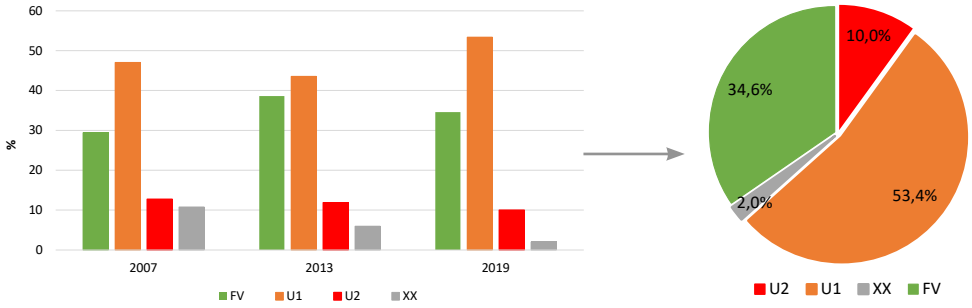
Note: The number in brackets indicates the number of status assessments in each bioregion

Source: SNC SR (CIMS)

We recorded a real change in the case of Liparis loeselii (one place in the Pannonian biogeographical region was flooded through natural processes and the population disappeared).

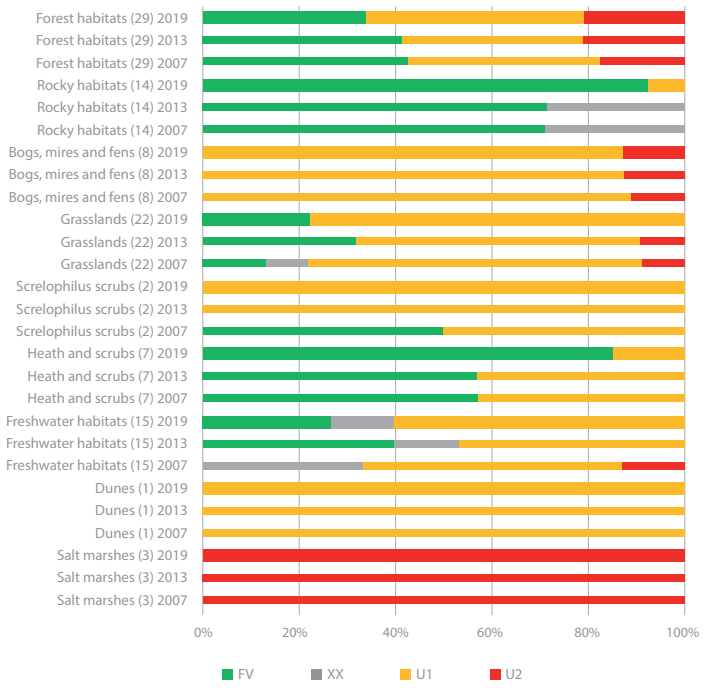
Assessment of the conservation status of habitats of European importance

Chart 032 I Comparison of the conservation status of habitats of European importance



Source: SNC SR

Chart 033 I Comparison of the conservation status of habitats of European importance by individual group



Source: SNC SR

Note: The number in brackets indicates the number of status assessments in each bioregion

We recorded a real change only in the case of habitat 9190 (the area was reduced by 17% due to human interference).

The new report for 2013 to 2018 is primarily based on CIMS data, thanks to which the quantity of unknown assessments of the conservation status of habitats and species of European importance has significantly fallen.

Slovak reports submitted so far within the meaning of the above commitments are available at: https://cdr.eionet.europa.eu/Converters/sk/eu/art17/envxrnpda/

Assessment of the conservation status of individual bird species

In Slovakia there are 81 bird species subject to the Birds Directive and also subject to reporting pursuant to Art. 12 of this Directive (https://bd.eionet.europa.eu/article12/).
Primarily **species tied to the agrarian landscape have been assessed as in an unsatisfactory status**. Another group **in a bad status** as a whole are **predators**, with up to 10 species assessed as in a bad status. There are also relatively many species **in an unsatisfactory status** in the group **tied to wetland habitats**. The western capercaillie (*Tetrao urogallus*) and black grouse (*Tetrao tetrix*) **were also assessed as being in an unsatisfactory status**, while their favourable status is closely linked to a suitable method of managing forests and other mountain habitats in view of the sharp decrease in their population, the consequences of climate change and the impact of other factors such as predation (e.g. by foxes and wild pigs), while their habitat is shrinking and they are on the verge of extinction. Other forest species are also in an unfavourable status. Of the populations mentioned, the greater white-fronted goose (*Anser albifrons*), taiga bean goose (*Anser fabalis*) and the common merganser (*Mergus merganser*) have been assessed as in a bad status. The average **mortality of birds**, including threatened species, on power lines in the countryside remains high (50 to 100 000 individuals a year), despite systematic long-term activity in conjunction with electrical operators.

ECOSYSTEM SERVICES

Within the framework of the State Nature Conservancy of the SR, work on the preparation of a methodology and the assessment of ecosystem services (ES) in cooperation with external experts continued in 2018. A **proposal for a methodology for the national assessment of ES**, together with alternative assessment options, has been prepared. Work has been ongoing on **sections of the** nationwide assessment of ES, the preparation of materials, geodatabases and, primarily, further updates and **modifications of the map of Slovakian ecosystems**.

CARE FOR PROTECTED PARTS OF NATURE

Implementation of the law and conceptual activities in biodiversity protection

TRADE IN THREATENED SPECIES

In 2018, the Ministry of the Environment of the SR as the **executive body of the SR** pursuant to the **Convention on International Trade in Threatened Species of Wild Fauna and Flora (CITES) issued 2 101 exemptions** from the ban on commercial activities pursuant to Art. 8(3) of **Council Regulation (EC) No 338/97,** on the protection of species of wild fauna and flora by regulating trade therein, as amended (hereinafter only the "Council Regulation"), especially for turtles (about 60%), parrots, birds of prey and owls; **1 consent** to the relocation of live specimens for a zoo pursuant to Art. 9 of the Council Regulation; and **190 permits** for import/export/re-export pursuant to Art. 4 and Art. 5 of the Council Regulation (especially watchstraps made of alligator leather - approx. 45%).
In 2018, the Ministry of the Environment of the SR continued to perform the tasks arising from the **National Action Plan of the SR 2014-2019 for the enforcement of the Council Regulation.** Inspections of large felines have been identified as priorities.

BIODIVERSITY PROTECTION

Within the framework of the performance of tasks arising from the **Convention on Biological Diversity (CBD)** and the **EU Biodiversity Strategy to 2020**, there was active participation in the 14th session of the conference of the CBD parties **(COP14)** (as part of which ecological connectivity in the Carpathians and Central Europe was presented) as well in the 9th meeting of the parties to the **Cartagena Protocol and the 3rd Meeting of the Parties to the Nagoya Protocol in Egypt.** Two meetings of the Biodiversity Working Group were prepared and held (Bratislava, 23 April 2018, 9 November 2018). Materials for the assessment of the performance of tasks from the **Action Plan** for the Implementation of Measures Arising from the **Updated National Biodiversity Strategy to 2020** as well as materials and a proposal for the **6th national report on CBD implementation were prepared.** At the same time, the preparation of materials for the **global strategic framework for biodiversity protection after 2020 (Post 2020)**, as well as the preparation of the **new Common Agricultural Policy after 2020, has already begun.**
Within the framework of the performance of tasks arising from the **Convention on Wetlands of International Importance Especially as Waterfowl Habitats** (Ramsar, Iran, 1971), proposals for updating the **Slovak Wetland Care Programme to 2024** and the **Wetland Action Plan for 2019-2021 were prepared in 2018. Management measures** in selected **Ramsar localities were carried out, and a draft national report** for the 13th session of the **Conference of the Parties to the Convention was prepared.**

Cave protection

In 2018 **no** new cave buffer zones or new publicly accessible caves **were declared**. 4 new cave closures **were constructed** and 7 damaged cave closures **were repaired**.
The State Nature Conservancy of the SR and the Slovak Caves Administration **operated** 13 accessible caves, while another 5 accessible caves were rented for operation (Morské oko cave was out of operation).

As of 2018, **7 439 caves were registered in the SR**, and are also natural monuments pursuant to the Act on Nature and Landscape Protection. **44 of the most important** of these have been included in **national natural monuments. 19 caves are accessible, 45 are open to the public and 20 have a declared buffer zone.**

Protection of minerals and fossils

The **list of protected minerals** includes **12 mineral types** described for the first time for science in the territory of Slovakia; **61 significant minerals**, appearing rarely in the SR and of European importance; minerals with specific morphological shape or evolution; and meteorites found in the territory of the SR. The list of **protected fossils** includes **655 fossil types**, which are unrepeatable material from extinct flora and fauna, pursuant to which the relevant taxon was first described in Slovakia, and **selected groups of rarely occurring fossils**, the character and level of conservation of which make them unique records of the development of organisms in the geological history of Slovakia.

Protected trees

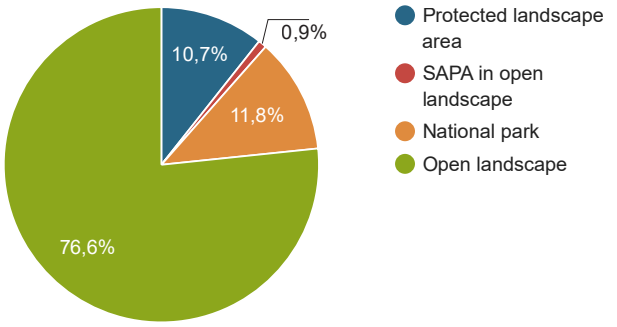
The protected trees (PT) system includes a total of **443 PT** and their groups, including alleys - protected sites, or a total of **1 251 individual trees** within the framework of **65 taxa** (of which 32 are native and 33 non-native). 62.8% of PT were in an **optimal** status, 33.4% **were threatened** and 3.8% **degraded.**

National system of protected areas

AREA OF PROTECTED AREAS

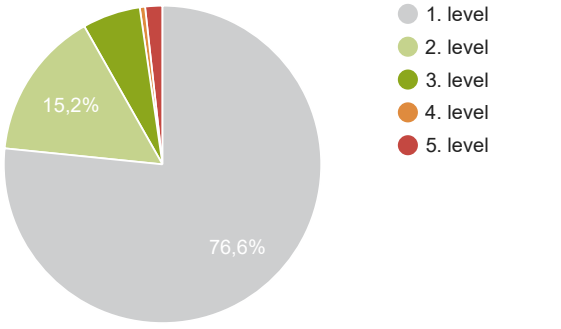
In 2018 no protected areas **were declared, updated or cancelled** in the national system.
The total area of specially protected nature in the SR classified using levels of protection (**2nd to 5th level** of protection, the so-called national system of protected areas) **in 2018** was **1 147 060 ha**, or **23.39%** of Slovak territory.

Chart 034 I Share of protected areas by selected category



Source: SNC SR *Note: Data per 2018*

Chart 035 I Share of protected areas by level of protection



Source: SNC SR *Note: Data per 2018*

Table 010 I Overview of the number and area of protected areas

Category	Number	Number Size of core area (ha)	Size of buffer zone (ha)	% of SR territory (incl. PZ)
National parks	**14**	**522 582**	**x**	**10.66**
Protected landscape areas	**9**	**317 541**	**262 591**	**11.83**
Protected landscape fragments	1	3	x	0.00
Protected sites	172	11 015	2 425	0.27
Nature reserves (including 2 private)	384	14 222	301	0.30
National nature reserves	209	80 776	2 239	1.69
Natural monuments (without caves and waterfalls)	217	1 525	207	0.04
Natural monuments - publicly accessible caves	45	0	31	0.00
Natural monuments - other declared caves	9	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
SAPA total	**1 097**	**107 599**	**8 545**	**2.37**

Source: SNC SR

STATUS OF PROTECTED AREAS

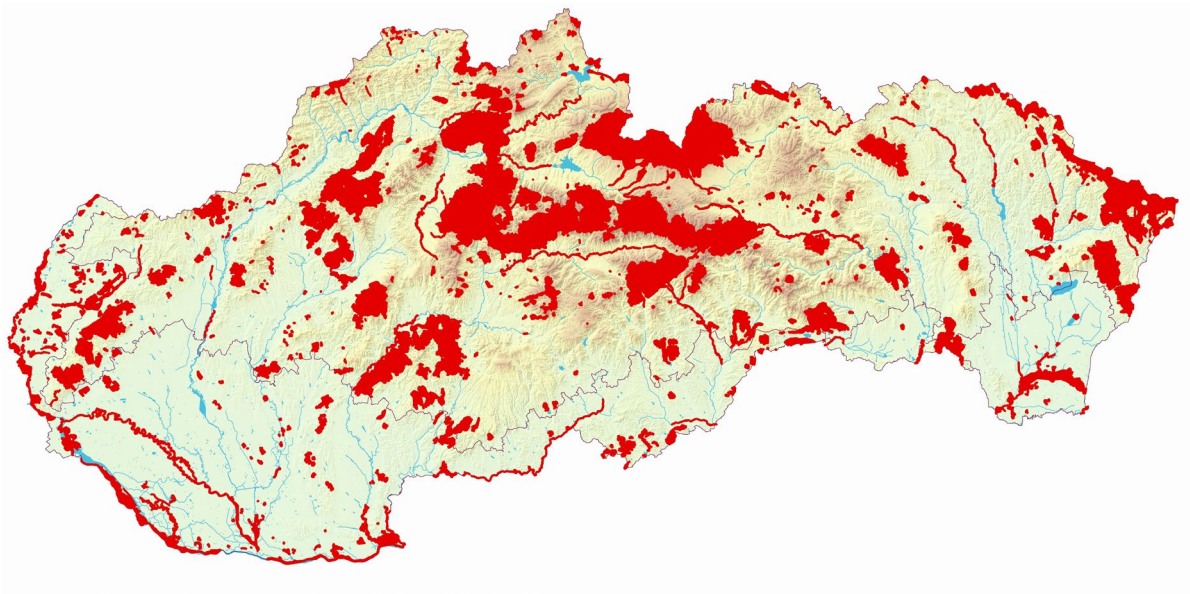
The status of so-called small-area protected areas placed in the 2nd to 5th level of protection is assessed through 3 categories of endangerment. Of the total area of 116 144 ha of small-area protected areas, **0.4% were degraded, 17.3% threatened and 82.3%** in an **optimal status.**

European network of protected areas - Natura 2000

Sites of Community importance

- the updated **national list of sites of Community importance (SCI**; approved by Government Resolution of the SR No 239 of 17 March 2004, Government Resolution of the SR No 577 of 31 August 2011, and Government Resolution of the SR No 495 of 25 October 2017) **contains 642 SCI;**
- **SCI** account for **12.56% of the territory of Slovakia**, while the average for landlocked SCI in the whole of the EU is 13.84% (pursuant to EC data from February 2018). Of this, **agricultural land** makes up **6.3%** and **forest land 83.9%**;
- **in 2018** the EC **assessed the sufficiency** of the updated national list of SCI. On 30 May 2018 and 12 October 2018 bilateral talks with the EC were held in Bratislava, and the official conclusions were subject to consultation;
- in 2018 the State Nature Conservancy of the SR continued with the **preparation of protection projects** for declared SCI wholly or partly outside the national system of protected areas. **24 new** protection projects were **processed** and **a further 21** protection projects **updated** pursuant to the requirements of the Ministry of the Environment of the SR.

Map 011 I Map of sites of Community importance according to the updated national list (after the 2nd update)

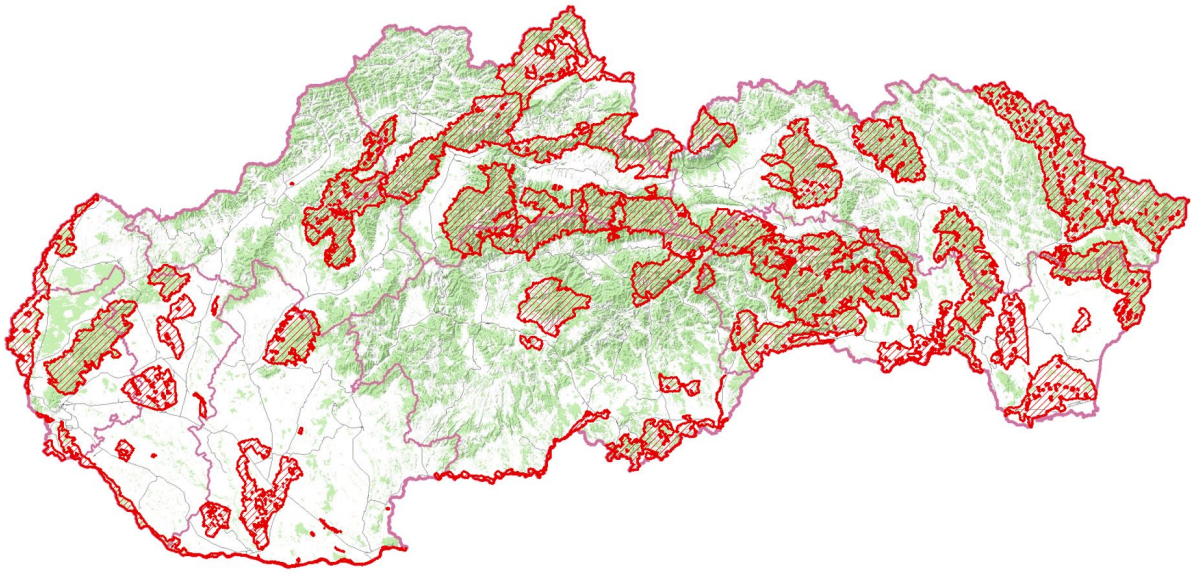


Source: SNC SR

Special protection areas (SPA)

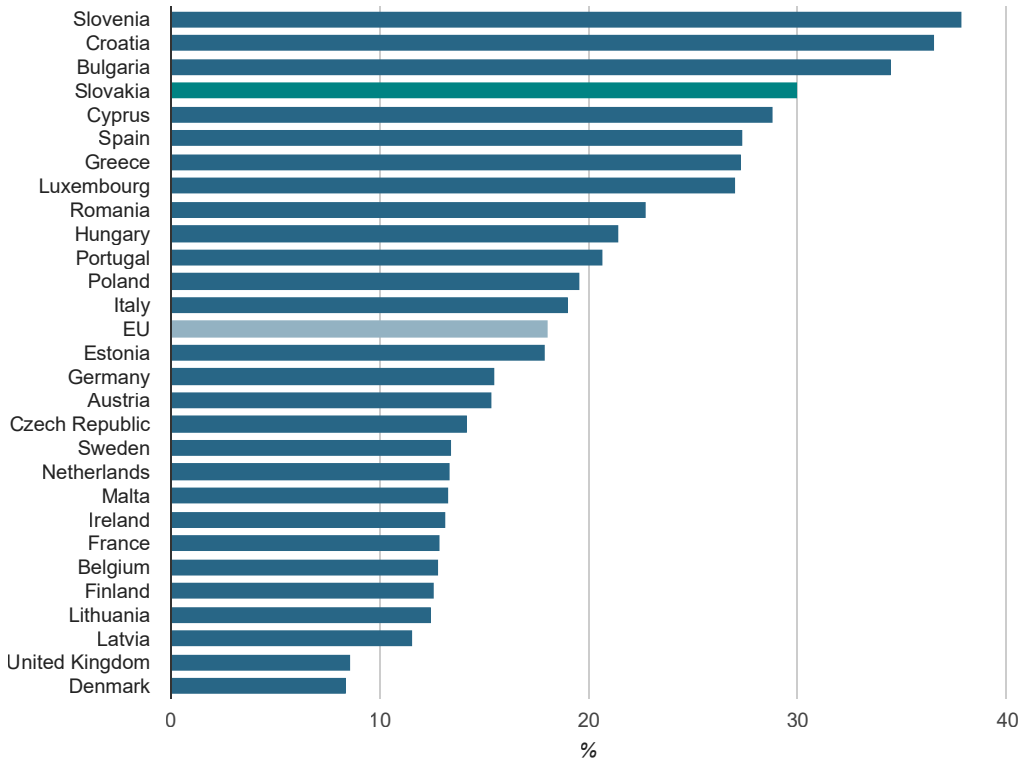
- **the updated national list of SPA** (approved by Government Resolution of the SR No 636 of 9 July 2003 and Government Resolution of the SR No 345 of 25 May 2010) contains **41 territories** covering **26.16%** of the SR. **Agricultural land** accounted for **22.8%** of this and **forest land 69.7%**;
- all the SPA have already been declared through generally binding legislation;
- **in 2018** the Ministry of the Environment of the SR in cooperation with State Nature Conservancy of the SR also continued the process of completing expert proposals for **care programmes for SPA and, in cooperation with the municipal authorities** in the regions, continued their discussions with the subjects concerned. The Government of the SR **approved** care programmes for **7 SPA in 2018**.

Map 012 I Map of SPA pursuant to the updated national list



Source: SNC SR

Chart 036 I International comparison of the share of Natura 2000 territory in the total territory of the country



Note: Data per 2018

Source: EC (Natura 2000 Barometer, EU-28)

Protected areas in the international context

Council of Europe European Diploma of Protected Areas:
- NNR Dobročský prales (1998),
- NP Poloniny (1998).

UNESCO World Natural Heritage (within the framework of the Convention for the Protection of the World Cultural and Natural Heritage):
- Caves of the Slovak and Aggtelek Karst (1997),
- Old beech forests and beech forests of the Carpathians and other regions of Europe (2007, with an expansion of the localities in 2011 and 2017).

Biosphere reserves (within the framework of the ***UN Man and the Biosphere Programme - MaB):***
- Biosphere Reserve (BR) Poľana (1990),
- BR Slovenský kras (1977),
- BR Východné Karpaty (1998; trilateral BR: Poland/Slovakia/Ukraine),
- BR Tatry (1992; bilateral BR: Poland/Slovakia)

Ramsar localities (within the framework of *Convention on Wetlands of International Importance Primarily as Habitats of Waterfowl, the so-called Ramsar Convention):*
- **14 localities**; in total 40 695 ha, respectively 0.8% of Slovak territory.

Most of these areas are also part of the national system of protected areas.

Care of protected areas

In 2018 **35** care programmes for **small-area protected areas**, which are concurrently also sites of Community importance, were **approved**. With the approval of care programmes for **7 SPA**, the total number of such approved documents increased to 13.

In 2018 **2 educational trails** established by State Nature Conservancy of the SR **were added**, meaning that within the framework of its organisational units **70 educational trails are registered**. In addition, **83 educational localities** have been registered and **1 information centre for nature protection has been added**, bringing the total number within the framework of organisational units of the State Nature Conservancy of the SR to **11**.


LETO NA KORZE

LANDSCAPE PROTECTION, CREATION AND MANAGEMENT

KEY QUESTIONS AND KEY FINDINGS

What are the rural and urban population shares?
*In 2018 the SR had 2 890 settlements. Of this number, 140 were towns or cities and 2 750 villages. The majority of the population **(53%)** had their permanent address **in towns** rather than **rural areas (47%)**.*

What is the trend in the financing of the Village Renewal Programme?
*The subsidies fluctuate. In 2018 approved subsidies from the Environmental Fund totalled EUR **799 864.17**. The total drawn amount within the framework of the VRP was EUR **767 233.20**. The total average subsidy per applicant was EUR **4 790**.*

What is the share of natural areas in Slovak towns?
In 2018, 8 Slovak towns were selected for an investigation into the status of natural areas according to urban biodiversity indicators. The city of Pezinok has the highest share of natural areas, with over 30% of the city's territory being natural area.

Describe the composition of the Slovak Monuments Fund and its status.
In 2018 there was another increase in the total number of both immovable (and movable) cultural monuments. 9 990 immovable national cultural monuments (NCM) and 15 169 movable NCM were registered. Taking a long-term viewpoint (since 1993), the number of immovable NCM has grown by 44.6%, while in the medium term (since 2005) there has been an increase of 29.3%, and year-on-year of 1.4%. Over 25% of immovable monuments show a disturbed or desolate structural-technical status. Over the long term this status has fallen only minimally (by 0.8%), while in the medium-term horizon it has even slightly increased and has remained practically unchanged year-on-year.

What is the number of registered environmental burdens?
As of 2018, the Environmental Burdens Information System registered 882 probable environmental burdens, 313 confirmed and 805 already remediated environmental burdens, 113 localities in part A of the register and also in part C of the register, and 122 localities in part B of the register and also in part C of the register.

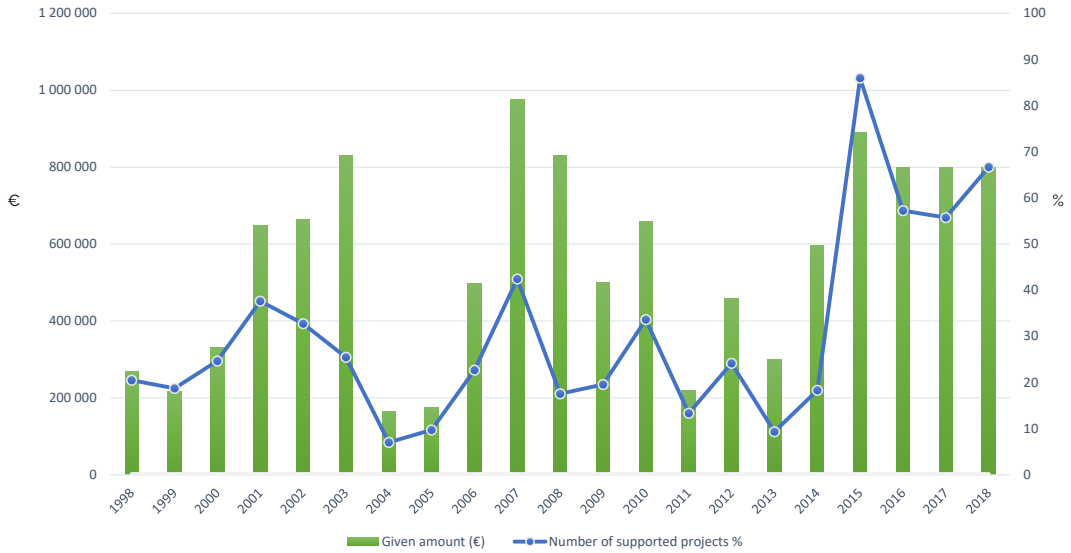
CARING FOR THE URBAN AND RURAL ENVIRONMENTS

Its natural conditions predetermine the SR to a situation in which part of its population is and will remain tied to the rural environment. In 2018, 47% of the population lived in rural areas. The trend in the population living in urban areas has shown a slight decrease, from 56% in 2005 to 53% in 2018, with more women living in urban areas (52%) than men. Of the **2 890 settlements** found in the SR, 2 750 are rural municipalities (95%) and **140 towns or cities** (5%). Of the total area of the SR by individual region types, the greatest share (59.0%) is primarily rural, while 36.8% are transitional regions and the lowest share (4.2%) is predominantly urban regions.

Over the 21 years of activity of the Village Renewal Programme (VRP), 13 110 applications have been submitted from municipalities and 933 from microregion associations, while subsidies have been provided for **3 574 projects** (3 287 municipalities and 287 MR) with a total value of EUR **11 625 041**.

In 2018 VRP support reached a total of EUR **767 233.20** and the total average subsidy per applicant was EUR **4 790**.

Chart 037 I Trend in allocated VRP subsidies



Source: Slovak Environment Agency

Since 1990, every two years ARGE announces a competition for the **European Village Renewal Award**. The national version of this event is the **Village of the Year** competition, which the SR has been organising since 2001.

The municipality of **Oravská Polhora** progressed to the European competition as the winner of the national Village of the Year 2017 competition. Based on its extraordinary results, Oravská Polhora won the **European Village Renewal Award** for its comprehensive, sustainable development of a village of exceptional quality.

In 2018 there were 140 towns and cities in the territory of the SR. Of this total number, 68 have populations of under 10 000, 62 have populations of between 10 000 and 50 000, 8 have populations of between 50 000 and 200 000 and 2 have populations of over 200 000, while 12.32% of the population of the SR lived in them in 2018. The highest percentage (23.6%) of urban inhabitants **lived in towns and cities with populations between 10 000 and 50 000**.

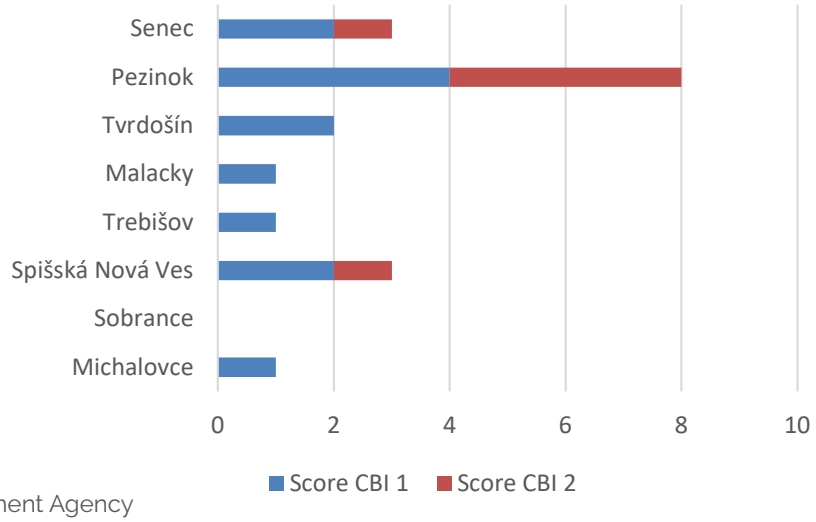
In 2018 the **Urban Development Concept of the Slovak Republic to 2030** was adopted, a framework document aimed at assessing the current status of urban development and proposing generally beneficial and applicable principles and a comprehensive set of measures for systemic changes to the current status, which will strengthen the role of cities in the overall development of the SR. This issue is also part of the **Envirostrategy 2030**, pursuant to which land-use planning will ensure a balanced relationship between the needs of the population, economic activity and the environment. Elements of territorial systems of ecological stability will be protected. An integrated concept of landscape protection based on the European Landscape Convention will be developed. The characteristic forms of the landscape will be preserved and revitalized in accordance with their historical and natural contexts.

