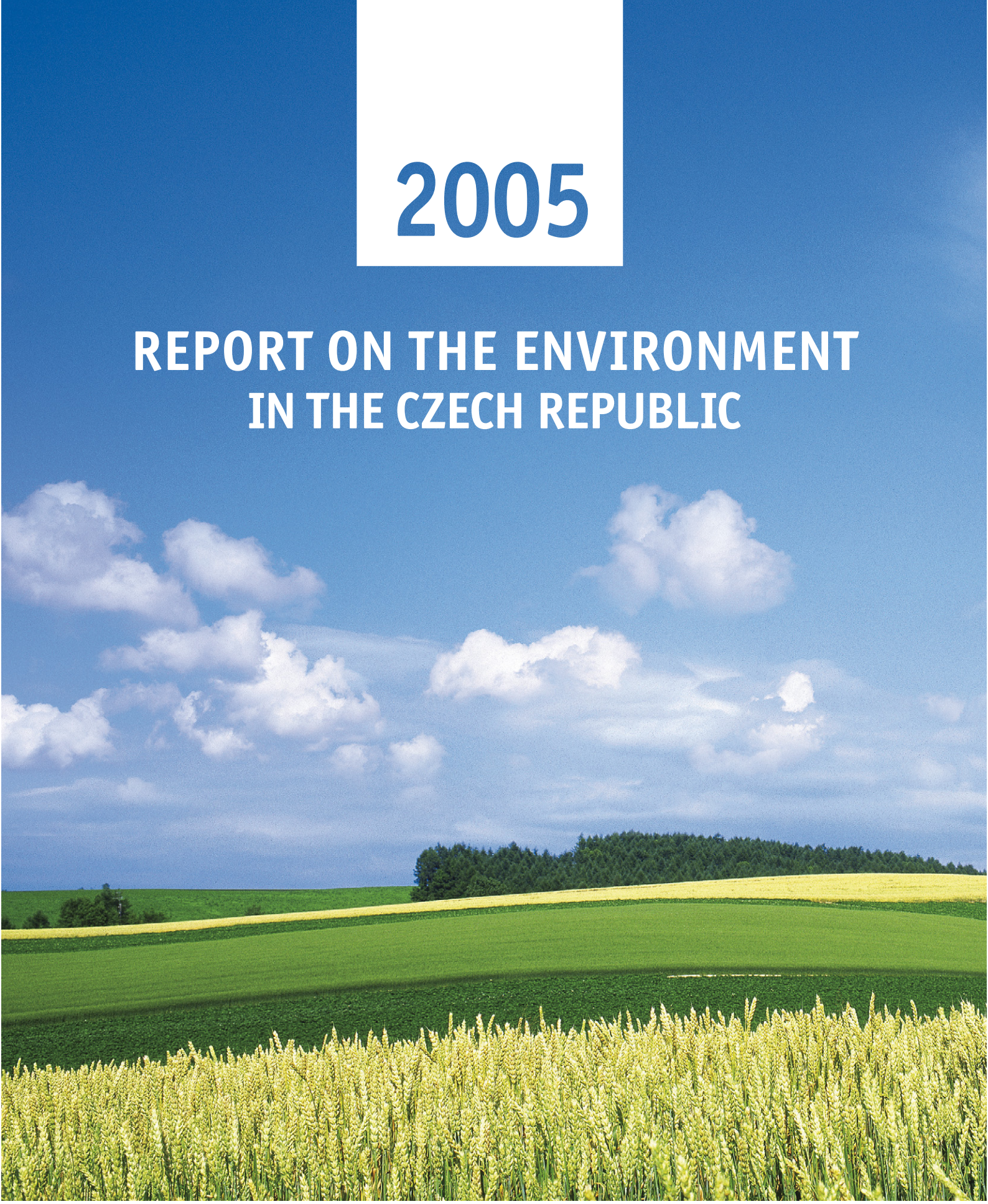
2005

REPORT ON THE ENVIRONMENT IN THE CZECH REPUBLIC



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MINISTRY OF THE ENVIRONMENT

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I Introduction

The Report on the Environment of the Czech Republic in 2005 continues in the tradition of previous reports on the environment that have been presented to the Government of the Czech Republic since 1991. Pursuant to Government Resolution No. 446 from 1994 the report shall be submitted to the Government by 30 September of each year.

Since 1999 the Ministry of the Environment has been responsible for the preparation of the report pursuant to Act No. 123/1998 Coll., on the Right to Information on the Environment. Section 12 thereof stipulates that the report includes, above all, information on the quality of the environment and on the environmental burdens impacting the environment.

In compliance with the above Act the report, having been considered and approved by the Government of the Czech Republic, is submitted to the Parliament. The report shall be published no later than within three months after the approval.

II Summarised Evaluation of the State and Development of the Environment of the Czech Republic

II.1 Summary

Based on the information provided in this Report it can be said that the **state of the environment of the Czech Republic has largely stabilized during the first decade of the 21st century** (after a dramatic improvement between 1990 and 2000), showing both positive and negative year-to-year differences. **Nevertheless, some indicators, especially those related to the quality of air, may indicate the beginning of new negative trends.**

The most significant signs of **improvement** of the environment of the Czech Republic are as follows:

- Considerable decrease and subsequent stabilization of sulphur dioxide emissions in the air;
- (Almost) global compliance with emission limits for sulphur dioxide, nitrogen dioxide, carbon monoxide, benzene and lead;
- Relatively high and continuously growing percentage of people connected to public water and sewer system with wastewater treatment;
- Improvement of water quality in major watercourses (elimination of quality classes VI and V);
- High degree of waste sorting and recycling, and the use of waste for material purposes;
- Faster land reclamation after mining and reduction of areas impacted by mining;
- Significant decrease in the energy intensity and certain signs of a decrease in the material intensity of the Czech economy.

The following areas of the environment continue being in the same condition or have **worsened:**

- **Over limit air pollution with suspended dust particles (PM_{10}) and polycyclic aromatic hydrocarbons has been observed in up to one third of the area of the Czech Republic, including most big cities;**
- Global over limit pollution of the Czech Republic with ground (tropospheric) ozone;
- High specific emissions (per capita) of the main greenhouse gas – carbon dioxide;
- Big noise load upon the inhabitants;
- High specific pollution of some less important watercourses;
- Eutrophization of water reservoirs due to global pollution;
- Missing sewer system and wastewater treatment plants in municipalities of 2,000 to 5,000 inhabitants;
- Continuing high percentage of ploughed farm land;
- Low land retention capacity;
- Significant impact of water and wind erosion on soil;
- Unfit condition and species, age and spatial composition of forests from the long-term view;
- Big number of endangered animal and plant species due to anthropogenic activities and non-original invasive species;
- Big percentage of municipal waste deposit in landfills;
- Hard to solve problems with illegal waste management (waste import form abroad).

The biggest **risk of environmental deterioration exists** in the following areas:

- Remaining / growing air pollution with suspended dust particles, polycyclic aromatic hydrocarbons and ozone;
- Increase in emissions of solid pollutants from tyre, brake and road surface abrasion related to increase in conveying capacity of both domestic and transit transport;
- Increasing emissions of solid pollutants and polycyclic aromatic hydrocarbons into the ground air layer caused by the return of small sources of pollution (households) to solid fuels;
- Increased risk of flooding and other undesirable climatic phenomena;
- Risk to the landscape and biodiversity due to unreasonable land appropriation;
- Risk of environmental deterioration in case the lignite extraction limits are broken as contemplated by the State Energy Policy of 2004,
- Permanent risk of environmental accidents (road transport, burdens form the past, industry).

The above risks may be aggravated by insufficient financing of environmental protection from central resources, missing interconnections between the elements of environmental law and insufficient staff enforcing the environmental law.

Positive development can be particularly expected in the following areas:

- Decrease in carbon dioxide emissions released into the air due to proactive measures in energy saving, the use of renewable sources and nuclear energy;
- Decrease in pollutant emissions released into the air, wastewater discharge and waste production from industrial sources due to natural technology modifications and proactive measures (both mandatory and voluntary);
- Mid-term decrease in pollutant emissions from road transport (with the exception for tyre, brake and road surface abrasion) provided the car pool will change; toll charges will regulate international transit road transport;
- Gradual increase in forest and green areas;
- Decrease in land appropriation for construction purposes provided the use of brown fields is actively supported;
- Improvement of waste management structure (increased reuse, recycling or energy and material use);
- Very gradual improvement of age, species and spatial forest composition and slow improvement of the condition in view of the long-term horizon.

Positive development of the environment may be significantly supported by greater attention the inhabitants pay to the environmental issues, their increased awareness and a larger use of the so-called soft or voluntary instruments of environmental protection.

A comprehensive evaluation of the strengths, weaknesses, threats (risks) and opportunities (positive expectations) for the components of the environment and relevant economic sectors is provided in form of a modified SWOT analysis in subchapter II.3.

II.2 Evaluation of the Fulfilment of the State Environmental Policy of the Czech Republic for 2004-2010

II.2.1 Components of the Environment

Air and Climate

The Czech Republic has fulfilled the obligations resulting from the Kyoto Protocol, i.e. an 8% decrease in greenhouse gas emissions compared to the reference year 1990 by 2008 – 2012 (the emissions dropped by 25%). However, stagnating aggregated greenhouse gas emissions have been a problem since 2000.

The priority 4.2.1 of the State Energy Policy (SEP) related to the accomplishment of the requirements of Directive 2001/81/EC of the European Parliament and of the Council on national emission ceilings, transposed by Government Resolution No. 417/2003, is being implemented as follows:

- The Czech Republic is able to meet with reserve the national emission ceiling of 265 kt for sulphur dioxide by 2010;
- The Czech Republic will probably meet the national emission ceiling of 220 kt for volatile organic compounds by 2010;
- The Czech Republic will probably meet the national emission ceiling of 80 kt for ammonia by 2010;
- The Czech Republic will closely meet the national emission ceiling of 286 kt for nitrogen oxides by 2010.

In line with the State Environmental Policy, emissions from combustion processes of big resources have been successfully decreased (the National Programme of Emission Reduction in Existing Very Large Combustion Sources). However, local solid fuel burning furnaces pose a serious problem as emissions have increased since 2005.

The priority 3.2 – to reduce the area with excessive critical burdens of the air – has been only partially accomplished. While the limits for sulphur dioxide, nitrogen dioxide, carbon monoxide and lead have been only rarely exceeded, **the imission limits for health protection in suspended particles in the PM_{10} fraction, valid as of 1 January 2005, have been exceeded in most parts of the country, especially in cities, and the total imission ozone limit has been exceeded in all parts of the country.**

Water

Pollution discharge into surface water has been going down, but global pollution of surface and ground water, particularly by nitrogen and phosphorus compounds, remains to be problematic. Ground water monitoring, in line with the State Environmental Policy, covers also deep springs nowadays (315 objects in total); the ground water quality criteria in these water objects are exceeded with less frequency than in shallow surface water.

A total of 91.6% of the inhabitants of the Czech Republic are connected to the public water system. The objective of the State Environmental Policy to supply 91% inhabitants with drinking water by 2010 has been met. The objective related to the construction or renovation of wastewater treatment plants has been also fulfilled in compliance with the implementation plan of the Council Directive 91/271/EEC – wastewater treatment has been solved in municipalities of 5,000 or more equivalent inhabitants subject to exceptions.

Soil

The main objective of the State Environmental Policy for soil is the protection against contamination by hazardous substances, which is a long-term objective and its realisation is very demanding. While the usage of nutrients in mineral fertilizers has been decreasing and the penetration of hazardous substances from wastewater treatment sludge into soil has been reduced on a long-term basis, **the content of absorbable organically bound halogens grew substantially in 2005 and the thresholds of DDT and DDE were also considerably exceeded.**

In spite of subsidies supporting soil protection against erosion and increasing the soil retention capacity, a large amount of soil in the Czech Republic is exposed to erosion, namely water erosion. Important priorities of soil protection, as specified in the State Environmental Policy, is the preparation and implementation of a national soil protection programme and increased levies for land appropriation with respect to related biological diversity. The national programme has not been approved.

Nature and Biodiversity

A partial objective of the priority "Protection of Natural and Biological Diversity" of the State Environmental Policy is called "Protection of Biological Diversity at the Level of Locations". In this respect the objective was being positively fulfilled by declaring protected bird areas and by approving a national list of special European areas of conservation and initiating steps to protect the areas. The measure "Protection of Specially Protected Animal and Plant Species" was fulfilled by implementation of protection programmes that had been approved and by proposing and approving new programmes. However, the ongoing landscape fragmentation and a significant number of non-original invasive species are big issues in this area, posing a threat to biological diversity. The protection of water and wetland ecosystems was accomplished by the implementation of Revitalisation Programmes. An important priority of the State Environmental Policy in this area is to approve and implement the National Wetland Protection Policy. The national policy has not yet been adopted.

II.2.2 Impact of Economic Sectors of the Environment

Energy and Raw Material Extraction

One of the minor objectives of the State Environmental Policy is the requirement to reduce the year-to-year GDP energy intensity by 2.6% at least by 2005, which was fulfilled, as in 2004 the year-to-year drop was 2.8% compared to 2003 and in 2005 it was 5.7%. Another partial objective is a 5% share of renewable energy sources in primary domestic energy resources in 2005; based on preliminary figures the share was only 3.4 – 3.5% in 2005 and the share of renewable energy sources is not expected to grow significantly in the future. Other objectives are being accomplished and largely integrated in the State Energy Policy.

In compliance with the cutback programmes the extraction of some raw materials has been reduced and some mines have been closed down and redeveloped. Also the extraction of mineral resources is being reduced in protected countryside areas.

Processing Industry

A number of voluntary activities are being implemented within the requirement of an integrated product policy and industry "greening". The activities especially include the National Programme of Cleaner Production, the National Programme of EMAS Implementation, the Responsible Care Programme and the implementation of the BAT. Businesses show an increasing interest in the implementation of EMAS pursuant to ISO 14 000. The "Operating Programme Industry and Enterprising for 2007 – 2013" of the Ministry of Industry and Trade reflects the requirements to support the application of low-emission, low-waste and energy-saving technologies and the compliance of industrial policy with environmental protection and the principles of sustainable development. The energy and emission intensity of industry has been decreasing.

Agriculture

A system of agro-environmental measures is being developed in compliance with the objectives of the State Environmental Policy. The objective of the measures is to support non-production functions of agriculture, to use biomass as an energy source and to revitalise damaged or destroyed natural components to achieve environmental stability of the countryside, lower soil erosion, or a smaller loss of soil nutrients (e.g. by bulk recovery, unbalanced water regime revitalisation, return of species diversity into meadows, etc.) A system of environmental farming incentives is being developed further; this system has helped to increase the area of agricultural land resources used for environmental farming up to almost 6% in 2005, which is right below the established level. In spite of a certain drop in 2005, gradual accomplishment of the objective for 2010 (10%) can be expected. The requirement to reduce the use of hazardous pesticides and biocides is not being accomplished as the usage of these preparations has not changed.

Transport

The proportion between passenger transport and freight has not shifted in favour of more environmentally friendly means of transport – while motor transport continues to predominate, railway and public transport are stagnating. There is also no systematic support of alternative fuels and the number of vehicles powered by alternative fuels continues to be very small. Activities aimed at reducing some transport emissions have been successfully implemented – in 2005 the allowed sulphur content in diesel oil was decreased significantly, which resulted into a positive drop in SO_2 emissions in that year. Passenger transport has seen a bigger number of petrol-powered cars equipped with three-port catalytic converters (as of 31 December 2005 there were 2,244,000 of such cars, i.e. 56.8% of all vehicles). Noise barriers are being built along main roads and railways in order to abate transport noise and noise protection windows are being installed, especially in close vicinity to airports. Railway lines have been cushioned in order to decrease the noisiness of this kind of transport. The development of a network of safe, separated cycling to promote cycling is too slow and the effort to combine it with public transport and pedestrian facilities has not been very successful.

Waste Management

The percentage of waste that is deposited in landfills has been steadily decreasing in the Czech Republic, which goes in line with the reduction of energy and material intensity of production and the increasing of material and energetic use of waste (point 2.4 of the State

Environmental Policy). The material use of waste has been preferred to the energetic one on a long-term basis. This results into a low percentage of waste used for energetic purposes, which was only 2.5% in 2005.

The accomplishment of the objectives of the State Environment Policy in the area of municipal waste management has been problematic. In 2005 the production of municipal waste increased to 4.8 million tons and although the percentage of waste sorted by the inhabitants increased to 36.2 kg/inhabitant/year, 63.9% of all municipal waste was deposited in landfills. The percentage of municipal waste used in waste combustion, including energy-producing purposes, dropped to 8.7%. Another problem requiring a long-term solution is the decrease in biologically decomposable municipal waste deposited in landfills. This issue will require a solution in the near future, e.g. by implementing measures that would reduce the amount of waste deposited in landfills offering the municipal waste produced other options to use or dispose of the municipal waste.

Most of the main objectives of responsible hazardous waste management, provided especially in the Waste Management Plan of the Czech Republic, have been successfully accomplished. Also the objectives of responsible hazardous waste management have been fulfilled.

Environmental Burdens from the Past (EBP)

In 2005 the system of public control of the EBP elimination was improved. A new strategy to set priorities of the process of EBP disposal was proposed within research and development projects. The development of an integrated database of landfills and old environmental burdens was also completed.

However, the partial objective of the State Environmental Policy "to speed up the process of elimination of old environmental burdens incurred before privatisation" was only partly fulfilled. Even though the National Property Fund spent a historical maximum of resources in order to eliminate EBP, used mostly for redevelopment and reclamation works that were started in the previous period, there were no new tenders over CZK 2 million to eliminate EBP. A total of 102 small-scale tenders up to CZK 2 million were announced.

II.2.3 Instruments of Environmental Protection

As far as **prescriptive instruments** are concerned, the legal regulations of the European Communities were gradually transposed into the national legislation and the regulations adopted in the pre-accession period between 1999 and 2003 were modified.
As far as **economic instruments** are concerned, trading with greenhouse gas emissions was introduced. This instrument belongs to significant market-economy instruments of the environmental policy. The objective to support directly and indirectly the use of renewable sources and the efficient use of energy and energy saving was being fulfilled. Act No. 180/2005 Coll., on the Promotion of Electricity Production from Renewable Energy Sources, and amending certain acts, was passed.
In the course of 2005 an environmental tax reform was under discussion and the existing system of charges for pollution and environmental exploitation will have to be reassessed from other points of view.

As far as **information instruments** are concerned, the Integrated Pollution Register was established and operated; and as regards **institutional instruments,** the former Czech Environmental Institute was transformed into CENIA, Czech Environmental Information Agency.

II.2.4 Environmental Protection Expenses

The priority of the State Environmental Policy with respect to the financing of environmental protection is to increase the amount of environmental expenses from the state budget. Nevertheless, the Policy did not set any target amount to be used as a reference for the environmental expenses from the state budget. However, it can be said that this amount has been growing on a year-to-year basis. Environmental protection programmes that were announced are mainly focused on activities resulting from the membership of the Czech Republic in the EU and the use of foreign programmes has been improving, which means the realisation of other objectives of this area.