The quality of the environment is closely linked to the level of conservation and maintenance of natural and urban ecosystems. Hence one important role of cities is to protect and sustain biodiversity in their immediate surroundings and in the surrounding country. Avoiding and phasing out fragmentation of natural areas, while promoting and strengthening the connectivity of natural and semi-natural areas, are key ways to maintain and enhance urban biodiversity.

In 2018 the determination of the share of natural areas pursuant to **urban diversity indicators** continued with the analysis of **another 8 urban areas** (Michalovce, Sobrance, Spišská Nová Ves, Trebišov, Malacky, Tvrdošín, Pezinok and Senec). Greenery mapping was performed using the European Earth Observation Copernicus programme's so-called Street Tree Layer as the data source. 2 indicators were monitored - Indicator 1: Share of natural areas in the city (CBI 1) and indicator 2: Determination of the connectivity of ecological networks (CBI 2).

Based on the results obtained when determining the values of the CBI 1 and CBI 2 indicators, the city of Pezinok had the highest share of natural areas. It contains two relatively large sites of European importance with a total area of 2 190.66 ha (CBI 1 - 30.11%, CB 2 – 1 561.36 ha), giving it the highest score of 4 (assessment pursuant to the City Biodiversity Assessment Manual): Kuchynská hornatina with its 7 habitats of European importance and 5 species of European importance and Homolské Karpaty with its 8 habitats of European importance and 14 species of European importance. On the other hand, the town of Sobrance contains natural areas of alluvial streams covering 5.5 ha, or only 0.51%.

Chart 038 I CBI 1 and CBI 2 assessment indicators



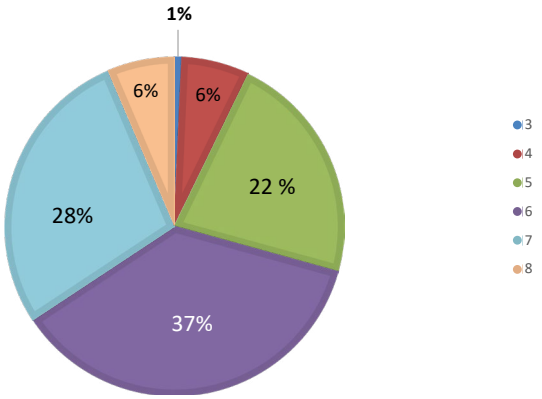
Source: Slovak Environment Agency

Score (pursuant to CBI 1) *for the share of natural areas in a town: 0 points: < 1.0% ; 1 point: 1.0%-6.9%; 2 points: 7%-13.9%; 3 points: 14.0%-20%; 4 points: > 20.0%*
Score (pursuant to CBI 2) *for determining the connectivity of ecological networks as a means of combating fragmentation: 0 points: < 200 ha; 1 point: 201-500 ha; 2 points: 501-1000 ha; 3 points: 1001-1500 ha; 4 points: > 1500 ha*

In 2018 the **consumption of drinking water in urban areas was 52% of the total consumption in the** SR. The average consumption of drinking water in urban areas has been **declining since 2001**. Compared to 2001 the consumption of drinking water in urban areas had decreased by 49.7% in 2018. **Bratislava** held first place **in the consumption of drinking water** in 2018 with its consumption of 32 326 000 m^3, or 15.5% of the total consumption in the SR. This was followed by Trnava (1.9%) and Hlohovec (1.1%), with consumption of over 1%. The consumption of the other 137 urban areas was under 1%. The lowest values were measured in the urban areas Šaštín-Stráže (0.08%), Gabčíkovo and Gbely (0.09%).

Recalculated per inhabitant, the spa town of **Dudince** had the **highest consumption of** drinking water (925.5 l/person/day) and **Košice** the **lowest** (6 l/person/day).
Slovak towns and cities are working to improve the efficiency of **waste management** in addition to reducing the generation of municipal waste, building a network of collection sites, building composting facilities and improving and extending the separate collection system. In 2018 only **9 urban areas in the** SR addressed **all 8 categories of sorted waste** (paper and cardboard, glass, textiles, plastics, metals, biowaste, drinks cartons, batteries and accumulators), 39 towns 7 categories and most towns (51) 6 categories.

Chart 039 I Number of categories of sorted municipal waste in urban areas of the SR (2018)



Source: Slovak Environment Agency

Dust, noise, vibrations and emissions caused by traffic significantly affect the quality of the environment in urban areas. One of the major objectives of urban strategies is the modernization and construction of infrastructure for non-motorized transport - the **cycling network** (dedicated cycle paths and traffic lanes). The city of Žilina increased the length of its cycle paths from 8.69 km in 2013 to 12.3 km in 2018, the city of Trnava from 11.16 km to 19.93 km and the city of Nitra from 8.75 to 15.3 km.

LAND-USE PLANNING

The basic **land-use planning document for the SR is the Land-use Development Concept for Slovakia 2001**, which was updated in 2010. At regional level, all self-governing regions have valid land-use plans that they update when needed in accordance with the Building Act. Since 2006, every year the Ministry of Transport and Construction of the SR has supported municipalities by providing subsidies for the processing of land-use planning documentation for municipalities pursuant to Act No 226/2011, on the provision of subsidies for the processing of land-use planning documents.

Subsidies for 71 municipalities totalling EUR **610 000** were **approved for 2018**.

Table 011 I Status of land-use planning documentation by region

Region	Total number of municipalities	Number of approved plans of municipalities and cities, their amendments and supplements			
			2016	2017	2018
Bratislavský	73	13	9	8	14
Trnavský	251	30	49	47	45
Trenčiansky	276	23	28	26	32
Nitriansky	354	26	31	20	19
Banskobystrický	516	26	31	25	23
Žilinský	315	37	44	36	27
Prešovský	665	53	58	61	39
Košický	440	14	25	41	40
Total	**2 890**	**222**	**275**	**264**	**239**

Source: Ministry of Transport and Construction of the SR

MONUMENT FUND

In 2018 there was another **increase** in the total number of immovable (and movable) cultural monuments compared to 2017.

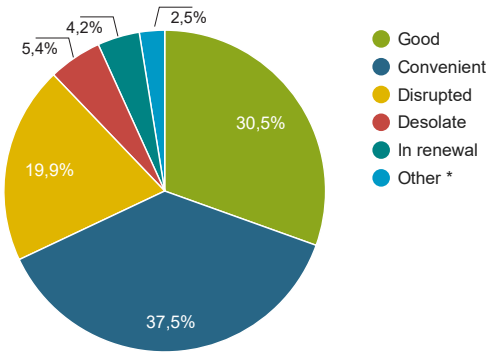
As of 31 December 2018 **9 990 immovable national cultural monuments (NCM)** were recorded in the SR, an increase compared to 2017 of 34 NCM. These are composed of 16 963 **monument buildings** (an increase of 236). There were **15 169 movable NCM** (an increase of 41), of which 98% are of a sacral character. Movable NCM consist of 34 934 monument articles (an increase of 200).

Literary sources put the number of **castles** in the SR at around 300. At present the 9 990 immovable NCM include 102 **castles** and 438 **mansions**. The following were recorded as part of monument buildings **(MB)** forming the NCM in 2018:

- 578 manor houses and mansions (+3)
- 102 castles (+1)
- 81 monasteries (+1)
- 1 634 churches (+5)
- 943 people's houses (+4)
- 2 374 burgher houses (-3)
- 388 palaces and villas (+2)
- 29 wayside sculptures (shrines)
- 12 wayside crosses and pillars (+2)
- 491 plaques and sites (-8)
- 76 cemeteries (in addition to cemeteries at churches) (+6)
- 289 graves (both individual and collective) (-1)*
- 69 tombs

Note: The numbers in brackets show the change in the number of MB compared to the preceding year.
** graves include all registered graves, not only military ones.*

Chart 040 I Structural-technical status of immovable NCM (2018)



Source: MB SR

Note: The "Other" category (2.54%) consists of MB in a different status (physical extinction, restoration of the loss of historical values, AG-not presented or KP missing for a long time).

The structural-technical status of MB has not changed over the past 5 years (a statistically insignificant percentage). The causes for the persistent number of sites in a bad status primarily relate to their inappropriate use, respectively in their absence of use.

In addition to protection for individual monuments/sites, the monument fund **is also protected in a blanket manner** in monument areas: **monument reservations** (MR-28) and **monument zones** (MZ-82). In 2018, 2 MZ were added: Martin - Malá Hora a Hostihora monument zone and Pezinok monument zone.

WORLD HERITAGE

World Heritage (WH) is a unique value that transcends national boundaries and is important for current and future generations of all mankind. Its permanent protection is of the utmost importance to the international community as a whole. The culmination of efforts to create protection for cultural and natural heritage was the adoption of the **Convention on the Protection of the World Cultural and Natural Heritage at the UNESCO General Conference in Paris in 1972, ratified by the Slovak Republic on 15 November 1990.**

Localities included in the World Heritage List

The WH List of 2018 included **1 092 localities** all over the world, of which 845 were cultural, 209 natural and 38 mixed, located in the **167 member** states of the Convention.

The WH List includes a total of **seven localities in the SR**, namely:

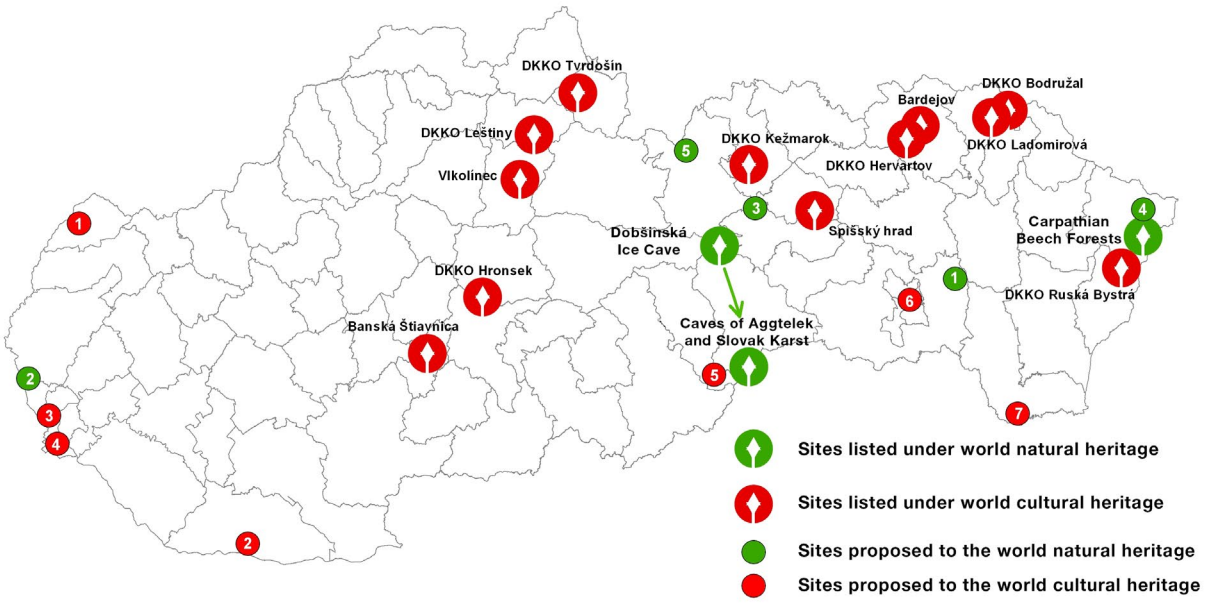
as part of cultural heritage

- **Vlkolínec** folk architecture reserves, the local part of Ružomberok, including the buffer zone (Cartagena, 1993)
- **Levoča, Spišský hrad** and the Associated Cultural Monuments (Spišská Kapitula, Spišské Podhradie, the Church of the Holy Spirit in Žehra), (Cartagena, 1993); extension to include the area of the monument reservation Levoča – historic town-centre of Levoča and the works of Master Paul in 2009, including the buffer zone
- **Historic Town of Banská Štiavnica** and the Technical Monuments in its Vicinity (Banská Štiavnica, Hodruša-Hámre, Štiavnické Bane, Banská Belá, Voznica, Vyhne, Banský Studenec, Počúvadlo, Kopanica, Kysihýbel, Antol, Ilija; especially 23 artificial reservoirs - tajchy), (Cartagena, 1993)
- **Bardejov Town Conservation Reserve -** including the buffer zone, including the Jewish suburb (Cairns, 2000)
- **Wooden churches** of the Slovak part of the Carpathian Mountain Area (wooden churches - Hervartov, Tvrdošín, Leštiny, Kežmarok, Hronsek - including the bell tower, Bodružal, Ladomírová, Ruská Bystrá) and their buffer zone (Quebec, 2008).

as part of natural heritage

- **Caves of Aggtelek Karst and Slovak Karst** (Berlin, 1995), to which was added in 2000 **Dobšinská Ice Cave** including Stratenská cave and Psie diery cave as a single cave system at the peak of Duča (Cairns, 2000),
- **Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe (Christchurch, 2007; extension in 2011 and 2017); joint locality of 12 European countries with a total of 82 components. There are 4 localities in Slovakia:** Stužica-Bukovské vrchy, Havešová, Rožok and Vihorlat.

Map 013 I World cultural and natural heritage



Source: Slovak Environment Agency

DKKO - Wooden churches of the Slovak part of the Carpathian Mountain Area

GEOPARKS

In 2018 **three geopark areas were operated in Slovakia**, which were awarded the title **"Geopark of the Slovak Republic" in 2016**. These were:

- Banskoštiavnický
- Banskobystrický
- the cross-border Slovakia-Hungarian Novohrad Geopark (NNG) with the international name Novohrad-Nógrád UNESCO geopark, which became a member of the European Geopark Network (EGN) and the UNESCO Global Geopark Network (GGN) in 2010.

In addition, activities were developed in several potential areas of Slovakia that could lead to the creation of other geoparks in the future, such as in the Little Carpathians and Zemplín areas.

ENVIRONMENTAL BURDENS

The collection of data and the provision of information on environmental burdens in the territory of the SR is provided by the **Information System of Environmental Burdens** (IS EB). At the end of 2018 there were **1 765 localities registered** in the IS EB (2 000 registration letters because some of the localities are in 2 parts of the register), while in **part A of the register (probable environmental burdens)** there were 882 localities, in part B of the register **(environmental burdens)** there were 313 localities, in part C of the register **(rehabilitated and reclaimed localities) there were 805 localities**, in part A of the register and concurrently in part C of the register there were 113 localities, in part B of the register and concurrently in part C of the register there were 122 localities.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TRANSITION TO A GREEN AND CIRCULAR ECONOMY

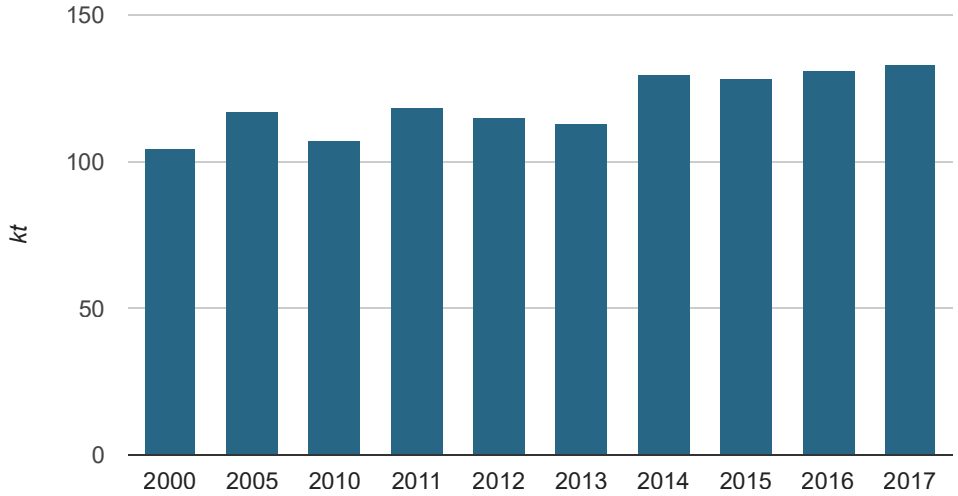
INDUSTRY

THE IMPACT OF INDUSTRY ON THE ENVIRONMENT

Industrial processes include all systematic activities where fuel is used in a technological process to produce products, including the storage, handling and distribution of products, and the use of products, including all activities related to their use (use of solvents, use of air conditioning, etc.).
The following trends can be observed in emissions of the main air pollutants from industry.

Emissions of CO from industry in 2017 made up 69.2% of total emissions and, compared to 2000 an increase of 27.8% was recorded. In 2017 emissions of CO from industry increased by 1.5% compared to the preceding year.

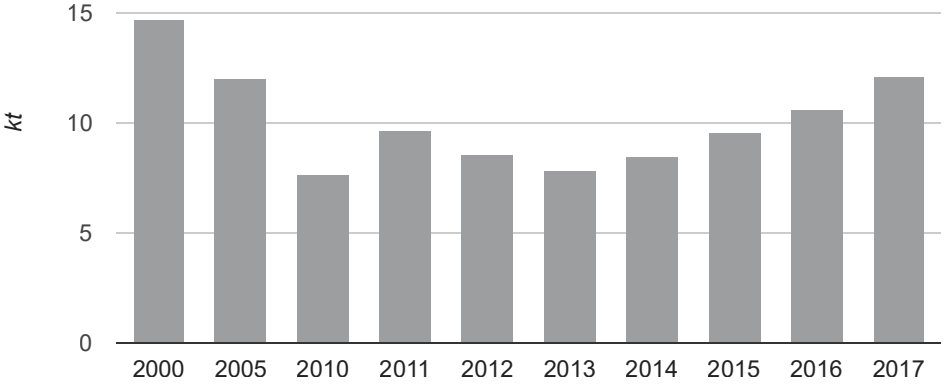
Chart 041 I Trend in emissions of CO from industry



Source: Slovak Hydrometeorological Institute

Emissions of SO_2 from industry in 2017 made up 6.3% of total emissions, and compared to 2000 a decrease of 17.4% was recorded. In 2017 emissions of SO_2 from industry increased by 14.2% compared to the preceding year.

Chart 042 I Trend in emissions of SO_2 from industry

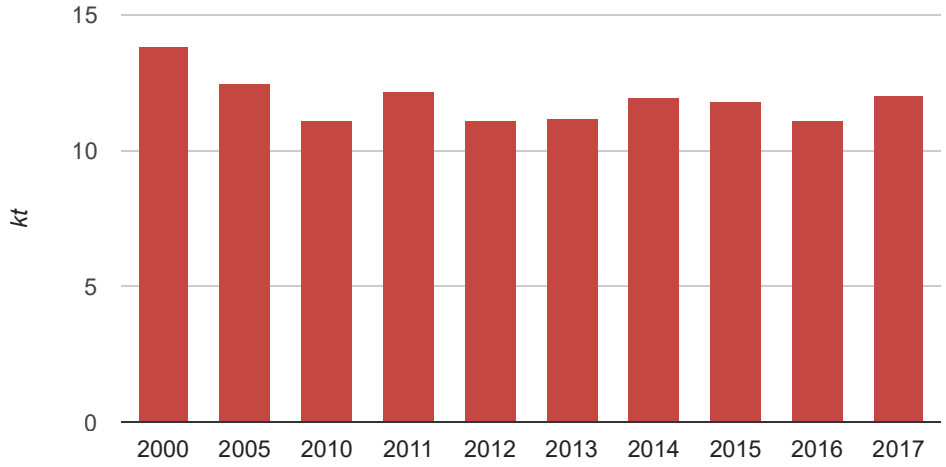


Source: Slovak Hydrometeorological Institute

Note: Emissions determined as of 30 September 2018

Emissions of NO_x from industry in 2017 made up 6.2% of total emissions and a decrease of 13.1% was recorded compared to 2000. In 2017 emissions of NO_x from industry increased by 7.9% compared to the preceding year.

Chart 043 I Trend in emissions of NO_x from industry

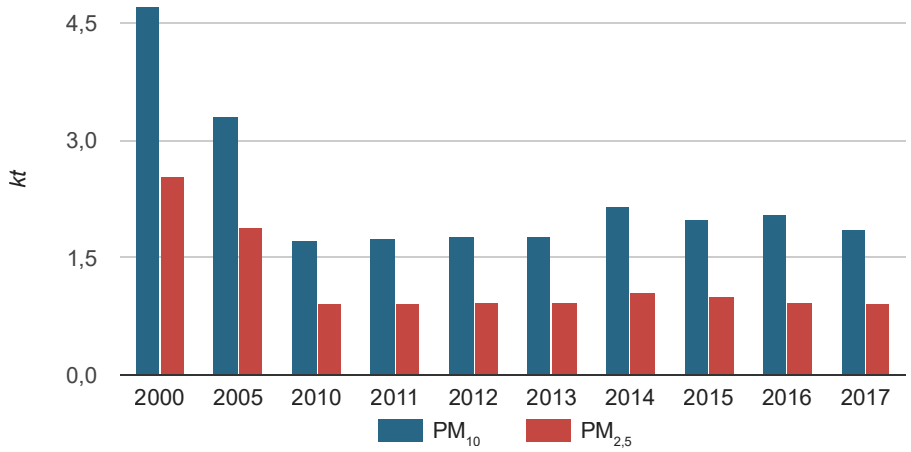


Source: Slovak Hydrometeorological Institute

Emissions of PM_{10} in 2017 made up 0.97% of total emissions and compared to 2000 a decrease in emissions of PM_{10} from industry of 60.4% was recorded. In 2017 emissions of PM_{10} from industry decreased by 8.8% compared to the preceding year.

Emissions of $PM_{2.5}$ in 2017 made up 0.47% of total emissions and compared to 2000 a decrease in emissions of $PM_{2.5}$ from industry of 63.8% was recorded. In 2017 emissions of $PM_{2.5}$ from industry decreased by 0.7% compared to the preceding year.

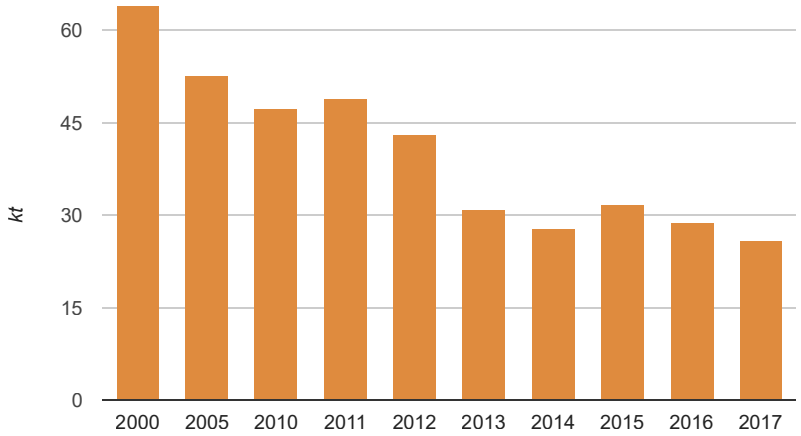
Chart 044 I Trend in emissions of PM_{10} and $PM_{2.5}$ from industry



Source: Slovak Hydrometeorological Institute

Emissions of non-methane volatile organic substances (NMVOC) in 2017 made up 13.4% of total emissions and compared to 2000 a decrease of 59.5% was recorded. In 2017 emissions of NMVOC from industry decreased by 10.5% compared to the preceding year.

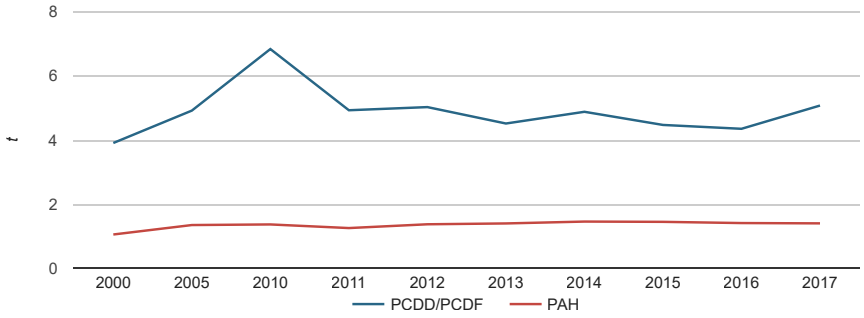
Chart 045 I Trend in emissions of non-methane volatile organic substances (NMVOC) from industry



Source: Slovak Hydrometeorological Institute

Emissions of persistent organic pollutants (POPs) from industrial processes had a declining trend in 2017 compared to the preceding year in the case of emissions of polycyclic aromatic hydrocarbons (PAH). Emissions of polychlorinated dibenzodioxins and dibenzofurans (PCDD/PCDF) increased by 29.8% compared to 2000, and emissions of polycyclic aromatic hydrocarbons increased in the same period by 32.8%.

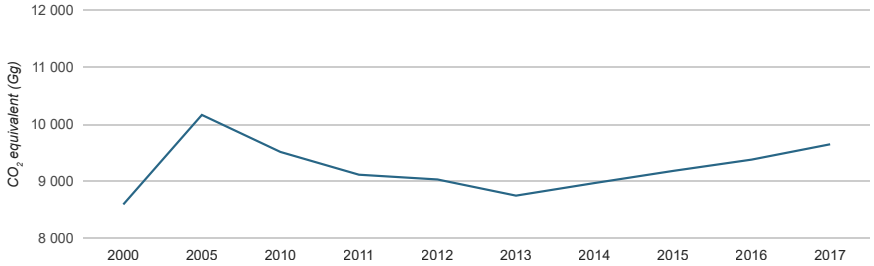
Chart 046 I Trend in emissions of persistent organic pollutants (POPs) from industrial processes



Source: Slovak Hydrometeorological Institute

In 2017 **greenhouse gas emissions** from industrial processes and used products increased by 12.3% compared to 2000 and increased by 2.9% compared to the preceding year. In 2017 industrial processes and the use of products made up 26.3% of total emissions of greenhouse gases.

Chart 047 I Trend in greenhouse gas emissions from industrial processes and the use of products

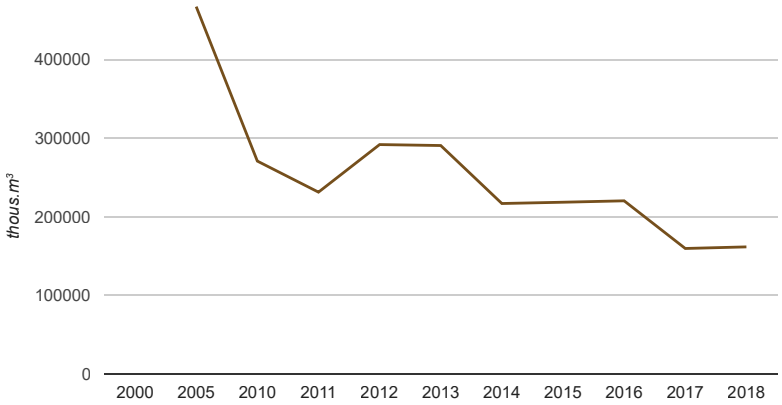


Source: Slovak Hydrometeorological Institute

Note: Emissions determined as of 11 April 2019

Water is another environmental element significantly impacted by industry. The trend in the discharge of **waste water** from industry shows a significantly falling yet fluctuating trend since 2013. In 2018 there was a decrease in the discharged quantity of waste water of 70.9% compared to 2000.

Chart 048 I Trend in the discharged quantity of industrial waste water



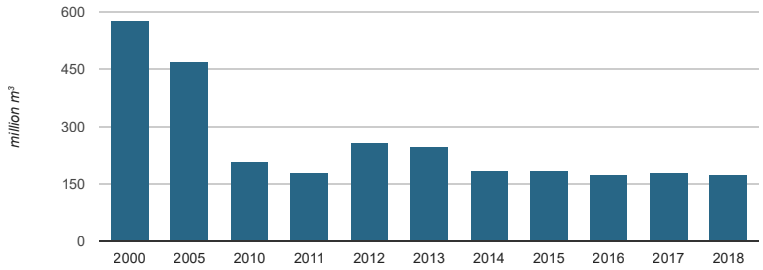
Source: Slovak Hydrometeorological Institute

In 2018, **3 865 881 t of waste was generated by industry**, of which **296 955 t was hazardous waste** and **3 568 925 t other waste**. Compared to 2008 there was a decrease in generated waste of 13.5% and compared to the preceding year there was a decrease of 1.08%. In terms of waste management, the share of waste generated by industry in the total volume of generated waste reached 34.7% in 2017.

RESOURCE-INTENSITY OF INDUSTRY

The abstraction of surface water in industry fell by 69.7% between 2000 and 2018. If a shorter trend assessment is used, it has remained at approximately the same level since 2014.

Chart 049 I Trend in surface water abstraction in industry

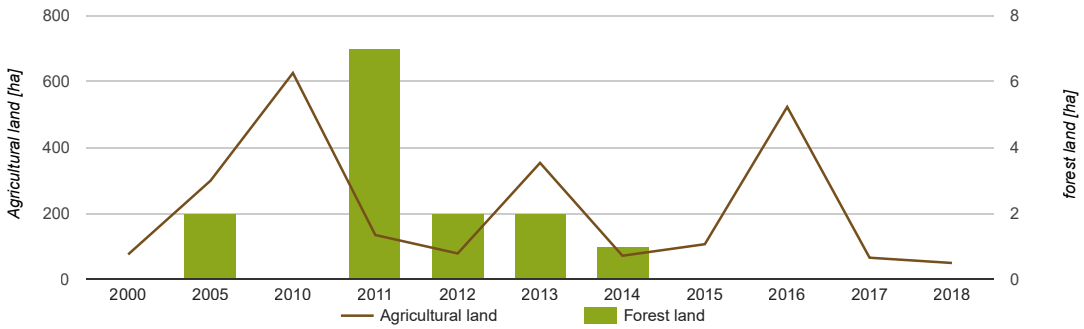


Source: Slovak Hydrometeorological Institute

The trend in **groundwater abstraction** has also shown a decrease over the long term. Groundwater abstraction in the **food industry** had fallen by 22.1% in 2018 compared to 2000, and groundwater abstraction in **other industry** fell by 29.4%. In a short-term comparison between 2010 and 2018 the trend is of stagnation, and in a comparison between 2018 and 2017 there was actually a recorded increase in abstraction.

The trend in **soil loss for industrial construction** has a fluctuating trend in the assessed period. The greatest **losses of agricultural land** for industrial construction was recorded in 2010 (606 ha). In terms of **forest land**, the greatest losses for industrial construction were recorded in 2011 (7 ha). In 2018 losses of agricultural land for industrial construction were 49 ha and in terms of forest soil no loss was recorded.

Chart 050 I Trend in soil loss for industrial construction



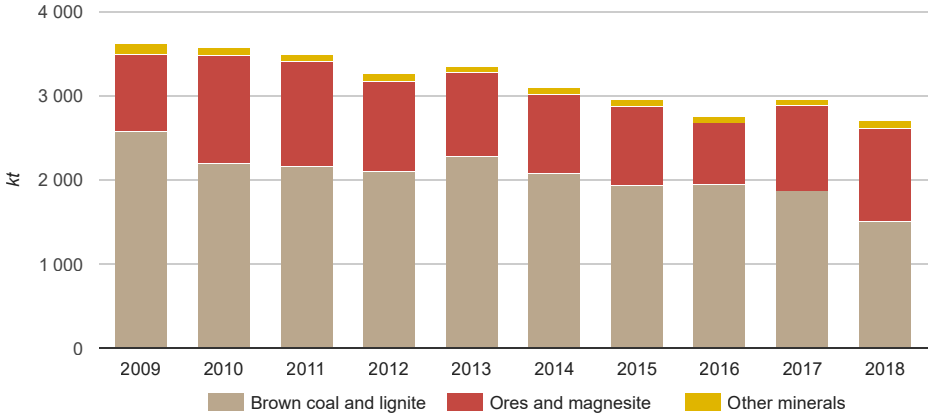
Source: The Geodesy, Cartography and Cadastre Authority of the Slovak Republic

MINERAL MINING

TREND IN MINERAL MINING

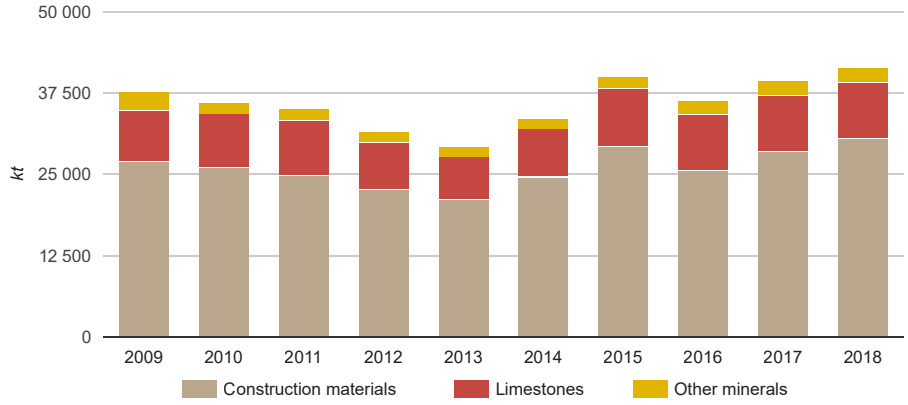
In 2018 there was a slight increase in surface mining and a slight decrease in deep mining compared to the preceding year. A comparison between 2005 and 2018 shows a decrease in mining of brown coal of 40%, of magnesite by 32%, and of ores up to 93%. From a longer-term perspective, the volume of mining in 2018 did not reach the status of 1993 for the majority of extracted resources. From the perspective of the exploitation of natural resources and environmental impacts connected with mining, this trend can be seen as positive.

Chart 051 I Trend in underground mining



Source: MMO SR

Chart 052 I Trend in surface mining



Source: MMO SR

MINING AND THE ENVIRONMENT

In 2018 a total of 99 dumps were recorded, 71 of which are in mining areas (56 active and 15 inactive) and 28 outside mining areas (25 active and 3 inactive). Dumps occupy an area of 332.73 ha.

As of the end of 2018 a total of 28 tailings ponds were recorded, 14 of which are in mining areas (10 active and 4 inactive) and 14 outside mining areas (10 active and 4 inactive). Tailings ponds occupy an area of 117.45 ha.

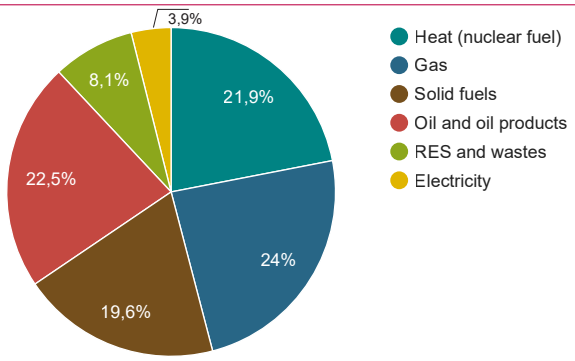
THE ENERGY SECTOR

ENERGY SOURCES BALANCE/ENERGY SECURITY

The SR has high import dependency. Almost 90% of primary energy sources are imported from territories outside the EU internal market. Inland primary energy sources include brown coal, hydropower and biomass. Inland oil and gas production is minimal and most gas and oil is imported from the Russian Federation and Azerbaijan. All black coal is also imported. Nuclear fuel is also imported from the Russian Federation.

The structure of the primary energy sources used in 2017 showed a balanced share of individual energy sources in gross inland consumption (the so-called energy mix). The long-term decrease in solid fuel and natural gas consumption and the increase in renewables consumption is positive. Gross inland energy consumption reached 722 039 TJ in 2017, or approximately a 10.0% fall compared to 2005. GIEC increased year-on-year (6.1%), while the consumption of liquid and gaseous fuels increased most significantly (10.2% and 6.2%).

Chart 053 I Energy mix (2017)

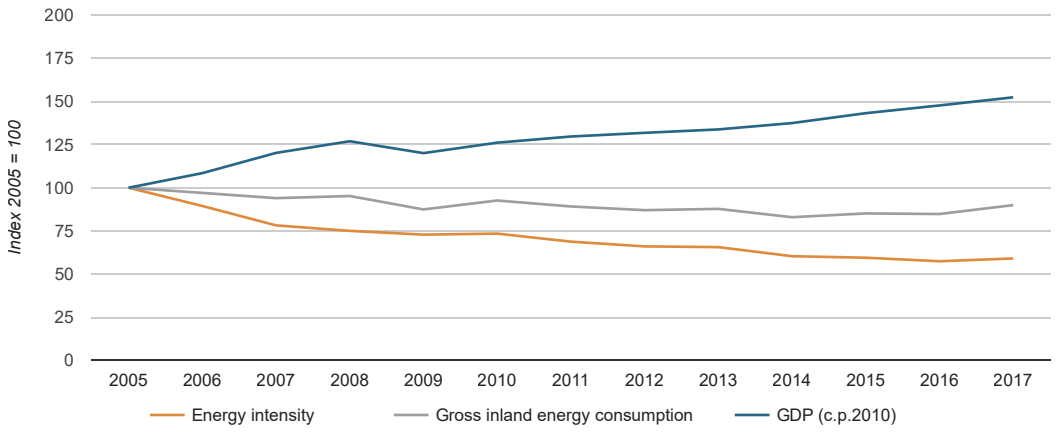


Source: Statistical Office of the Slovak Republic

ENERGY INTENSITY AND ENERGY EFFICIENCY

Reducing the energy intensity (EI) of the Slovak economy, defined as the ratio of gross inland energy consumption to GDP, is one of the long-term goals of the Slovak energy policy. Between 2005 and 2017 the energy intensity of the Slovak Republic fell by 41.0%. This decrease is the result of an increase in GDP at constant prices 2010 (52.4%) and a concurrent decrease in GIEC (10.0%). In a year-on-year comparison EI increased by 2.8%.

Chart 054 I Trend in energy intensity, gross inland energy consumption and GDP at constant prices 2010



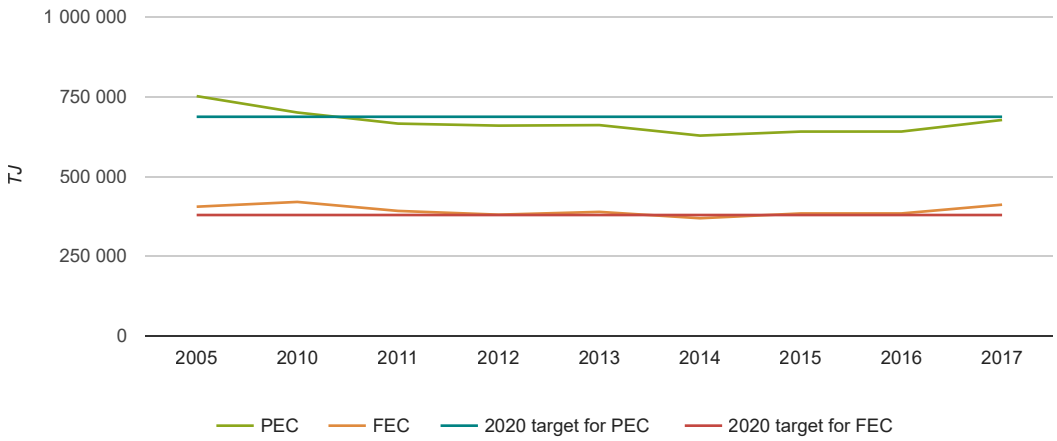
Source: Statistical Office of the Slovak Republic

Despite the favourable trend, the SR is one of the EU Member States with high energy intensity.

One of the main factors in achieving long-term energy and climate targets is energy efficiency, and its increase is enshrined in Envirostrategy 2030. Based on Directive 2012/27/EU on energy efficiency, the SR has adopted a commitment to reduce final energy consumption to 378 PJ and primary energy consumption to 686 PJ by 2020.

Primary energy consumption (PEC) was 676 034 TJ in 2017. In a year-on-year comparison between 2016 and 2017 there was a 5.7% increase in PEC. In a comparison between 2005 and 2017, PEC decreased by 10.0% with slight fluctuations.

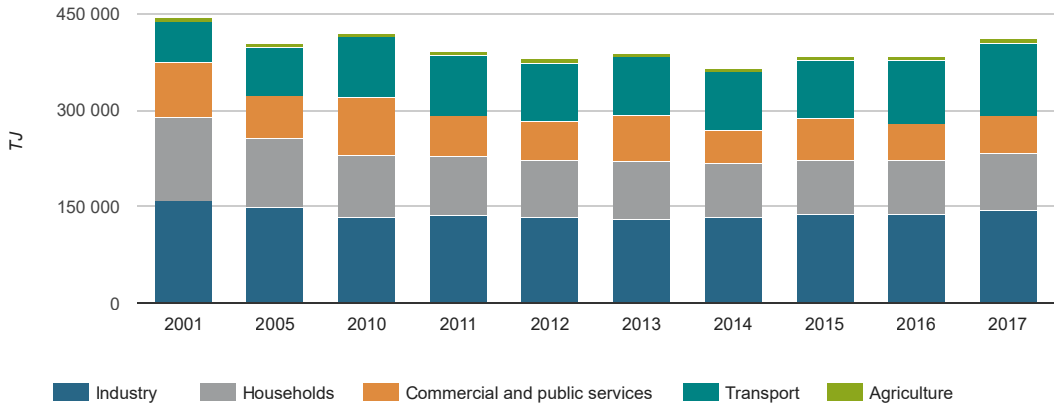
Chart 055 I Trend in primary energy consumption and final energy consumption



Source: Statistical Office of the Slovak Republic

In 2017 final energy consumption was 410 403 TJ. Due to a significant year-on-year increase in 2017 (7.2%), as well as in previous years, its positive falling trend to 2014 was interrupted and final energy consumption in 2017 was 1.6% higher compared to 2005. Final energy consumption decreased year-on-year in all sectors with the exception of the agriculture sector. The most significant increase was recorded in the transport (13.8%) and trade and services (9.0%) sectors. The sector with the highest share of total energy consumption in 2017 was industry (35.0%) followed by three sectors: transport (27.5%), households (21.5%) and trade and services (14.6%). Agriculture had the lowest, with a share of only 1.5%.

Chart 056 I Trend in final energy consumption in sectors of the economy

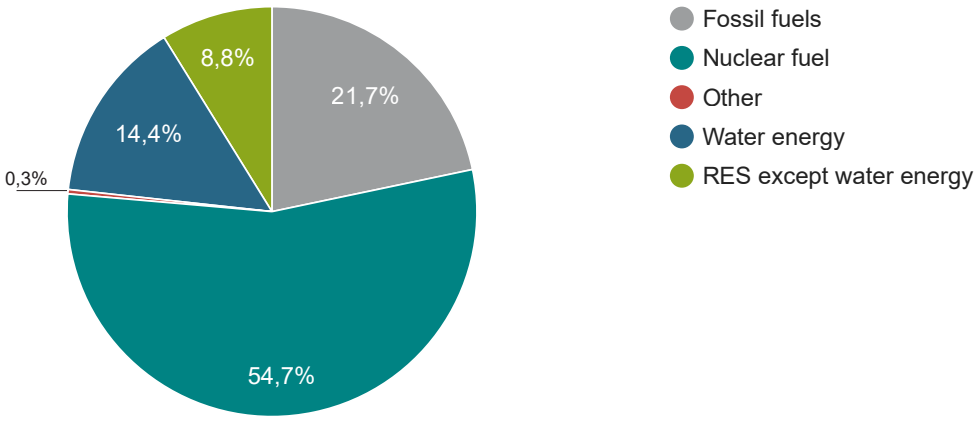


Source: Statistical Office of the Slovak Republic

ENERGY SUSTAINABILITY

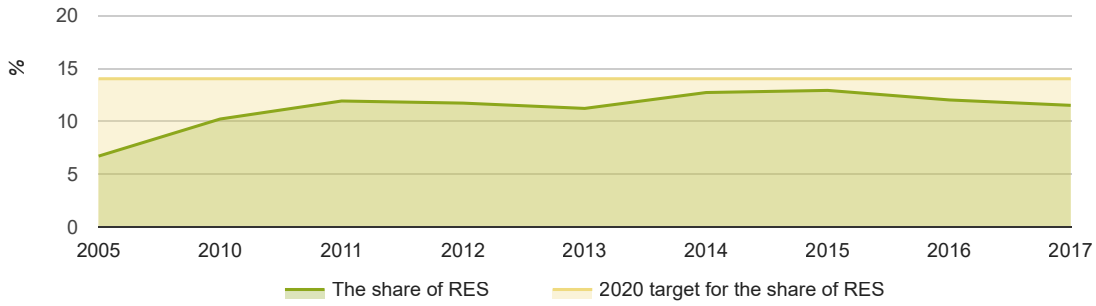
Electricity generation has a fluctuating trend. In a long-term comparison between 1993 and 2018, a 12.8% increase in electricity generation was recorded, while there were decreases in electricity generation in a medium-term comparison between 2005 and 2018 (13.2%) and in a year-on-year comparison between 2017 and 2018 (3.1%). In 2018 27 149 GWh of electricity was generated in the SR. The SR already has a low-carbon mix of electricity sources, since the share of carbon-free electricity generation in 2018 was around 80%. As in previous years, in 2018 the majority of electricity was generated from nuclear fuel. From a long-term perspective **electricity generation in thermal power plants** is gradually **falling** while the importance of nuclear energy and energy from renewables is rising.

Chart 057 I Electricity generation by source (2018)



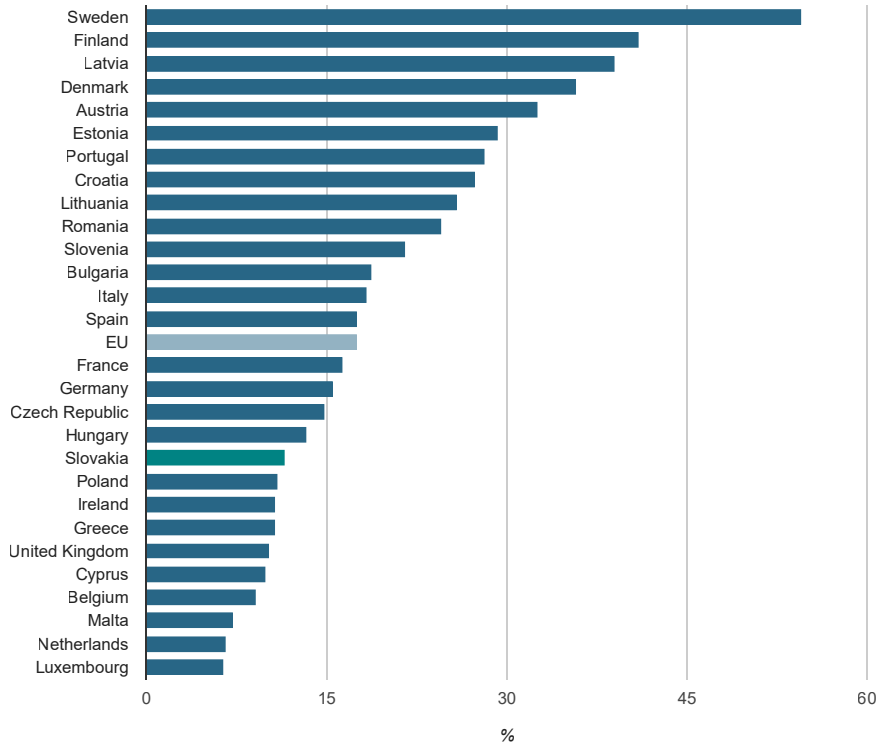
Source: SEPS, a. s.

Chart 058 I Trend in the share of energy from renewables from the perspective of meeting the national target in 2020



Source: Ministry of Economy of the Slovak Republic, Statistical Office of the Slovak Republic

Chart 059 I International comparison of the share in energy from renewables (2017)

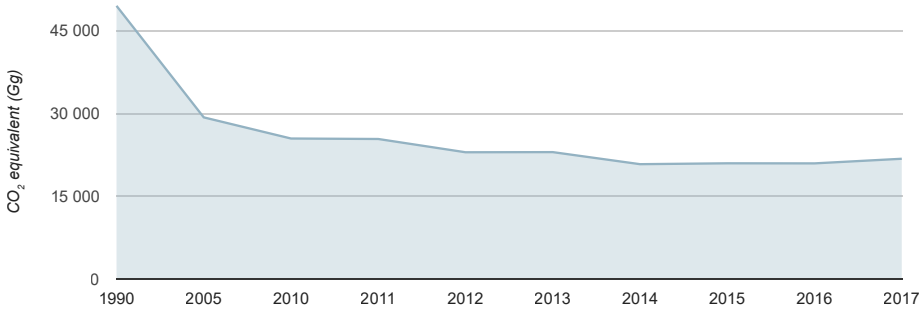


Source: Eurostat

THE ENVIRONMENTAL IMPACT OF THE ENERGY, HEAT AND GAS SECTORS

Despite a significant decrease in **greenhouse gas emissions** from the **energy sector** compared to 1990, this sector remains one of the largest producers. In 2017 the energy sector generated 21 782.6 Gg of CO_2 equivalent greenhouse gas emissions, or **50.3% of total emissions** generated in the SR. Compared to 1990 **emissions** had **decreased** by **55.9%** by **2017**. This significant decrease in emissions is a result of the increased share of services in GDP creation, the increased share of natural gas in the fuel mix, structural changes, and a decrease in energy consumption in energy-intensive sectors. A year-on-year comparison between 2016 and 2017 shows an increase in greenhouse gas emissions from the energy sector of 4.0%, caused primarily by an increase in industrial output and fuel consumption in services.

Chart 060 I Trend in greenhouse gas emissions from the energy sector

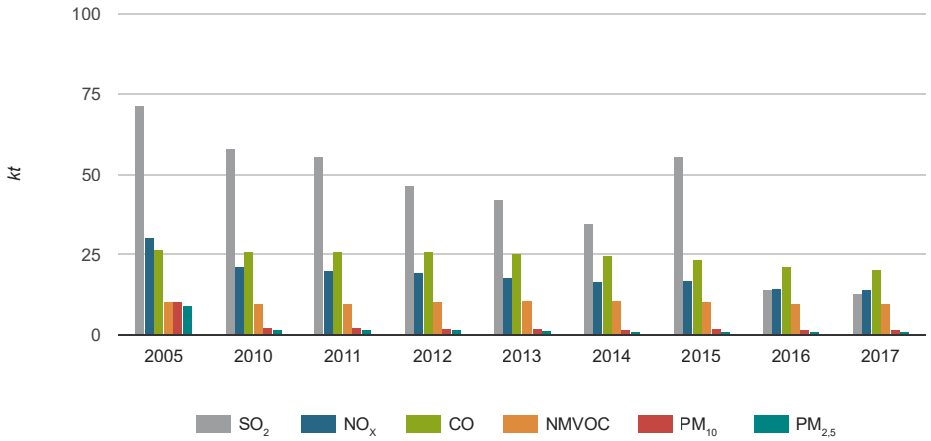


Source: Slovak Hydrometeorological Institute
Note: Emissions determined as of 11 April 2019

The energy sector is an important producer of **emissions of SO_2, NO_X, CO, NMVOC, PM_{10} and $PM_{2.5}$.**

In the period from 2005 to 2017 **a positive trend** in monitored emissions of pollutants was achieved. Similarly, a positive trend was also achieved in a year-on-year comparison between 2017 and 2016. A year-on-year decrease of over 7% was recorded for emissions of PM_{10} (7.5%), SO_2 (7.2%) and $PM_{2.5}$ (7.1%). In 2017 the energy sector generated around 48.5% of total emissions of SO_2, 21.6% of NO_X and 11.0% of NMVOC. The energy sector's share in emissions of other monitored substances was less than 7%.

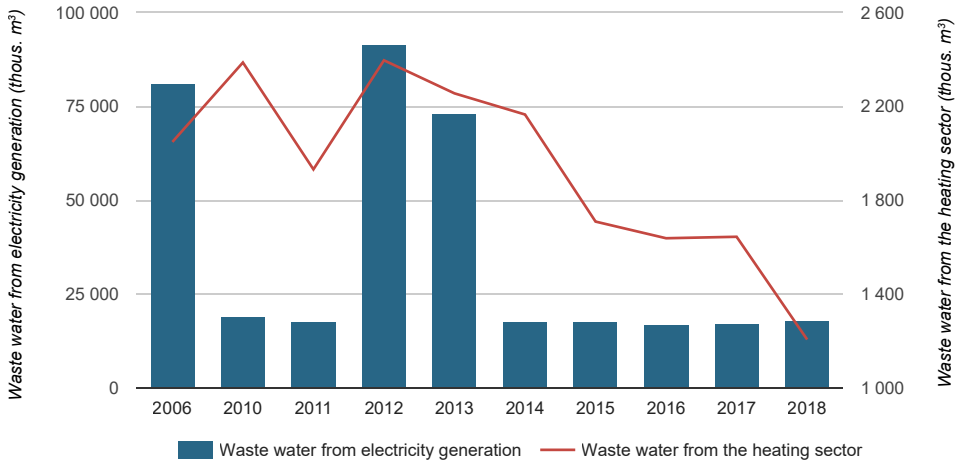
Chart 061 I Trend in emissions of SO_2, NO_X, CO, NMVOC, PM_{10} and $PM_{2.5}$ from the energy sector



Source: Slovak Hydrometeorological Institute

The highest share of the total volume of **discharged waste water** in the energy sector was from power engineering. Waste water generated by power plants is primarily water from technological and cooling processes, and to a lesser extent a public sewerage system. Technology waste water is contaminated with chemicals, and also radiochemical pollution in the case of the primary circuits of nuclear power plants. Water used for cooling is predominantly subject to thermal pollution.

Chart 062 I Trend in the volume of discharged waste water from the energy sector



Source: Slovak Hydrometeorological Institute

In 2018 a 4.5% increase in the volume of discharged waste water from **electricity generation** was **recorded compared to 2017**. On the other hand, the quantity of waste water from the heating sector fell year-on-year by 26.6%. Compared to 2006 there was a significant decrease in the quantity of waste water from electricity generation (77.8%), as well as the quantity of waste water from the **heating sector** (41.1%).

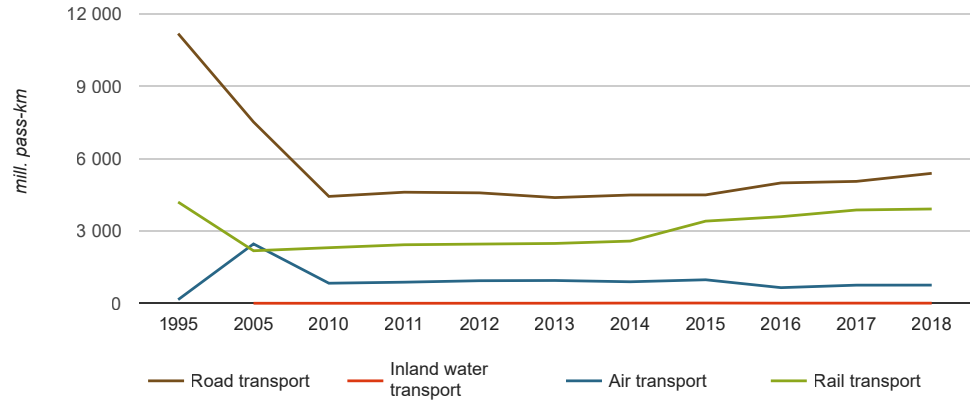
In 2018 the electricity, gas, steam and cold air supply sectors generated 1 083 487.9 tonnes of **waste placed on the market**, an increase in generation by approx. 20.9% compared to 2017. Hazardous waste only accounted for 0.2% (2 367 t) and other waste 99.8% (1 081 121 t). According to the classification of economic activities, this sector only contributed 9.7% of total waste generation in 2018.

TRANSPORT

TRANSPORT OF PERSONS AND GOODS

In 2018 the increase in the numbers of **people transported** in rail and air transport continued, while road and water transport experienced a slight year-on-year decrease. Transport performance in all types of passenger transport remained at approximately the same level compared to the year before. The shares of the individual modes of transport in the performance of passenger transport is as follows: individual 72%, road public transport 13%, rail transport 10%, city mass transit 3%, air transport 2%.

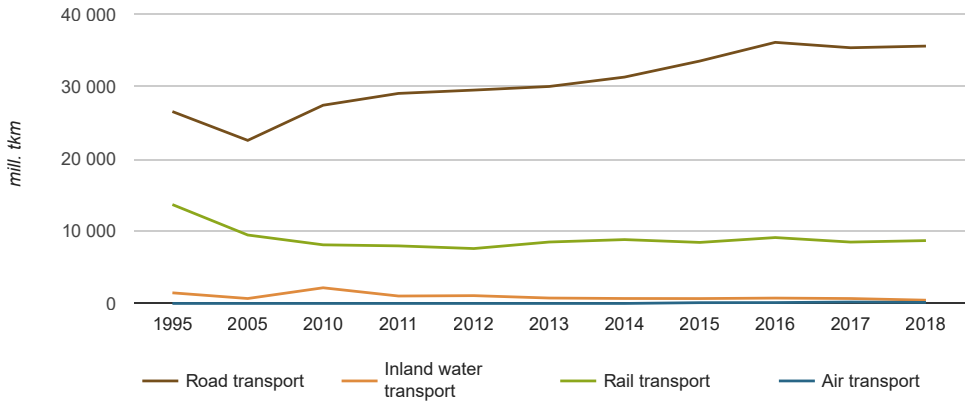
Chart 063 I Trend in transport performances by mode of transport



Source: Statistical Office of the Slovak Republic

The transport of goods and transport performances in freight transport increased in road and rail transport year-on-year in 2018, while a slight decrease was recorded in water and air transport. Road transport had the highest share of freight transport performances (approx. 79%), followed by rail transport (19%) and inland water transport with only 2%.