II.3 Modified SWOT Analysis

Components of the Environment	
STRENGTHS	**WEAKNESSES**
Air	
• Greenhouse gas emissions dropped by 25% compared to 1990; the Czech Republic meets the obligations of the Kyoto protocol. • Decreasing emissions of most pollutants from big stationary sources, especially suspended particulate matters, volatile organic compounds and NO_x. • Air pollution by SO_2 is not a problem any more; the SO_2 concentration rarely exceeds allowable limits for the protection of public health and ecosystems. • The Czech Republic complies with the Montreal Protocol and has zero consumption of CFC, methyl bromide and hallons.	• 35.5% of the Czech Republic (in 2004 it was only 2.12%) belongs to areas with impaired air quality from the perspective of public health. This radical decline is caused by exceeded limits for PM_{10}, even in rural areas. • The structure of air pollutants – the decisive emitters of suspended particulate matters and NO_x are groups of sources hard to regulate, i.e. small household sources and transport that are often obsolete. • 84% of the population (99% of the whole Czech Republic) was exposed to ground ozone concentrations exceeding the target emission limits for public health protection. From the perspective of ecosystem and flora protection, the over limit values of the exposure index AOX40 were measured in 72.4% of the Czech Republic. • Between 2000 and 2004 greenhouse gas emissions did not go down. • Emissions of suspended particulate matters increased on a year-to-year basis by 3%. • Air pollution due to suspended particulate matters of PM_{10} fraction exceeds the emission limit valid as of 1 January 2005, which means the Czech Republic does not comply with its obligations towards the EU. • The compliance of the national emission ceilings for VOC and NH_3 is threatened. • Target emission limits for polycyclic aromatic hydrocarbons (benzo(a)pyrene and cadmium) were largely exceeded and the concentrations of suspended particulate

	matters $PM_{2,5}$ remain high. • Insufficient support of energy saving and the use of renewable energy sources as tools aimed at lowering energy intensity an emission and compliance with national obligations and objectives.
Water	
• Discharge of pollution into surface water has been decreasing. • The quality of surface running water has been improving; quality classes IV and V are hard to find in major water courses. • Consumption of surface and ground water has been decreasing. • The number of people connected to public water and sewer systems with subsequent wastewater treatment is increasing. • 8 new wastewater treatment plants have been built for 21,000 equivalent inhabitants, 29 more wastewater treatments plants were renovated. • Municipalities of more than 5,000 equivalent inhabitants have their own wastewater treatment plants subject to exceptions.	• The global pollution of surface water and soil due to atmospheric contaminant fall-out (especially nitrogenous compounds) and use of fertilizers and plant protection preparations continues to be large. • Ground water quality, especially shallow ground water in river drifts, is not improving. • Insufficient retention capacity of the landscape continues and the drop in urbanization of alluvial plains, particularly in areas with a flood risk, has not been observed. • The number of reservoirs threatened by euthrophization.
Nature and Biodiversity	
• Relatively high compliance of natural and landscape legal protection with the legislation of the European Community and approved international conventions. • Proclamation of protected bird areas and approval of a list of special European areas of conservation in the Czech Republic. • Existence of a broad spectrum of national subsidy titles for natural and landscape protection. • Gradual increase in natural forest reproduction; effort to introduce more deciduous tree species through artificial forestation.	• Species, communities and ecosystems endangered by continuing landscape fragmentation. • Biodiversity threatened by a large number of imported invasive species. • Unsuitable age and species composition of tree species in forests.
Soil	

• Ongoing decrease in the area of arable land in favour of permanent grass and forest zones. • Decline in nutrient consumption in mineral fertilizers and decline in penetration of other substances into the soil (e.g. sludge from the wastewater treatment plants). • Reclamation of land affected by mining, especially forestry and agricultural reclamation. • Exiting system of subsidies to protect soil against erosion and to improve the retention capacity of the landscape.	• Thresholds of DDT (dichlorodiphenyltrichloroethane, pesticide) and DDE (metabolite DDT) considerably exceeded. • A major erosion risk to farmland (up to 42% water erosion and 8% wind erosion). • Increasing land appropriation in relation to the development of industry, transport infrastructure and construction.
Components of the Environment	
OPPORTUNITIES	**RISK/THREATS**
• Energy savings in relation to the air quality. • Lower CO_2 emissions due to proactive measures aimed at energy savings, use of renewable sources and new instruments (trading with emissions). • Lower pollutant emissions released into the air, lower wastewater discharge and waste production from industrial sources due to natural technology upgrade and proactive measures (both mandatory and voluntary). • Mid-term decrease in pollutant emissions from road transport (with the exception of tyre, brake and road surface abrasion) caused by the fact that car pool renewal has been faster than the increasing transport capacity. • Gradual increase in the area of forest and grass land. • Decreased land appropriation for construction purposes in case of an active use of brown fields. • Improved waste management structure (further increase in the reuse, recycling or energetic and material use of waste). • Very gradual improvement of age, species and spatial composition of forests and slow improvement of their condition from the long-term point of view. • Measures aimed at lower emissions from small pollution sources.	• Continuing air pollution by suspended dust particles and ozone. • Increased emissions of suspended particulate matters from tyre, brake and road surface abrasion with expected growth in the conveying capacity of both domestic and transit transport. • Increase in energy prices and a corresponding massive change to solid fuels and resulting deterioration of the air quality and public health. • Potentially antagonistic effects of air protection and the use of renewable energy sources. • Landscape and biodiversity threatened with unreasonable land appropriation. • A permanent risk of environmental accidents (road transport, environmental burdens from the past, industrial activities). • Low legal awareness of business entities and risk of law-breaking (e.g. illegal import of water, export of endangered species, illegal production of wood in forests).
Economic Sectors and the Environment	
STRENGTHS	**WEAKNESSES**
Raw Material Extraction	

• The energy intensity of GDP is decreasing. • The percentage of solid fuels in primary energy resources is decreasing. • A developed system of central heat supply (more environmentally friendly than local heating) and gas connections. • Extraction cutback in protected countryside areas. • Redevelopment and liquidation of mines, subsequent reclamation. • Coal mining decline. • Drop in the area affected by the extraction of mineral resources.	• The energy intensity of GDP is still high compared to the EU average. • The percentage of solid fuels in primary energy resources continues to be high. • A low percentage of renewable energy sources – the volume of energy produced from renewable energy sources has not changed recently; in 2005 it was approximately 4.5% of the gross domestic power consumption (in 2004 it was 4%). • Dependence on the import of energy resources (mainly oil and natural gas). • The extraction of limestone in protected landscape areas is still high.
Processing Industry	
• Support to construction of industrial zones within brown field recovery. • Significant decrease in pollutant emissions released into the air since 1990 (especially suspended particulate matters and SO_2) due to industry. • Decrease in the energy intensity of industry. • Application of the BAT in the process of issuing integrated permits.	• The level of greenfield development still high. • Increase in pollutant emissions released into the air in relation to the development of some industries over the last years (especially NO_x and CO).
Construction	
• A trend of using construction materials made of natural renewable resources. • Construction of low-energy and passive houses. • Improved construction of waste management.	• Disruption of the protected landscape areas due to the extraction of construction materials and increased dust and noise emissions. • A high energy intensity of the construction sector. • A decreased soil retention capacity due to land appropriation, a big percentage of soil threatened with water erosion and disruption of landscape structure, including fragmentation caused by linear constructions. • Production of construction and demolition waste.
Agriculture	
• Promotion of integrated agriculture. • An incentive system of environmental friendly farming and development of a system of agro-environmental measures aimed at the promotion of non-production functions of agriculture. • Successful completion of the process of issuing integrated permits within the IPPC and application of the BAT.	• No significant reduction in the consumption of fertilizers or plant protection preparations over the last ten years, which continues to have adverse effects on the condition of surface and ground water. • Continuing large-scale farming preventing from plant dissemination and animal movement. This results also in big water and wind erosion.
Transport	

• Renewal of both passenger cars and trucks is faster than the increase in conveying capacity and new cars have better running stability than old cars. • The emission limits for new vehicles are stricter. • Emission decrease and lower petrol and diesel consumption as a result of the development of new combustion technologies and catalytic treatment of combustion products.	• Unlimited pollutant emissions are increasing (e.g. polycyclic aromatic hydrocarbons – PAH). • Increased emissions due to tyre, brake and road surface abrasion (practically in line with the conveying capacity). • A high percentage and increasing conveying capacity of passenger transport and freight, especially compared to railway transport. • The conveying capacity of transport is growing fast due to the development of tourism. • Appropriation of farm land and forest land by new transport infrastructure. • Continuously high noise load in cities impacting the public health. • Transport services of rural areas still at a low level. • The number of CNG –powered buses is low.
Waste Management	
• Waste production is no longer dependent on the development of economy (decoupling). • Lower waste production rate per capita compared to most EU countries. • A high degree of waste recycling and material usage. • A high percentage of people involved in the system of waste sorting.	• A high percentage of municipal waste deposited in landfills. • A low degree of separation of biologically decomposable waste and its usage. • Uneven distribution of waste disposal and waste treatment facilities (e.g. incinerating houses and hazardous waste dumps). • Low usage of waste for energetic purposes compared to the amount of disposed waste.
Environmental Burdens from the Past	
• The number of registered locations is close to the estimated number of EBP locations. • A project aimed at the selection of priorities in EBP elimination was started; the project is supposed to ensure efficient redevelopment of the most dangerous locations.	• No tenders to eliminate EBP exceeding CZK 2 million were awarded, the resources that had been invested were devaluated in many cases, the decisions of the Czech Environmental Inspection Agency are not complied with and the assignees are damaged. • There is not a single body responsible for EBP.
Economic Sectors and the Environment	
OPPORTUNITIES	**RISKS/THREATS**
Energy and Raw Material Extraction	
• High potential of energy saving. • Potential of using renewable energy sources, especially vegetable biomass. • Increased energy efficiency will result in lower use of natural resources.	• Limits of brown coal mining exceeded.

• Support of the use of renewable energy sources resulting into elimination of greenhouse gas emissions.	
Processing Industry	
• Further development and implementation of the BAT and other environmentally friendly technologies. • Technical and technological innovations (environmental efficiency) in the area of environmental protection.	• More farmland appropriation (greenfields) due to construction of new industrial zones and warehouses with all negative consequences to the environment. • Increasing industrial production will result into goods transportation especially by the least convenient motor transport. • Continuing pollutant emissions with negative impact on ecosystems.
Construction	
• Support of constructions protecting the environment, such as wastewater treatment plants, sewer systems, waste recycling plants. • Building redevelopment and construction of water management facilities because of floods – this provides the possibility to use more environmentally friendly materials and ensure higher energy efficiency of building operation.	• Extraction of construction materials causes irreversible changes to the landscape character. • Construction development in flood areas. • Loss of the most valuable locations including the extinction of rare animal and plant species because of linear construction.
Agriculture	
• Development of environmentally friendly agriculture supported by the development of ecological and agricultural tourism. • Revitalisation of natural elements that were damaged or completely destroyed (return of dispersed vegetation into the countryside, balk reclamation, revitalization of an unbalanced water system, return of species diversity of meadows, etc.) with the objective to achieve lower soil erosion, smaller losses of nutrients from soil or the stabilization of population of some rare field animals.	• Complicated decrease in the use of fertilisers and plant protection preparations used in agriculture and continuing significant penetration of pollutants into the ecosystems.
Transport	

• Renewal of road transport car pool in favour of new and less polluting cars. • Inclusion of externalities that had not been paid for yet into the price of transport services, which will result into searching for economically and socially optimal solutions. • Introduction of an electronic toll system will result in a decrease in freight transiting through the Czech Republic and in better use of the existing capacity of the railway system. • Completion of modern railway infrastructure and market liberalization of the sector will result in an increased demand of railway transport. • Drop of noise burden due to the car pool renewal, new technical requirements of cars and implementation of noise protection measures. • Increased percentage of alternative fuel cars (especially CNG), mainly in public transport vehicles. • Development of non-motor transport, cycling paths within the "Cycling Strategy" and the "Park and Ride" and "Bike and Ride" systems.	• Continuing emissions and noise caused by transport including negative impacts on public health. • Affordable individual car transport will result into smaller attractiveness of public transport. • Increase in waste production caused by motor transport development. • Import of used cars from other EU countries will slow down the renewal of obsolete car pool. • Decline in transport services in some regions due to unprofitability of some public transportation lines. • Subsidises into air transport will result into a further artificial decrease in the cost of air transport (price deformation).
Waste Management	
• Economic pressure caused by price increase of primary raw materials might support waste recycling. • Significant involvement of the inhabitants in waste recycling.	• Insufficient economic incentives and relief in waste recycling. • In case of increased waste disposal charges there is the threat of environmentally unsuitable behaviour of waste producers, on the other hand the existing charges do not motivate the producers to reuse the waste.
Environmental Burdens from the Past	
• Use of modern technologies, experience and know-how of the EU countries together with EU resources.	• Elimination of all EBP in a short time horizon cannot be expected (it is a long-term problem and a big number of locations involved). • If there are insufficient resources and the EBP elimination is delayed, it can cause risks to sources of potable water.
Instruments of Environmental Policy	
STRENGTHS	**WEAKNESS**

• A number of new legal regulations related to the areas of the State Environmental Policy were adopted, gradual transposition of the legislation of the European Community. • The number of applications for integrated permits (IPPC) has increased, the permits are granted with respect to the BAT evaluation. • An increasing number of announced EIA evaluation plans. • The Integrated Pollution Register was put into operation, the number of records has been increasing. • Development of the use of voluntary instruments, number of business with EMAS and ISO 14001 is increasing as well as the number of eco-label licences. The network of non-profit organizations dealing with environmental education was further developed. • The map portal operated by CENIA, a part of the Public Administration Portal, was enhanced and extended.	• The enforceability of environmental law is generally low. • Payments towards environmental protection do not motivate to adopt "green" measures, but fulfil only a fiscal function. • The environmental tax reform is facing some problems. • There is no significant support of environmentally friendly products.
OPPORTUNITIES (Positive expectations)	**RISKS/THREATS**
• Establishment of a comprehensive system of financial instruments to support environmentally friendly behaviour, including both efficient sanction instruments (charges, penalties) and positively motivating instruments. • Bigger involvement of the general public in environmental issues in relation to education and information sources. • Efficient institutional support of the environment, development of a functional and cooperative network of organizations.	• Decrease in the number of inspectors of the Czech Environmental Inspection Agency and simultaneous increase in competencies (e.g. GMO, transfer of powers form the Customs Administration, international business). • Non-efficient state administration of the environment. • The environmental aspect is still not a priority to many businesses. • Development of executive branch instead of development of organizations and capacities involved in monitoring, research and development and provision of services to the general public.
Environmental Protection Expenses	
STRENGTHS	**WEAKNESSES**
• The total amount of environmental protection expenses has been growing since 2003. • A continuing trend of transferring the focus of the expenses from central to local resources. • Existence of a broad spectrum of sectoral, non-sectoral and foreign nature and landscape conservation programmes.	• A low volume of charges for pollution and the use of the environment not reflecting the economic and social costs.
OPPORTUNITIES (Positive expectations)	**RISKS/THREATS**

• The Czech Republic will receive CZK 100 billion / year in the new budget period of the EU (2007 – 2013) (i.e. CZK 777 billion in current prices).	• The obligations of the Czech Republic towards the EU are costly and the failure to meet them might result in sanctions.

Environment and Society

STRENGTHS	WEAKNESSES
• In 2005 there were no accidents according to the definition provided in Act No. 353/1999 Coll. • The system of public health monitoring of the Czech Republic is functional (www.szu.cz/chzp/monitor/). • The quality of drinking water is monitored in most public water systems in the Czech Republic; the data is processed with the help of the information system (IS PiVo). • The geopark Český ráj was included into the European Geoparks Network and the UNESCO worldwide geoparks network. • Successful activities of foundations supporting environmental projects of non-governmental organizations such as Nadace Partnerství (Czech Environmental Partnership Foundation), Nadace Via (Via Foundation), NROS (Civic Society Development Foundation). • The citizens of the Czech Republic view the situation of the environment in their country more positively than the EU25 average (CR – 59%, EU25 – 51%).	• Only 6% of the population is supplied with drinking water of the recommended optimal magnesium concentration, i.e. 20 – 30 mg/l. • The spreading of the cities into surrounding landscape is very problematic. • Green areas in the cities shrink and give place to developed areas. • A relation between the incidence of the so-called civilisation diseases (namely hypertension) and the noise level at night was established. • Compared to the rest of the EU, the citizens of the Czech Republic view the environment of the country worse than the EU average. • Environmental protection was weighed as a low priority among the inhabitants of the Czech Republic (only 2%). • Small support of sustainable consumption.
OPPORTUNITIES	**RISKS/THREATS**
• New chemical legislation REACH was proposed – minimization of chemical risks to human health. • Research into genetic modification within health monitoring. • Quality pollutant monitoring. • Use of the results of health monitoring for remedial measures. • Use of the Platform of Environmental Non-governmental Organizations Zelený kruh (Green Circle) and others to increase the public awareness of the environment and its remedy. • Support of environmental education and awareness also by 71 environmental education centres of the Pavucina association. • Support and development of environmental counselling, e.g. by the Eco-Counselling Network.	• Environmental exposure to k-PAHs has adverse effects on the population, damaging the genetic material of exposed individuals. • Diseases in children are largely caused by indoor pollution if a family member smokes or the household burns lignite. • Unsuitable consumption patterns of the population.

International Cooperation

STRENGHTS	WEAKNESSES
• Experience with providing development help. • Participation in the majority of important international conventions. • A network of international relations and links was established.	• Vague competencies in relation to international organisations. • Insufficient staffing.
OPPORTUNITIES	**RISKS/THREATS**
• Further use of international resources and experience (EU, OECD, OSN, etc.) • Better use of domestic experience.	• Budget limitations.

A detailed evaluation of the environment of the Czech Republic, the impact of economic sectors on the environment, the instruments of environmental protection and other related issues for the period until the end of 2005 is provided in the following chapters III – IX.

III Components of the Environment

III.1 Air

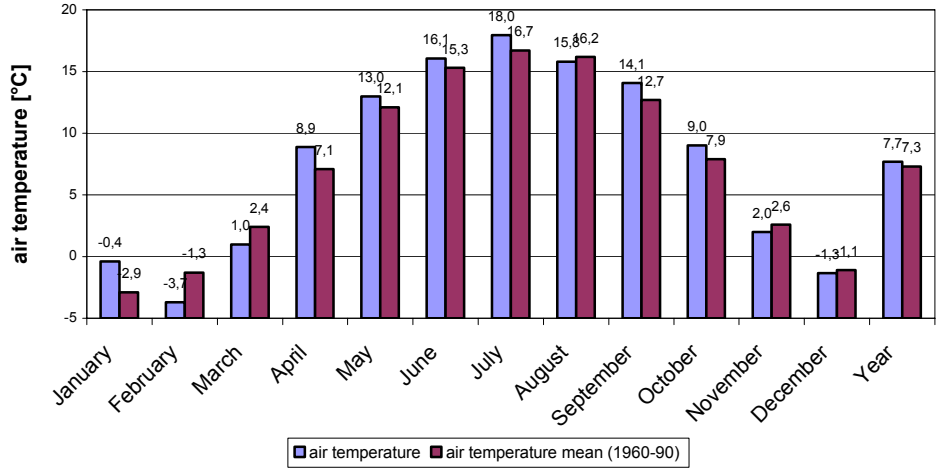
III.1.1 Temperature

Even though the year 2005 was evaluated by the World Meteorological Organisation as one of the warmest years since 1861, the average annual temperature of the Czech Republic was close to the long-term average of 1961–1990 (7.7°C, which is 0.4°C above the long-term standard). Moravia was slightly warmer than Bohemia (7.8°C and 7.7°C respectively), however, the positive temperature difference in Moravia was lower compared to higher long-term air temperature averages (+0.5°C in Bohemia, +0.2°C in Moravia).

Due to atypical weather at the beginning of the year (the maximum temperature in lower parts of Moravia was at 10°C, in Southern Bohemia it was between 12 to 15.5°C), the average January temperature was 2.5°C higher than the long-term average. The coldest month of the year was February with the average temperature at – 3.7°C, which is 2.4°C below the long-term standard. The first ten days in March were also extremely cold, the lowest temperature – 31.2°C was measured on 2 March in the station Horská Kvilda. Spring temperatures were slightly above the average, the biggest difference was measured in April (+1.8°C). Summer culminated at the end of July when the maximum temperatures over 30°C were measured in all places of the country (with the exception of mountains). The highest maximum temperature of 38.3°C was measured on 29 July in the station Plzeň, Mikulka. The above-average temperatures of July (difference +1.3°C) were followed by much colder August weather. September and October were above the average, the temperatures in November and December were standard.