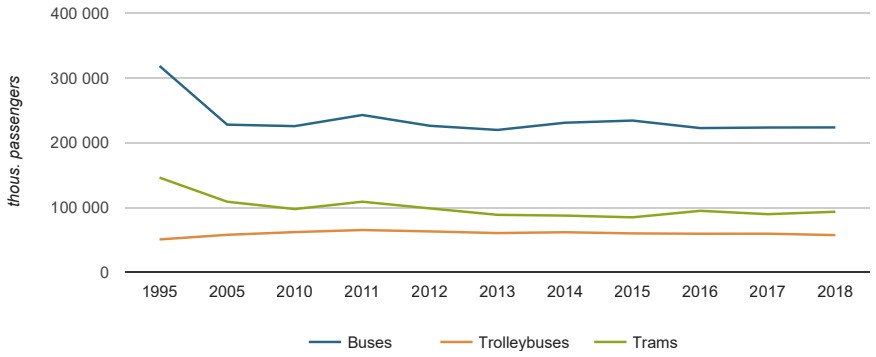
Chart 064 I Trend in transport performances in freight transport by mode of transport



Source: Statistical Office of the Slovak Republic

Urban public transport (UPT) is provided by public transport companies in v Bratislava, Košice, Prešov and Žilina. In other Slovak cities, UPT is provided by private transport companies, respectively by self-employed persons. Such transport is not run as UPT. In 2018 a year-on-year increase in the numbers of people transported by buses and trams was recorded. Passenger transport by trolleybus fell year-on-year. During the monitored period bus transport maintained its leading position, followed by trams and trolleybuses.

Chart 065 I Trend in the numbers of people transported by UPT



Source: Statistical Office of the Slovak Republic

TRANSPORT INFRASTRUCTURE

In **2018 there were no significant** changes in transport infrastructure in the SR. The transport network consisted of **18 045 km of roads and motorways**, with motorways accounting for 482 km and local roads 38 895 km. There were **3 627 km of railway lines**, of which 1 587 km were electrified. The length of navigable watercourses remained unchanged at **172 km** and 38.45 km of canals.

VEHICLE NUMBERS

In 2018 there were 3 203 441 motor vehicles registered in all categories in the SR, an increase compared to 2017 of **125 793**.

When assessing the increase in road transport and individual car transport, important indicators are the **motorisation rate** (the number of inhabitants of a specific territorial unit per motor vehicle) and the **passenger car rate** (the number of inhabitants of a specific territorial unit per passenger car). In 2018 the passenger car rate was 2.45 people per passenger car, while in 2010 it was 3.25.

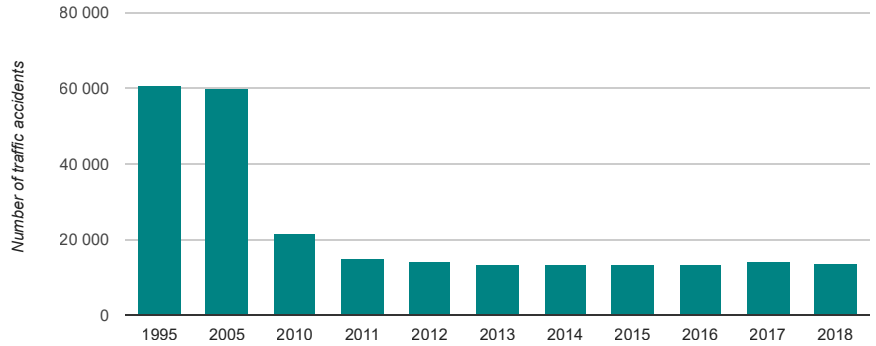
In 2016 the Ministry of the Economy of the SR launched a subsidy programme to promote electromobility worth EUR 5.2 million to end in 2018. During the project period between 2016 and 2018, 831 applicants drew from this subsidy, purchasing 514 battery-electric vehicles and 317 plug-in hybrid vehicles. In total there are 1 700 electric vehicles registered in the SR. In 2018 the Ministry of the Economy of the SR resented the **"Action Plan for the Development of Electromobility"** with 15 specific measures to be implemented within three years. The goals of the plan are to increase the numbers of electric vehicles and to construct the necessary infrastructure and promote research and development into components for electric vehicles. The anticipated approval date for the Action Plan is 2019.

The numbers of means of transport in rail and water transport (the most environmental modes of transport for both passengers and freight) saw a minimal year-on-year increase.

TRANSPORT ACCIDENT RATES

In 2018 there were 13 902 transport-related accidents in road transport, a decrease of 111 compared to 2017. The number of fatalities fell to 229 persons and lightly injured persons to 5 643. There was an increase in the numbers of heavily injured persons to 1 272. In 2018 there were a record 63 accidents in rail transport, 48 of which occurred on marked railway crossings.

Chart 066 I Number of transport-related accidents in road transport



Source: Statistical Office of the Slovak Republic

*Note: * a change in methodology from 2009*

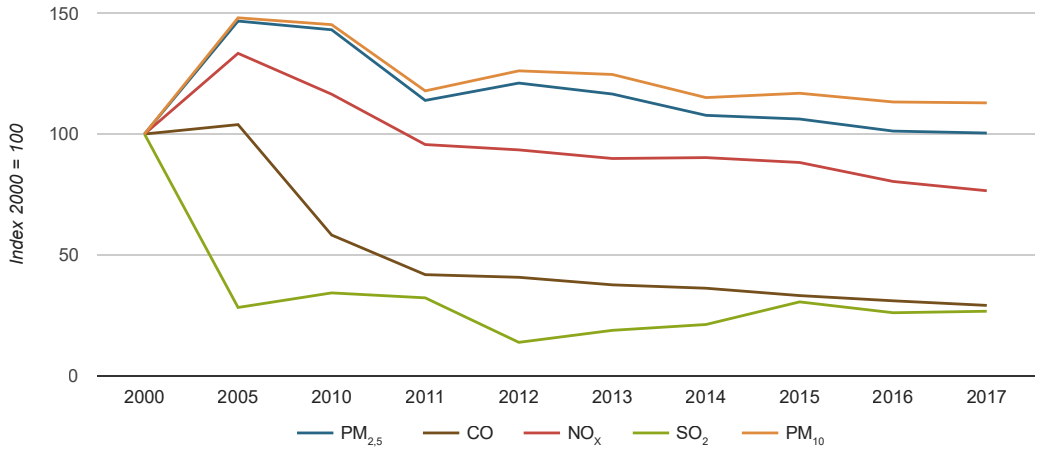
THE IMPACT OF TRANSPORT ON THE ENVIRONMENT

In the SR an inventory of the generation of emissions of selected pollutants is carried out on an annual basis, and also includes **an annual inventory of road, rail, water and air traffic**. To determine the quantity of pollutants generated by transport the CORINAIR methodology is used. Its special SW product called COPERT is designed to take inventories of the annual generation of emissions from road transport.

In the total emissions of pollutants for 2017, the 14.7% share of transport in emissions of CO, 45.9% of NO_x, 7.1% of NMVOC and 0.72% of emissions of SO_2 is significant. The share of non-exhaust emissions of $PM_{2.5}$ particulates was 9% and of PM_{10} was 9.2%.

The share of transport, after recalculation, in emissions of heavy metals is approx. 5.2%, while copper (14.3%) had the highest share in emissions of heavy metals generated by transport in 2017, followed by lead (2.0%) and zinc (4.4%).

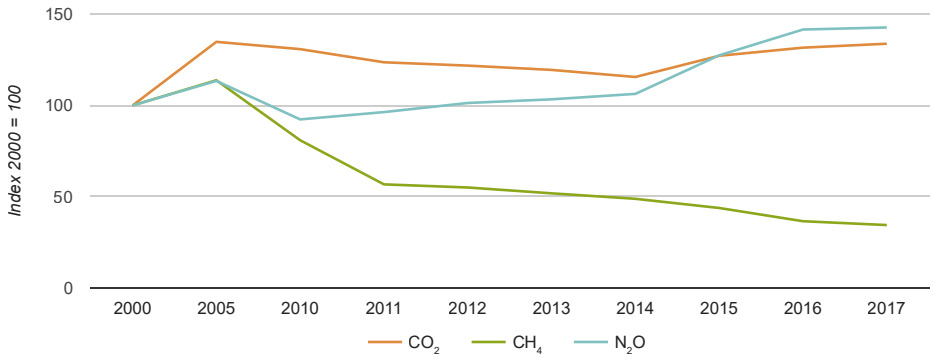
Chart 067 I Trend in emissions of basic pollutants from transport



Source: Slovak Hydrometeorological Institute

The transport sector's share in total generated emissions of greenhouse gases in 2017 was 20.8% (expressed as CO_2 equivalent). The long-term trend in emissions of CO_2 from transport in the 2000 to 2017 period fluctuated, however in a comparison between 2017 and 2000 emissions of CO_2 from transport grew by 33.7%. Compared to 2016 they increased by 1.7%. The most significant decrease since 2000 (65.5%) was recorded by emissions of CH_4 while on the other hand emissions of N_2O increased by 42.7%.

Chart 068 I Trend in greenhouse gas emissions from transport



Source: Slovak Hydrometeorological Institute

In the transport and roads sector 1 772 280 t of **waste** was generated in 2018, 16 570 t of which was hazardous waste and 1 755 710 t other waste, an increase of 613 760 tonnes compared to the preceding year.

An overview of the results of the processing of **old vehicles** is provided in the chapter Waste.

AGRICULTURE

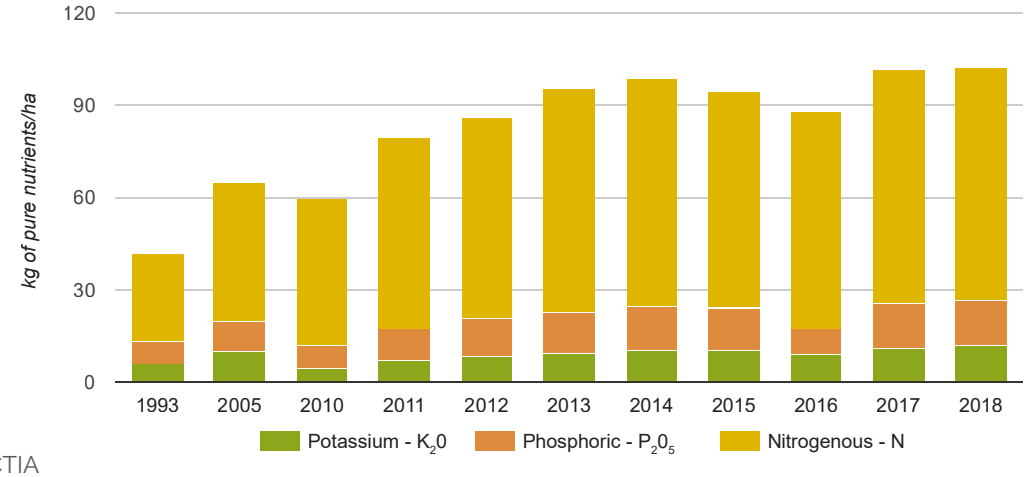
STRUCTURE OF AGRICULTURAL LAND

In 2018 the **total area of agricultural land in the SR was 2 379 101 ha.** The greatest parts of this were arable land at 59.17% and permanent grassland at 35.8%. On the other hand, the smallest shares were occupied by hop gardens at 0.02%, fruit orchards at 0.71%, vineyards at 1.1% and gardens at 3.2%. The land fund trend is characterised by the further loss of agricultural land to the benefit of forests, non-agricultural land and non-forested land.

CONSUMPTION OF INDUSTRIAL FERTILISERS AND PESTICIDES

The consumption of industrial fertilisers was 102.4 kg of pure nutrients per hectare of agricultural land in 2018, or 0.6 kg.p.n./ha more than the preceding year. With the changes occurring after 1989 in the agriculture sector, there was a significant decrease in the consumption of industrial fertilisers in agriculture. Since 2000, however, the consumption of industrial fertilisers has fluctuated and shown a tendency to increase again.

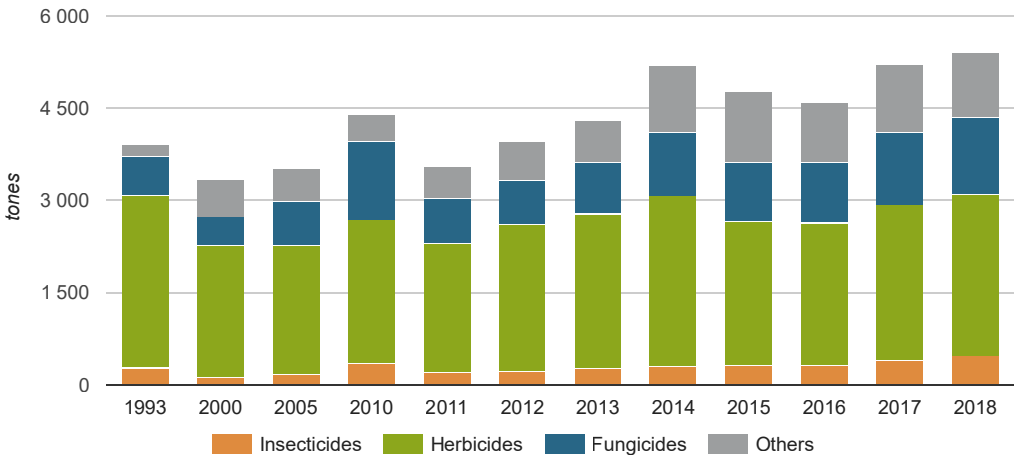
Chart 069 I Trend in the consumption of industrial fertilisers converted to N, P_2O_5 and K_2O



Source: CCTIA

The consumption of pesticides grew year-on-year by 191.4 t compared to 2017. In 2018 at total of **5 403.5 t** of preparations to protect flora were applied, of which approximately 2 650.6 t of herbicides, 1 235.7 t of fungicides, 456.7 t of insecticides and 1 060.6 t of other preparations.

Chart 070 I Trend in the consumption of pesticides by group

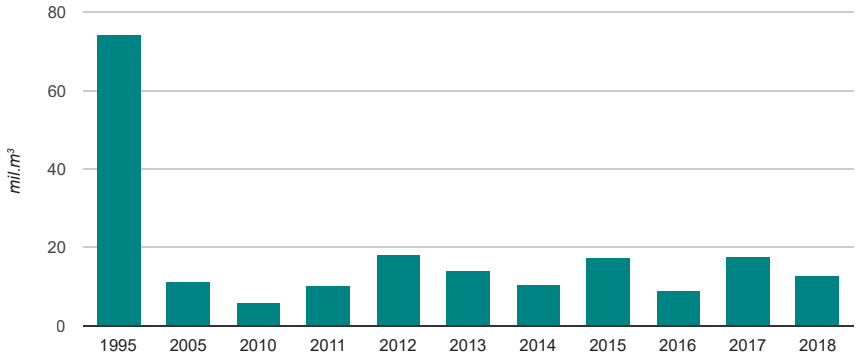


Source: Statistical Office of the Slovak Republic

THE IMPACT OF AGRICULTURE ON THE ENVIRONMENT

The greatest total abstraction of surface water in agriculture is **for irrigation**, while this depends on the extent and temporal distribution of natural precipitation during the growing season. In 2018 the total abstraction of surface water for irrigation was 12.95 million m³.

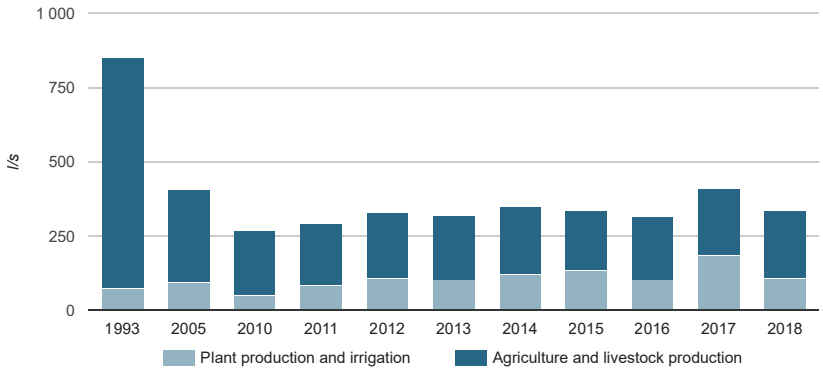
Chart 071 I Trend in the exploitation of surface water for irrigation



Source: Slovak Hydrometeorological Institute

In 2018 groundwater abstraction for agriculture totalled 335.5 l/s.

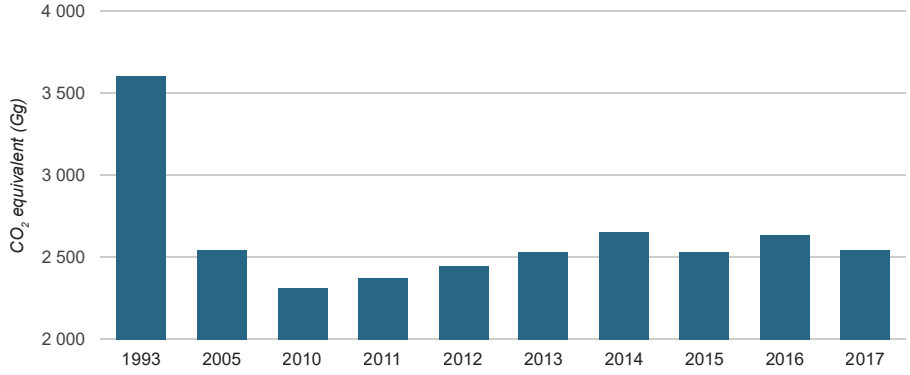
Chart 072 I Trend in the use of groundwater in agriculture



Source: Slovak Hydrometeorological Institute

Agriculture contributed to **emissions of greenhouse gases**, primarily methane (CH_4) and nitrous oxide (N_2O). In 2017 its emissions expressed as CO_2 equivalent were 6% of all the greenhouse gas emissions in the SR (not including the LULUCF sector).

Chart 073 I Trend in greenhouse gas emissions from agriculture

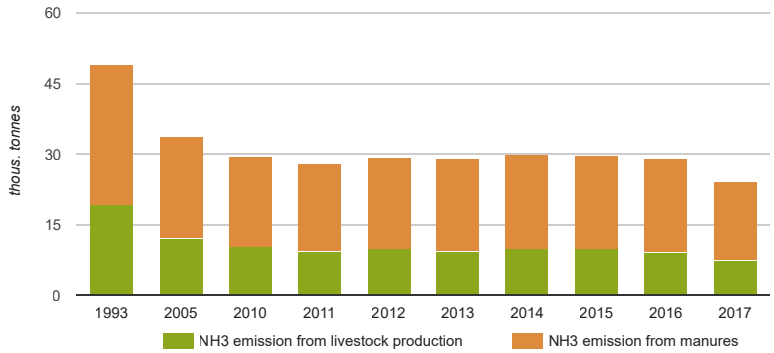


Source: Statistical Office of the Slovak Republic

Note: Emissions determined as of 11 April 2019

Agriculture is the greatest producer of ammonia (NH_3). Emissions of NH_3 have generally fallen since 2000, with agriculture generating 24 044 t in 2017.

Chart 074 I Trend in emissions of ammonia from agriculture



Source: Slovak Hydrometeorological Institute

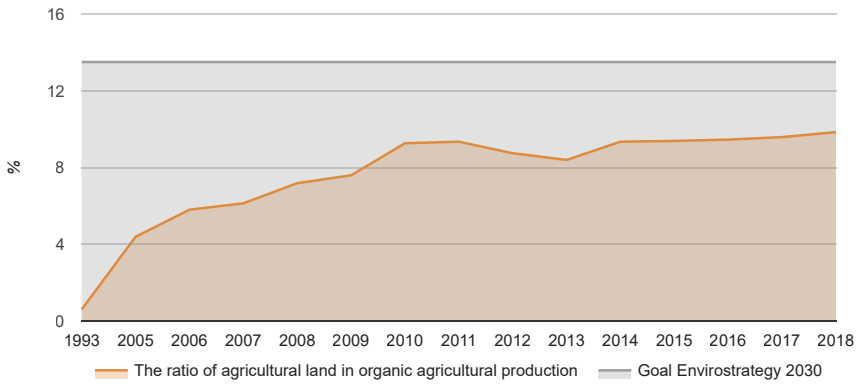
In 2018 a total of **115 323 m³ of waste water** was discharged in connection with agricultural activities, an increase of 16.7% compared to 2017. In the year in question **508 466 t of hazardous and other waste was generated in agriculture.**

ORGANIC AGRICULTURAL PRODUCTION

In 2018 a total of **802 entities** farming **on 192 143.1 ha of agricultural land**, or 9.85% of the agricultural land fund, was registered in the **organic agricultural production** system. Compared to 2000 this area had increased by 133 803.1 ha.

One of the main targets of Envirostrategy 2030 for sustainable land management is to increase the share of land managed in the organic agricultural production system to at least 13.5% of total agricultural land by 2030.

Chart 075 I Trend in the share of organic agricultural production land to total agricultural land



Source: CCTIA

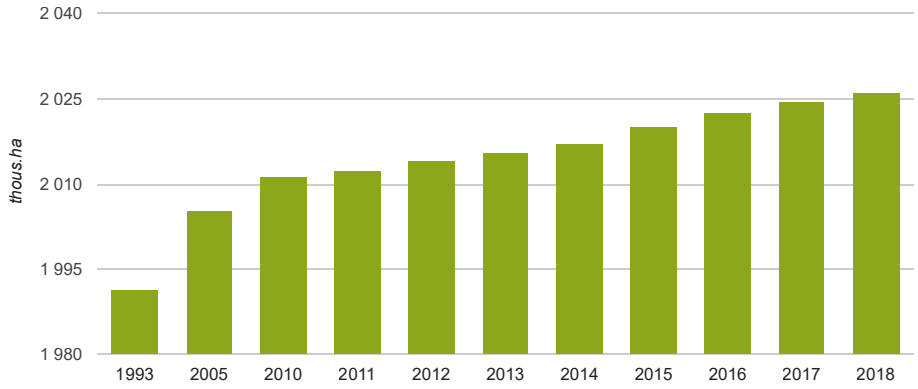
A comparison of EU Member States from 2017 showed that the SR is in eighth place in terms of the share of land managed in organic agricultural production.

FORESTRY

AREA, COMPOSITION AND FUNCTION OF FORESTS

The area of the SR covered with forest has been stable over the long term (approx. 41%), respectively the area of forest land (FL) is slightly increasing (pursuant to data from the forest care programmes, respectively the land register). Satellite images of land cover (in the context of CORINE projects) however indicate a decrease in forested land. There are 2 different methodologies and approaches to assessing the area of forested land. **The area of forest land** (pursuant to the land register) reached 2 026 027 ha (with a year-on-year increase of 1 653 ha), or **41.3%** of Slovak territory. In addition to FL, forests also appear on agricultural and other land (so-called **white areas**). The results of the second cycle of the National Forest Inventory and Monitoring in the SR 2015-2016 (NFIM 2) indicate that such area is **288 ± 39 000 ha**, or a significant share of forests in FL, and after this is taken into account the actual area of forests in Slovakia is 45.1 ± 0.9%.

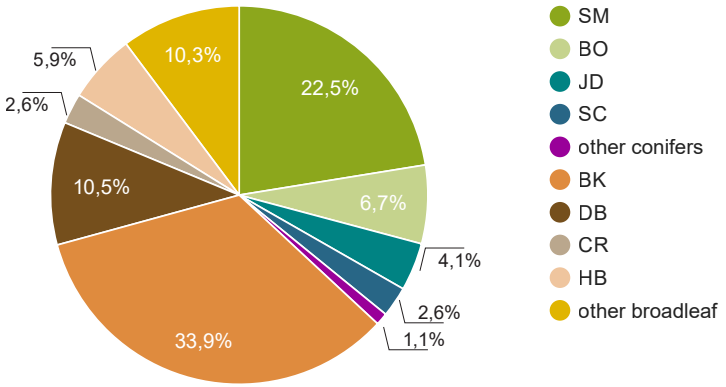
Chart 076 I Trend in the area of forest land



Source: GCCA SR

In 2018 the increase in the favourable share of **broad-leaved** trees **(63.1%)** compared to **coniferous** trees **(36.9%)** continued. Compared to 2017 the share of broad-leaved trees increased by another 0.3%, while a decrease in the share of coniferous trees was recorded especially for spruce, as a result of harmful pests. **The most common** tree species are beech (33.9%), spruce (22.5%), common oak and sessile oak (10.5%) and pine (6.7%).

Chart 077 I Shares of tree species in forests of the SR (2018)



Source: NFC

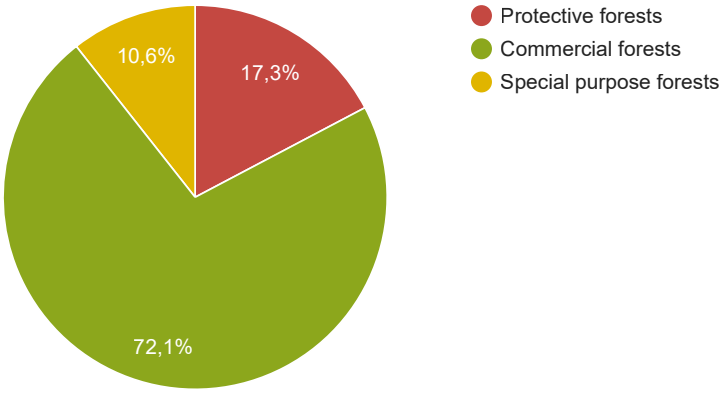
Note: SM-spruce, BO-pine, JD-silver fir, SC-larch, BK-beech, DB-oaks, CR-Austrian oak, HB-hornbeam

The current trend in the **age structure** of forests differs significantly from the normal (ideal) structure. Forests over 70 years old, where regeneration should commence, predominate while on the other hand the share of young forests aged from 20 to 70 is under the normal level. This status demonstrates the aging of forests in Slovakia, with the average age of all the main trees increasing with the exception of spruce (due to frequent calamities).

State-run forest management organisations own a total of **40.3%** of forested land (784 684 ha), however they manage up to **52.4%** forested land (1 005 208 ha). The remainder of forested land is managed by non-state forest management entities that own and manage private, community, church, municipal and agricultural cooperative forests. As part of the reprivatisation process Forests of the Slovak Republic, state enterprise has handed over a total of 3 103 ha of forest land.

The most common category are **commercial** forests, followed by **protective** forests, while the smallest category is special-purpose forests. The majority of commercial forests are multifunctional forests that perform other associated environmental and social functions in addition to production functions.

Chart 078 I Shares of forest categories in forested land (2018)



Source: NFC

FOREST REGENERATION AND STANDING VOLUME

The total scope of **forest regeneration compared** to the preceding year increased by 689 ha to its current **17 387.7 ha**, and this has been a relatively balanced trend over recent years. **Natural regeneration** slightly increased compared to 2017, while its share in total forest regeneration from a long-term (since 1993) and medium-term (since 2005) perspective showed a significant increase, reaching **40.6% as of 2018**.

Standing volume in forests has been increasing over the long term and in 2018 reached **481.8 million m³** of barkless wood matter, 1.55 million m³ more than in the preceding year. At present, as a consequence of the age composition of its forests, the SR has its historically largest standing volume, however their volume is already culminating. The standing volume of **coniferous** wood has been falling since 2010 (due to frequent damage, especially to spruce forests), on the other hand the trend in the increase of standing volume of broad-leaved wood continued. In addition to this there is standing volume of 46 ± 7 million m3 in forests **on non-forest land** (white areas) pursuant to findings from NFIM 2. **The average stock** per hectare was **248 m³/ha**.

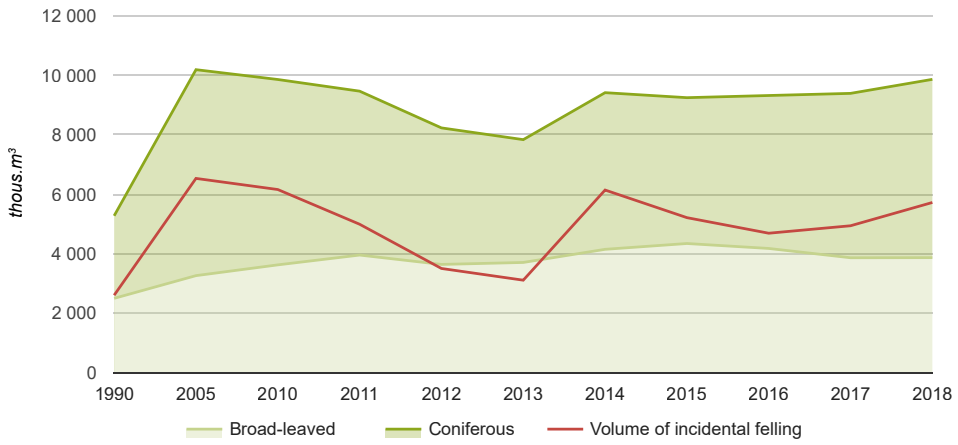
Deadwood is also an important component of forest ecosystems and should be kept in forests to the extent necessary to promote biodiversity. Pursuant to NFIM 2 results there is 87.0 ± 5.7 million m³ of dead wood (standing dry trees, stumps, lying rough and thin wood) in forests, an average of 45.2 ± 2.8 m³ per ha; on non-forest land there is another 6.8 ± 1.8 million m³. The volume of dead wood in Slovakia is significantly higher than the average for European Member States.

Of the natural ecosystems, **forest ecosystems** are among the most important links in the **carbon cycle**. Forests are able to accumulate large volumes of carbon thanks to their large amounts of wood biomass over the long term, and hence reduce CO_2 levels in the atmosphere. **The carbon stock** in forest ecosystems, and above-ground and underground biomass, is related to the stock of wood in forests and the area of forest soil, while it was **504.9 million tonnes in 2018**.

TIMBER FELLING AND FOREST RESOURCES UTILISATION

In 2018 timber felling increased by 5% compared to the previous year, reaching **9 864 727 m³**. The share of **incidental felling** in total felling increased by 5.4% to 58% compared to the previous year. The **intensity of forest resources utilisation** (share of felling volumes and increment) was 82.15% (increase of 4% compared to 2017). The **main factor** in increased felling possibilities and actual timber felling was the current age structure of forests with normal to above-normal area representation of 8th and higher age groups (71 years and over), mostly mature forests, yet its increase is approaching culmination.

Chart 079 I Trend of total and incidental felling



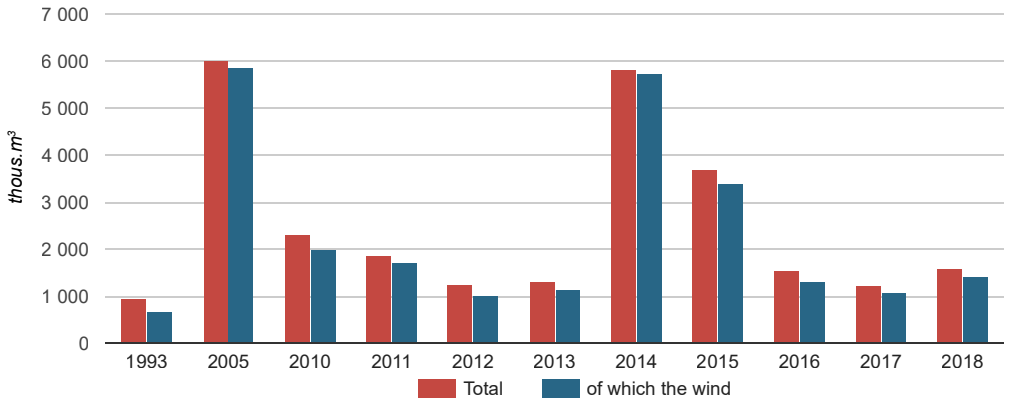
Source: NFC

HARMFUL FACTORS AND FOREST CONDITION

Abiotic harmful agents

As a result of the harmful effects of wind, snow, ice, drought and other abiotic agents **1 602 382 m³** of wood was damaged as of 2018, of which 146 883 m³ was the unprocessed volume of the previous year. The **share of wind** in abiotic harmful agents was up to **87.6%**. A total of **93.8% of wood mass was processed**. The most damaged coniferous trees were the spruce and the most damaged broad-leaved trees the beech.

Chart 080 I Trend in forest damage by abiotic agents



Source: NFC

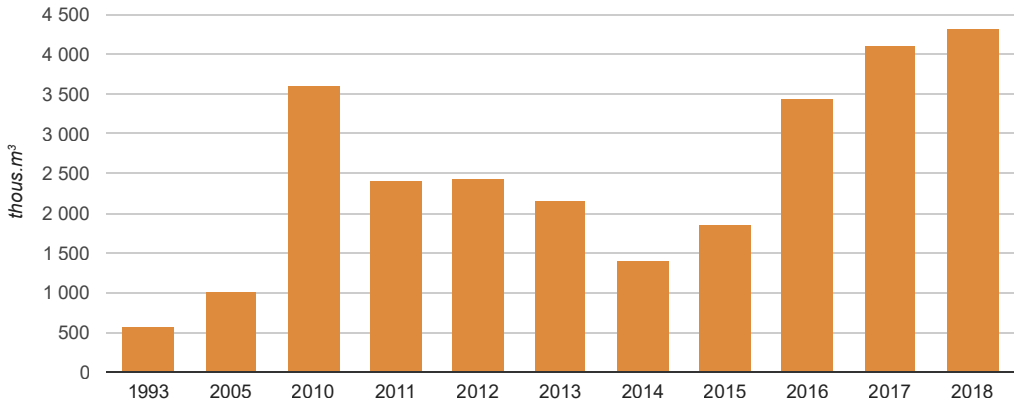
Biotic harmful agents

The increase in calamity caused by **biotic harmful agents** was **4 066 572 m³** in 2018 (together with the remainder from the previous year a total of 4 591 698 m³ was damaged). Of this, bark-beetles and woodworms continue to have the highest influence on incidental felling, posing a danger to forest ecosystems containing spruce. Other harmful agents are phytopathogenic microorganisms, fungal diseases, insectivorous and sucking insects and game hunting. The volume of damage was approx. 100 000 m³ higher compared to 2017, thus creating a new maximum of matter attacked by biotic agents at least since 1960.

Bark-beetles and woodworms damaged **4 339 340 m³** of wood matter. Compared to the preceding year this was an increase of 229 200 m³. 91.6% of this was processed. The most important harmful agent was again the **spruce bark-beetle**.

Phytopathogenic organisms damaged a total of **252 358 m³** of wood mass (a year-on-year increase of 21.1%), while the most important pathogen was **honey fungus** (67.1%).

Chart 081 I Trend in forest damage by bark-beetles and woodworms



Source: NFC

Anthropogenic harmful agents

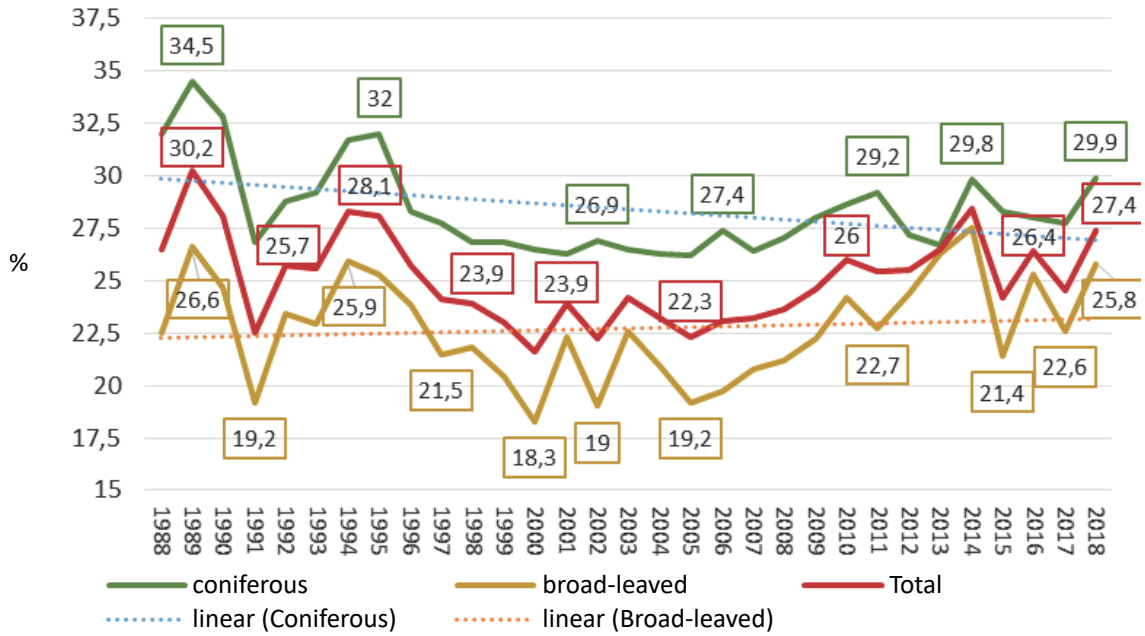
Anthropogenic harmful agents damaged **31 930 m³** of wood mass, of which 2 707 m3 was the unprocessed volume from the preceding year (this was a year-on-year **decrease** of 33.8%). **Emissions** had the highest share (up to 65.1%) and wood theft also had a high share (24.4%).

There were a record **262 forest fires** over an area of 243.38 ha (compared to 297.66 ha in 2017), with direct quantified damage of EUR 436 140.

Forest condition

The basic element of the assessment of forest trees condition is a visual assessment of the crowns and specific losses of assimilation organs (**defoliation**). The decisive factor is the share of trees in degrees 2 to 4, meaning with defoliation exceeding 25% (medium to heavily defoliated and dead trees; trees with lower defoliation are considered healthy). Such an assessment is carried out every year at 107 permanent level I monitoring sites throughout the Slovak Republic by PMS Forests.

Chart 082 I Trend in average defoliation - coniferous, broad-leaved and total



Source: NFC

After an improvement in forest condition in 2017 there was another **significant increase in defoliation** of coniferous and broad-leaved trees in 2018. The share of coniferous trees in defoliation degrees 2 to 4 was 49.7% (a year-on-year deterioration of 8.1%), the share of broad-leaved trees in the indicated degrees was 38.2% (a year-on-year deterioration of 12.2%). There was total defoliation of **42.6%** (a year-on-year decrease of 10.7%). In terms of individual **species of** trees, the long-term defoliation trend shows a **slight improvement for firs**, is **stabilized for spruce and oak and is deteriorating for pine, hornbeam and beech.**

FOREST CERTIFICATION

The goal of forest certification is to promote sustainable forest management, the consumption of wood as a renewable resource, products from wood, nature conservation and sustainable development of society. In the SR two certification schemes are used for forest certification:

- Certification pursuant to the Programme for the Endorsement of Forest Certification PEFC (PEFC Slovakia Association)
- Certification pursuant to FSC (FSC Slovakia Association).

As of 2018 **1.364.7 million ha** of forest was certified, meaning **70.1%** of the total forested area. Pursuant to **PEFC** this was 1 216 500 ha, while 263 certificates of participation in forest certification were issued. Pursuant to **FSC** this was 148 300 ha, and 10 certificates were issued. **Compared to 2017** the area of certified forests **decreased** by 15 000 ha due to the termination of PEFC certification for two entities and changes in the use of the forest land.

RECREATION AND TOURISM

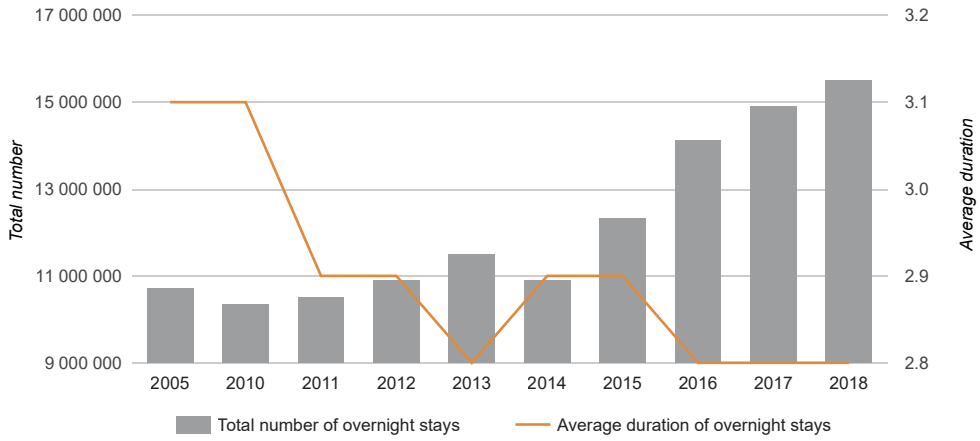
SPECIFIC ANALYSIS OF RECREATION AND TOURISM

The development of tourism is **one of the few encouraging sectors for which the SR has promise** and that cannot be relocated to neighbouring countries. This does not however mean that it can be developed in Slovakia without limits. It will be **necessary to determine the carrying capacity of the territory, primarily in localities with high traffic and vulnerable environments**, to ensure expertly justified and more precisely supported regulations, respectively to direct the development of tourism, including visitor numbers.

The trend in the SR is a slight rise in the number of overnight stays, with alternating periods of longer stays slightly increasing and on the other hand short significant decreases.

In 2009 there was a more significant decrease in the number of overnight stays (a decrease by almost 17%), compared to a longer period of growth between 2005 and 2008. Since then **the number of overnight stays has again increased, while in 2018 there was an additional year-on-year increase** (by 3.87%), while in the medium term (since 2005) this increase is even more significant (44.6%). From 2005 to 2011, however, there was an almost **continuous average fall in the duration of overnight stays** reflecting the level of attractiveness of the tourism destination as well as the level of infrastructure development impacting the duration of stays (from 3.8 overnight stays to 2.9). Since then it has stabilised at approximately this level (2.8 overnight stays).

Chart 083 I Trend in the performance of accommodation facilities in the SR



Source: Statistical Office of the Slovak Republic

IMPACT OF RECREATION AND TOURISM ON THE ENVIRONMENT

The intensity of tourist traffic is not evenly distributed. For tourists, the most attractive destinations are the national parks, yet these are potentially the most vulnerable to tourist activity. Localities for mountain tourism are concentrated in the TANAP, NAPANT and the NP Malá Fatra areas. From the perspective of the density of **marked bike trails and marked hiking trails** (MHT)**, the most fragmented areas are, due to their size, PIENAP, National park (NP) Muránska planina and NP Slovenský raj.** In 2018 there was a year-on-year **slight increase in the length of cycle trails in TANAP and hiking trails in NP Veľká Fatra. There was a slight decrease in the length of footpaths for tourists in NP Slovenský raj. In NP Slovenský kras 1 locality for mountaineering and rock climbing was added.**

Table 012 I Numbers of localities for mountain tourism outside the built-up areas of municipalities in the territory of the national parks (Section 14(1)(b)(c) and (d) of Act No 543/2002, on nature and landscape protection)

Name of the protected area	Mountaineering and rock climbing	Skialpinism	Camping and bivouacking	Ski resorts	Cross-country skiing **	Cyclotourism **	Hiking **
Tatra national park (TANAP)							
2005	whole territory*	6	1	7	108/0.14	150/0.20	690/0.93
2017	whole territory*	6	1	7	108/0.14	276/0.38	703/0.95
2018	whole territory*	6	1	7	108/0.14	279/0.38	703/0.95
National park Nízke Tatry (NAPANT)							
2005	4	6 (3 sites, 2 routes, 1 locality)	7	6	40 + suitable MHT	718/0.39 (including buffer zone)	800/0.98
2017	4	6 (3 sites, 2 routes, 1 locality)	7	6	41.2 + suitable MHT	764/0.42 (including buffer zone)	816.5/0.45 (vrátane OP NP)
2018	4	6 (3 sites, 2 routes, 1 locality)	7	6	41.2 + suitable MHT	764/0.42 (including buffer zone)	816.5/0.45 (including buffer zone)
National park Malá Fatra							
2005	5	0	4	2	15 + 157 MHT	35	157/0.69
2017	5	0	4	2	15 + 157 MHT	35/0.15 + 6.09 downhill	172/0.76
2018	5	0	4	2	15 + 157 MHT	35/0.15 + 6.09 downhill	172/0.76
Pieniny national park (PIENAP)							
2005	0	0	2	1	22/0.59	15/0.4	60/1.6
2017	0	0	2	0	27/0.70	21/0.60	52/1.40
2018	0	0	2	0	27/0.70	21/0.60	52/1.40
National park Slovenský raj							
2005	5***	0	3	7	50 + suitable MHT (including buffer zone)	118.5/0.1 (including buffer zone)	215/1.09
2017	10***	0	3	5	88 + suitable MHT (including buffer zone)	102/0.5	238/1.3
2018	10***	0	3	5	88 + suitable MHT (including buffer zone)	102/0.5	232/1.2
National park Muránska planina							
2005	2	0	3	0	26/0.13	13/0.06	318/1.57
2017	2	0	3 (in addition bivouacking: do 100 m od MHT in addition to NNR, NR and PS)	0	44 + all MHT, i.e. 362 (incl. OP)	198 (NP including OP)	318 (including OP)
2018	2	0	3 (in addition bivouacking: do 100 m od MHT in addition to NNR, NR and PS)	0	44 + all MHT, i.e. 362 (incl. OP)	198 (NP including OP)	318 (including OP)

Name of the protected area	Mountaine-ering and rock climbing	Skialpinism	Camping and bivouacking	Ski resorts	Cross-coun-try skiing **	Cyclotourism **	Hiking **
National park Poloniny							
2005	0	0	2	1	suitable MHT	44/0.15	119/0.4
2017	0	0	2	1	suitable MHT	33/0.11	85/0.29
2018	0	0	2	1	suitable MHT	33/0.11	85/0.29
National park Slovenský kras							
2005	1	0	0	0	0	38/0.19	270/0.78
2017	1	0	4	0	suitable MHT	40/0.20	270/0.78
2018	2	0	4	0	suitable MHT	40/0.20	270/0.78
National park Veľká Fatra							
2005	8	1	6	3	300/0,74	103/0.26	300/0.74
2017	8	1 + MHT	6	3	302/0,75	150/0.40	390/1.00
2018	8	1 + MHT	6	3	302/0,75	150/0.40	392/1.00

Source: State Nature Conservancy of the SR

Note:
** - in addition to 10 localities defined in the visitor rules, where mountaineering is banned*
*** - in the case of cross-country skiing, cyclotourism and hiking, data are given for the length of the marked cross-country trails, cycle trails and marked hiking trails in km or in km/km²*
**** - including ice climbing*

One significant environmental problem is the **continuous increase in the length of erosion-impacted MHT located in the zone above the upper tree limit and in gorges**, where the extreme climatic conditions significantly worsen the conditions for regeneration of soil and vegetation. **Critical erosion of** soil on marked hiking trails is visible **in NAPANT, NP Malá Fatra, NP Muránska planina and TANAP. This erosion is increasing. In 2018 there was a slight increase in the length of impacted cyclotourism trails in TANAP** (of 0.4 km)**. There was a more significant increase in impacted MHT in TANAP** (of 8 km) and **NP Slovenský raj** (of 6 km). In **NP Slovenský raj there was also a more significant increase in the length of impacted cyclotourism trails** (from 4 to 5 km).

Table 013 I Soil erosion on marked hiking trails and cyclotourism trails in the national parks

Name of protected area	Total length of erosion-impacted cyclotourism trails (km/% of the total length)	Total length of erosion-impacted marked hiking trails (km/% of the total length)
Tatra national park		
2005	0	150/21.7
2017	23.5/8.5	248/35.5
2018	23.9/8.6	256/36.4
National park Nízke Tatry		
2005	0	390/48,7
2017	90/12	570/70
2018	90/12	570/70
National park Malá Fatra		
2005	all cycle routes are part of MHT	120/76
2017	all cycle routes are part of MHT	125/74.85
2018	all cycle routes are part of MHT	125/74.85

Name of protected area	Total length of erosion-impacted cyclotourism trails (km/% of the total length)	Total length of erosion-impacted marked hiking trails (km/% of the total length)
Pieniny national park		
2005	2/13.3	2/3.3
2017	4/19	4/7.7
2018	4/19	4/7.7
National park Slovenský raj		
2005	0	50/23.3
2017	4/4	24/10
2018	5/5.3	30/12.9
National park Muránska planina		
2005	0	118/37.2
2017	2.94/2	118/37.2
2018	2.94/2	118/37.2
National park Poloniny		
2005	0	1/1
2017	0	4/4.7
2018	0	4/4.7
National park Slovenský kras		
2005	15/10	30/11.1
2017	15/10	30/11.1
2018	15/10	30/11.1
National park Veľká Fatra		
2005	1/1	17/5.7
2017	3.0/2.3	15/4.5
2018	3.0/2.3	15/4.5

Source: State Nature Conservancy of the SR

MATERIAL INTENSITY OF THE ECONOMY

KEY QUESTIONS AND KEY FINDINGS

What is the trend in resource productivity?
Resource productivity in the economy of the SR was EUR 1.15/kg in 2017. Compared to 2000 this was an increase of 48.9%, yet despite this increase the SR remains significantly behind the average resource productivity in the EU.

MATERIAL FLOWS

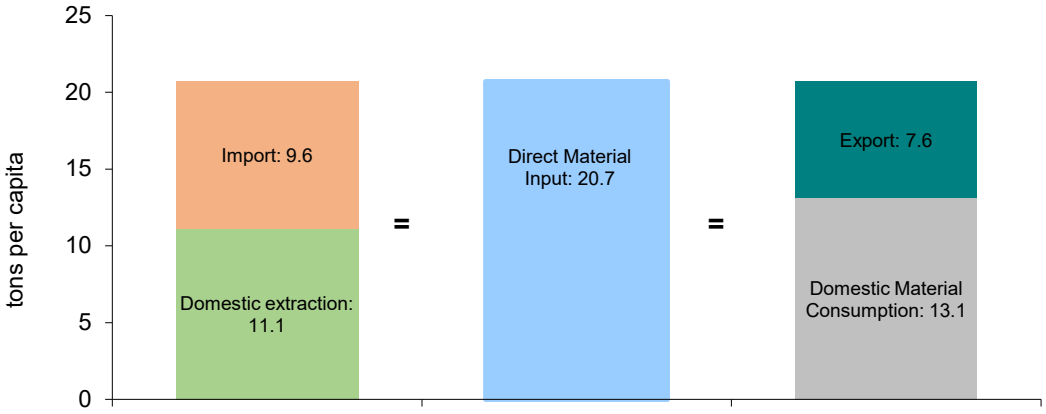
Material flow accounts show the quantity of materials physically available in a given economy. These material flows include the inland mining of minerals within national economies (mineral raw materials and biomass) and physical imports (the weight of imported goods). The sum of these material flows is the direct inland material input into the economy.

Inland mining was 11.1 tonnes per inhabitant in 2017, while the average value in the EU was 11.3 tonnes per inhabitant. Imports of goods were 9.6 tonnes per inhabitant in 2017. The direct material input (DMI) was thus 20.7 tonnes per inhabitant in the SR in 2017 (the average value in the EU was 14.8 tonnes per inhabitant).

The material available in the economy may be either consumed in the given country or exported, either as a raw material or as finished products. After deducting **exports**, the material balance is the **domestic material consumption** (DMC).

The DMC was 13.1 tonnes per inhabitant in 2017 in the SR (13.4 tonnes per inhabitant in the EU).

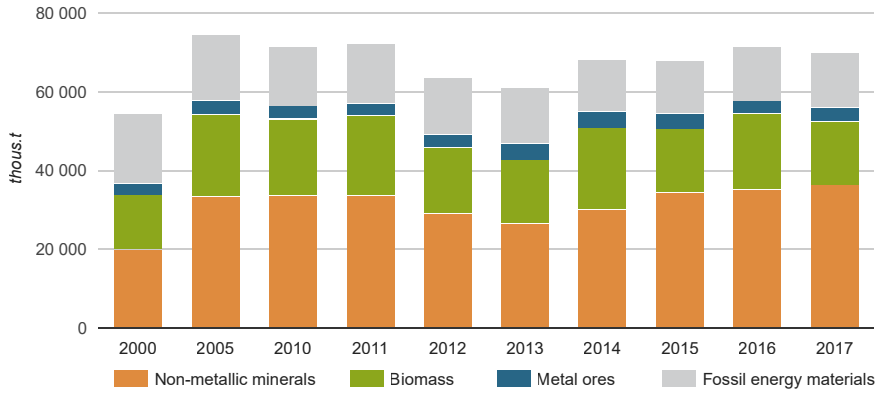
Chart 084 I Quantity of available materials and their exploitation (2017)



Source: Eurostat
Note: The chart expresses the relationship between inland mining, DMI, DMC, imports and exports.

DMC in the SR in 2017 was primarily made up of non-metallic minerals (52%), followed by biomass (23%), energy raw materials (20%) and metallic minerals (5%).

Chart 085 I Trend in domestic material consumption

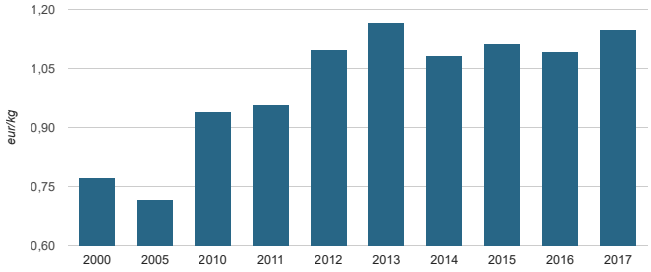


Source: Eurostat

RESOURCE PRODUCTIVITY

In 2017 resource productivity (GDP/DMC) in the economy of the SR was EUR 1.15/kg, which is an increase compared to 2000 of 48.9%. The SR remains behind the average resource productivity in EU Member States (EUR 2.07/kg).

Chart 086 I Trend in resource productivity



Source: Eurostat

Note: resource productivity (measured as GDP at constant prices 2010 to DMC)

WASTE AND WASTE MANAGEMENT

KEY QUESTIONS AND KEY FINDINGS

Is waste generation falling?

Compared to 2017 there was a year-on-year increase in waste generation of almost 10% in 2018. In 2018, 2 325 178 tonnes of municipal waste was generated in the SR, or 427 kg of municipal waste per inhabitant. Compared to EU Member States, municipal waste generation per inhabitant is low and under the average for the EU-27.

Municipal waste generation since 2005 has increased by 49.2%.

Is the share of landfilled waste falling?

There is a long-term persistent negative high share of waste landfilling in overall waste management (24.8% for waste in total and 53.8% for municipal waste).

Is the SR meeting binding limits arising for the waste issue from international regulations?

The main goals in the communal sphere have not yet been achieved. The recycling of municipal waste is at a low level and the goal to increase municipal waste recycling to 50% by 2020 will not be achieved. We can also evaluate waste sorting and the recovery of biodegradable municipal waste as unsatisfactory.

In 2018, 5.76 kg/inhabitant of waste from electrical and electronic equipment was collected. In 2018 the SR met the target for collecting WEEE determined in Annex No 3 of the Waste Act, and also the target determined by the applicable EC Directive.

The SR complied with the limits for the recovery and recycling of individual categories of WEEE determined pursuant to Annex No 3 of the Waste Act in 2018.

The SR has met the share of the re-use of parts of old vehicles and the recycling of old vehicles within the meaning of the applicable EC Directive and thus complied with the prescribed limit. The level of re-use and recovery of old vehicles was 96.75% in 2018.

The recovery of old tyres is also progressing successfully, and the determined target is being met.

In 2018, 813.03 tonnes of used portable batteries and accumulators were collected, a 57.66% collection rate. The SR thus met the limit set by the applicable EC Directive.

Is the share of waste packaging recovery increasing?

Of the total quantity of packaging waste, over 65.68% was recycled in 2017 and almost 68.57% of the total quantity of packaging waste was recovered, including material recovery. The recovery and recycling rates are increasing for the individual types of waste.

WASTE GENERATION AND MANAGEMENT

Total waste generation and management

In the SR a total of 13 478 036 tonnes of waste was generated in 2018. Compared to 2017 this was a year-on-year increase of almost 10% in 2018.

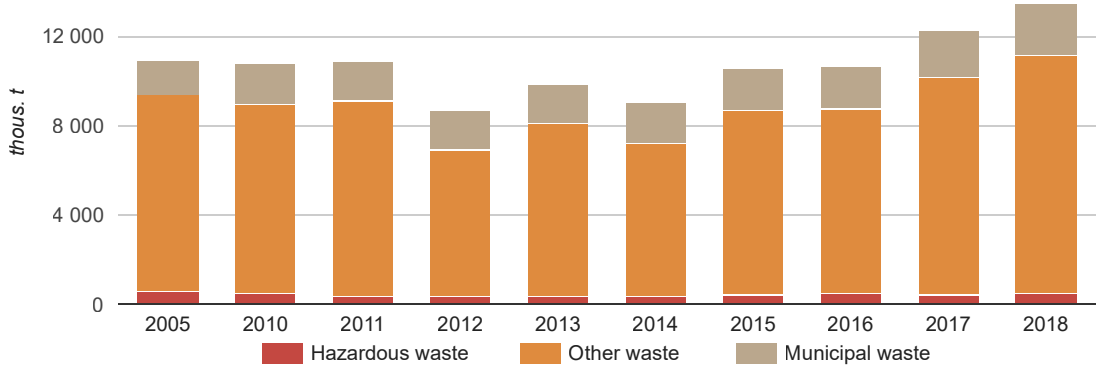
Table 014 I Waste generation balance (2018) (t)

Waste category	Quantity
Hazardous waste (HW)	512 470
Other waste (OW)	10 640 388
Municipal waste* (MW)	2 325 178
Total	13 478 036

Source: Ministry of the Environment of the SR

*Note: * MW includes both waste categories (OW and HW), its separation is necessary due to the special nature of the waste and the mode that applies to MW.*

Chart 087 I Trend in waste generation

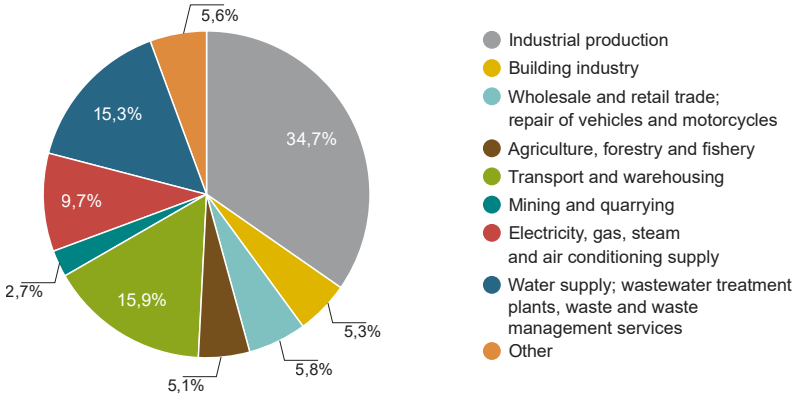


Source: Ministry of the Environment of the SR

Note: MW includes both waste categories (OW and HW), its separation is necessary due to the special nature of the waste and the mode that applies to MW

In terms of waste generation pursuant to the SK NACE classification of economic activities, the largest waste producer is industrial production (primarily other waste), which contributed 34.7% of total waste generation, followed by transport and warehousing with 15.9%.