The distribution of the average annual air temperature and the temperature difference in 1961-1990 are shown in maps III.1.2-3. The comparison of global averages of the monthly and annual air temperatures in the Czech Republic in 2005 with the average of 1961-1990 is shown in Graph III.1.1.

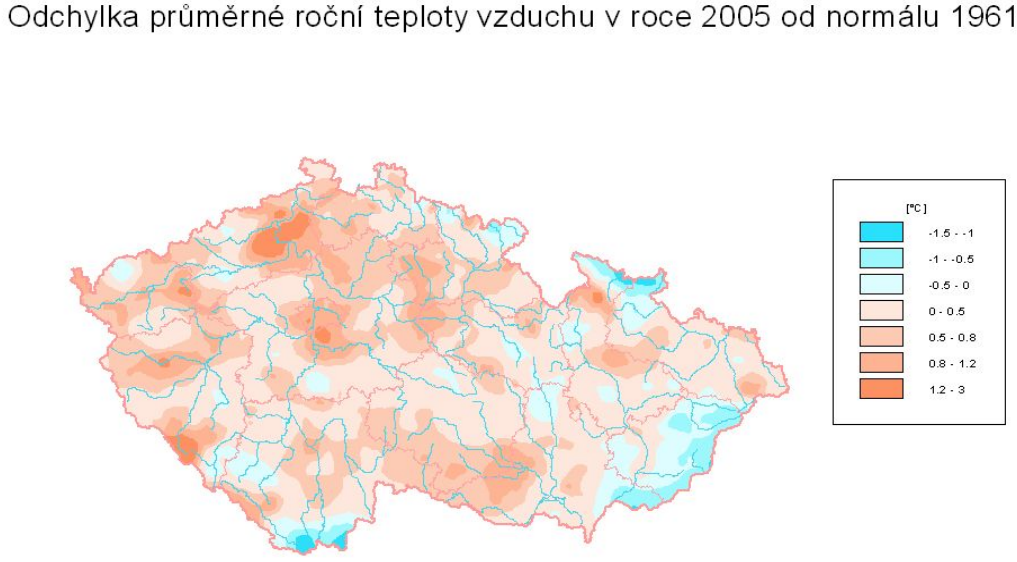
Graph III.1.1
Average air temperature in the Czech Republic (global average values) in 2005 in comparison with the long-term temperature average between 1961 and 1990 [°C]



Source: CHMI

Figures III.1.2-3

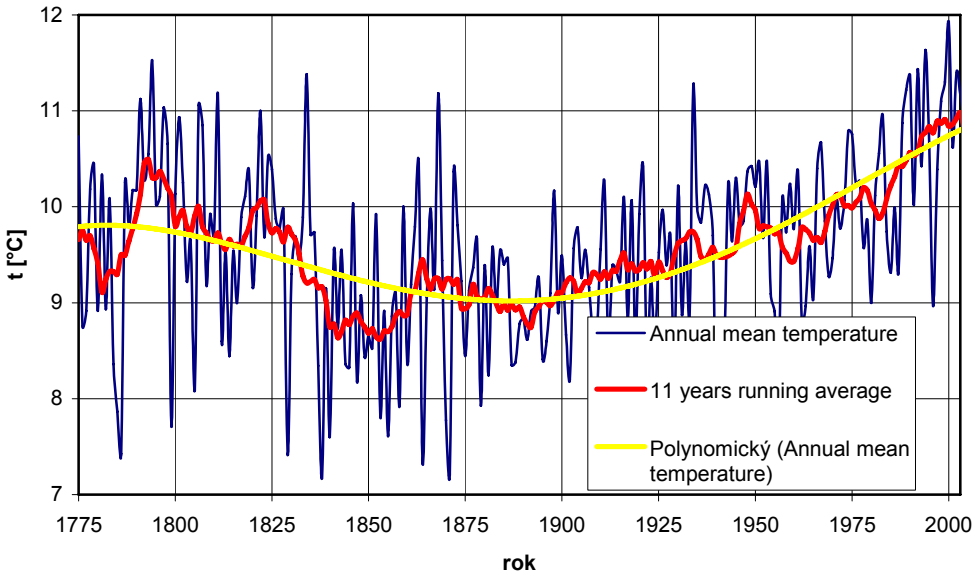
Average annual air temperature in the Czech Republic in 2005 in absolute values and in percentage of the standard value 1961-1990



Source: CHMI

The development of temperature in the long-term context can be demonstrated by the development of the average annual temperature measured in the secular station Klementinum in Prague (a number of original measurements might be non-uniform) where the air temperature has been monitored since 1775. Moving 11-year averages and the polynomial trends show that the average annual temperature has been rising since the 1990s after the temperature drop between 1800 -1900. The acceleration of the growing temperature trend towards the end of the 20th century can be related to an anthropogenic growth in the greenhouse gas effect, but also to increased intensity of the so-called urban heat island, which refers to specific temperature conditions in cities caused by components of radiation and heat balance.

Graf III.1.4
Average annual air temperature (°C) in Prague-Klementinum between 1775 and 2005



Source: CHI

III.1.2 Emissions

III.1.2.1 GHG Emissions

The inventory of gases impacting the climatic system of the Earth (greenhouse gases) is made in compliance with the IPCC methodology. This inventory is used as the reference for the supervision of the compliance with international obligations established by the Kyoto Protocol. The Czech Republic agreed to decrease the total GHG emissions before the period of 2008-2012 by 8% compared to the reference year 1990[1]. The balance includes some carbon dioxide degradation in the atmosphere due to photosynthetic assimilation. The negative item of the balance is called Land use, land use changes and forestry (LULUCF).

[1] The reference year for CO_2, CH_4 and N_2O in the Czech Republic is 1990, for HFC, PFC and SF_6 it is 1995.

With respect to the methodology development and the systematic introduction of inspection mechanisms the values are re-calculated if necessary and therefore there may even be slight changes over the years in the continuously reported emission inventories. The GHG inventory results are regularly finished for the previous year (in this case 2004) 15 months after the end of the year.

The total emissions including the GHG emissions fall in the Czech Republic, expressed as the CO_2 equivalent, dropped from 194.5 million tons in 1990 to 142.3 million tons in 2004 (see Table 1), which is 13.9 t $CO_{2\ eqv.}$ per capita in 2004. The actual carbon dioxide emissions (excluding the emissions and fall in LULUCF) dropped from 196.3 million tons to 147.2 million tons. Relatively expressed, it means a 25% decrease compared to the reference year 1990, which means the obligations of the Kyoto Protocol have been fulfilled with a big reserve. The emissions of the best-know anthropogenic GHG – carbon dioxide – fell from 165.1 million tons in 1990 to 127.3 million tons in 2004, which is 12.5 t CO_2 per capita in 2004.

Table III.1.1
Total GHG emissions between 1990 and 2004 [kt $CO_{2ekv.}$]

	$CO_{2\ total}$ [2]	$CO_{2\ LULUCF}$ [3]	CH_4	N_2O	F-gases	Total emissions		International air transport
						incl. LULUCF	excl. LULUCF	
1990	165,060	163,281	18,590	12,604	n.a.	194 474	196 253	627
1991	155,261	145,254	17,012	10,853		173 119	183 126	563
1992	140,160	130,466	15,881	9,611		155 958	165 653	483
1993	136,704	127,781	14,809	8,580		151 170	160 093	378
1994	131,242	122,908	13,914	8,417		145 239	153 573	289
1995	132,125	124,314	13,580	8,724	76	146 694	154 505	377
1996	133,506	123,012	13,470	8,260	183	144 924	155 418	467
1997	138,032	133,035	12,716	8,469	341	154 562	159 559	413
1998	129,188	125,560	12,258	8,416	382	146 615	150 243	231
1999	122,099	117,227	11,553	8,069	348	137 195	142 068	547
2000	129,017	122,136	11,531	8,258	413	142 338	149 218	349
2001	129,033	121,960	11,458	8,491	573	142 483	149 556	446
2002	124,040	117,875	11,434	8,204	472	137 984	144 149	505
2003	128,075	122,326	11,109	7,744	715	141 894	147 644	607
2004	127,297	122,427	10,895	8,318	667	142 306	147 177	815

Note: The calculation of aggregated emissions $(CO_2)_{ekv}$ used values of the radiation potential of the GHGs according to the applicable methodology (e.g. for CO_2 = 1, CH_4 = 21, N_20 = 310). The inventory includes also emission drops caused by changes in the land use and forestry. The emissions from international air (and sea) transport are reported separately and are not included into the total national emissions.

Source: CHI

Since 1995 the emissions of substances with fluorine content have been monitored – so-called F-gases (HFC, PFC and SF_6) – which also belong to the GHGs monitored under the Kyoto Protocol. Their current share in the total GHG emissions is 0.4% in the Czech Republic. The share of CO_2 emissions in the total emissions was at 86.0% in 2004, the CH_4 emissions were at 7.7% and the N_2O emissions at 5.8%; the above share have not changed much recently.

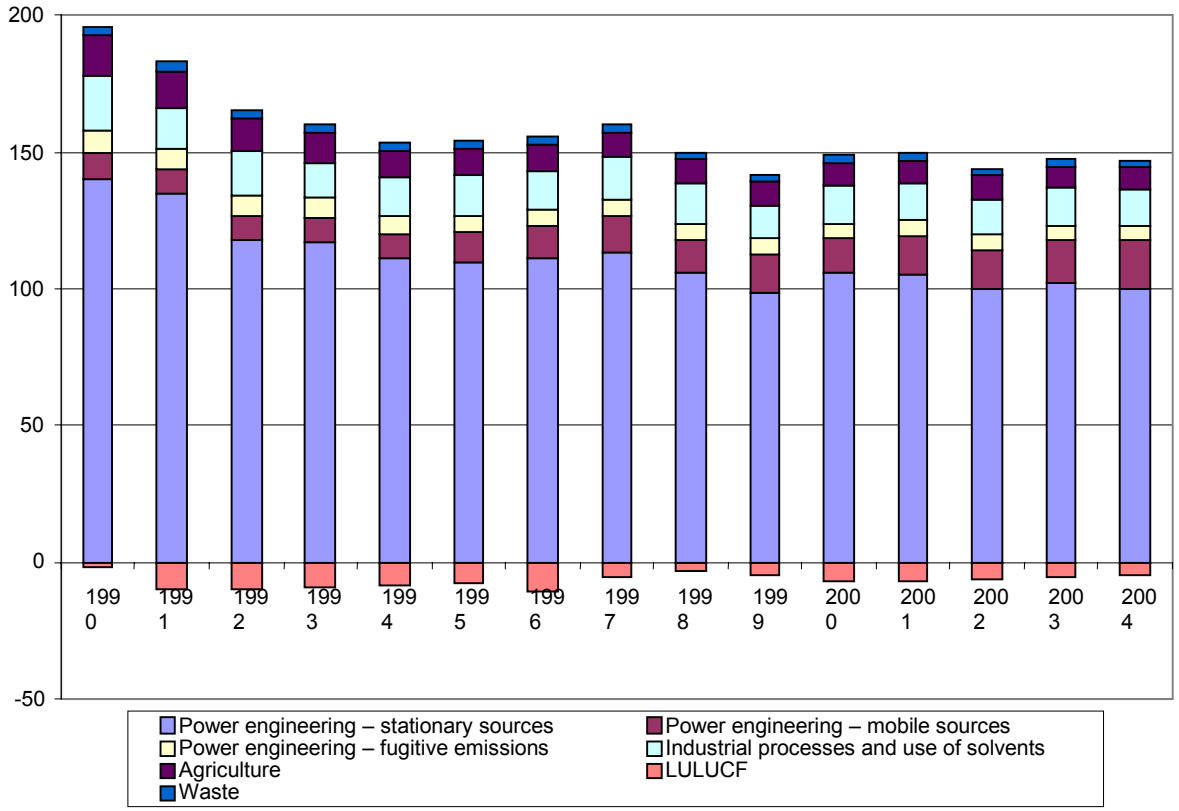
[2] CO_2 emissions excluding the LULUCF fall.

[3] CO_2 emissions and drops including the LULUCF fall.

According to the methodology, the GHG emissions are divided into six basic sectors: power engineering, industrial processes, use of solvents and other substances, agriculture, LULUCF and waste. These categories are further divided into sub-sectors (e.g. power engineering into combustion from stationary sources, combustion from mobile sources and fugitive emissions). The amount of aggregated GHG emissions according to the sectors and the most important sub-sectors and the change between 1990 and 2004 are provided in Graph III.1.5. The most important GHG source is power engineering – stationary combustion processes (heat and electricity generation). The relative distribution is provided in Graph III.1.6.

Graph III.1.5

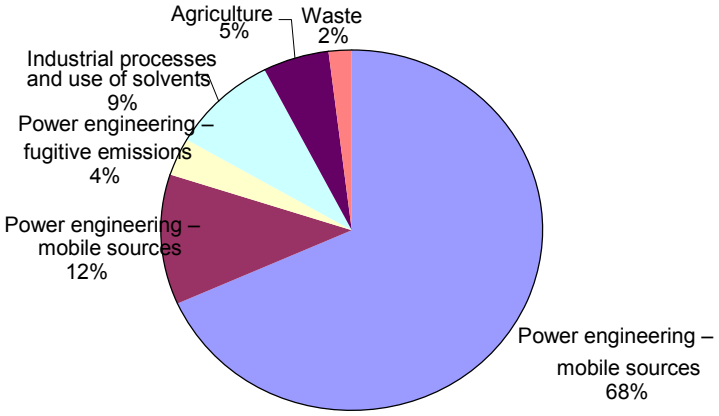
Development of GHG emissions between 1990 and 2004 [million t $CO_{2\ ekv.}$]



Source: CHI

Graph III.1.6

Share of the sectors in the total GHG emissions in 2004



Source: CHMI

III.1.2.2 Emissions of Pollutants

Pursuant to Act No. 86/2002 Coll., on Protection of the Air (the Clean Air Act) the air pollution sources are divided into stationary (extra large, large, medium and small) and mobile sources. Extra large, large and medium sources are monitored as individual emission points; small sources are monitored globally at the level of municipalities; mobile sources are monitored linearly (selected segments added up) and globally (other roads, railway transport, agricultural machines, etc.) at the level of the regions of the Czech Republic. The information about emission pollutants and other technical information on pollution sources are registered in the REZZO database (Register of Emissions and Sources of Air Pollution).

As shown in Tables III.1.2 and III.1.3 there were only minor changes on the year-on-year basis in the total emissions of main pollutants. The biggest increase was registered in the suspended particulate matters (SPM) (3% up); the VOC and NO_x emissions fell by 3.4% or 1.3% respectively. While the emissions from extra large and large sources decreased on the year-on-year basis, with the exception of ammonia (the largest decrease was in SPM by 7.5%), the emissions from small sources increased significantly over the same period of time by as much as 11%. Since small sources belong to important SPM emitters (unlike SO_2 and NO_x), there was the above mentioned increase in the total SPM emissions, which remain to be the biggest pollution source in the Czech Republic. The year-on-year decrease in the emissions of combustion sources is positive (e.g. NO_x emissions by approx. 5,000 t).

The largest group of emission points is public and industrial power engineering (over 75% SO_2 and 40% NO_x of total emissions). Primary production and iron processing account for almost 50% of CO emissions. Global sources also account for a big percentage of the total emissions, mainly household heating (41% of particulate matters), use of solvents (approx. 60% VOC) and unregistered agricultural activities (approx. 55% NH_3). Mobile sources largely contribute to the total emissions with exhaust fumes (NO_x 45% and CO 46%) and abrasion emissions (particulate matters 36%).

Table III.1.2

Total emissions of selected basic pollutants in 2004 – adjusted data and shares of the pollution categories in the total emissions

Source category	Particulate pollutants		SO_2		NOx		CO		VOC		NH_3	
	kt	%	kt	%	kt	%	kt	%	kt	%	kt	%
Extra large and large sources	13.3	18	184.0	81	143.4	50	168.4	31	21.4	11	15.7	23
Medium sources	4.9	7	5.1	2	4.1	1	6.7	1	4.2	2	14.6	21
Small sources	28.6	39	33.5	15	13.1	5	101.6	19	108.8	57	36.9	53
TOTAL stationary sources	**46.8**	**64**	**222.6**	**98**	**160.6**	**56**	**276.7**	**51**	**134.4**	**70**	**67.2**	**97**
Mobile sources*	26.9	36	4.0	2	125.8	44	270.1	49	56.6	30	2.3	3
TOTAL	**73.7**	**100**	**226.6**	**100**	**286.4**	**100**	**546.8**	**100**	**191**	**100**	**69.5**	**100**

** The above data includes emissions from the total sales of fuels, i.e. including those consumed outside the Czech Republic (estimated at about 111,000 t of diesel fuel).*

Source: CHI, CEI, TRC, NRIPM, RIAE

Table III.1.3

Total emissions of selected basic pollutants in 2005 (kt) and the year-on-year change (2004-5) in %

Source category	Particulate pollutants		SO_2		NOx		CO		VOC		NH_3	
	kt	%	kt	%	kt	%	kt	%	kt	%	kt	%
Extra large and large sources	12.3	-7.5	183.4	-0.3	137.9	-3.8	164.7	-2.2	19.6	-8.4	15.8	0.6
Medium sources	4.8	-2.0	5.0	-2.0	4.8	17.1	5.7	-14.9	3.3	-21.4	12.0	-17.8
Small sources	31.3	9.4	36.9	10.1	14.6	11.5	113.5	11.7	108.3	-0.5	37.6	1.9
TOTAL stationary sources	**48.4**	**3.4**	**225.3**	**1.2**	**157.3**	**-2.1**	**283.9**	**2.6**	**131.2**	**-2.4**	**65.4**	**-2.7**
Mobile sources*	29.1	8.2	1.9	-52.5	130.8	4.0	265.6	-1.7	55.6	-1.8	2.4	4.3
TOTAL	**77.5**	**5.2**	**227.2**	**0.3**	**288.1**	**0.6**	**549.5**	**0.5**	**186.8**	**-2.2**	**67.8**	**-2.4**

** The above data includes emissions from the total sales of fuels, i.e. including those consumed outside the Czech Republic (estimated at about 64,000. t of diesel fuel).*

Note: Data collection, processing and verification of more than 30,000 individually monitored establishments is a very time-consuming process and if the most significant part of emissions (extra large and large sources) is not available at the time of finishing the publication, the whole emission balance is considered to be preliminary.

Source: CHI, CEI, TRC, NRIPM, RIAE

The trend in total emissions of selected basic pollutants since 1985, including recalculated data since 2002, is shown in Table III.1.4. A major drop in emissions (SO_2 and SPM) between 1990 and 1995 was caused mainly by economic changes (production decrease and restructuring), between 1996 and 1999 also by partly subsidised global fuel replacement (medium and small sources) and by compliance with legal requirements related to the general applicability of emission limits specified in the Decree of the Ministry of the Environment No. 117/1997 Coll., which sets emission limits and conditions for the operation of stationary air pollution sources. The amount of emissions was decreasing due to a different composition of the car pool, and increasing at the same time due a dynamic growth of the conveying capacity, mainly in road transport. The changes in legal regulations and the implementation of air protection measures together with the other mentioned factors caused a dramatic SPM and SO_2 emission decrease (by almost 90% between 1990 and 2005) and a significant decrease in the emissions of other basic pollutants (NO_x and CO). As a consequence of an increasing share of more environmentally-friendly paints and degreasing agents and a different composition of the vehicle pool the VOC emissions have been decreasing.