Chart 088 I Waste generation pursuant to NACE (2018)



Source: Ministry of the Environment of the SR

The dominating recovery activity is **material recovery** with a 27.6% share in the total quantity of generated waste. The high share of **waste landfilling**, up to 24.8% of the total amount of waste generated, remains a problem. In 2018, 111 waste landfills and 19 incinerators and waste co-incineration plants were operated, of which 2 were for municipal waste.

Table 015 I Waste management, including MW (2018) (t)

Management method	
Landfilling	3 344 077
Incineration without energy recovery	40 857
Other disposal	321 294
Incineration with energy recovery	569 321
Material recovery (recycling)	3 721 477
Other recovery	1 526 576
Other management	3 954 434
Total	13 478 036

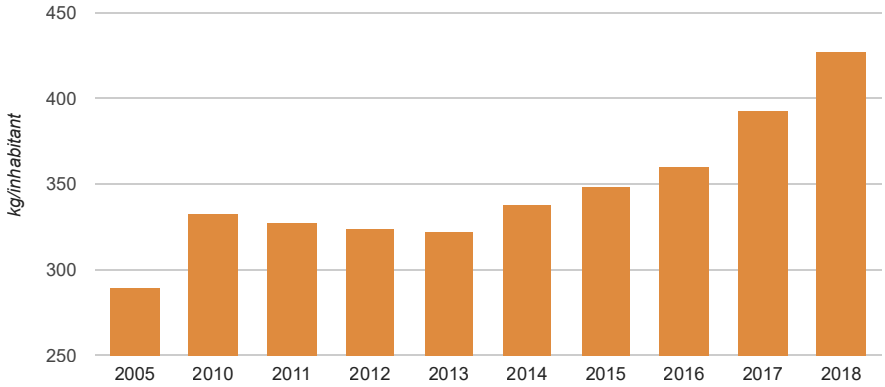
Source: Ministry of the Environment of the SR

Municipal waste

In 2018 almost **2 325 178** tonnes of municipal waste was generated in the SR, or **427 kg of MW per inhabitant**. Compared to 2017 this was an increase of 34 kg of MW per inhabitant.

In a Europe-wide comparison the SR has one of the lowest MW generation rates.

Chart 089 I Trend in the quantity of municipal waste by disposal method

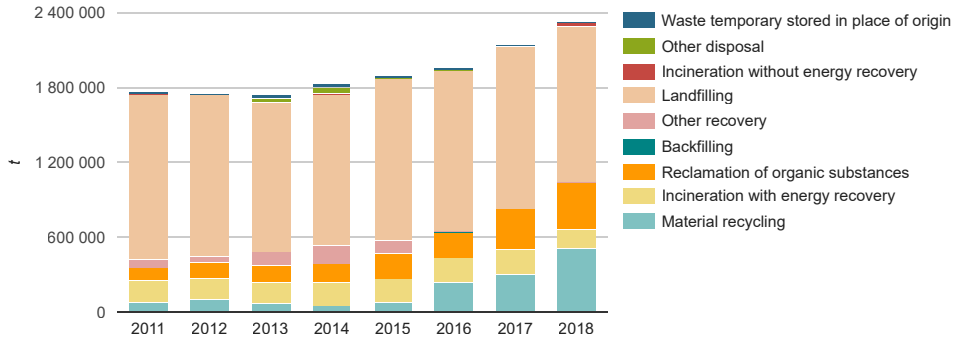


Source: Statistical Office of the Slovak Republic

Waste landfilling was the dominant activity for MW management. The share of landfilled municipal waste in total management was 53.8%, or a year-on-year decrease of 7%. The **recycling** of municipal waste reached 38.1% in 2018.
The **Envirostrategy 2030** goals are to increase the recycling of municipal waste, including its preparation for re-use, to 60% by 2030 and to reduce landfilling to under 25% by 2035.

The long-term monitoring of the sorted collection of MW has shown a **slightly rising trend in the quantity of sorted components of MW**. From the perspective of its commitments, the SR will however need to significantly intensify sorted collection in the area of preparation for waste re-use and recycling.

Chart 090 I Trend in the sorted collection of municipal waste components



Source: Statistical Office of the Slovak Republic

As with other sorted components of MW, it will be necessary to significantly intensify the effectiveness of the sorted collection of municipal biowaste to achieve the targets in terms of reducing the quantity of biowaste (BMW) disposed of through landfilling.

Table 016 I Sorted biodegradable municipal waste (in addition to paper and cardboard) (2018) (t)

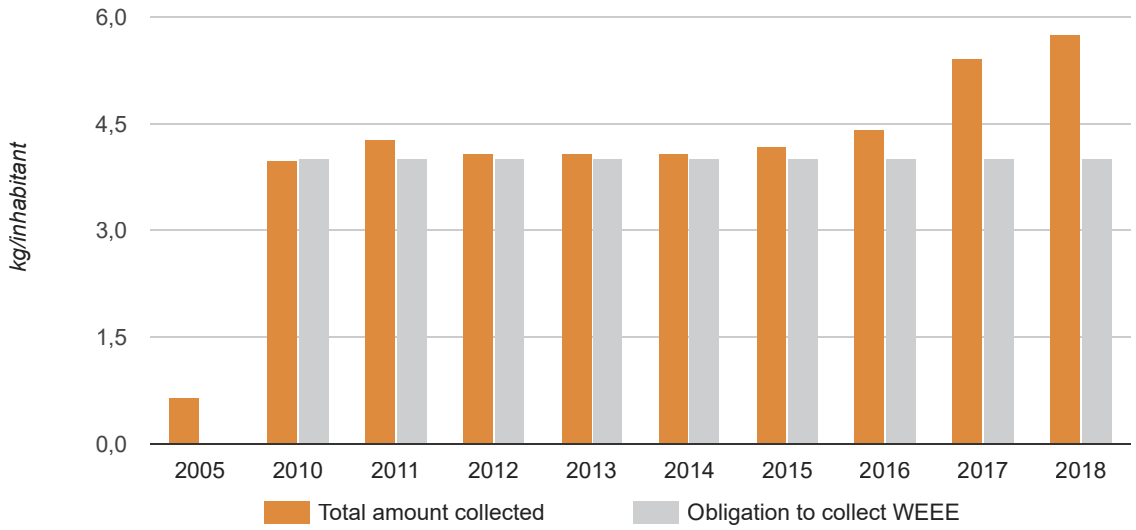
Waste code	Waste	Quantity BMW
200108	Biodegradable kitchen and catering waste	19 345
200125	Edible oils and fats	334
200138	Wood other than that mentioned in 200137	13 382
200201	Biodegradable waste	199 970
200302	Waste from markets	578

Source: Ministry of the Environment of the SR

WEEE

Electrical equipment manufacturers have an obligation to meet limits for collection, recovery, appropriate recycling and reuse of electrical waste for 10 categories. From the perspective of meeting the targets set in Directive 2012/19/EU of the European Parliament and of the Council on Waste from Electrical and Electronic Equipment (WEEE), the Ministry of Environment of the SR has, since 2016, monitored and evaluated compliance with the collection target as a minimum share of the average weight of electrical equipment placed on the market in the SR in the previous three years.

Chart 091 I Trend in the quantity of WEEE collected from households



Source: Ministry of the Environment of the SR

Note: Since 2010 the collection target has been set at 4kg/person

In 2018 manufacturers ensured the collection of 31 032 631 kg of **WEEE**, or 5.76 kg/person. The targets for the recovery and recycling of **WEEE** have been met for all WEEE categories since 2005.

Old vehicles

In 2018, 39 343 old vehicles were processed in the SR, an increase of 11% compared to 2017.

Table 017 I Total reuse of parts of old vehicles, recovery of waste from the processing and recycling of old vehicles, the number of processed old vehicles and the total weight of processed old vehicles (2018)

Reuse (t)	Total recycling (t)	Total recovery (t)	Total reuse and recycling	Limit for reuse of old vehicle parts and recycling of old vehicles *	Total reuse and recovery	Limit for reuse of old vehicle parts and recovery of waste from the treatment of old vehicles *
893.469	35 197.39	35 906.58	**94,89 %** (36 090.859 t)	**85 %**	**96,75 %** (36 800.049 t)	**95 %**
Number of processed old vehicles (pcs)					39 343	
Total weight of processed old vehicles (t)					38 035.638	

Source: Ministry of the Environment of the SR

** The activity limits for the average weight per vehicle have been valid since 2015 for all vehicles*

Waste tyres

Material recovery has dominated the management of waste tyres over the long term. In 2018 material recovery reached 89.8% and energy recovery 9.15%. The landfilling of waste tyres is banned pursuant to the Waste Act. The target for waste tyres was to achieve a level of material recovery of 80% with 15% energy recovery by 2020, and this was met in 2018.

Packaging and packaging waste

The total quantity of packaging waste is increasing. The material recovery of packaging waste increased from 45.21% in 2005 to 65.68% in 2017. The level of recycling and recovery is increasing for individual packaging waste types, and the targets set for 2017 have been met.

Used batteries and accumulators

In 2018, 813.03 tonnes of used portable batteries and accumulators were collected, a collection rate of 57.66%.

Table 018 I Recycling efficiency for used batteries and accumulators

Type	2011 (%)	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	Target (%)
Lead	96	97	93	87	92	90.5	90.51	91.4	90
Ni-Cd	84	97	83	76	80	80.9	78.98	77.18	75
Other	98	97	89	64	61	65.3	67.38	66	60

Source: Ministry of the Environment of the SR

CROSS-BORDER SHIPMENTS OF WASTE - IMPORT, EXPORT AND TRANSIT OF WASTE

In 2018 the Ministry of Environment of the SR issued a total of 120 decisions on the transboundary shipment of waste, which permitted the transboundary movement of waste within the meaning of Regulation 1013/2006/EC of the European Parliament and of the Council on shipments of waste).

Table 019 I Overview of validity and number of decisions issued in 2018

Valid to	Import	Export	Transit	Total
2018	2	2	5	**9**
2019	53	19	31	**103**
2020	1	-	-	**1**
2021	-	5	2	**7**
Total	**56**	**26**	**38**	**120**

Source: Ministry of the Environment of the SR

CLIMATE CHANGE

KEY QUESTIONS AND KEY FINDINGS

What is the trend in greenhouse gas emissions in the SR?

Greenhouse gas emissions have decreased over the longer term (by 41% between 2017 and 1990). Emissions significantly declined until 1996. Emissions remained stable between 1996 and 2008. After 2008 and 2009, marked by recession, a slight increase in emissions was recorded due to the economic recovery. Year-on-year (2016-2017) greenhouse gas emissions recorded an increase of 2.8%.

What is the observable development of climate change in the SR?

We have seen a rise in the average annual air temperature of 1.73˚C in Slovakia in the period from 1881 to 2018. There has been a decrease in annual total atmospheric precipitation by about 0.5% on average (in the south of the SR the decrease was more than 10% in places, while in the north and north-east the total precipitation sporadically increased by 3%); there has been a decrease in relative air humidity; a decrease in all characteristics of snow cover up to a height of 1000 m across almost the whole territory of the SR (at higher altitude an increase has been recorded); an increase in potential evaporation; and a decrease in soil moisture and changes in climate variability (especially rainfall totals).

The increase in average annual air temperature has been most significant in the last thirty years. The average annual air temperature for the 1981 to 2010 period was 10.6˚C in Hurbanovo, growth of 0.7 ˚C compared to the 1951 to 1980 period. The eight hottest years have been reported, based on the average annual air temperatures since 1871, in the last twenty years at the station in Hurbanovo. Strongly above-normal temperatures were recorded in Hurbanovo in 1994, 2000, 2002, 2007, 2008, 2012-2015 and 2017- 2018, and in Liptovský Hrádok in 1994, 2000, 2002, 2007-2009, 2013-2015 and 2017- 2018.

Over the past 15 years there has been a more significant rise in extreme daily and several-day precipitation, which has resulted in an increase in the risk of local flooding in various areas of the SR. On the other hand, in the period from 1989 to 2017 there have been more frequent local or nationwide droughts than before, caused primarily by long periods of relatively warm weather with low precipitation in some parts of the growing season.

Climate change interferes in the function of ecosystems and the provision of ecosystem services. As a consequence of the increased average air temperatures a shift is anticipated in vegetation zones and levels, which from the perspective of biodiversity may result in endangerment to ecosystems, habitats, species of organisms and their communities. We anticipate changes in the structure and composition of habitats, the replacement of species in habitats, which will result in reduced resilience of ecosystems, a reduction in their ability to provide ecosystem services or their collapse. The changed conditions such as the concentration of carbon dioxide, increased average air temperature or availability of water will impact the lifecycles of flora and fauna.

TREND IN GREENHOUSE GAS EMISSIONS

The basic source of data on trends in greenhouse gas emissions is the National Inventory Report of the Slovak Republic for 2019, which states 2017 as the last assessed year.

Total anthropogenic greenhouse gas emissions for 2017 were 43 316 448 tonnes of CO_2 equivalent (without including the LULUCF sector).

Compared to 1990, total anthropogenic emissions decreased by 41%. After a more significant decline in 2009 as a consequence of the economic crisis, the trend in total anthropogenic emissions slightly decreased in 2010 to 2014 and a slight rise recorded in 2015, 2016 and 2017, with a year-on-year increase of 2.8% (2017 compared to 2016). In 2017 we managed to maintain the so-called decoupling, meaning a slower increase in greenhouse gas emissions compared to GDP growth.

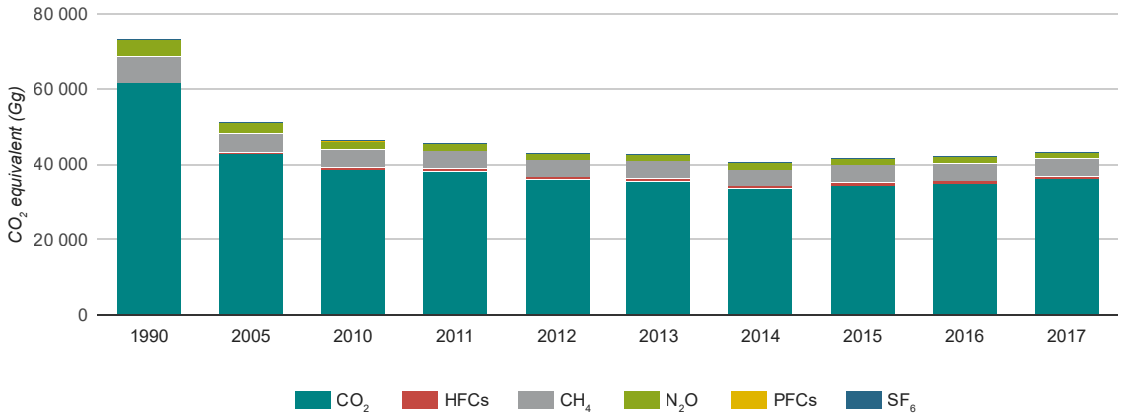
Table 020 I Aggregated anthropogenic greenhouse gas emissions in CO_2 equivalent (Gg)

Year	1990	2005	2010	2011	2012	2013	2014	2015	2016	2017
Spolu (bez LULUCF)	73 361.59	51 142.21	46 295.49	45 545.21	43 057.23	42 727.14	40 659.92	41 644.66	42 153.87	43 316.45
Spolu (vrátane LULUCF)	63 661.06	45 423.07	40 147.60	39 076.69	35 631.45	34 630.78	34 540.84	35 028.01	35 431.74	36 732.06

Source: Slovak Hydrometeorological Institute

Note:
Emissions determined as of 11 April 2019
The years 1990 to 2016 have been recalculated in the table
LULUCF (Land use, land-use change, and forestry)

Chart 092 I Trend in greenhouse gas emissions



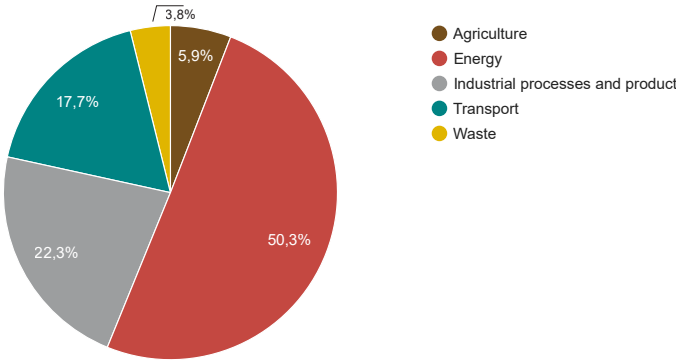
Source: Slovak Hydrometeorological Institute

Note: Emissions without the LULUCF sector (Land use, land-use change, and forestry)
Emissions determined as of 11 April 2019

One important sector in which the SR has not succeeded in stabilising the growth of greenhouse gas emissions is the **road transport sector**. The share in emissions from **the energy sector** including transport in total emissions of greenhouse gases was 68% in 2017 (expressed as CO_2 equivalents), while emissions from transport within the framework of the energy sector made up around 32%. Another problematic area in which it has not been possible to efficiently regulate the increase in greenhouse gas emissions is the **burning of fossil fuels in households**, so-called local emissions sources.
The **industrial processes** sector is the second-most-important sector, with a share of over 22% in total emissions of greenhouse gases in 2017.

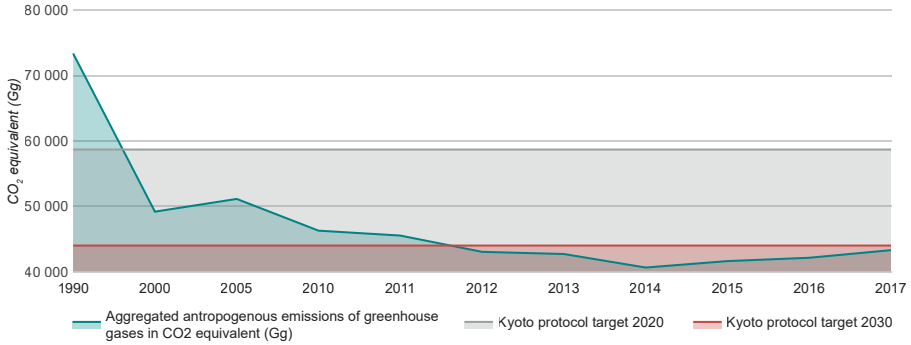
The **agriculture** sector had a 6% share in total emissions of greenhouse gases in 2017. Emissions in this sector fell sharply from 1990, however since 2000 their trend has been stable and only affected by agricultural commodity prices and subsidies. The significant decrease in the 1990s was primarily due to the significant decrease in the use of nitrogen-based fertilisers and livestock numbers. Improvements in agriculture practices as well as the introduction of organic farming have created additional prerequisites for the favourable development of emissions in this sector in coming years.
The waste sector accounted for almost 4% of total emissions of greenhouse gases in 2017. The share of the individual sectors in total emissions of greenhouse gases in 2017 did not significantly differ from that in 1990.

Chart 093 I Share of individual sectors in emissions of greenhouse gases (2017)



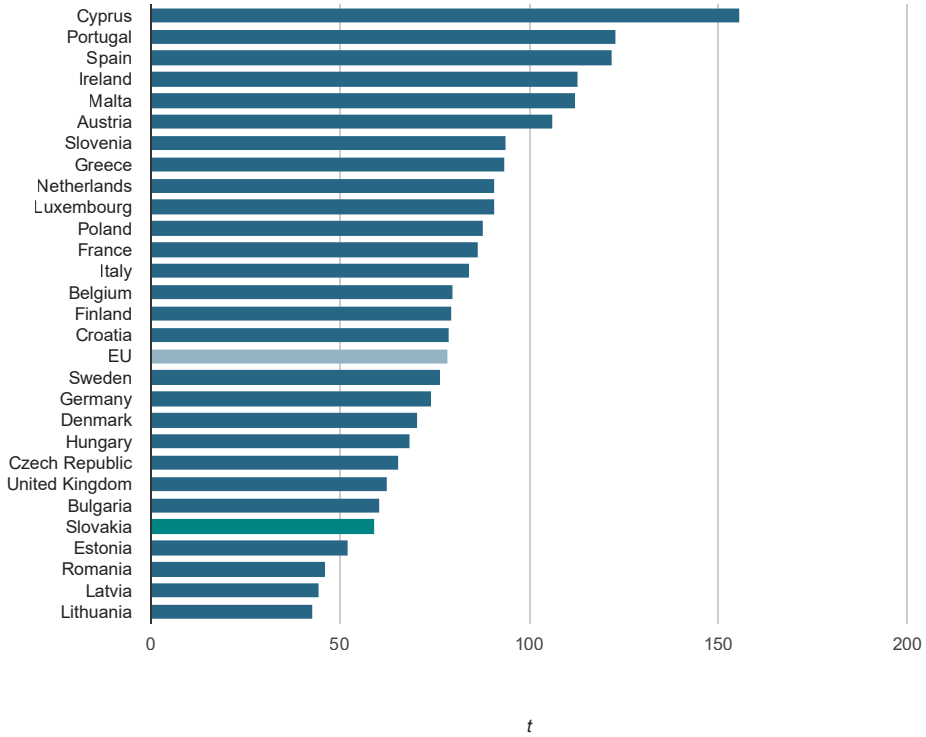
Source: Slovak Hydrometeorological Institute
Note: Emissions determined as of 11 April 2019

Chart 094 I Trend in greenhouse gas emissions in connection with meeting Kyoto Protocol targets



Source: Slovak Hydrometeorological Institute
Note: Emissions determined as of 11 April 2019

Chart 095 I International comparison of greenhouse gas emissions (CO2 equivalent) per inhabitant in 2017



Source: Eurostat

MANIFESTATIONS OF CLIMATE CHANGE AND ADAPTATION TO THE UNFAVOURABLE CONSEQUENCES OF CLIMATE CHANGE

The climate trend is assessed using trends in long-term time series (1951 2018) for individual climate elements and based on a comparison of the values for individual years with the normal climatology period of 1961-1990. Together with climate elements, hydrological flow characteristics that immediately react to climate development are also assessed (meaning atmospheric precipitation, air temperature and evaporation). To ensure a representative assessment of indicators in relation to the altitude of Slovakia, two monitoring stations have been selected. For lowland areas this is the Hurbanovo weather station, for higher areas the Liptovský Hrádok weather station.

CLIMATE ELEMENTS

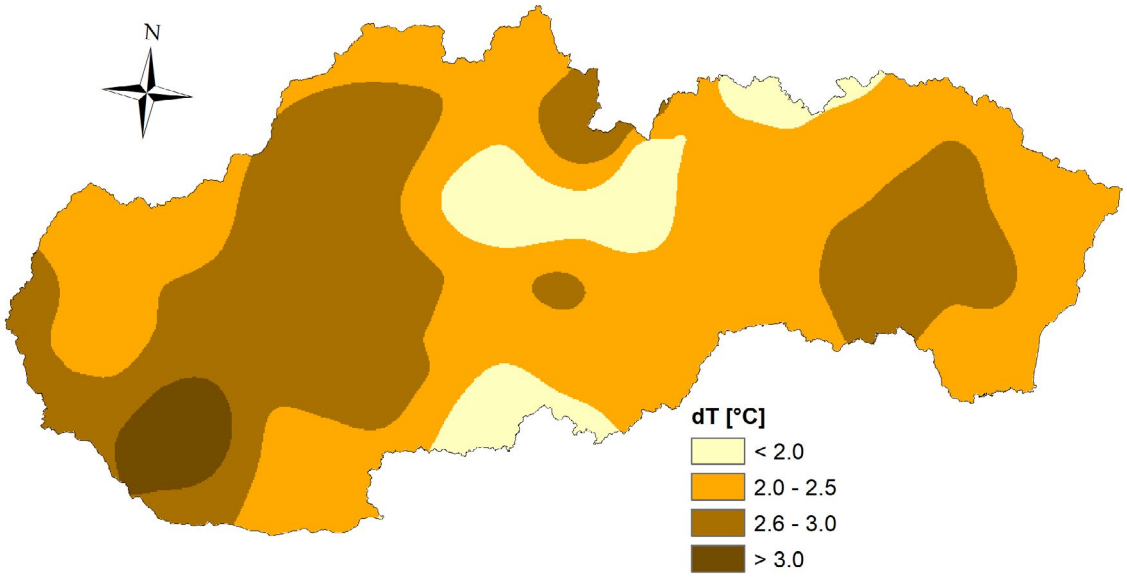
AIR TEMPERATURE

2018 was assessed in most of the territory of Slovakia as **exceptionally to extremely warm**. The territorial average for the SR as a whole in 2018 (10.1 °C) **was the second-highest at least since 1951** with a deviation of 2.4 °C from the average of the temperatures from the 1961 to 1990 period. In the southwest and southeast of Slovakia it was actually the warmest year since records began (in **Hurbanovo 2018 was the warmest since 1871**). At the same time, an average annual air temperature of 12°C and over was recorded at the most ever meteorological and climatological stations. **In Žihárec** the average annual temperature in 2018 was even **13°C**, while this marked the first ever recording of such a temperature in Slovakia.

A comparison of average temperatures in 2018 compared to the 1961 to 1990 period:

- Number of icy days (maximum temperature under 0 °C) - 12 fewer
- Number of frosty days (minimum temperature under 0 °C) - 32 fewer
- Number of summer days (temperature over 25 °C) - 45 more
- Number of tropical days (temperature over 30 °C) - 16 more.

Map 014 I Deviations in the average annual air temperature from the 1961 to 1990 normal in Slovakia in 2018

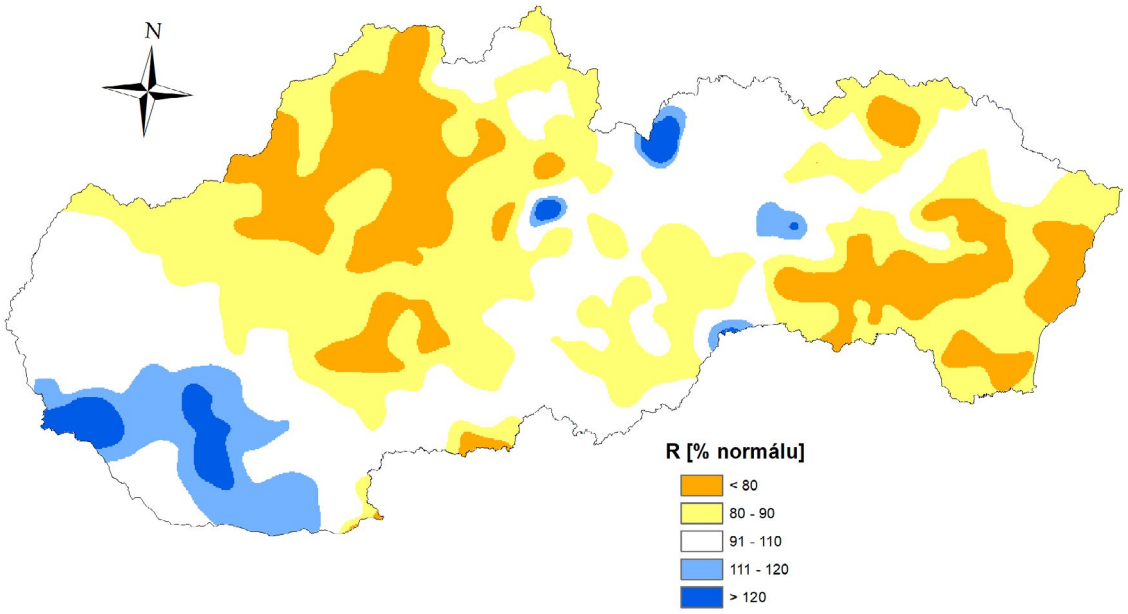


Source: Slovak Hydrometeorological Institute

ANNUAL TOTAL OF ATMOSPHERIC PRECIPITATION

2018 was **subnormal in terms of precipitation**, with the total reaching 88% of the long-term average for ;1901 to 2000. The atmospheric precipitation balance was negative in April and May, with an even longer period with a negative precipitation balance from July to November, while this was interrupted in western Slovakia by heavy rains at the start of September. There was another negative precipitation balance in January, but not as significant as in the months mentioned above. The precipitation deficit created was corrected by precipitation that occurred primarily in June, but also in March and December and then the mentioned precipitation in the rainy part of September. Compared to the values from the 1961 to 1990 period, an excess of annual atmospheric precipitation was observed only in the extreme southwest of Slovakia, where the percentage of normal annual precipitation relative to the above 30-year period reached over 120% in places.

Map 015 I Total atmospheric precipitation in Slovakia in 2018 as a % of the 1961 to 1990 base



Source: Slovak Hydrometeorological Institute

DROUGHT INDEX

The drought index is based on the difference between the sum of potential evapotranspiration and total atmospheric precipitation.

A drought index of 1.6 in Hurbanovo in 2018 giving a deviation (positive) compared to the 1961 to 1990 period base of 0.12.
A drought index of 0.58 in Liptovský Hrádok giving a deviation compared to the 1961 to 1990 period of 0.16.

SOIL DROUGHT

Regarding soil drought, the situation until mid-April was quite favourable. In the second half of April the drought began to spread initially towards the north east, and subsequently also towards the east of Slovakia. At the start of May it was extremely dry over **16% of the country**, while the worst status was in the **Žilina, Prešov and Trenčín regions.** In the second half of May the situation improved to some extent. The extreme dryness once again expanded in the first ten days of June, especially in the east and northwest of Slovakia. By 10 June the extreme dryness had impacted 7.5% of the country. In July and in August soil drought was not as extended. There was a deterioration in September, when there was extreme drought especially in the extreme east of Slovakia. The soil moisture deficit in the extreme east reached up to **-100 mm**. Relative saturation was at its lowest value on 5 and 19 August, when over 1.2% of the SR saturation was **under 10%.** The point of reduced availability (relative saturation under 50%) was over approximately 2/3 of the country in this period. The estimated revenue loss was **30% and over** in several districts in Slovakia. The highest estimated loss of revenue was in the districts of **Rimavská Sobota, Michalovce, Košice-okolie and Nové Mesto nad Váhom.**

HEATING SEASON

In the 1951 to 2018 period a statistical and significant fall **in the number of heating days** in lowland areas was seen. In **Hurbanovo** this was, with 183 days in 2018, a decrease of 22 days.

A similar trend was recorded in higher mountain locations - at the station in **Liptovský Hrádok** with 210 days in 2018, the decrease was 24 days compared to the 1951 to 2018 period.

HYDROLOGICAL ELEMENTS

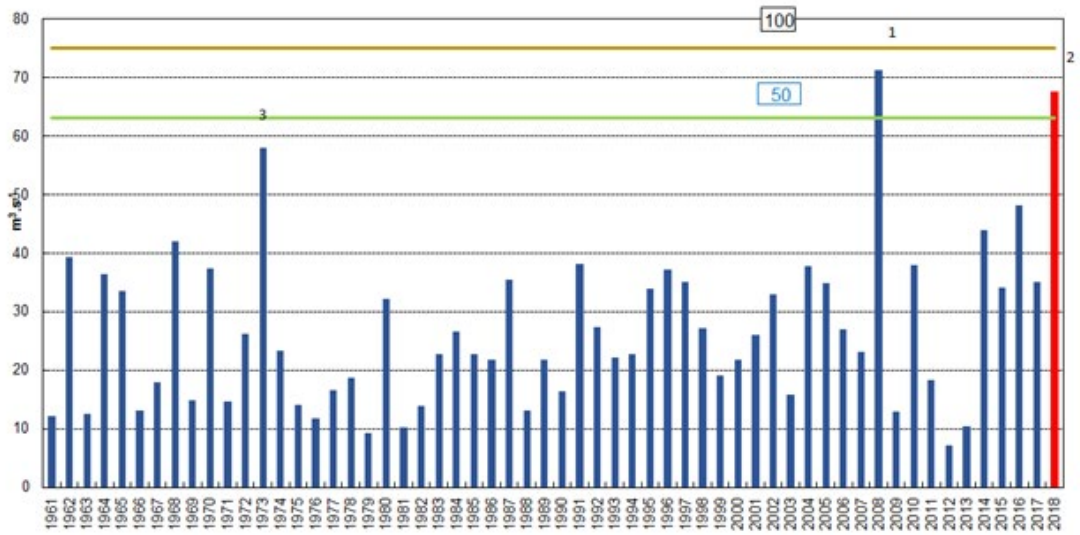
AVERAGE WATER LEVELS

The **outflows** from Slovakia corresponded to the average precipitation in 2018 (**assessed as dry in terms of precipitation**), and were **under the long-term values** in all parts of Slovakian river basins (reference period 1961 to 2000).

MAXIMUM FLOW RATES

In 2018, despite the fact that it was a relatively dry with a significant dry period in June to August, significant flooding occurred (especially in the northern part of Slovakia). The most significant culmination situations were recorded in the night of 18 July 2019 at the water-measuring stations Ždiar-Lysá Poľana na Bielej Vode (20-50 years' flow), Ždiar-Podspády na Javorinke (50-100-year flow) and Podbanské na Belej (10-year flow). Significant culmination flows also occurred in the early morning of 19 July at the stations Červený Kláštor-Kúpele na Lipníku (10-year flow), in Batizovce na Velickom potoku (10-20-year flow) and in Starej Lesnej na Studenom potoku (20-50-year flow; the water-measuring station was destroyed by the floodwater). The second-highest culmination since 1961 was recorded by the Ždiar-Podspády station for the Javorinka. In other areas of Slovakia the maximum inflows mostly did not exceed the 1-year flow rate in 2018.

Chart 096 I Maximum peak flows since monitoring began at the Ždiar-Podspády station with marked repetition time of 50 and 100 years



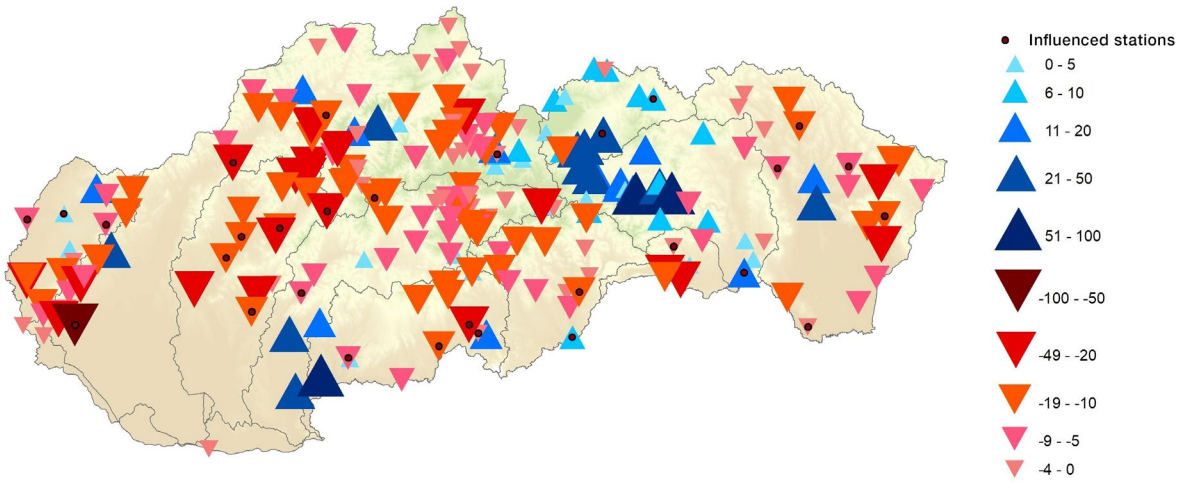
Source: Slovak Hydrometeorological Institute

MINIMUM FLOW RATES

The prolonged exceptionally warm period with occasional storms meant that in the period from June to August 2018 low to extremely low water values were recorded. For more than half the water-measuring stations in 2018 there were minimal average daily inflows lower than or equal to the 355-day flow rate, which is a low water value.

When assessing the long-term annual flow rates based on analyses of differences for the 2001 to 2015 period against the 1961 to 2000 reference period, the majority of the country showed a slight decrease in flow rates with the exception of the northern area, e.g. in the Poprad and Dunajec river basins and in the upper part of the Hornád basin, where some water-measuring stations recorded an increase in flow rates.

Map 016 I Differences in long-term average flow rates in the 2001 to 2015 period against the 1961 to 2000 reference period



Source: Slovak Hydrometeorological Institute

Note: On the map, falls in compared flow rates are represented with a red triangle pointing down and increases with a blue triangle pointing up in the individual assessed profiles. The shades of blue and red and the size of the triangle correspond to the size of the changes in % as follows: Stations whose hydrological regime is partly influenced by human activity are indicated on the maps with a black dot in the corresponding triangle.

ADAPTATION TO THE UNFAVOURABLE CONSEQUENCES OF CLIMATE CHANGE

ACTION PLAN FOR THE IMPLEMENTATION OF THE STRATEGY FOR THE ADAPTATION OF THE SR TO CLIMATE CHANGE (ACTION PLAN)

The preparation of the Action Plan, which began in 2018, is the responsibility of the Ministry of the Environment of the SR in cooperation with the Prognostic Office of the SAS. Adaptation measures will be prioritised in the Action Plan based on qualitative and quantitative analyses. The prioritisation will be based on the results of a participation process that will include all the relevant actors. Short-term measures for the 2020 to 2022 period and medium-term measures for the 2022 to 2025 period with an outlook to 2027 will be identified. The measures will be prioritised pursuant to their importance, feasibility and the availability of financial resources. The Action Plan should contribute to better translating adaptation measures into the sectoral policies of the relevant ministries. It should also include a proposal for a vulnerability monitoring system, a proposal for a medium-term assessment system for the adaptation process in Slovakia, including cost-benefit linkages, and a platform for publishing and sharing positive experiences.

The adaptation action plan should be submitted to the Government of the SR by 31 December 2020.

ENVIRONMENTAL ECONOMY

KEY QUESTIONS AND KEY FINDINGS

How are environmental protection costs evolving?

National expenditure on environmental protection *for the* ***public administration*** *sector reached EUR 553 million (34.5%), for the* ***corporate*** *sector it reached EUR 772 million (48.1%) and for the* ***household*** *sector EUR 279 million (17.4%). The total national expenditure for environmental protection was EUR 1.604 billion which, compared to the previous monitored period of 2015, was a decrease of 16.3%.*

The costs for businesses and municipalities for environmental protection *fluctuate in a year-on-year comparison. Costs in 2018 are significantly higher than to 2000 (by 225.7%).* ***The share of business costs*** *for environmental protection are far* **higher** *than those of municipalities.*
More than half the costs of businesses and municipalities for environmental protection result from ***waste management*** *(62.6% in 2018), followed by costs for* ***waste water management*** *(17.9% in 2018) and* ***air protection*** *(9.9% in 2018).*
The SR is one of the EU Member States with the ***lowest share of taxes with an environmental aspect in GDP*** *(in 2017 this share was 1.76% for the SR, while the EUR-28 average was 2.4%).*

NATIONAL EXPENDITURE ON ENVIRONMENTAL PROTECTION

Total expenditure on environmental protection reached EUR 1.604 billion in 2016. Compared to 2008 this was an increase of 27.8%. Compared to the preceding year it was a decrease of 16.3%.

Over two thirds of expenditure came from EU sources, including co-financing (70%), from the state budget (18%) and from the Environmental Fund (10%), especially in the form of capital expenditure.

Table 021 I National expenditure on environmental protection (EUR millions)

Year	Public administration	Businesses	Households	Total
2008	500	510	245	1 255
2009	551	648	271	1 470
2010	581	598	379	1 558
2011	553	607	266	1 426
2012	574	720	294	1 588
2013	534	695	266	1 495
2014	586	709	258	1 553
2015	740	912	265	1 917
2016	553	772	279	1 604

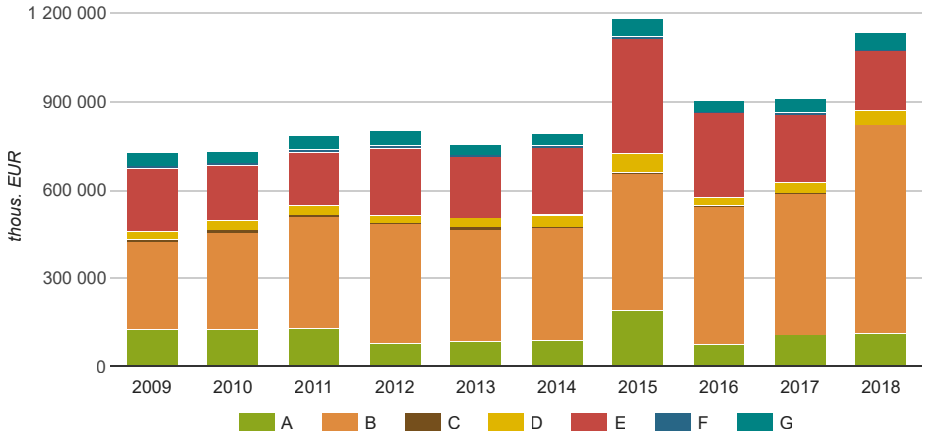
Source: Statistical Office of the Slovak Republic

ENVIRONMENTAL COSTS AND REVENUES FOR BUSINESSES AND MUNICIPALITIES

Environmental protection costs for businesses and municipalities show a fluctuating trend. In 2018 they reached EUR **1 139 868 000** (of which: investments EUR 304 066 000, current costs EUR 835 802 000). Compared to 2005 this was an increase of 55.3% and compared to the preceding year an increase of 24.9%. Revenues from environmental protection reached EUR **1 063 090 000 in 2018**, an increase of 31.4% compared to the preceding year.

Environmental protection costs for **soil and groundwater protection** reached EUR 58 143 000 in 2018, an increase of 18.7% compared to 2009 and an increase of 19.4% compared to the preceding year.

Chart 097 I Trend in environmental protection costs for businesses and municipalities by area



Source: Statistical Office of the Slovak Republic

Note:
A - Air protection
B - Waste management
C - Reducing noise and vibration
D - Other
E – Waste water management
F - Biodiversity and landscape protection
G - Soil and groundwater protection

SELECTED SOURCES OF FINANCING IN THE AREA OF ENVIRONMENTAL CARE

Environment Fund

Environment Fund was established through Act No 587/2004 on the Environment Fund and on amendments and supplements to some other Acts. The main mission of the Fund is to provide funds to applicants in the form of **subsidies** or **loans** to promote projects within the framework of activities focused on achieving national environmental policy objectives at national, regional or local level.

Environment Fund income from selected economic instruments was **EUR 26 881 251 in 2018.** In 2018 the Fund also received funds from proceeds from the **auctioning of quotas based on Act No 414/2012 on emissions trading of EUR 229 692 891 and from the exclusion of non-existing old vehicles from the register pursuant to Section 54(7) of Act No 223/2001, on waste, of EUR 108 028.**

In 2018 the largest income item for the Environment Fund from fines was fines for violation of the Integrated Pollution Prevention and Control Act of **EUR 334 008** (26.3%), violation of the Water Act of **EUR 298 910** (23.5%) and violation of the Air Protection Act of **EUR 239 122** (18.8%).

Table 022 I Overview of Fund income from environmental fees and fines (2018)

Fees	EUR
Air pollution fees	10 671 632
Fees for extracted minerals	2 204 904
Gas and liquid storage fees	979 061
Fees for discharging waste water into surface water	2 233 696
Fees for groundwater abstraction	10 058 608
Fees for land exploration	733 350
Financial compensation for interference in a habitat of European importance under the Nature and Landscape Protection Act	0
Total for fees	**26 881 251**
Fines	**EUR**
Violation of the Water Act	298 910
Violation of the Public Water Supply and Sewerage Act	999
Violation of the Air Protection Act	239 122
Violation of the Nature and Landscape Protection Act	108 907
Violation of the Fisheries Act	0
Violation of the Waste Act	238 028
Violation of the Act on Integrated Pollution Prevention and Control	334 008
Violation of the Emissions Trading Act	0
Violation of the Packaging Act	401
Violation of the Biocides Act	0
Violation of the Act on Prevention of Serious Industrial Accidents	18 000
Violation of the Chemicals Act	0
Violation of the Act on the Use of Genetic Technologies and Genetically Modified Organisms	0
Violation of the Environmental Product Labelling Act	0
Violation of the Geological Act	1 860
Violation of the Act on Trade in Threatened Species of Wild Fauna and Flora (CITES)	29 382
Block fines	1 174
Total for fines	**1 270 791**
Total for fees and fines	**28 152 042**

Source: Environment Fund

In 2018 the Environmental Fund provided **293** subsidies totalling **EUR 32 909 973.96**. The largest share of the subsidies went to water protection and use, totalling EUR 26 392 514 (80.2%). **EUR 2 570 370** (7.8%) was directed to the development of waste management and **EUR 1 695 016** (5.2%) to air and ozone layer protection.

The Environment Fund expanded the "Specification of support activities in the form of subsidies for 2018" to **improve the energy efficiency of existing buildings, including thermal insulation, where a subsidy of EUR 14 013 861 was provided**, there was support for **electromobility with a subsidy of EUR 997 380** and for the **fight against flooding** with a provided subsidy of **EUR 79 304.65**.

Financial support in the form of loans totalling **EUR 1 178 514.21** was provided in two cases in 2018.

Table 023 I Overview of provided subsidies and loans (2018)

Programme	Environment Fund		Number of approved projects	Financing amount (EUR)	Drawing as of 31 December 2018 (EUR)
Priority axis 1	Air protection and ozone layer	1.1 Support for heat and hot water generation through the use of low-emissions sources	3	225 245	225 244.99
		1.2 Promoting the generation of heat, hot water and electricity through the use of renewable resources	3	380 000	379 523.19
		1.3 Supporting projects aimed at adapting to the unfavourable consequences of climate change while improving air quality	14	1 089 771	1 078 007.66
Priority axis 2		Protection and use of water	213	26 392 514	25 710 763.70
Priority axis 3	Development of waste management	3.1 Prevention of biodegradable municipal waste generation and recovery of biodegradable municipal waste	22	1 292 168	1 248 643.33
		3.2 Introducing separate collection in municipalities and building collection yards	15	1 278 202	1 260 483.30
Priority axis 4	Nature and landscape protection	4.1 Establishment of TSES elements and green infrastructure based on approved TSES documentation	0	0	0
		4.2 Protection of the natural species composition of ecosystems	2	200 000	183 455
		4.3 Implementation of approved care programmes	0	0	0
		4.4 Implementation of measures in buffer zones protected areas	1	350 000	350 000
		4.5 Implementation of measures to achieve or maintain the favourable status of protected species and habitats	3	330 000	329 989.47
		4.6 Implementation of measures aimed at fulfilling, achieving and maintaining the mission of zoos	1	78 000	77 900
Priority axis 5	Environmental training, education and promotion	5.1 Environmental training, education and promotion	13	973 839	856 528.01
Priority axis 6	Research, development and research aimed at identifying and improving the status of the environment	6.1 Research and development aimed at identifying and improving the status of the environment	2	320 000	318 685.68
Priority axis 7	Environmental burdens	7.1 Removal of environmental burdens	0	0	0
		7.2 Support for the removal of the consequences of accidents	0	0	0
		7.3 Supporting the elimination of the consequences of an extraordinary deterioration in water quality or an extraordinary endangerment to the quality of water endangering or damaging the environment	1	234.96	234.96

	Funding amount (EUR)	Drawing as of 31 December 2018 (EUR)
Village renewal programme	800 000	767 097.37
Extraordinary subsidies	287 149	286 234
Services of general interest	79 304.65	79 304.65
Compensation	10 000 000	10 000 000
Electromobility	997 380	917 200.26
Thermal insulation	14 013 861	13 673 688.75

Source: Environment Fund

Green Education Fund

The Green Education Fund (GEF) is an instrument of the environmental policy of the SR focusing on promoting the development of environmental training, education and awareness in the territory of the SR through the promotion of the principles of shared responsibility and direct support for selected activities. It was established **in 2017**.

Eligible applicants that may submit project plans are civic associations, interest associations of legal entities, foundations and non-profit organizations performing public benefit services with an environmental focus.

Table 024 I GEF implementation

Indicator name	2017		2018	
	Number of projects delivered	Number of approved projects	Number of projects delivered	Number of approved projects
Project scope: regional	20	18	19	14
Project scope: nationwide	24	10	21	14
Required financial support	EUR 294 299.55		EUR 282 114.60	
Approved financial support		EUR 153 809.30		EUR 170 797.80

Source: Slovak Environment Agency

OPERATIONAL PROGRAMMES

Operational Programme Quality of Environment (OP QE) (2014 - 2020)

The OP QE is a programme document of the SR for drawing assistance from the EU structural funds and the Cohesion Fund in the 2014 to 2020 programming period in the area of the sustainable and effective use of natural resources, ensuring environment protection, active adaptation to climate change and support for an energy-efficient low-carbon economy.

Table 025 I Implementation of the Operational Programme Quality of Environment (EUR)

Priority axis	Allocation 2014-2020		Approved NFC application	Contracting		
	EU sources	SR sources		Contracted NFC	Contracted EU sources	Contracted SR sources
PA 1- Sustainable use of natural resources through environmental infrastructure development	1 475 851 729	147 938 969	1 083 188 127	947 543 289	854 917 632	92 625 657
PA 2- Adaptation to the adverse effects of climate change with the focus on flood protection	385 260 853	66 877 119	102 584 389	101 012 805	87 733 424	13 279 381
PA 3- Promoting risk management, emergency management and resilience to emergencies affected by climate change	260 901 369	42 971 993	204 096 199	184 105 001	150 913 655	26 629 094
PA 4- Energy efficient low-carbon economy in all sectors	938 886 480	88 957 935	632 020 716	521 521 610	460 601 957	56 794 866
PA 5- Technical assistance	77 000 000	15 775 942	62 688 208	51 055 594	42 373 351	8 682 243

Priority axis	ESIF drawing (at national level)		% drawing (EU sources)
	EU sources	SR sources	
PA 1- Sustainable use of natural resources through environmental infrastructure development	327 142 419	31 560 804	22.17
PA 2- Adaptation to the adverse effects of climate change with the focus on flood protection	3 151 242	542 612	0.82
PA 3- Promoting risk management, emergency management and resilience to emergencies affected by climate change	4 336 226	765 654	1.66
PA 4- Energy efficient low-carbon economy in all sectors	144 624 009	20 323 578	15.4
PA 5- Technical assistance	26 433 198	5 416 085	34.33

NFC – Non-repayable financial contribution

Source: Office of the Deputy Prime Minister of the SR for Investments and Informatization

Rural Development Programme (2014-2020)

In relation to the environment, the Rural Development Programme (RDP) is focused – through two areas – on addressing the regeneration, conservation and strengthening of ecosystems related to agriculture and forestry, on promoting resource efficiency and on promoting the transition to a low-carbon economy.

Table 026 I Implementation of the Rural Development Programme

Priority axis		Number of approved applications			Allocation 2014-2020 (EUR)
PA 4 Recovery, conservation and enhancement of ecosystems related to agriculture and forestry	4 A Recovery, conservation and enhancement of biodiversity in areas of the Natura 2000 network and in areas with natural or other specific restrictions and in agricultural activity with high natural value and the regeneration, retention and improvement of the status of Europe's landscape areas	189*	2015**	5034	896 538 000
			2016**	5890	
	4 B Improving water management, including management of fertilizer and pesticide use		2017**	6262	
	4 C Preventing soil erosion and improving its management		2018**	6526	
PA – 5 Promoting resource efficiency and promoting the transition to a low-carbon, climate-resilient economy in the agricultural, food and forestry sectors	5A Increasing water efficiency in agriculture				19 223 650
	5B Increasing the efficiency of energy use in agriculture and food processing				
	5C Facilitating the supply and use of renewables, by-products, waste, residues and other non-food raw materials for bioeconomics purposes		1		
	5D Reducing greenhouse gas and ammonia emissions from agriculture				
	5E Promoting the conservation and sequestration of carbon dioxide in agriculture and forestry	15	2016**	25	
			2017**	15	
			2018**	19	

	Priority axis	Committed expenditure (contracts concluded)) (EUR)	Drawing (EUR)
PA 4 Recovery, conservation and enhancement of ecosystems related to agriculture and forestry	4 A Recovery, conservation and enhancement of biodiversity in areas of the Natura 2000 network and in areas with natural or other specific restrictions and in agricultural activity with high natural value and the regeneration, retention and improvement of the status of Europe's landscape areas	896 238 000.00	526 663 324.36
	4 B Improving water management, including management of fertilizer and pesticide use		
	4 C Preventing soil erosion and improving its management		
PA – 5 Promoting resource efficiency and promoting the transition to a low-carbon, climate-resilient economy in the agricultural, food and forestry sectors	5A Increasing water efficiency in agriculture		
	5B Increasing the efficiency of energy use in agriculture and food processing		
	5C Facilitating the supply and use of renewables, by-products, waste, residues and other non-food raw materials for bioeconomics purposes	97 552	97 552
	5D Reducing greenhouse gas and ammonia emissions from agriculture		
	5E Promoting the conservation and sequestration of carbon dioxide in agriculture and forestry	683 650	291 07

Source: Ministry of Agriculture and Rural Development of the Slovak Republic

Note:
** project measures of the RDP SR 2014-2020 within the framework of priority 4 contribute towards several focus areas (4A, 4B and 4C)*
*** non-project measures (M10;M11;M12;M13;M15) of the RDP SR 2014-2020 within the framework of priority 4 contribute towards several focus areas (4A, 4B and 4C) and measures of continuing commitments from the RDP SR 2004-2006 and RDP SR 2007-2013 within the framework of measure 8.1, which contributes towards P5 5E. A payment application is submitted every year for the duration of the commitment*

Operational Programme Fisheries (2014-2020)

Within the framework of environmental protection, Operational Programme Fisheries finances the promotion of aquaculture that is environmentally sustainable, resource efficient, innovative, competitive and knowledge-based.

Table 027 I Implementation of the Operational Programme Fisheries (EUR)

Priority axis	Allocation 2014-2020		Approved NFC application	Contracting		
	EU sources	SR sources		Contracted NFC	Contracted EU sources	Contracted SR sources
PA 2- Fostering environmentally sustainable, resource efficient, innovative, competitive and knowledge based aquaculture	9 406 530	3 135 510	1 087 798	577 752	433 314	144 438

Source: Office of the Deputy Prime Minister of the SR for Investments and Informatization

Operational Programme Integrated Infrastructure (2014-2020)

This is a programming document of the Slovak Republic for the drawing of European Union funds in the transport and informatics sector for 2014 to 2020. Its global objective is to focus on sustainable, greener and more cost-effective transport infrastructure.

Table 028 I Implementation of the Operational Programme Integrated Infrastructure (EUR)

Priority axis	Allocation 2014-2020		Approved NFC application	Contracting		
	EU sources	SR sources		Contracted NFC	Contracted EU sources	Contracted SR sources
PA 1 - Railway infrastructure	725 839 166	128 089 265	660 175 263	660 175 263	561 148 974	99 026 289
PA 2 - Road infrastructure	1 142 500 000	201 617 648	1 598 814 746	1 547 105 271	1 315 039 481	232 065 791
PA 3 - Public passenger transport	322 350 000	322 350 000	174 805 950	175 185 150	156 726 507	18 458 643
PA 4 - Water transport infrastructure	116 450 000	116 450 000	7 707 238	292 156	254 771	37 385
PA 5 - Railway infrastructure	282 232 227	282 232 227	1 920 240	1 920 240	1 632 204	288 036
PA 6 - Road infrastructure	484 757 228	484 757 228	225 694 436	193 582 408	164 545 047	29 037 361

Priority axis	ESIF drawing (at national level)		% drawing (EU sources)
	EU sources	SR sources	
PA 1 - Railway infrastructure	186 219 073	32 862 189	25.66
PA 2 - Road infrastructure	673 665 846	118 882 208	58.96
PA 3 - Public passenger transport	124 493 710	14 656 534	38.62
PA 4 - Water transport infrastructure	25 201	1 482	0.02
PA 5 - Railway infrastructure	917 958	161 993	0.33
PA 6 - Road infrastructure	117 262 305	20 693 348	24.19

Source: Office of the Deputy Prime Minister of the SR for Investments and Informatization

Integrated Regional Operational Programme (2014-2020)

The European Commission has approved an instrument that represents aid from EU funds for 2014-2020. One of the priorities of the operational programme related to environmental protection is safe and environmentally friendly transport in the regions, focused on low-carbon transport systems or the development of urban mobility through the support of cycling.

Table 029 I Implementation of the Integrated Regional Operational Programme (EUR)

Priority axis	Allocation 2014-2020		Approved NFC application	Contracting		
	EU sources	SR sources		Contracted NFC	Contracted EU sources	Contracted SR sources
PA 1- Safe and environmentally-friendly transport in regions	416 829 257	64 903 523	215 899 816	192 948 871	164 392 523	28 556 348

Priority axis	ESIF drawing (at national level)		% drawing(EU sources)
	EU sources	SR sources	
PA 1- Safe and environmentally-friendly transport in regions	29 088 117	7 616 255	6.98

Source: Office of the Deputy Prime Minister of the SR for Investments and Informatization

Horizon 2020 (2014-2020)

This focuses on three main areas - excellent science, industry leadership and societal challenges. Seven areas have been identified as social challenges where targeted investment in research and innovation can benefit citizens. Four areas are relevant to the environment.

Table 030 I Implementation of the Horizon 2020 programme

	Priority area	Number of approved projects with Slovak participation	Amount of financing for Slovak partners (EUR)
Societal Challenges	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy	23	24 986 503.00
	Secure, clean and efficient energy	32	5 209 253.0
	Smart, green and integrated transport	37	5 277 200.00
	Climate action, environment, resource efficiency and raw materials	19	2 722 880.00

Source: Ministry of the Environment of the SR

EEA Grants and Norway Grants

As part of this programme projects focusing on mitigation and adaptation measures in urban areas and schools, projects to improve awareness of climate change and the regeneration of damaged wetland ecosystems will be especially promoted. An important part of the programme is bilateral cooperation with the contributing states of Norway, Iceland and Liechtenstein. This will contribute towards strengthening bilateral relations between Slovakia and the contributing states, through which projects with donor partnerships will be further supported, and events and activities focusing on establishing contacts prior to announcing calls to submit project applications will be implemented, including during the implementation of the individual projects.

The goal of this programme is "To mitigate climate change and reduce vulnerability to climate change", which will be achieved through two outputs:
The first output, entitled "Increased Resilience to Climate Change and the Ability to Respond to Climate Change within the Framework of Targeted Territories" will be supported through two open calls to submit projects focusing on action plans to mitigate and adapt to climate change implemented by local authorities in urban areas. In addition, the output will be supported through one open call to submit projects and one Small Grants Scheme (SMG) focusing on improving awareness of climate change. The Small Grants Scheme is intended for primary and secondary schools. The output will also be supported through one pre-defined project focusing on measures, educational activities and improving awareness in the Living Lab in Dropie, which was supported by the contributing states as a pre-defined project. The ambition of the project is to lead environmental education in the form of innovative methods and demonstrations of the whole complexity of climate change for schools, local governments and various other target groups in Slovakia.