Table III.1.4

Trends in the emissions of selected basic pollutants between 1985 and 2005 (thousand. t.year^{-1})

Year	SPM [a)]	SO_2	NO_x	CO [b)]	VOC	NH_3 [c),d)]
1985	1,015	2,161	795	899		
1990	565	1,850	551	1,275	441	156
1991	525	1,749	527	1,197	394	134
1992	425	1,495	499	1,141	366	115
1993	367	1,366	459	1,055	346	99
1994	258	1,205	378	1,036	310	91
1995	211	1,103	370	1,044	292	86
1996	178	944	366	1,012	293	81
1997	127	697	349	944	277	81
1998	84	438	321	765	242	80
1999	66	268	313	716	234	75
2000	75	264	321	648	227	74
2001	70	251	332	649	220	77
2002*	74	234	285	547	202	84
2003*	76	229	286	564	200	82
2004*	74	227	286	547	191	70
2005 **	77	227	288	549	187	68

[*] *adjusted;* [**] *preliminary data*

[a)] *Emission caused by road surface, tyre and brake abrasion added in the road transport since 2000 (approx. 17,000 t).*

[b)] *In 1990 an estimate of metallurgical emissions added (approx. 245,000 t).*

[c)] *Agricultural emissions calculated according to a new methodology since 2003.*

[d)] *Emissions from mobile sources added in 2000 (approx. 2,000 t).*

Note: In processing the 2005 data the methodology used to determine the fuel consumption and emissions of mobile sources that belong to the competence of the Ministry of Transport used a new redistribution of the diesel fuel consumption between vehicles and other non-road mobile sources. The outputs of the updated balance of fuel consumption are related top a significant decrease in the estimate of emissions from agricultural and forestry machines and other non-road vehicles (e.g. construction machinery). In relation to the above changes the emissions until 2002 were recalculated.

Source: CHMI, CEI, TRC, NRIPM, RIAE, CSO

Emissions of Heavy Metals and Persistent Organic Pollutants

Table III.1.5 shows the emissions of heavy metals and persistent organic pollutants (POP) reported in compliance with the requirements of the CLRTAP Protocols. A major decrease in Pb emissions was caused by gradual decrease and a complete ban on leaded petrol as of 1 January 2001. Taking into account the changes in the methodology of POP emissions calculation the Table provides only data for 2001 – 2004. Currently a recalculation is being made for the emission inventories between 1990 and 2000.

Table III.1.5

Trends in the emissions of heavy metals and POP between 1990 and 2004

Year	Heavy metals			POP[a)]		
	Pb	Cd	Hg	PCB	PCDD/PCDF	PAHs
	t.year^{-1}	t.year^{-1}	t.year^{-1}	kg.year^{-1}	g.year^{-1}	t.year^{-1}
1990	241,4	4,3	7,5	.	.	.
1995	203,7	3,6	7,4	.	.	.
2000	105,7	2,9	3,8	.	.	.
2001	46,7	2,6	3,3	96,1	190,6	36,7
2002	47,2	2,7	2,8	82,5	177,3	24,4
2003	47,2	2,3	1,8	84,6	186,2	26,7
2004	36,6	2,4	2,1	89,9	185	24,4

[a)] *Emissions for 1990–2000 are recalculated according to a new methodology*

Source: CHI, TRC, CSO

III.1.3 Air Quality

When assessing the air pollution it is mainly the relation of detected pollution values and pollution limits that is monitored. The Government Order No. 350/2002 Coll., as amended, which sets the pollution limit values, conditions and the method of air quality monitoring, assessment, evaluation and management, sets limits for the following pollutants: sulphur dioxide, SPM of the PM_{10} fraction, carbon dioxide and nitrogen oxides, carbon monoxide, benzene, ozone, lead, cadmium, arsenic, nickel, benzo(a)pyrene and the deposit limit for dust fallout.

The first five substances are the main pollutants (mostly primary pollutants), ground ozone is a secondary pollutant. Another group of pollutants are heavy metals and benzo(a)pyrene as a PAH indicator.

The overview of pollution limit values, target pollution limits and the dates for attaining the limit values are provided in Table III.1.6. The limits are determined both with respect to public health and to vegetation and eco-system protection. The margins of tolerance apply only to 2005.

Table III.1.6

Overview of pollution limit values and margins of tolerance, upper and lower pollution limits and long-term pollution limits according to the Government Order No. 429/2005 Coll. (amending No. 350/2002 Coll.)

a) Pollution limit values for health protection

Pollutant	Averaging time	Assessment limit [μg.m^{-3}]		LV [μg.m^{-3}]	MT (for **2005**) [μg.m^{-3}]	Date for attaining the limit value
		LAT	UAT			
SO_2	1 hour	—	—	**350,** max. 24 times a year	—	—
	24 hour	**50**, max. 3 times a year	**75**, max. 3 times a year	**125,** max. 3 times a year	—	—
PM_{10}	24 hours	**20,** max. 7 times a year	**30,** max. 7 times a year	**50,** max. 35 times a year	—	—
	calendar year	**10**	**14**	**40**	—	—
NO_2	1 hour	**100,** max. 18 times a year	**140,** max. 18 times a year	**200,** max. 18 times a year	**50**	1 Jan 2010
	calendar year	**26**	**32**	**40**	**10**	1 Jan 2010
Pb	calendar year	**0.25**	**0.35**	**0.5**	—	—
CO	maximum daily 8-hour sliding average	**5,000**	**7,000**	**10,000**	—	—
Benzene	calendar year	**2**	**3.5**	**5**	**5**	1 Jan 2010

b) Target limits and long-term pollution goals

Pollutant	Averaging time	Assessment limit [μg.m^{-3}]		LV [μg.m^{-3}]	Date for attaining the limit value
		LAT	UAT		
O_3	maximum daily 8-hour sliding average	—	**120***	**120, 25 times** / 3 years on average	1 Jan 2010
Cd	calendar year	**0.002**	**0.003**	**0,005**	31 Dec 2012
As	calendar year	**0.0024**	**0.0036**	**0,006**	31 Dec 2012
Ni	calendar year	**0.010**	**0.014**	**0,020**	31 Dec 2012
BaP	calendar year	**0.0004**	**0.0006**	**0,001**	31 Dec 2012

** This ozone level is referred to as the long-term pollution goal in the Government Order.*

***Hg** – evaluation: annual average (no limits)*

***$PM_{2,5}$** – evaluation: annual arithmetic average, annual median, annual 98th percentile, annual max. of 24-hour average values (proposed limit for the annual average is 25 μg.m^{-3})*

Abbreviations::

LAT – lower assessment tolerance

UAT – upper assessment tolerance
LV – pollution limit value or the target pollution limit
LV + MT – pollution limit including the margin of tolerance

c) Limit values for the protection of ecosystems

Pollutant	Time interval	Assessment limits [µg.m^{-3}]		Air pollution limit value [µg.m^{-3}]	Date for attaining the limit value
		LAT	UAT	LV	
SO_2	winter season (1 October – 31 March)	**8**	**12**	**20**	—
NO_x	calendar year	**19,5**	**24**	**30**	—

Pollutant	Time interval	Long-term pollution target [µg.m^{-3}.h]	Target pollution limit value as of 1 January 2010 [µg.m^{-3}.h]
O_3	AOT40, calculated from the 1-hour values for May-July	**6,000***	**18,000** 5-year average

Areas where the pollution limits values shall be observed pursuant to a government order for vegetation and ecosystems protection:

a) *national parks and protected landscape areas;*
b) *areas 800 m above sea level and higher;*
c) *other selected forest areas according to the Bulletin of the Ministry of the Environment.*

Note: If a date for attaining the limit value is not provided, is has elapsed (usually 31 December 2005)

Source: CHI

Outdoor Air Monitoring Network of the Czech Republic

The air pollution monitoring the results of which are saved into the Air Quality Information System (the results for 2005 are presented in this report), is performed in a total of 230 locations (both AMS and manual measuring). Out of the total number, the CHI monitors 140 locations, health institutes 59, the FGMRI 6, ČEZ, a.s., 13, FRANTSCHACH PULP@PAPER, a.s., one and communal monitoring facilities 11 locations (Třinec 1, Plzeň 6, Pardubice 1, Šumperk 1, Olomouc 1, Zlín 1).

The number of locations included in the assessment (i.e. those with sufficient data for 2005 to be assessed): SO_2 159 locations, NO_2 and NO_x 173, PM_{10} 139, $PM_{2,5}$ 25, heavy metals 64, O_3 72, CO 39, benzene 26 and benzo(a)pyrene 26 locations.

Outdoor Ail Quality in 2005

Sulphur dioxide

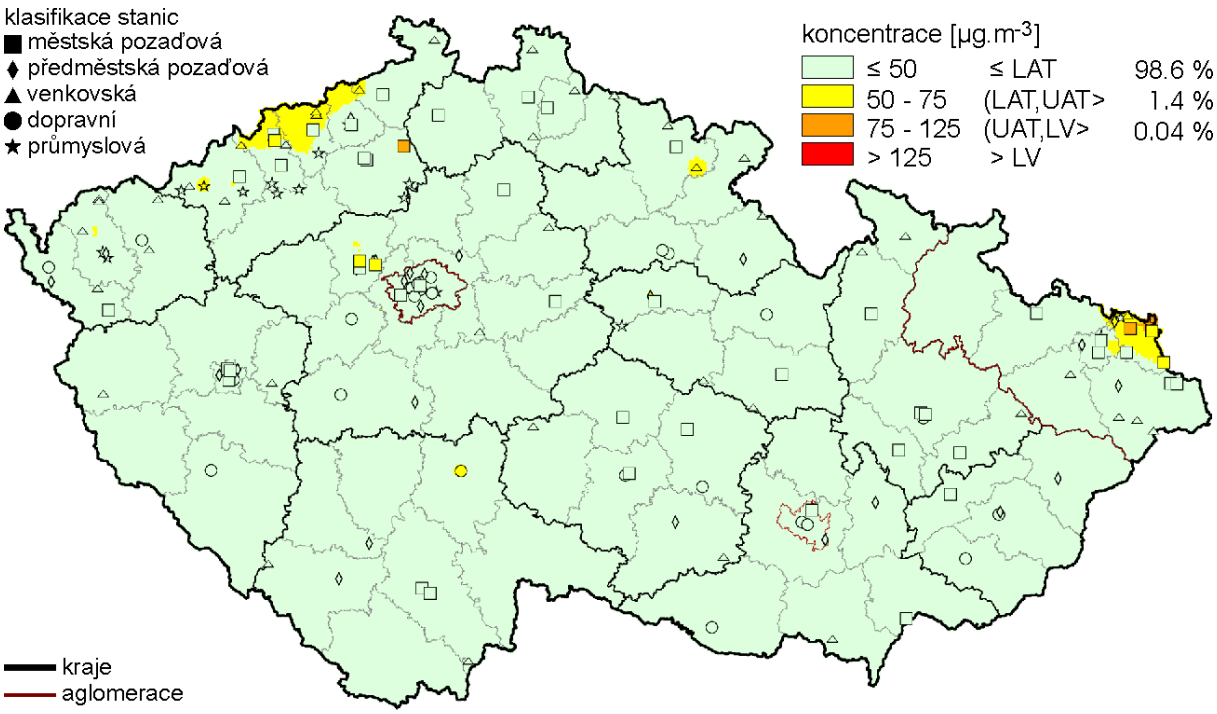
Sulphur dioxide is a gas originating from burning fossil fuels with sulphur content, which damages green parts of plants, mainly coniferous trees.

From the perspective of annual average concentrations, the SO_2 pollution is at a very low level and the limits were exceeded only exceptionally (see Figure III.1.7). The 24-hour concentration limit of SO_2 was not exceeded more than three times in one place in 2005. The annual limit for ecosystems and vegetation (20 $\mu g.m^{-3}$) was not exceeded in any location that is classified as rural.

The pollution slightly increased compared to 2004 in winter 2005/2006; the limit for ecosystems and vegetation (20 $\mu g.m^{-3}$) was exceeded in two location (Věřňovice – Moravskoslezský region, Krupka – Ústí n.L. region).

Figure III.1.7

Fields of annual average SO_2 concentrations in 2005



Abbreviations (apply to the maps in the whole chapter):
LAT – lower assessment threshold
UAT – upper assessment threshold
LV – pollution limit value
LV + MT – pollution limit value including the margin of tolerance
Note: An exceeded pollution limit value or a target limit value of a given type is marked red in the map; an exceeded limit value including the margin of tolerance is purple in the map.

Source: CHI

Suspended particulate matters in PM_{10} Fraction

Air pollution caused by the suspended particulate matters in PM_{10} fraction remains one of the major problems of air pollution, as documented by Figure III.1.8.

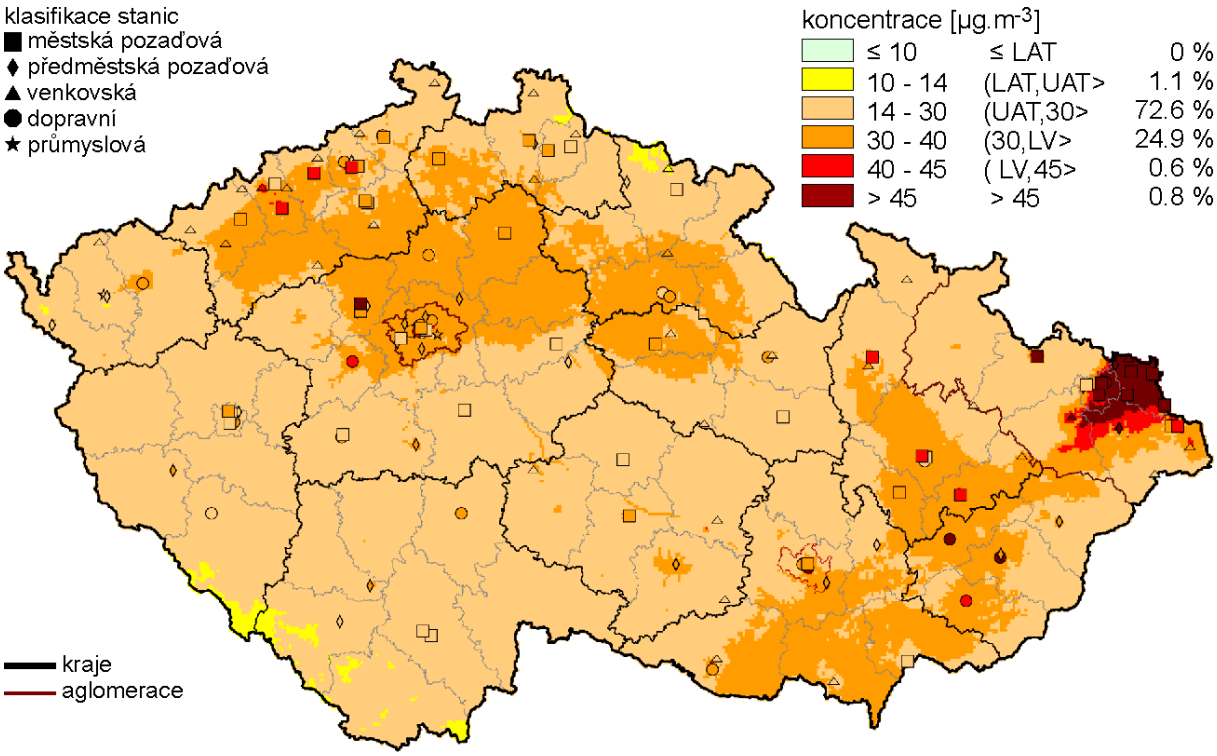
The most polluted area is the Ostrava region, similar to previous years. Out of the total number of 137 locations where the PM_{10} fraction is measured, 93 stations (68%) exceeded the

24-hour pollution limit of PM_{10} (50 µg.m^{-3} max. 35 times a year). The annual air pollution limit of PM_{10} (40 µg.m^{-3}) was exceeded in 31 stations.

The number of stations showing an exceeded pollution limit of both air pollution types of PM_{10} in 2005 compared 2004.

Figure III.1.8

Fields of annual average concentrations of PM_{10} in 2005



Source: CHI

Nitrogen dioxide and oxides of nitrogen

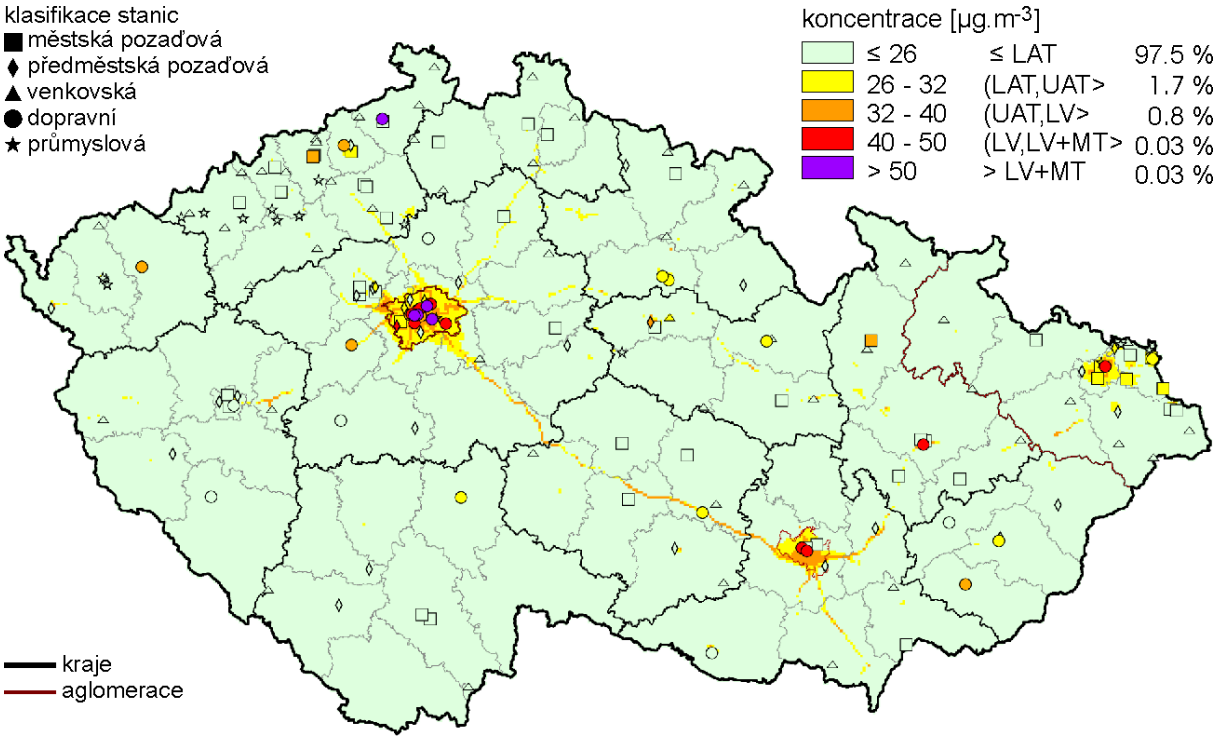
Nitrogen oxides come from combustion processes, i.e. not only form stationary, but also from mobile sources (transport). Substances harmful to human health and ecosystems include both nitrogen oxides and the so-called secondary pollutants that originate from them in the air (e.g. ozone). The occurrence of photochemical smog is bound to summer periods (unlike sulphur oxides) where the solar radiation is strong enough.

The air pollution limits of nitrogen oxides with respect to the public health (40 µg.m^{-3}) are exceeded only a limited number of stations, in agglomerations and big cities exposed to heavy traffic (see Figure III.1.9). Out of the total number of 173 locations where nitrogen oxide was monitored in 2005, the annual pollution limit was exceeded in 16 of them. The air pollution limit including the margin of tolerance (50 µg.m^{-3}) was exceeded in 5 locations. The hourly pollution limit (200 µg.m^{-3} max. 18 times per year, margin of tolerance 50 µg.m^{-3}) was exceeded in a busy road in Prague (Legerova Street) where it was exceeded 174 times (LV+MT exceeded 36 times). The air pollution limits for NO_2 have to be achieved by 1 October 2010 latest.

The annual NO_x limit for ecosystems (30 µg.m^{-3}) was not exceeded in 2005 in any station classified as rural (EKO). The average annual NO_x concentration exceeded this limit in approx. 10% of the Czech Republic, solely in locations with heavy traffic.

Figure III.1.9

Fields of annual average nitrogen oxides concentrations in 2005 with respect to the public health limits



Source: CGI

Carbon monoxide

An anthropogenic source of carbon monoxide pollution is the processes of incomplete combustion of fossil fuels. The main causes are traffic, but also stationary sources, such as household furnaces.