SELECTED ECONOMIC ENVIRONMENTAL POLICY INSTRUMENTS

FEES FOR GROUNDWATER ABSTRACTION

Fees for groundwater abstraction show a fluctuating trend and reached EUR 10 058 600 in 2018. Total fees for groundwater abstraction decreased by 13.4% compared to 2005 and decreased by 1.6% compared to last year. These fees are income for the Environment Fund.

LAND EXPLORATION PAYMENTS

Land exploration payments are implemented through Act No 569/2007, on geological work. 50% of the payment is income for the Environment Fund and 50% is sent to the budget of the municipality in which the exploration area is located.

Income for the Environment Fund from exploration payments reached EUR 733 350 in 2018. Income from payments for land exploration increased by 88.9% in 2018 compared to 2005 and increased by 7.5% compared to the preceding year.

PAYMENTS FOR EXTRACTED MINERALS

Payments for extracted minerals show a fluctuating trend. In 2018, payments for extracted minerals reached EUR 2 316 820.99, a decrease of 6.9% compared to 2005. Compared to the preceding year they increased by 7.1%. Such payments are income for the state budget and the budgets of the municipalities.

PAYMENTS FOR THE STORAGE OF GASES AND LIQUIDS

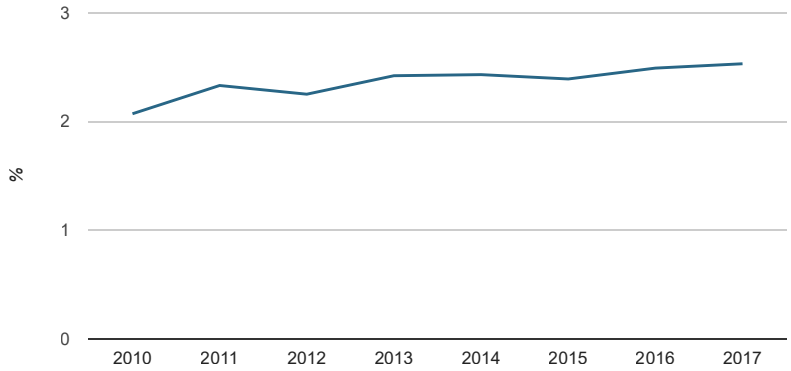
Payments for the storage of gases and liquids show a fluctuating trend. In 2018, payments for the storage of gases and liquids reached EUR 1 406 509, an increase of 37.7% compared to 2005 (an increase of 12.6% compared to the preceding year).

TAXES WITH AN ENVIRONMENTAL ASPECT

Pursuant to Regulation No 691/2011 of the European Parliament and of the Council, taxes with an environmental aspect apply to taxes for **energy, transport and pollution**.

The share of taxes with an environmental aspect in GDP in the SR between 2006 and 2013 had a falling trend, while in 2014 there was slight growth to 1.77% and subsequently in 2015 a decrease to 1.76%. In 2017 the share of taxes with an environmental aspect in GDP was 1.76%, a decrease of 0.05% compared to 2016.

Chart 098 I Trend in the share of taxes with an environmental aspect in GDP



Source: Statistical Office of the Slovak Republic, Eurostat

In 2017 the SR was one of the EU Member States with the lowest share of taxes with an environmental aspect in GDP.

CARE FOR THE ENVIRONMENT

ENVIRONMENTAL POLICY

In February 2019, the Government of the SR approved the material **Strategy of the environmental policy of the Slovak Republic until 2030 (hereinafter referred to as 'Envirostrategy 2030')**. Slovakia thus has, after 26 years, a new strategic document that reacts to the current challenges and sets out a vision, targets and measures for its environmental policy. Its preparation, performed on a participation basis, was under the auspices of the analytical section of the Ministry of the Environment of the SR, the **Environmental Policy Institute (EPI)**.

The draft Envirostrategy 2030 was prepared based on public consultation, EPI analyses and the work of **7 expert working groups** composed of almost 160 experts from various fields, but also suggestions from the public. It was based on international, European and national legislation and valid strategic documents, on a study by the European Environmental Agency analysing global megatrends and the subsequent assessment of global megatrends from the perspective of Slovakia. The goals of Envirostrategy 2030 are in accordance with Agenda 2030, and its implementation will contribute to the fulfilment of sustainable development objectives in the Slovak Republic.
Envirostrategy 2030 defines the basic **vision of the environmental policy** to 2030. It comprises a better-quality environment and a sustainable circular economy and the mitigation of consequences of climate change through mitigation and adaptation measures. Air quality, waste management and protection of habitats and species primarily in forest, grassland and wetland ecosystems are identified as the biggest environmental challenges in Slovakia. This vision has resulted in defined goals and the measures to achieve them. In the area of air, the goal is to improve its quality and meet the defined limits. Efforts are being made to significantly reduce emissions of pollutants by 2030 compared to 2005 - SO_2 by 82%, NOx by 50%, NMVOC by 32%, NH_3 by 30% and PM2.5 by 49%. The introduction of an emissions trading system for air pollutants is being considered. Low-emissions transport and a transition to cleaner forms of household heating should be supported. Envirostrategy 2030 counts on the termination of electricity and heat generation from coal. In this respect there has already been progress in the case of subsidising electricity generation that is unprofitable without support. The Government of the SR has approved that it will take until 2023 - meaning seven years less than originally planned. It is precisely the termination of environmentally harmful subsidies and regulations that is one of the priorities of Envirostrategy 2030. It also includes a more comprehensive plan to consider a green fiscal reform to shift the burden of taxation towards environmental taxes in accordance with the "polluter pays" principle.

Waste is an area where Slovakia most lags behind other EU Member States. The goal is to increase the recycling of municipal waste, including its preparation for re-use, to 60% by 2030 and to reduce landfilling to under 25% by 2035. This will be accompanied by a gradual increase in fees for landfilling waste while improving the prevention of illegal dumps, as well as consistent punishment for offenders. The first slight increase in the mentioned fees was introduced by the amendment to the Waste Act valid from January 2019 and their gradual increase has been enshrined in law to 2021. A bill on deposits relating to PET bottles and drinks cans has been prepared. The bill was based on an EPI analysis entitled **Actual Deposit Price**. The law was approved in 2019, including a ban on the use of some single-use plastics such as plastic cookware, which should go into force on 3 July 2021. Another goal of Envirostrategy 2030 is to prevent biodegradable and food waste. Measures to improve waste management are part of the activities defined for the purpose of Slovakia's transition to a **circular economy**. Envirostrategy 2030 emphasises eco-design, and anticipates increased support for green innovations, science and research. The plan is that green procurement will account for at least 70% of public procurement in 2030.

One of the keys to **biodiversity** protection will be the preassessment and simplification of the system of protected areas and degrees of protection. The core national park non-intervention zone will be gradually expanded to cover up to 75% of the area of the national park in management category II. protected areas pursuant to **IUCN**. In the non-intervention areas mining will be banned and close-to-nature management will be prioritised in areas with active management. At the same time, the control of mining will be made more effective. The introduction of assessment of the ecosystem of services and payments for them, or the regeneration of 15% of degraded ecosystems such as salt marshes, wetlands or floodplain forests is anticipated. Organic agricultural production will extend at least to 13.5% of agricultural land.

Climate change is linked to all three priorities of Envirostrategy 2030. It is planned to reduce greenhouse gas emissions in emissions trading sectors by 43% and outside these sectors by at least 20% compared to 2005. This represents a decrease of 53% between 1990 and 2030. Slovakia is thus one of the most ambitious states in this area. An effective emissions trading scheme will continue, and its revenues should be channelled primarily into measures addressing the consequences of climate change and adaptation to climate change. The **Low-carbon Development Strategy of the SR to 2030 with a View**

to 2050 will set out the mitigation measures more specifically. Transport solutions without the negative impacts of climate impacts will be supported. Regions and municipalities will have to adopt adaptation measures.
The changing climate will bring about more extreme weather events, and Envirostrategy 2030 will therefore focus on protection from both flooding and drought. Green measures to slow water runoff from the land will be preferred. Water retention, better planning in the countryside and more responsible water management will contribute towards reducing drought and water scarcity.
In the area of ensuring sufficient clean **water** for all, Envirostrategy 2030 defines the targets of achieving good water status and potential in all water bodies. Waste water disposal and purification measures are also intended to prevent water pollution. By 2030 agglomerations with over 2 000 population equivalent are to achieve 100% collected and treated waste water, and agglomerations with less population equivalent 50%.

ENVIRONMENTAL ASSESSMENT AND PRODUCT LABELLING

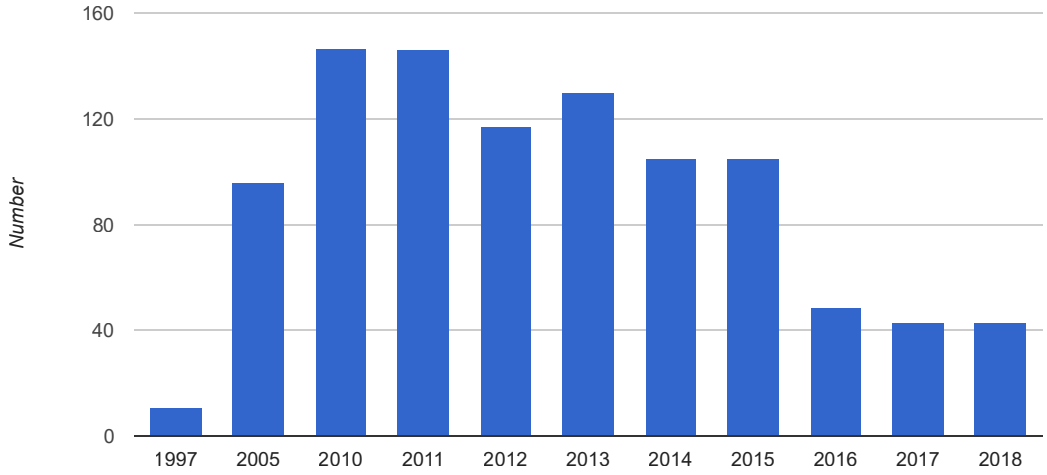
TYPE I ENVIRONMENTAL LABELLING

The environmental labelling of products has been performed in the SR since 1997, when the Ministry of the Environment of the SR announced the **National Programme of Environmental Assessment and Labelling of Products (NPEALP)**. Through the national environmental labelling scheme, the Ministry of the Environment of the Slovak Republic grants products and services that have met strict environmental criteria the national environmental label **"Environmentally Friendly Product"** (EFP). Since 2002 the conditions and procedure for awarding and using the national label have been regulated by Act No 469/2002 on the environmental labelling of products, as amended.
National environmental criteria for specified product groups are issued as special conditions in the form of notifications from the Ministry of the Environment of the SR and published in the Journals of the Ministry of the Environment of the SR. National environmental criteria have been created for a total of 40 product groups since 1997. In 2018, special conditions were in force for the following 16 product groups:

- Gas infrared heaters
- Biodegradable plastic materials and products from them
- Sorption materials
- Cements
- Adhesives and sealants
- Solid noble biofuels
- Wrapping paper and corrugated cardboard
- Wire-frame structures
- Wood-based panels
- Solid biomass combustion plants
- Winter maintenance products
- Masonry materials
- Tissue papier
- Windows and outside doors
- Concrete roofing
- Insulating materials

Based on the expressed interest of manufacturers, importers, dealers and service providers in the award of the national eco-label, conformity assessment of submitted products is carried out with specific conditions laid down for the specified product group. A total of 254 products have been assessed and awarded EFP branding in the SR since 1997. The highest number of products (148) was recorded in 2008 and 2009. Since 2015, the trend of in the year-on-year increase in EFP products has been decreasing.

Chart 099 I Trend in the number of products with the right to use the EFP branding



Source: Slovak Environment Agency

Table 031 I Holders of the national EFP branding (2018)

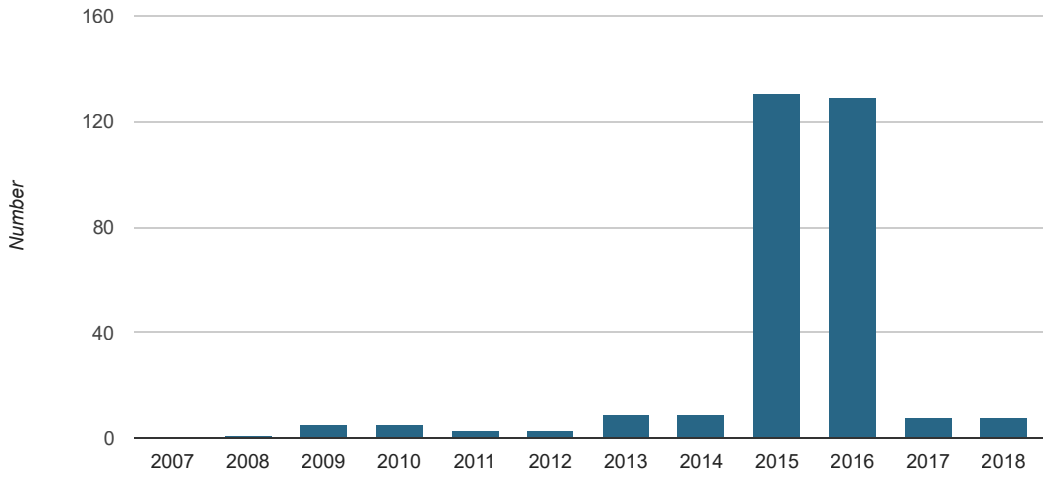
Považská cementáreň, Inc Ladce, (cements)
Johan ENVIRO, Ltd, Bratislava (sorption materials)
COMPAG SK, Ltd, Bratislava (wire-frame structures)

Source: Slovak Environment Agency

The EC environmental brand (EU Ecolabel) is at present granted pursuant to Regulation (EC) No 66/2010 of the European Parliament and of the Council. European environmental criteria for designated product groups are issued in the form of EC decisions and published in the Official Journal of the EC.

A total of 136 products have been assessed and awarded the EU Ecolabel in the SR since 2004, of which 3 are accommodation services.

Chart 100 I Trend in the number of products entitled to use the EU Ecolabel



Source: Slovak Environment Agency

Table 032 I Table EU Ecolabel holders (2018)

SHP Harmanec, Inc., Harmanec *(tissue paper products)*
Slovenská Grafia, Inc., Bratislava *(printed paper products)*
Daira Ltd., Košice *(accommodation service)*
XFUSION, Ltd., Bojnice *(accommodation service)*
SCA Hygiene Products Slovakia, Ltd., Gemerská Hôrka *(tissue paper products)*

Source: Slovak Environment Agency

TYPE II ENVIRONMENTAL LABELLING

The fundamentals and principles of **type II environmental labelling** are standardised through the international ISO 14 021 standard. This type of labelling makes it possible for companies to make their own declarations on the environmental characteristics of their products and services, formulated by manufacturers, importers, distributors, retailers or anyone likely to benefit from the claim. Own declarations may be made without certification by a third party. Type II labelling provides the opportunity to improve competitiveness if environmental criteria are not set in advance through a national or European labelling scheme. The environmental statement is verified by the SEA, and this was first performed in 2005.

Table 033 I Number of organizations with verified environmental product claims

Year	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of organisations	1	4	3	2	2	2	2	3	3	2

Source: Slovak Environment Agency

Table 034 I Organizations with verified truthful claims about the environmental characteristics of the product (2018)

SILICON, Inc., Bratislava *(winter maintenance products)*
K+S Czech Republic,Inc., Praha *(winter maintenance products)*

Source: Slovak Environment Agency

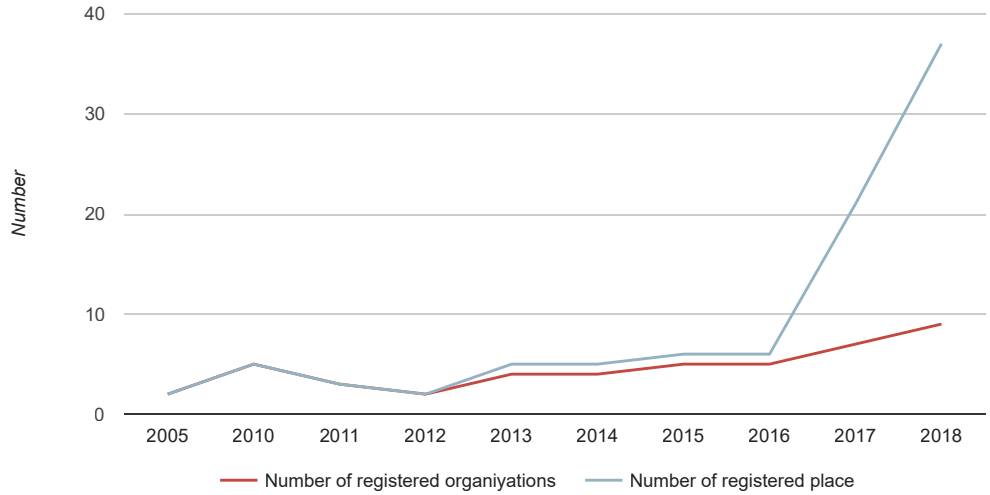
ENVIRONMENTAL MANAGEMENT AND AUDIT

The Eco-Management and Audit Scheme (EMAS) is a voluntary instrument for organisations that want to assess and improve their environmental management. By implementing EMAS, an organisation declares compliance with environmental legislation, local responsibility, active involvement of employees, reliability and the credibility of published environmental information.

The conditions for an organisation to participate in EMAS are determined by Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation of organizations in a Community environmental management and audit scheme, Commission Regulation (EU) 2017/1550 and Commission Regulation (EU) 2018/2026. amending the Annexes to Annex I - IV to Regulation No 1221/2009. At national level, the conditions set out in EMAS are enshrined in Act No 351/2012 on environmental verification and registration of organizations in the EU Environmental Management and Audit Scheme and on amendments and supplements to some other Acts.

EMAS
OVERENÉ ENVIRONMENTÁLNE MANAŽÉRSTVO

Chart 101 I Number of registered organizations and their places in the EMAS scheme



Source: Slovak Environment Agency

Two new organizations were added to the national EMAS register in 2018:

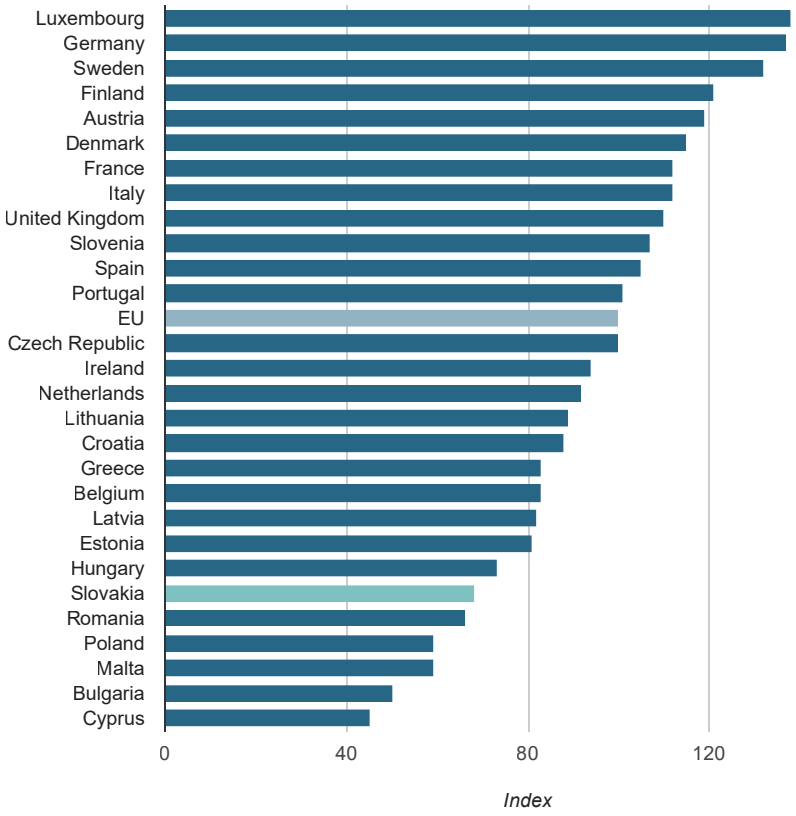
- **PROSPECT, Ltd.,** Nové Zámky with **2 places of organisation**, *sector E- Waste water cleaning and removal, Waste and services, sector F- Construction*
- **STRABAG, Ltd.,** Bratislava **with 14 places of organisation,** *sector F - Construction*

The majority of the organisations registered in EMAS are located in Germany, Italy and Spain, Slovakia is in 19th place. According to the number of places of organisation in EMAS the largest number of registered sites is found in Italy, Germany and Greece. Slovakia ranked 14th, and is among the first half of the European countries.

ECO-INNOVATION

The EC defines **eco-innovation** as any **innovation** resulting in significant progress towards the goal of sustainable development, by reducing the impacts of our production modes on the environment, enhancing nature's resilience to environmental pressures, or achieving a more efficient and responsible use of natural resources.
Progress in eco-innovation is assessed through the eco-innovation index. Its goal is to assess various aspects of eco-innovation through 16 indicators grouped into five components - eco-innovation inputs, eco-innovation activities, eco-innovation outputs, environmental results and socio-economic results.
In 2018, Slovakia ranked 23rd among EU Member States. Its strengths are eco-innovation activities, socio-economic results and environmental results with growing potential in the field of environmental management, which demonstrate the pursuit of higher environmental standards in the business sector. Its weaknesses are eco-innovation inputs and outputs, mainly due to low public funding of research and development in the field of environmental and insufficient human resources in this area.

Chart 102 I Comparison of the eco-innovation index for EU Member States (2018)



Source: EK

GREEN PUBLIC PROCUREMENT

In December 2016, the third National Action Plan for Green Public Procurement in the SR for 2016-2020 (NAP GPP III) was approved through Government Resolution of the SR No 590. Its strategic goal is to achieve a 50% share of green procurement by state authorities in the total volume of contracts concluded by them for selected product groups.

Monitoring GPP development is carried out annually based on two quantitative indicators, namely:

- **Indicator 1:** percentage share of GPP in total procurement in relation to the number of contracts (contracts, orders, purchases) for the calendar year concerned
- **Indicator 2:** percentage share of GPP in total public procurement in relation to the value of executed contracts (contracts, orders, purchases) for the respective calendar year.

In 2018, 1 529 public institutions were addressed through the monitoring, of which 459 subjects (30%) participated in a questionnaire survey. Within the framework of Indicator 1, the level was 7.58% and in indicator 2 it was 3.83%. The results of the implementation of GPP for the monitoring year 2018 indicate that the **set strategic objective cannot be achieved.**

ENVIRONMENTAL CRIMINALITY

In 2018, there was an overall decrease in the number of crimes detected (141) compared to 2017. This status was almost exclusively related to a decline in the number of wood theft crimes, where the situation lasted all through 2018, from January. However, a permanent decrease in the solving rate, which fell below 60% for the first time (58.01%) can be seen as negative. Indeed, the number of easily solvable crimes (and of wood theft) continued to decline, and the number of crimes more difficult to solve (e.g. related to waste) rose.

Crimes related to waste are probably the closest monitored. The number of cases detected was almost the same as in the previous year (216 vs. 221), while the solving rate increased slightly from 7.24% to 11.11%.

There was a positive change in poaching in 2018. After a long-term unfavourable trend in the number of crimes detected in previous years, 47 more cases were detected than in 2017. At the same time the solving rate rose to 68.71%.

Another positive outcome is that double the number of crimes of animal abuse were detected, while the solving rate was maintained, as was the detection of violations of flora and fauna protection and crimes related to hazardous materials.

Table 035 I Overview of detected and solved crimes in 2017 and 2018

	2017			2018		
	Detected	**Solved**	**%**	**Detected**	**Solved**	**%**
Section 168 endangerment to health	1	0	0	1	0	0
Section 169 endangerment to health	0	0	0	1	0	0
Section 212/2d theft of wood	849	699	82.33	626	509	81.31
Section 298 nuclear materials	13	3	23.08	22	4	18.18
Section 299 object for the production of hazardous substances	0	0	0	0	0	0
Section 299a illegal structure	3	0	0	5	0	0
Section 300 endangerment of the environment	12	2	16.67	17	1	5.88
Section 301 endangerment of the environment	2	0	0	6	1	16.67
Section 302 unauthorized waste management	221	16	7.24	216	24	11.11
Section 302a emission of pollutants	0	0	0	0	0	0
Section 303 water and air protection	2	0	0	1	0	0
Section 304 water and air protection	3	0	0	2	0	0
Section 304a ozone layer protection	0	0	0	0	0	0
Section 305 flora and fauna protection	67	34	50.75	80	43	53.75
Section 306 trees and bushes protection	113	42	37.17	99	20	20.20
Section 307 spread of animal disease	0	0	0	0	0	0
Section 308 spread of plant disease	0	0	0	0	0	0
Section 309 escape of genetically modified organisms	0	0	0	0	0	0
Section 310 poaching	263	165	62.74	310	213	68.71
Section 378 cruelty to animals	20	7	35.00	40	14	35.00
Section 378a neglect of care	1	0	0	3	0	0
ENVIRONMENTAL CRIMINALITY	**1 570**	**968**	**61,66**	**1 429**	**829**	**58,01**

Source: Ministry of the Interior of the Slovak Republic

LIST OF SELECTED ABBREVIATIONS

AEI	Average Exposure Indicator
AMS	Automated Monitoring Stations
AOT40	Accumulated Dose Over a Threshold of 40 ppb
BaP	Benzo(a)pyrene
BOD_5	Biochemical Oxygen Demand
BR	Biosphere Reserve
CBD	Convection on Biological Diversity
CCTIA	Central Controlling and Testing Institute in Agriculture
CIMS	Comprehensive Information and Monitoring System
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMT	City mass Transport
COD_{Cr}	Chemical Oxygen Demand by Dichromate
COD_{Mn}	Chemical Oxygen Demand by Permanganate
Coll.	Collection of Laws
CORINAIR	Core Inventory Air Emission
CORINE	Coordinate Information on the Environment Land Cover
CR	Critically Endangered Taxon
DMI	Direct Material Input
DMC	Domestic Material Consumption
EAP	Environmental Action Programme
EC	European Commission / European Community
EEA	European Environmental Agency
EFP	Environment-friendly Product
EGN	European Geoparks Network
EI	Energy Intensity
EIA	Environmental Impact Assessment
EMAS	Eco-Management and Audit Scheme
EMEP	European Monitoring and Evaluation Programme
EN	Endangered Taxon
EP	European Parliament
EPI	Environmental Policy Institute
EPN	European Permanent Network
ERDF	European Regional Development Funds
EU	European Union
EUROSTAT	Statistical Office of the European Communities
FL	Forest Land
FSC	Forest Stewardship Council
GCCA SR	Geodesy Cartography and Cadaster Authority of the Slovak Republic
GDP	Gross Domestic Product
GHGs	Greenhouse Gases
GPP	Green Public Procurement
ha	Hectare
IS	Insoluble Substances
IUCN	The International Union for the Conservation of Nature and Natural Resources
KP	Kyoto Protocol
Ltd.	Limited corporation
LULUCF	Land Use-Land Use Change and Forestry
MB	Monument Building
MoARD SR	Ministry of Agriculture and Rural Development of the Slovak Republic
MoE SR	Ministry of Environment of the Slovak Republic
MoH SR	Ministry of Health of the Slovak Republic
MoI SR	Ministry of Interior of the Slovak Republic
MoTaC SR	Ministry of Transport and Construction of the Slovak Republic
MR	Monument Reserve
MW	Municipal Waste
NCM	National Cultural Monument
NES_{UV}	Non-polar Extracting Substances
NFC	National Forest Centre
NFIM	National Forest Inventory and Monitoring
NM VOC	Non-Methane Volatile Organic Compounds
NNR	National Nature Reserve
No.	Number
NP	National Park
NPEALP	National Programme of Environmental Assessment and Ecolabelling of Products
NR	Nature Reserve
ODPMII	Office of the Deputy Prime Minister of the SR for Investments and Informatization
OECD	Organization for Economic Co-operation and Development
OP QE	Operational Programme Quality of Environment
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCDD/	Polychlorinated dibenzodioxins and furan
PCDF pcs	Pieces
pH	Acidity in pH
PM_{10}	Particulate Matter between 2.5 and 10 micrometers in size
$PM_{2.5}$	Particulate Matter to 2.5 micrometers in size
PML	Permanent Monitoring Localities
PMS	Partial Monitoring System
PMS-GF	Partial Monitoring System – Geological Factors
PMS-S	Partial Monitoring System - Soil
POPs	Persistent Organic Pollutants
PT	Protected Trees
PZ	Protective Zone
SCI	Sites of Community Importance
SEA	Slovak Environment Agency
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
SO SR	Statistical Office of the Slovak Republic
SPA	Special Protection Area
SR	Slovak Republic
SSCRI	Soil Science and Conservation Research Institute
TANAP	Tatra National Park
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
V4	Visegrad group (4 Central European Countries: Czech Republic, Slovakia, Hungary, Poland)
VOC	Volatile Organic Compounds
VU	Vulnerable Taxon
WEEE	Waste from Electrical and Electronic Equipment
WH	World Heritage
WRI	Water Research Institute
WWTP	Waste Water Treatment Plants

CONTENT

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