In 2005 carbon monoxide was monitored in 39 locations. The maximum 8-hour moving averages of carbon monoxide were not exceeded in any of them (10 mg.m^{-3}).

Benzene

As the intensity of automobile transportation grows, the importance of monitoring air pollution from aromatic hydrocarbons increases. Exhaust gases from petrol-powered vehicles are a decisive source of atmospheric emissions of aromatic hydrocarbon, especially benzene and its alkyl derivatives. In addition, losses through the evaporation of petrol during handling, storage and distribution constitute another important source of emissions of these hydrocarbons.

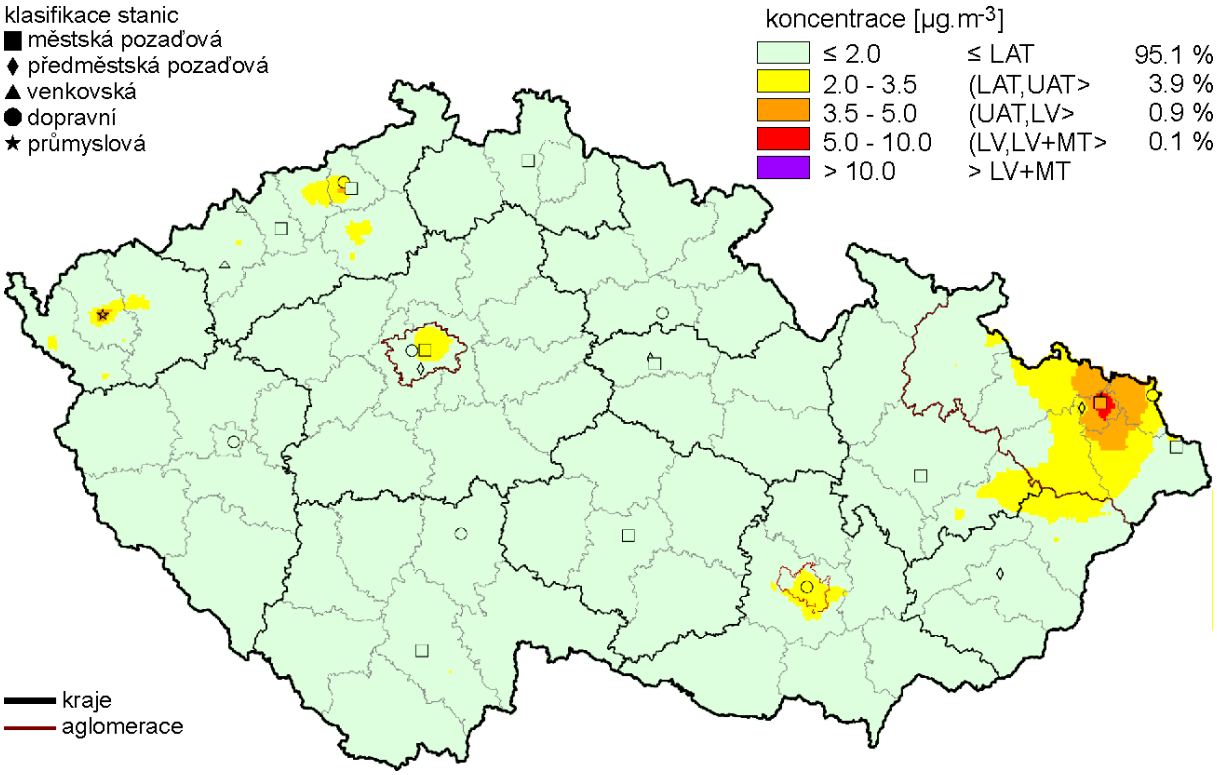
Emissions from mobile sources represent approximately 85% of the total emissions of aromatic hydrocarbons, with exhaust gases accounting for a major portion. We estimate that the remaining 15% of the emissions originate from stationary sources and are generated by processes in the production of aromatic hydrocarbons and those within which these compounds are used for production of other carbons.

The most significant effects of the exposure to benzene include deterioration of haematopoiesis and carcinogenic effects.

Increased annual average values of (Figure III.1.10) are observed in almost 5% of the area of the Czech Republic, mainly in the Ostrava region. Out of the total number of 26 locations where the benzene concentration was measured in 2005, the annual pollution limits were increased by the margin of tolerance for (5+5 µg.m^{-3}) in the station of the health institute in Ostrava-Přívoz (10,4 µg.m^{-3}).

Figure III.1.10

Fields of annual average benzene concentrations in 2005



Source: CHI

Tropospheric ozone

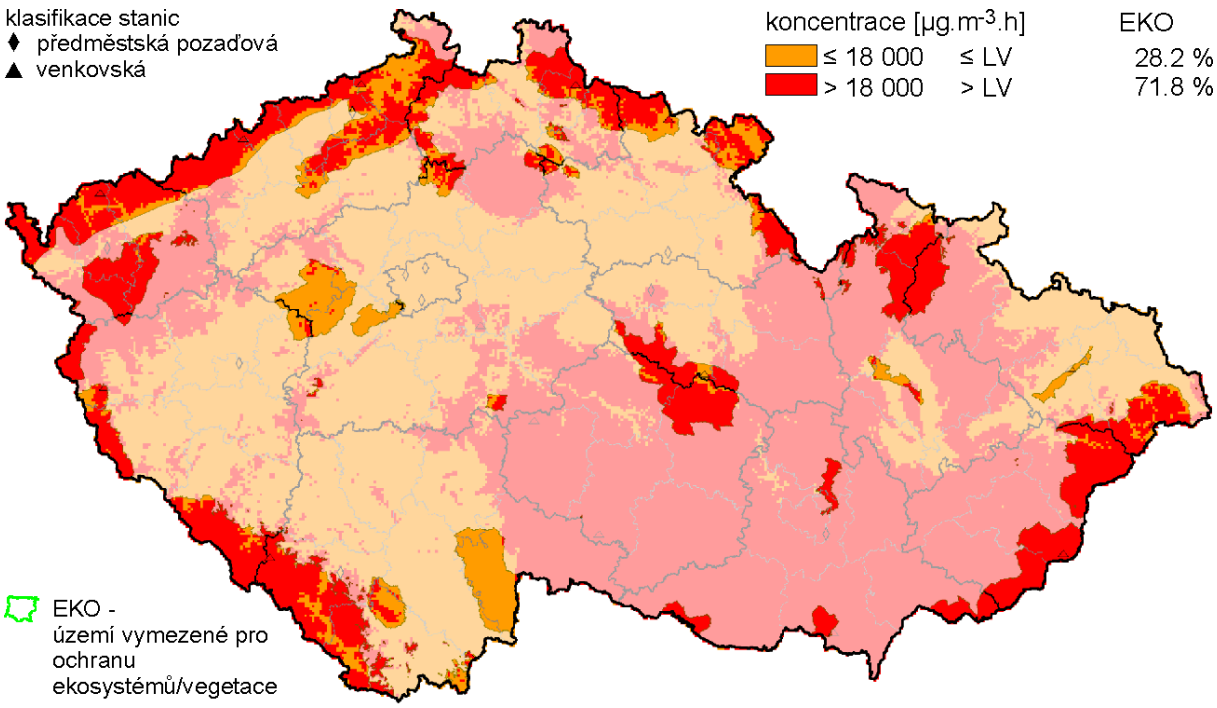
In the ground atmospheric layers, troposphere ozone is produced under the influence of solar radiation through a complex of photochemical reactions, mainly between nitrogen oxides, VOC (mainly hydrocarbons) and other components of the atmosphere. Troposphere ozone is classified as a secondary pollutant because it is not primarily emitted by anthropogenic air pollution sources.

In 2005 the ozone levels were monitored in 72 stations, 50 (69%) of which recorded instances of exceeding the target pollution level limit for the three-year period 2003–2005 (or shorter).

The highest values were measured in mountains. Compared to 2004 the situation did not change.

Out of the total number of 29 rural and suburban stations for the AOT40 calculation is relevant pursuant to law, the target limit values for ozone vegetation protection were exceeded (i.e. the average for 2001–2005) in 20 stations (see Figure III.1.11). The target air pollution limits for vegetation protection (18 000 µg.m^{-3}.h) was exceeded in 11 out of 12 stations in the EKO zone for the same period.

Figure III.1.11
Fields of the exposure index AOT40, 5-year average, 2001-2005



Note: In compliance with the relevant EU directive, the Czech legislation uses the AOT40 exposure index for the evaluation of the protection of vegetation from excessive ozone concentrations [AOT40: cumulative exposure to ozone; AOT40 is calculated as a sum of differences between the hourly ozone concentrations and the threshold levels 80 µg.m^{-3} (= 40 ppb) for each hour when the threshold level was exceeded. According to Government Order No. 350/2002 Coll., as amended, AOT40 is calculated from May to July, every day between 8:00 a.m. and 8:00 p.m. CET (= from 7:00 a.m. to 7:00 p.m. UTC)].

Source: CHI

Arsenic

Anthropogenic sources of arsenic include mainly combustion processes (lignite, hard coal and heavy fuel oils), iron and steel production and copper and zinc production. Arsenic is found mainly in particles of fine fraction (with an aerodynamic diameter of 2.5 µm) that can be transported for longer distances and penetrate deeper into the respiratory system. Almost all arsenic is bound to particles with an aerodynamic diameter of 10 µm.

Out of the 64 stations where arsenic is measured the total air pollution limit (6 ng.m^{-3}) which has to be complied with by 31 December 2012 was exceeded in Tanvald (7.2 ng.m^{-3}).

Cadmium

Cadmium (apart from minority natural resources) mostly comes from iron and steel production, metallurgy of ono-ferrous metals, waste incineration, and fossil fuel burning (lignite, hard coal and heavy fuel oils). A minor source of emissions if transport. Cadmium is typically bound to fine particles (with an aerodynamic diameter below 2.5 μm), which involves a higher risk of a negative impact on human health. Almost all cadmium is bound to particles below 10 μm in size.

Long-term exposure to cadmium impairs renal function. Cadmium has been demonstrated to have carcinogenic effects on animals, while there is limited evidence of its carcinogenetic effect on human.

In 2005 cadmium was measured in 64 stations. The target pollution limit (5 $ng.m^{-3}$) was exceeded, as in arsenic, in Tanvald (14.1 $ng.m^{-3}$). The reason for this long-term unsatisfactory condition is the glassworks where cadmium sulphide is used for glass colouring.

Nickel

Nickel is the fifth most common element of the Earth's core, while its content in the Earth's crust is lower. In general, 26% of nickel is produced by natural resources (continental dust and volcanic activity). The main anthropogenic sources include the combustion of heavy fuel oils, the extraction of nickel ore and nickel refining, waste incineration and iron and steel production. In atmospheric aerosol, nickel is found in several chemical compounds with different toxic effects on human health and ecosystems.

Approximately 70% nickel particles have a fraction below 10 μm and can thus be can be transported across longer distances. Almost 30% of nickel is found in aerosol with an aerodynamic diameter of at least 10 μm, which rapidly sediments in the vicinity of the source.

From medical perspective, it causes allergic dermal reactions and is classified as a human carcinogen.

None of the 52 monitoring stations exceeded the target pollution limit (20 $ng.m^{-3}$), as in previous years.

Lead

The majority of lead contained in the atmosphere originates from anthropogenic emissions, such as high-temperature processes, especially fossil fuel combustion, iron and steel production and non-ferrous metallurgy.

Long-term exposure of the human health organism to lead affects the nervous system and blood pressure. Evidence of the carcinogenic effects of lead and its compounds on humans is evaluated as insufficient.

None of the 64 stations detected any instances of exceeded target pollution level limits (500 $ng.m^{-3}$). The top 2005 concentrations were recorded in the health institute Tanvald 57.1 $ng.m^{-3}$. The levels of lead concentrations are well below the pollution limit and do not reach the LAT value.

Benzo(a)pyrene

As with other polycyclic aromatic hydrocarbons (PAH), of which benzo(a)pyrene is the most important representative, this substance enters the atmosphere both through an imperfect

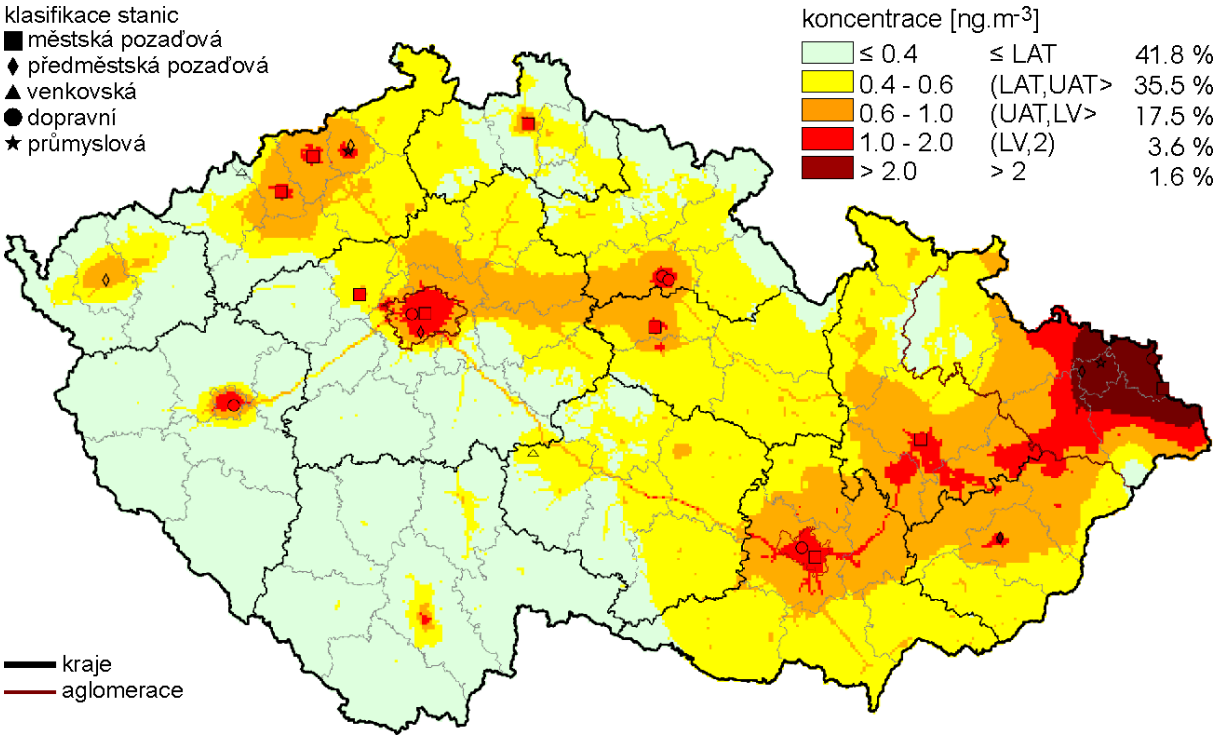
combustion of fossil fuels and through certain technologies such as coke and iron production processes. The stationary sources are mainly represented by household furnaces; the main mobile sources are compression-ignition engines burning diesel fuel. Benzo(a)pyrene, like certain other PAH, has been demonstrated to have carcinogenic effects on human organism.

In 2005 benzo(a)pyrene was monitored in 26 stations, of which the target pollution limit (1 $ng.m^{-3}$) was exceeded in 22 (85%). This pollution limit has to be met by 31 December 2012. The fields of average annual benzo(a)pyrene concentrations prepared by emissions dispersion models and measured benzo(a)pyrene concentrations in the stations show a significant proportion of this substance in defining areas with lower air quality. The highest concentration was measured in Ostrava (Ostrava-Přívoz 9.2 ng/m^3).

It is important to note that in municipalities where monitoring is not performed, the concentrations of benzo(a)pyrene may be increased due to local sources (household combustion).

Figure III.1.12

Fields of annual average air concentrations of benzo(a)pyrene in 2005



Source: CHI

Areas with Lower Atmospheric Quality from the Perspective of Health Protection

For the purpose of determining the zones and agglomerations with lower ambient air quality pursuant to Act No. 86/2002 Coll., as amended, the exceeded limits for the annual average concentrations of SO_2, PM_{10}, and NO2, lead, benzene, cadmium, arsenic, nickel, mercury and ammonia were assessed. In addition to that, a calculation was made of the frequency of cases exceeding the daily limits for the PM_{10} fraction and SO_2, the frequency of cases exceeding the hourly limits for SO_2 and NO_2 and the frequency of cases exceeding the 8-hour limit values for CO and ozone.

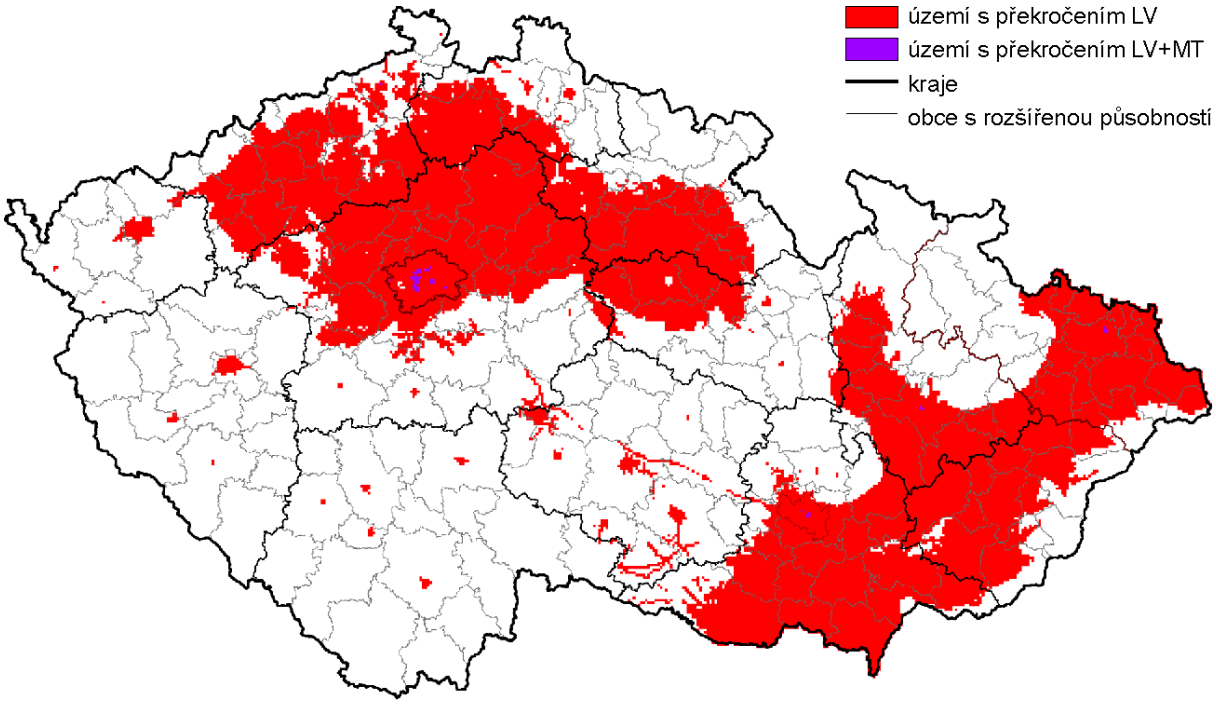
A data synthesis resulted into maps of the air quality from the perspective of health and ecosystems protection. The areas with pollution level characteristics higher than the relevant pollution limit values are classified by the Clean Air Act as areas with impaired atmospheric quality.

Figure III.1.13 shows a map of areas with lower atmospheric quality where the pollution limit levels were exceeded in 2005 (including the margin of tolerance) for the protection of health, excluding ozone. This map shows that the pollution limit values (LV) including the margin of tolerance (MT) were exceeded for some of the pollutants specified above (excluding ozone) in 35.5% of the Czech Republic (in 2004 it was 2.12%). This sharp increase is caused mainly by exceeded PM_{10} limits, even in rural stations.

The LV of ozone was exceeded in almost the whole area of the Czech Republic. Measures to decrease the concentrations exceeding the target pollution limit, or long-term pollution limits for ozone, have to be adopted for the whole country.

Figure III.1.13

Delimitation of areas with deteriorated air quality with respect to the limits for health protection according to Act No. 86/2002 Coll., as amended, excluding ozone, 2005



Source: CHI

<u>Areas with Lower Atmospheric Quality from the Perspective of Vegetation and Ecosystem Protection</u>

Based on the mapping of the distribution of the 2005 pollution characteristics pertaining to vegetation protection, the distribution of the occurrences exceeding the NO_x, SO_2 and AOT40 annual average concentration limit values for vegetation and ecosystem protection is shown for areas specified by law (the EKO Zones), i.e. for areas in which, according to Government Order No. 350/2002 Coll., as amended, the pollution limits for vegetation and ecosystem

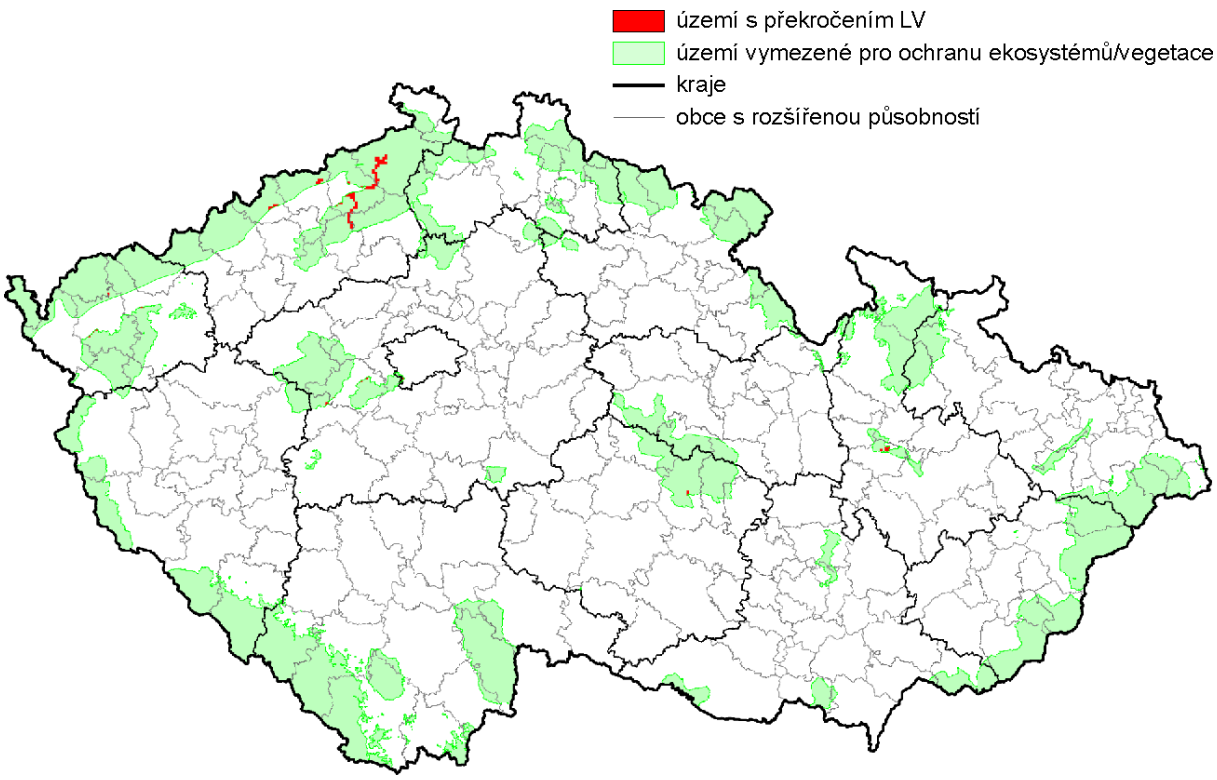
protection must be met (national parks and protected landscape area, areas with an altitude of 800 m and more and other selected areas as announced by the ME Bulletin).

Figure III.1.14 shows the map depicting areas where the LV was exceeded for ecosystems and vegetation in 2005, excluding AOT40. The results are positive: the LV of the pollutants (excluding AOT40) were exceeded only in 0.7% (in 2004 it was 0.77%) of the area with mandatory ecosystem and vegetation protection.

However, the exceeded exposure index for AOT40 (troposphere ozone) remains to be an issue. In 2005 this problem concerned 72.4% of the areas with mandatory ecosystems and vegetation protection.

Figure III.1.14

Delimitation of areas with deteriorated air quality with respect to limits for the protection of ecosystems/vegetation according to Act No. 86/2002 Coll., as amended, excluding AOT40, 2005



Source: CHI

III.2 Water

III.2.1 Precipitation

The total annual average precipitation in the Czech Republic was 732 mm, which means 109% of the standard of 1961-1990. The precipitation standard in Moravia and Silesia was 742 mm (109% of the standard); in Bohemia it was 726 mm (110% of the standard).

The precipitation was abundant in January and February. The precipitation standard was exceeded in January by 65%; the biggest precipitation was in the Liberecký region (130 mm, 190% of the standard). The precipitation average was 64 mm in February, which is 170% of the standard. The biggest precipitation was in the Zlínský region (82 mm, 177%) and the Karlovarský region (81 mm, 182%). At the end of February the whole area of the Czech Republic was covered in 30 cm of snow, the total snow depth in the mountains was 255 cm (Labská bouda). The snow remained in most parts of the country until the middle of March (e.g. on 15 March there were 15 cm of snow in Ruzyně, Prague). In some mountain stations the maximum snow depth values were exceeded; in Labská bouda there was 345 cm of snow on 15 March.

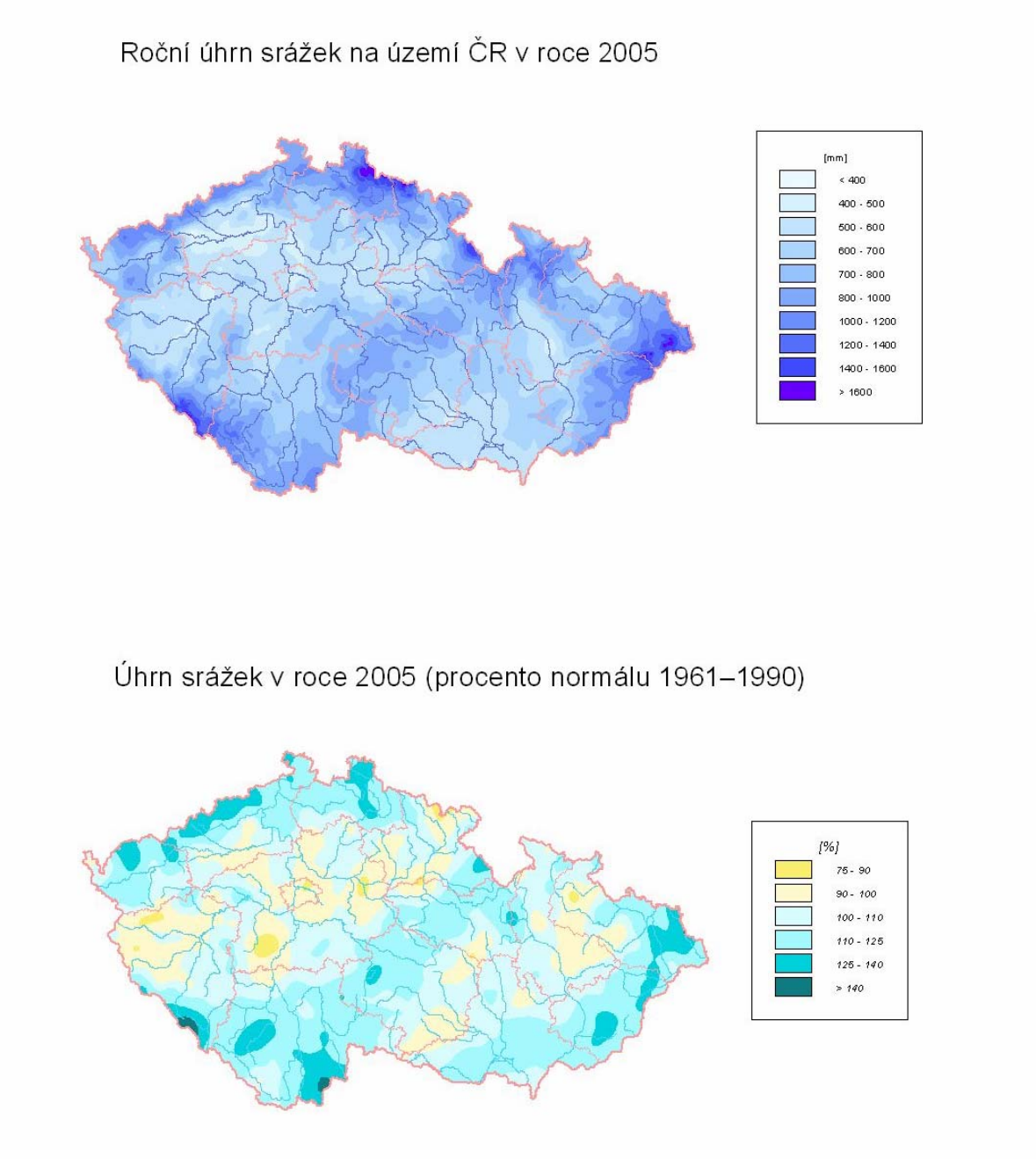
The weather in summer was very wet; the precipitation standard in July is high above the average with 132 mm (167% of the normal). The usual values of the precipitation standard were exceeded by more than 80%, mainly in Bohemia. After a wet summer, there was a sunny and relatively dry autumn with October as the driest month when the precipitation depth was only at 27% of the normal.

Territorially, the precipitation was distributed over the Czech Republic depending on the altitude and orographic effects (heavier precipitation due to windward or a rain shadow). The biggest rainfall, similarly to previous years, was measured in the border mountains (Jizerské, Krkonoše, Šumava) and in Moravia in Moravskoslezské Beskydy and Jeseníky. On the other hand, the lowest precipitation depth was measured in Podkrušnohoří.

The precipitation depth of the Czech Republic in 2005 is shown in figure III.2.1; the deviation from the 1961-1990 standard is shown in Figure III.2.2. The monthly precipitation depth in the Czech Republic, Bohemia, Moravia and Silesia is shown in Graph III.2.3.; relative monthly precipitation depth is shown in Graph III.2.4.

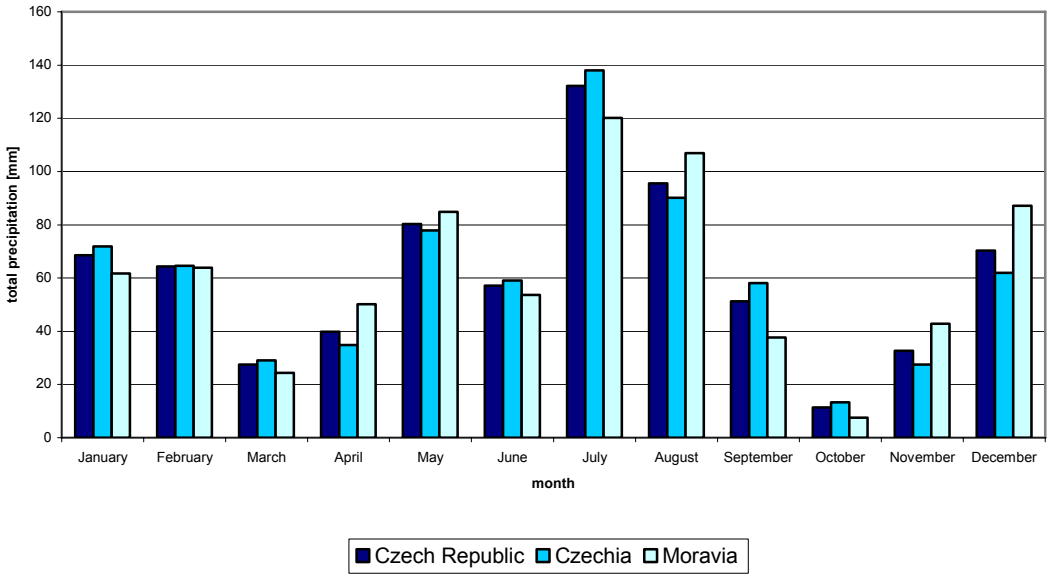
Figures III.2.1-2

Total annual precipitation in the Czech Republic in 2005



Graph III.2.3

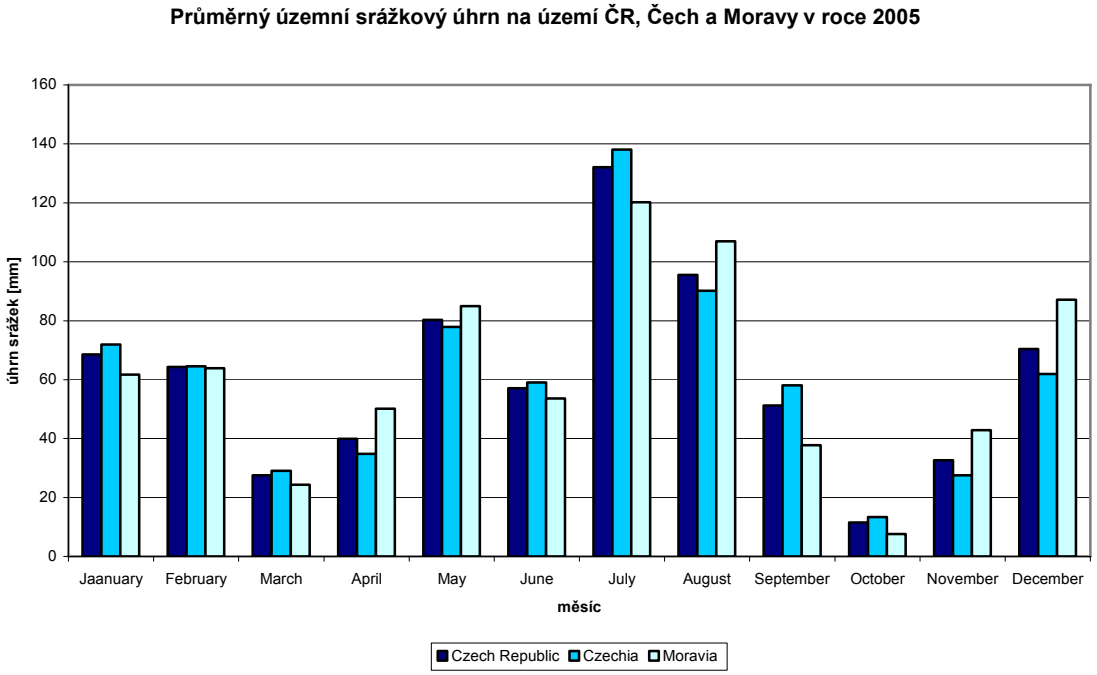
Precipitation (mm) in 2005



Source: CHI

Graph III.2.4

Precipitation in 2005 expressed as percentage of the 1961-1990 standard



Source: CHI

III.2.2 Water Flow

From the water runoff perspective, 2005 was an average year. The average annual flow ranged from 80 to 130% of the long-term annual average. The smallest flow was measured in

the catchments of the Orlice, the Odra and the Bečva, the relatively biggest flow was measured in the Olše.

The biggest water flow was measured in March when the average flows of all water courses were approximately once or twice of the long-term monthly average (Q_m). The same applies to August and for the Vltava, the Ohře and the lower Elbe catchments also to February. Relatively driest periods were June and the period from the end of October to the end of December. In November and December the water run-off in the main catchment areas dropped below 70% Q_m.

The average monthly flows in the first quarter were between 50 to 150% Q_m; at the end of the period in March they were between 100 and 230% of the long-term standard due to floods. The monthly flows of February were slightly below the long-term average in monitored water courses in the catchment area of the Elbe, the Odra and the Morava. The first quarter is characterised by a fluctuating trend, especially at the beginning and towards the end, while the flow maximal value of the flood episodes was increasing. The maximal flows corresponding to $Q_{½}$ (exceptionally Q_2) were reached at the beginning of the period; in the middle of the period they were at the level of one-year (Q_1), exceptionally five-year (Q_5) water level. The last episode was characterised by Q_5 to Q_{10}, especially in the Morava and the Odra catchments area. This episode (between 16 and 19 March) was the culmination of a long-period of snow accumulation and brought the end of winter to low and medium altitudes.

The downward trend which started in the last decade of March continued in the second quarter. The development was interrupted only by short episodes caused by water-level fluctuation according to the daily temperature development, in all catchment areas, accompanied by precipitation and storms in later May. This trend stopped in the last May decade due to the floods when the 1st degree of flood activity was reached at $Q_{½}$. At the beginning of the period the flow was rather average, ranging from 75 to 120% Q_m, later in June it was below the average ranging from 50 to 120% of the long-term average. Some water courses were slightly above average in the Beskydy Mountains, Bílé Karpaty and Hostýnské vrchy in May (200% Q_m).

During the third quarter the temporary downward trend was replaced by water-level fluctuation in the relatively cold and wet period at the end of June and beginning of July. This trend continued, with minor interruptions, until the end of August. Water-level fluctuation was caused by several precipitation episodes with flow values corresponding to Q_2. The period culminated between 24 and 25 August. There were exceptional floods in the Beskydy mountains (south-east of the country) during this period. It was the most significant flood episode of the last year (reaching up to the Q_5 level in some locations, in certain small non-monitored watercourses the extremes were probably bigger). Comparing the long-term monthly average flows the period was generally slightly abnormal and standard in September. Water flow through closing profiles was between 70 and 150% Q_m in August and September.

The last quarter started with warm and dry October and the trend continued until the middle of November, fluctuating later with a slight water-level increase. This applies mainly to the Odra and the Bečva catchment areas. The flows were average or below average, with the only exception of slightly above average water flows in the Šumava mountains (the Otava, the upper Berounka) at the beginning of the period and in the Beskydy mountains (the Olše) and Bílé Karpaty. Generally, the flow through the main profiles was the lowest from the whole year, accounting for 35 to 75% Q_m in November or December. There were no significant flood episodes in that period. On the other hand, low water contents were relatively frequent. This applied mainly to the middle Elbe and its branches, the Odra, the Ostravice and the Svitava.

Floods in 2005

A frontal system over the Czech Republic between 21 and 27 January brought a temperature increase and rainfall, which caused mainly an increase in the water level of main water courses in medium altitudes. Following the precipitation in Českomoravská vrchovina and the Berounka catchment (precipitation depth between 30 and 40 mm for approx. 12 hours), the water level in the Radbuza and Úhlava catchments increased (from 150 to 210 cm). The first flood activity degree (FAD) was shortly reached in the following locations: the Mže in Stříbro, the Radbuza in Lhota, the Klabava in Nová Huť, the Střela in Plasy and also the Skalice in Varvažov. The water level of the Úhlava in Klatovy reached the 2nd FAD, the Radbuza in Tasnovice was between the 2nd and 3rd FAD and in Staňkov the limit was even exceeded for two hours.

The temperature increased significantly between 11 and 13 February, accompanied by heavy rain or mixed falls. The quick snow melting resulted in numerous cases of FAD, including the third FAD. The most affected areas as to the frequency and FAD were catchments of the Berounka, the upper Vltava with the Lužnice. The FAD was most frequent in upper parts of the rivers. Most of them occurred in the upper Vltava, the Otava, the Sázava, the Radbuza, the Úhlava, the Berounka, the Střela, the lower Vltava, the Cidlina, the Ohře and the middle Elbe.

The most significant flood episode in 2005 was associated with snow melting at the turn of the second and third March decades when the temperature increased in the whole country (the average daily temperatures were as much as + 10 °C). The temperature increase was accompanied only by moderate precipitation. There was intensive snow melting, mainly in low and middle altitudes, which resulted into the floods of most water courses between 16 and 20 March. The highest water levels in most water courses exceeded at least one FAD limit. The 2nd FAD was exceeded in the Metuje, the Doubrava, the middle Elbe, the Výrovka, the lower Jizera, the middle Lužnice, the Lomnice, the Skalice, the Berounka and its branches (with the exception of the Litavka), the Teplá, the Ohře below Nechranice, the Bílina, the Opavice, the lower Opava, the upper Odra, and also in lower parts of the Bečva, the Morava, the Dyje and the Olšava. The 3rd FAD was reached in Bohemia in the water courses in the catchments of the Orlice, the Elbe below the confluence with the Orlice and also in Ústí nad Labem and Děčín, the Nežárka, the lower Lužnice, the Sázava, the lower Střela, the Ploučnice and the lower Smědá. In Moravia it was in the middle Opava, the Třebůvka, the Morava itself and in the Dyje catchment water courses. The culmination flows usually corresponded to ½ or 2-year maximal value. The biggest values were reached in the Výrovka (Plaňany 5-y), the Lužnice (Pilař 5-y), the Nežárka (Lásenice 5-y), the Skalice (Varvažov 5-y), the Sázava (Zruč nad Sázavou 5-y), the Teplá (Březová 5-y), the Sázava (Lupěné 10-y), the Morava (Moravičany 10-y, Olomouc 5-y, Strážnice 10-y), the Třebůvka (Loštice 10-y), the Moravská Dyje (Janov 10-y), the Dyje (Podhradí 10-y), the Jihlava (Dvorce, Ptáčov 5-y) and Svratka (Dalečín, Bílovice, Židlochovice 5 -y).

At the end of the first decade relatively high precipitation depth was observed, exceeding 20 or 30 mm in some locations. In reaction to the precipitation the water level of mountain rivers generally increased. The Elbe in Vestřev reached the 2nd FAD and the 1st FAD was reached in the Elbe below VD Labská, the Úpa in Česká Skalice, the Jizera in Jablonec nad Jizerou and in Železný Brod, the Opava in Karlovice, the Morava in Moravičany and later also in Strážnice and the Dyje in Vranov.

There were several storms and heavy rains during May and June. Those were only of a local character but caused serious damage of flooding. Probably the most significant of these events happened on 23 May when storms accompanying a cold front flooded houses and roads in the

districts of Rychnov and Pelhřimov. The Janovský potok and the Želivka in the catchment of the Želivka reservoir reached the 3rd FAD.

At the turn of the first and the second decades a cold front crossed the Czech Republic, bringing heavy rain. The focus was in southern Bohemia and in Českomoravská vrchovina where the precipitation was of permanent character (with interruptions from 6 do 11 July). This was only slowly reflected in the water level of the rivers in the catchments of the Otava, the Berounka, the Sázava, the Lužnice and the Doubrava. Similarly in the Beskydy region the water level of the Olše and the Bečva increased. Only the Černá and the Malše reached the 2nd FAD. The 1st FAD was exceeded in the Tichá Vltava, the Blanice (south Bohemia), the Úhlava, the Sázava, the Doubrava and the Třebůvka.

In August there were three periods of several days when the precipitation was stronger, which was reflected in most water courses by increased water level. The first period was between 2 and 7 August, another between 14 and 16 August and the third one between 20 and 24 August. The first two of them were not accompanied by any dangerous water level increase, some water courses were only slightly swelled (the Třebůvka 1st FAD, the upper Lužnice 1st FAD, the Malše 1st FAD) with the exception of the Černá, which reached the 3rd FAD on the culmination day 16 August. The third event had a bigger flow response which caused swelling of a number of water courses in previously saturated catchments in southern Bohemia with more frequent FAD, or due to heavier precipitation in north-eastern Moravia. In addition to numerous 1st FAD, the 2nd FAD was exceeded in the Malše in Roudné, the Otava in Sušice (1/2-y water flow) and in Písek (2-y), the Volyňka in Němětice (2-y), the Blanice in Heřmaň (2-y), the Úhlava in Klatovy (1-y), the Ostravice (Sviadnov and Ostrava 2-y), in Lubina (in Petřvald 2-y), the upper Odra (Svinov 1-y, Bohumín 2-y), the Bílý Potok in Smědé and the Rožnovská Bečva in Valašské Meziříčí (1-y). The 3rd FAD was exceeded in the Blanice Blanice in Podedvory (2-y) and the lower Olše in Český Těšín (5-y) and in Věřňovice (2-y).

III.2.3 Flood Protection Measures

In 2005 all the regional flood protection plans were finished and the Ministry of the Environment approved their compliance with the Flood Plan of the Czech Republic.

The September issue of the Ministry of the Environment Bulletin published 2 methodical guidelines – the Methodical Guideline to Secure Warning and Forecast Service and the Methodical Guideline to Prepare a Plan of the Protection of a Region Located near a Dam against Special Floods. The Ministry of the Environment co-operated closely with the Ministry of Agriculture and the Ministry of the Interior – the headquarters of the Fire Department of the Czech Republic.

The activities of the International Commission of the Elbe Protection were evaluated within the international co-operation; the results will be included in the First Performance Report of the Action Plan of the Elbe Flood Protection between 2003 and 2005 to be published in the second half of 2006.

III.2.4 Groundwater

The groundwater levels in the monitored wells and the water yield of the springs were mostly below the long-term monthly averages at the beginning of 2005, showing an upward trend. The increase was caused by slightly above-average rainfall in December 2004 and was more

visible in the northern part of the country. The influence of precipitation during January which was relatively warm was much bigger, accelerating the groundwater level increase. The temperature decrease in February was reflected by the stagnation of the groundwater level and the spring yield, or even drops in water objects in higher altitudes. On the other hand, lower locations showed a slight increase. February was very above the standard in terms of precipitation, at lower temperatures the precipitation did not have any special impact on the groundwater. The temperature increase in March started to elevate the groundwater level due to snow melting and at the turn of March and April the groundwater level and spring yield in all the monitored objects culminated. At the same time the both annual and monthly long-term limits were exceeded in most monitored objects for the comparative period 1971-1990.

The maximum groundwater and water yield values were followed by a gradual decrease which continued until the end of July when the groundwater started to respond to more intensive precipitation. The increase was shown in the whole country, the most significant places were the Šumava Mountains and the Giant Mountains, but mainly eastern Bohemia and Moravia. The measured values in most parts of the country did not exceed the spring maximum values. The annual maximum values were reached in August or in September only in the south Bohemian basins, in the Giant Mountains, in Českomoravská vysočina and in southern part of Moravia. The increased values continued only to October. In the month after which were below the standard in terms of precipitation, the groundwater levels and water yield were decreasing. Only heavier rainfall in the early December stopped the downward trend and the groundwater reserves started to be replenished.

III.2.5 Water Pollution

III.2.5.1 Point Source Pollution

The protection of water against pollution is usually assessed according to the amount of produced and discharged pollution.

Produced pollution is the pollution contained in produced (untreated) waste water. In relation to the EU and OECD requirements the development of produced pollution in the Czech Republic has gained a lot of attention recently. The assessment involves extended data collecting from a bigger number of subjects. The data on produced pollution is continuously completed and further specified this way. The production of organic pollution according to the BOD_5 increased by 3,180 t (1.2%) in 2005 compared to 2004 and by 22,258 t (2.4%) according to dissolved inorganic salts (DIS). The COD indicator determined by the double-chromate method (COD_{Cr}) showed a decrease by 15,507 t (2.6%) compared to 2004 and according to the suspended solids indicator (SS) by 11,615 t (4.0%).

Discharged pollution is the pollution contained in waste water discharged into surface water. Compared to 2004, the discharged pollution decreased in 2005 in the following indicators: BOD_5 by 626 t (6.1%), COD_{Cr} by 4,471 t (7.8%), SS by 461 t (2.6%) and DAS by 37,364 t (4.1%). The downward trend of the discharged pollution according to the BOD_5, COD_{Cr} and SS indicators continued in 2005. Almost all catchment areas showed a decrease.

In the industrial sphere there was a significant decrease in the discharged pollution in the common WWTP for ALIACHEM Synthesia Pardubice and the city of Pardubice (by 721 t COD_{Cr} and 54 t BOD_5), paper mill Bělá (by 281 t COD_{Cr} and 162 t BOD_5), Tanex – klihárna Vladislav (by 276 t COD_{Cr} and 136 t BOD_5), paper mill Štětí (by 258 t COD_{Cr}) and BIOCEL Paskov (by 242 t COD_{Cr}) in 2005 compared to 2004.

In the municipal sphere there was a significant decrease in the discharged pollution in the central WWTP Prague (by 768 t COD_{Cr} and 144 t BOD_5), WWTP Písek (by 156 t COD_{Cr} and 35 t BOD_5) and the sewage system (untreated waste water) Děčín (by 168 t COD_{Cr} and 61 t BOD_5) in 2005 compared to 2004.

The discharged pollution fell between 1990 and 2005 (BOD_5 by 93.5%, COD_{Cr} by 87.0%, SS by 91.0% and DIS by 10.7%).

The discharge of hazardous and extra hazardous substance was decreased between 1990 and 2005 as well as the AOX discharge. A significant drop was observed also in macro-nutrients (nitrogen, phosphorus) due to the fact that the waste water treatment technology in new and intensified WWTP has been systematically using biological nitrogen disposal or chemical phosphorus disposal.

III.2.5.2 Diffuse Pollution

The quality of surface and ground water is also significantly influenced by **diffuse pollution.** The most serious types of diffuse pollution sources include nitrogenic substances, mainly nitrates, which get into water in relation to agriculture. The evaluation of monitoring profiles of mostly farm land areas shows that there have been positive changes over the past 10-15 years and the pollution has been decreasing. In spite of that some areas of more intense agriculture show the pollution of surface and ground water has been stagnating or slightly increasing. Measures adopted in relation to the Nitrate Directive implementation are applied primarily to these areas of which all are included in the vulnerable areas defined in Government Order No. 103/2003 Coll.

Another important diffuse pollution source is the input of nitrogen and sulphur, possibly also other pollutants, which get into water via atmospheric deposition. Since 1989 there has been a major drop in the atmospheric deposition and in the pollution of water with acidifying substances because of the decrease in sulphur emissions from big combustion equipment. The decrease in nitrogen values was considerably lower and the atmospheric deposition of nitrogen has become a significant environmental issue in the Czech Republic recently due to the growing number of cars and gas connections.

Serious diffuse water pollution sources include also pesticides. Apart from old water and soil pollution with chlorinated pesticides, water may also contain increased concentrations of some pesticides that are still allowed and the harmfulness of which has become a subject of expert debates not only in the EU, but also in the USA and other countries where these substances are applied.

The last significant diffuse pollution source is phosphorus which comes mostly from the wash-off in erosion-affected areas. Its percentage can be very high in areas without large municipal pollution sources and also in land prone to erosion. Recently the impact of dissolved phosphorus which gets into water from farm land and does not originate from erosion has been examined as this substance might have immediate impact on water eutrophication with all the negative effects.

III.2.5.3 Accidental Pollution

The quality of surface and ground water is also negative influenced by **accidental pollution. In 2005 the CEI registered 264 cases of accidental pollution or water quality risks in the Czech Republic** of which 8 concerned ground water. Compared to 2004 there were 42 less

cases of accidents concerning water. The most numerous group of pollutants from accidents were petroleum substances, similarly to the previous years (51.1% of all registered cases), followed by pollution caused by accidental discharge of untreated waste water (12.5%). As far as accidents sources are concerned, the most numerous group were accidents caused by transport (14.8%), followed by accidents associated with waste water and solid waste disposal (9.1%). The source was not identified in 62.1% cases (in 2004 it was 53.6% cases).

III.2.6 Ground and Surface Water Quality

III.2.6.1 Surface Water

In order to assess the surface water quality the classification according to the CSN 75 7221 standard was used and the data was taken from the national network of surface water quality operated by the Czech Hydrometeorological Institute (hereinafter CHI). At the moment the network includes approx. 330 optimised profiles of water courses significant for water management in which samples are taken 12 times per year to analyse the basic physical and chemical parameters. The quality classes according to the CSN 75 7221 standard in 2004-2005 for the BOD, $N\text{-}NO_3$ and the total amount of phosphorus (P_{celk}) are showed in Figures III.2.5-7. Generally it can be said that from the long-term point of view the water quality has been improving.

The number of profiles of the worst quality classes (class V and class IV) has dropped since the beginning of the 1990s within the monitored surface water quality profiles. Class V (very polluted water) has been eliminated both in the main water courses (the Elbe, the Vltava, the Morava and the Odra), and in most of their important branches. In the period 2004 – 2005 the above main water courses usually fall within class III, with the exception of the Elbe in Lysá nad Labem and below Štětí (paper mill) and Lovosice (chemical plant Lovochemie), a section of the Vltava below Lužnice (backwater of the Orlík reservoir), a section of the Odra below Jičínka and the Morava below Uherské Hradiště. The water quality of many water courses has moved from class V to class IV since the early 1990s (the Cidlina, the Mrlina, the Výrovka, the Vlkava, the Blanice (a branch of the Sázava), the upper Sázava, the Bystřice (a branch of the Bílina), the Mandava, a section of the Lužická Nisa along the border, the upper Jihlava, the Rokytná, the Oslava, the Jevišovka, the Haná, the Valová, the Oskava, the Ostravice, the Lučina, the Olše), or to class III: the Volyňka, the lower Sázava and other sections of minor rivers.

Trends in Surface Water Quality according to the Selected Indicators

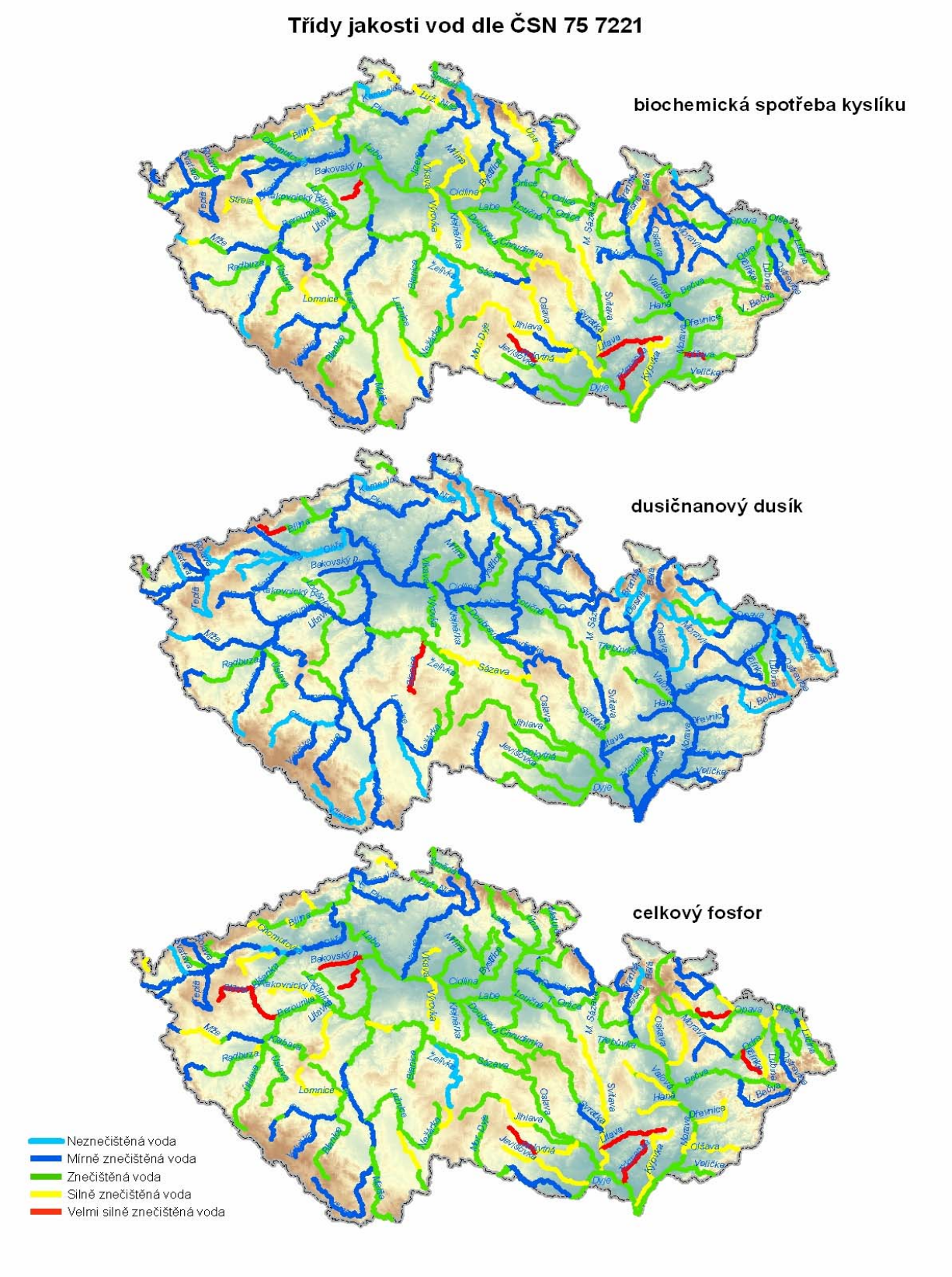
Nitrate nitrogen (or nitrates) is one of the basic indicators analysed in any standard surface water sample. It is an important substance which belongs to the group of nutrients. It comes from soil water, outwash from fields, agriculture productions and atmospheric deposition. The limits are exceeded to a bigger extent in small and medium water courses. The closing profiles of big rivers show below-limit concentrations and the trend is stagnating or slightly decreasing. Pursuant to Government Order No. 61/2003 Coll. the permissible pollution limit is 7 mg/l.

Pursuant to Government Order No. 61/2003 Coll., **cadmium** belongs to extra hazardous substances. Therefore the permissible surface water pollution limit of 1µg/l shall be attained by 2009. The cadmium concentrations show a downward trend in all closing profiles of and the limit is exceeded only exceptionally (e.g. the Litavka, the Nisa or the Střela in Borek).

AOX (absorbable organically bonded halogens) belong to hazardous substances which are often found in surface water. It is an orientation summary indicator which shows an approximate amount of AOX in water and the value of which is decisive for more detailed and more comprehensive sample analysis. Pursuant to Government Order No. 61/2003 Coll., the pollution standard is 30 µg/l and it is frequently exceeded in measured profiles. The downward trend was observed in the closing profiles in Děčín and Bohumín; however, the measured values exceed the set limit several times. On the other hand, locations where the AOX values correspond to the limits show an upward trend.

Figures III.2.5-7

Water quality evaluation in the Czech Republic according to CSN 75 7221 for the indicators BOD, N-NO_3 and P_{celk} in 2004-2005



Source: CHI

III.2.6.2 Still Water

Eutrophication, i.e. a process caused by an increased content of mineral nutrients, mainly phosphorus and nitrogen compounds, was observed in a number of reservoirs during 2005.

Major problems were observed in the following water supply reservoirs: Vrchlice, Hamry, Křižanovice, Seč, Lučina, Pilská, Obecnice, Láz, Myslivny, Mostiště, Fryšták, Vír, in the following reservoirs not used for water supply: Rozkoš, Pastviny, Harcov, Mšeno, Pařížov, Les Království, České Údolí, Hracholusky, Orlík, Skalka, Slezská Harta, Vranov, Bystřička, Nové Mlýny I, II, III, Oleksovice, Křetínka, Luhačovice, Plumlov, Jevišovice and Brněnská přehrada. Generally it can be said that the impaired water quality was well-handled in 2005 and there were no supply restrictions for the population and only water sports were prohibited in reservoirs not supplying water (e.g. Harcov, Slezská Harta, Skalka, Brno). Swimming was prohibited in the season of 2005 due to an extensive content of toxic cyanophytes in 17 locations of the Czech Republic, i.e. 9.7%. As this figure is significantly above the European average (5.2%), it is important to focus on this problem.

Aerial liming that has been applied for a number of years to eliminate the adverse effects of peat water with a low pH value was positively reflected in the Souš reservoir.

III.2.6.3 Groundwater

In 2005, 462 sites consisting of 138 springs, 147 shallow wells and 177 deep wells were monitored within the state groundwater quality monitoring network. 150 indicators in total were analysed twice a year in spring and in autumn. The analysis of some specific substances, related to agricultural activities, was made only in spring samples.

The chemical composition of water was analysed according to the Methodical Guideline for Environmental Damage issued by the Ministry of the Environment "Criteria of Soil and Groundwater Pollution" of 1996 which divides the following categories (criteria) of ground water pollution:

Category A1	natural (geogenic or very low) content of the monitored substance
Category A2	slightly increased content, a criterion exceeded
Category B	increased content, criterion B exceeded which is evaluated as pollution, it can be harmful to human health and the environmental components
Category C	exceeded criterion C means pollution which brings significant risk to human health and other environmental elements

As results from the criteria B and C, 26 indicators were above the C standard at least once in 2005 and the highest percentage was registered for chlorides (3.8% of all samples, 7.5% of shallow wells), ammonium ions (3.0% of all samples, 5.1% of shallow wells) and aluminium (2.0% of all samples without any major difference in the different types of the sites). 1, 2-cis-dichlorethene (0.8% of all samples) and tetrachlorethene (0.7% of all samples) were exceeded very rarely. The remaining 21 indicators (pesticides, VOC and metals) were rarely above the C standard (0.1 to 0.4% of all samples). The values measured between the B and the C limits were observed in 23 substances out of which the biggest percentage is made up by chlorides (3.6% of all samples, 9.9% of shallow wells), ammonium ions (2.9% of all samples, 5.8% of shallow samples), boron (2.8% of all samples, 3.2% of deep wells and springs) and aluminium (0.8% of all samples, 1.0% of deep wells and springs). Generally, the indicators were above the B and C limits mostly in ground water of shallow well in alluvial plains which are most impacted by anthropogenic activities.

A list of indicators exceeding B and C limits has not changed much recently (see table III.2.1). The number of the indicators in 2005 was higher compared to 2004, which is related to a broader extent of the analysed indicators.

Table III.2.1

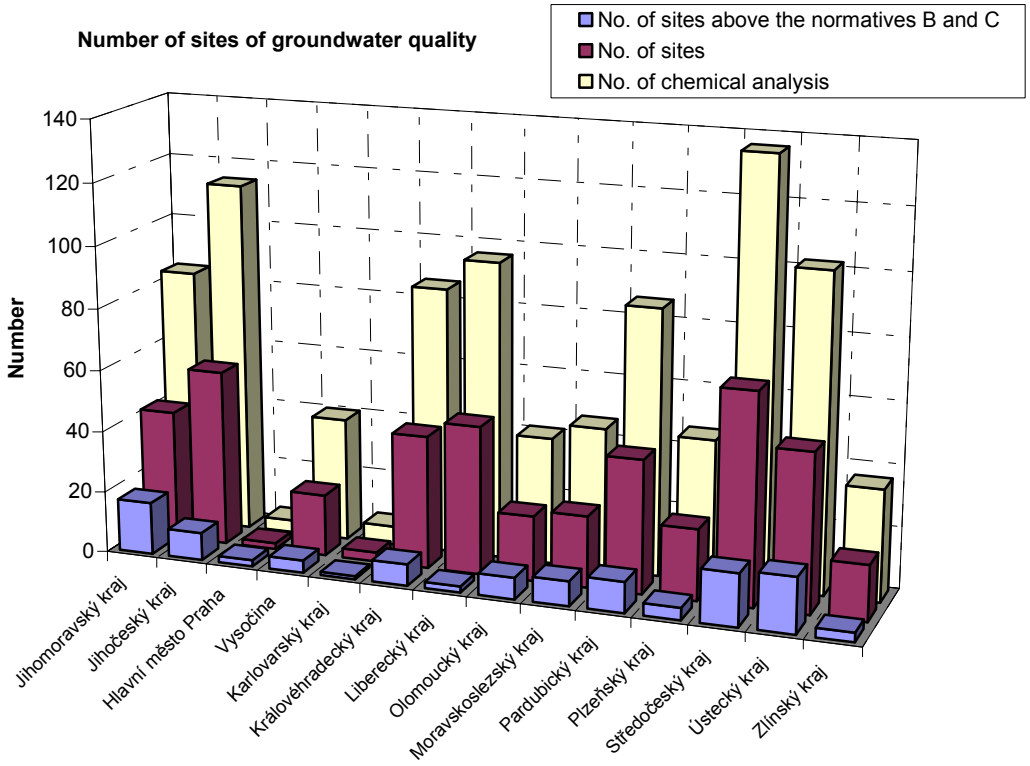
Number of sites with exceeded B and C standards in 2005

Sites	Number of sites	Sites with exceeded B or C standards	% of sites with exceeded B or C standard
Shallow wells	147	57	38.8 (42.2 in 04)
Deep wells and springs	315	52	16.5 (13. in 04)
All sites	462	109	23.6 (22.9 in 04)

Source: Agricultural Water Management Authority

Graph III.2.8

Results of groundwater monitoring in the regions of the Czech Republic in 2005



Source: CHMI

Comparing the groundwater quality indicators with the drinking water requirements (pursuant to the Decree of the Ministry of Agriculture No. 252/2004 Coll., laying down the drinking water requirements and the extent of inspection), the limit values were exceeded for ***nitrates*** (13.0% of over limit samples), ***ammonium ions*** (11.6% of over limit samples), ***COD of permanganate*** (9.4% of over limit samples), ***sulphates*** (8.2% of over limit samples) ***chlorides*** (7.4% of over limit samples), ***nickel*** (4.7% of over limit samples), ***aluminium*** (3.6% of over limit samples) and ***benzo(a)pyrene*** (2.8% of over limit samples). The limits of the following indicators were exceeded less frequently: arsenic (2.6% of over-limits),

fluorides (2.3% of over limit samples), *atrazine* (2.5 % of over limit samples), *desethylatrazine* (2.5% of over limit samples), *hexazinone* (1.7% of over limit samples). All of the above over limit substances (with the exception of fluorides, aluminium and nickel) are largely represented in groundwater of shallow wells (alluvial fields). ***The Dyje catchment area*** was the most polluted alluvial field.

Over limit concentrations of the monitored indicators were most often observed in shallow quaternary wells of alluvial rivers. These areas are suitable for agricultural activities which contaminate groundwater, mainly with nitrates and ammonia. The exceeded limits in shallow wells for nitrates and ammonia ions between 1995 and 2005 are shown in Table III.2.2.

Taking into account the drinking water requirements, the basic chemical composition of the over limit concentrations did not change compared to 2004. The content of hazardous substances in the over limit concentrations is also comparable to 2004, the content of benzo(a)pyrene concentrations has slightly decreased.

Table III.2.2

Cases of over limit nitrogenic substances in shallow wells since 1995

Indicator	Allowed value for drinking water	Number of exceeded limits pursuant to the Decree of the Ministry of Agriculture No. 252/2004 Coll. (CSN 75 7111) in %						
		1995	2000	2001	2002	2003	2004	2005
Ammonia ions	< 0.5 mg/l	27.3	23.3	21.4	19.2	21.5	21.6	20.5
Nitrates	< 50 mg/l	21.2	16.4	18.3	20.6	22.9	19.2	20.8

Source: CHI

The trends of nitrogen substances in groundwater of quaternary silts are related to the application of nitrogen fertilisers on farm land. Compared to 1995 the percentage of over limit cases for drinking water decreased for these substances. The obvious decrease was observed between 1995 and 2001 when stricter measures for more efficient fertiliser application were adopted.

III.2.6.4 Silts and Sediments

The comparison of the national data shows that out of the total of 94 substances in the silt matrix, 14 of them exceeded the B criterion (according to the Methodical Guideline for Environmental Damage of the Ministry of the Environment of the Czech Republic – criteria for soil and ground water pollution from 1996) and indicate increased pollution.

The substances include mainly mercury (13.4%), benzo(a)pyrene (3.3%), cadmium (2.1%) and chlorphenols (2%). The pollution is considered to be harmful (category C) if the limit values were exceeded in 14 substances at least once. The most frequently exceeded values are arsenic (8.4%), copper (1.8%), nickel (1.4%), mercury (0.9%), cadmium (0.9%) and from inorganic substances it was benzo(a)pyrene (2.2%), p-cresol (7.7%), monochlorphenol (4.2%) and tetrachlorphenol (1.5%).

The number of substances exceeding the above criteria in sediments is lower from the long-term point of view. The criterion B was exceeded in 8 substances: As by 1.1%, Be 2.2%, Sb 1.1%, Zn 1.1%, Hg 1.1%, benzo(a)pyrene 1%, p-cresol 3% and 2-monochlorphenol by 2.3%. Risk concentrations over the C criterion were observed in six substances: As by 2.2%, Ni

2.2%, benzo(a)pyrene 1.1%, 2,3,4,6-tetrachlorphenol 4.5%, p-cresol 3.2% and 2-monochlorphenol by 2.3%.

A positive outcome of the monitoring in 2005 is a lower number of over-limit or risk contents of some substances. Similarly to 2004, the number of substances in silts exceeding the limits generally decreased and a lower of number of cases of increased or harmful mercury and PAHs concentrations in both the matrixes was observed. Over-limit concentrations of some chlorphenols in silts and nickel in sediments increased in terms of a percentage value, but with respect to the frequency it cannot be viewed as serious deterioration.

The concentration of mercury, arsenic, PAHs (benzo(a)pyrene) and chlorphenols, which remain to be high, are unsatisfactory in terms of toxicity for water organisms and humans, i.e. the surface water quality. Unlike in the previous years, it is not a global problem.

There were certain differences between the monitored segments of water courses in the pollution of silts and sediments due to specific pollution and diverse geogenic background for metals. The results of monitoring of solid matrixes in 2005 showed in relation to the previous year a slight decrease in the anthropogenic pollution and gradually improving contamination of solid matrixes, mainly in the Ostrava region. It is not possible to say whether this trend will be permanent, it has to be confirmed by further monitoring. On the other had, in areas influenced by industrial production the concentrations of some pollutants remain to be high in the monitored watercourses, these concentrations exceed the limit values B and C and the standards of the Ministry of the Environment and document almost hazardous pollution. Traditionally, this pollution concerns the Bílina, the upper Ohře, the middle and the lower Elbe and the Lužická Nisa. Anthropogenic effects are still visible in the Odra catchment in the Ostrava region, the upper and the middle Morava, in the closing profile of the Bečva, the Svitava and the Svratka below Brno. A significant increase in contamination was observed only in chlorphenols in the Morava and Dyje catchments. This does not necessarily mean a worse quality as only extreme values are influenced.

III.2.6.5 Accumulation Biomonitoring of Surface Water between 2000 and 2005

Accumulation biomonitoring is performed by the CHI in co-operation with Povodí in 19 profiles of main rivers of the Czech Republic since 2000. Most of them are closing or border profiles and the pollutant values refer to a longer period (unlike in point water sampling).

Based on the accumulation biomonitoring it is possible to determine water pollution with specific organic substances and heavy metals which are easily accumulated in fatty tissues of organisms, but are harder to detect in water samples (the concentrations are often below the detectable level).

Indicator macrozoobenthos species (water insect larvae living on the river bottom, small invertebrate such as the leech, the shellfish and the mollusc) are analysed within the accumulation biomonitoring as well as clams (*Dreissena polymorpha*), biofilm (bacteria, algae, sessile organisms) and fish (dace).

The monitored pollutants include heavy metals (lead, cadmium, mercury and arsenic), specific organic substances include indicative congeners PCB (PCB-28, PCB-52, PCB-101, PCB-138, PCB-153 and PCB-180) and chlorinated pesticides (p,p and o,p´isomers DDT, DDD, DDE, alpha, beta and gamma HCH and hexachlorbenzene).

Generally, it can be said that the concentrations of **heavy metals** were determined in **biofilm**. In mercury unlike other monitored metals the values were also high in fish, exceeding the health limits for fish meat. **Specific organic substances** compared to the biofilm showed

higher values in **organisms**. High values of PCB and pesticides of DDT type were measured in *Dreissena polymorpha* in the Dyje and the Morava catchments.

No significant downward (or upward) trends were observed in the concentrations of the monitored pollutants. Even though poly-chlorinated biphenyls and chlorinated pesticides of DDT type have not been used for a long time, it is evident, that thanks to their accumulation capacity and a low bio-degradability degree they preserve in the water ecosystem

III.2.7 Water Management

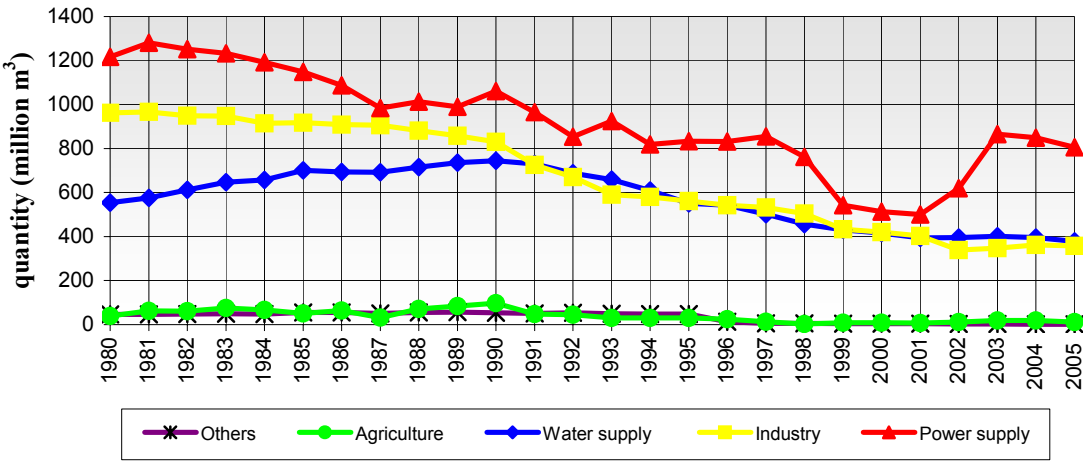
III.2.7.1 Water Economy

A total of 1,553.4 million m^3 of water was withdrawn from surface sources in 2005. The surface water withdrawal dropped on the year-to-year basis by 4.5%. Due to the data consolidation within the state enterprise Povodí, the surface water withdrawal does not include water transfer or water used for the fishpond systems.

The withdrawal decreased in all the categories. The biggest year-to-year fall was observed in agriculture, withdrawal for power, natural gas, vapour and hot water generation and distribution have been slightly decreasing after a sharp increase in 2001-2003 (a 5.1% decrease compared to 2004); however, they still account for more than one half of total withdrawal. The trend in the withdrawal categories since 1980 is shown in Graph III.2.9., the withdrawal structure according to the users in Graph III.2.10.

Graph III.2.9

Surface water withdrawal in the Czech Republic between 1980 and 2005

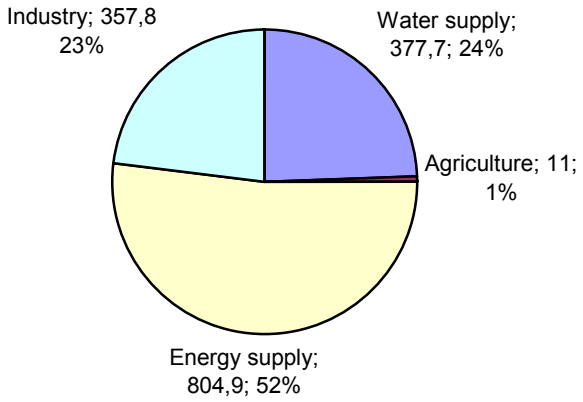


Source: MA

The biggest percentage of surface water withdrawal is used for power, gas, vapour and hot water generation and distribution; the withdrawal used for the production of water in public water lines account for almost one quarter of the total withdrawal and the share has been decreasing (see Graph III.2.10).

Graph III.2.10

Structure and volume of surface water withdrawal in 2005 (in million m^3)



Source: Ministry of Agriculture

Groundwater

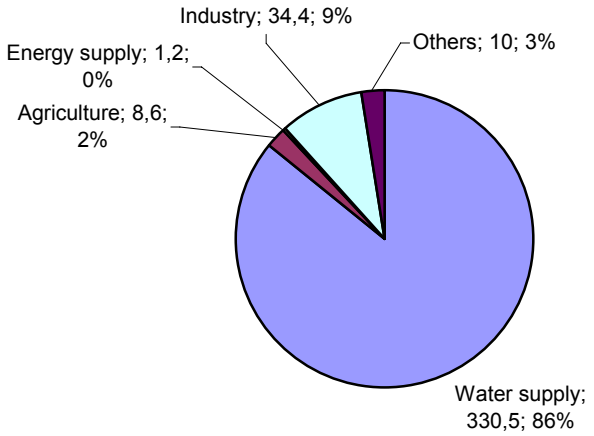
A total of **386.1 million m^3** water was withdrawn from groundwater sources in 2005, which means a year-to-year drop by 3.9% compared to 2004 and a continuing downward trend.

The drop was observed in all the withdrawal categories with the exception of agriculture, which slightly increased compared to 2004. Groundwater withdrawal for water treatment and distribution decreased on the year-to year basis by more than 17 million m^3, which is almost 5%.

The withdrawal structure is shown in Graph III.2.11. Over ¾ of the total groundwater withdrawal belong to the category of public water lines and sewage systems. The very small percentage for power engineering is very interesting (1.2 million m^3, less than 1%).

Graph III.2.11

Structure of groundwater withdrawal according to the user and the volume of each withdrawal category in million m^3



Source: Ministry of Agriculture

Waste and Mining Water Discharge

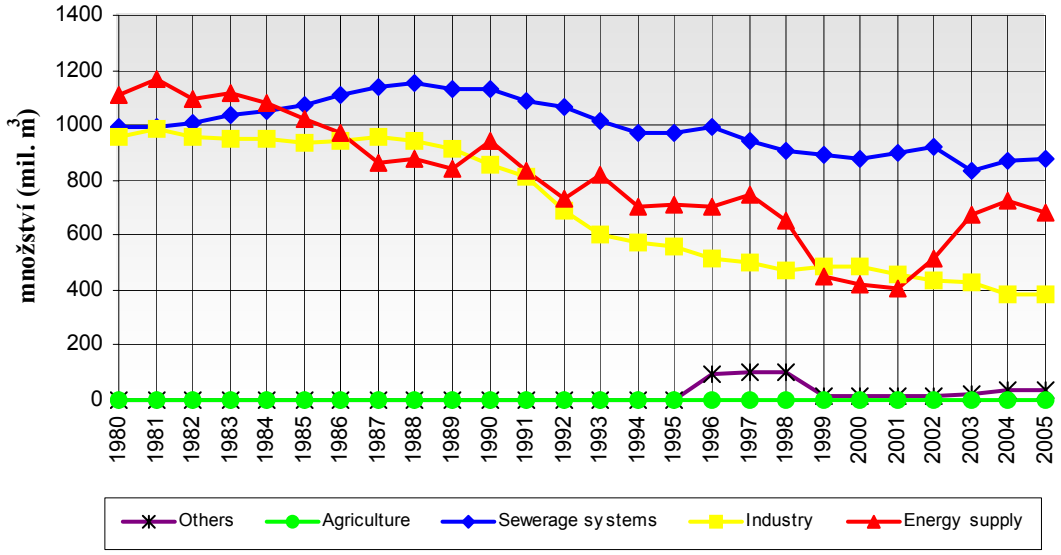
1 971.8 million m^3 of waste and mining water was discharged into water courses in 2005, which means a year-to-year drop by approx. 2.6%. Out of that volume, 841.5 million m^3 were treated, which is 42.6% of the total volume of discharged water. A total of 3,884 cases of waste and mining water discharge were registered (sources over 6000 m^3/year or 500 m^3/month).

The most significant decrease in the volume of discharged water was observed in the category of power, gas, vapour and hot water generation and distribution (by 6.9%). Other categories stagnated or slightly increased (Graph III.2.12).

Almost one half of all cases of discharge into surface water come from the public sewage system (45%). The percentage values of the discharge categories of waste and mining water are shown in Graph III.2.13.

Graph III.2.12

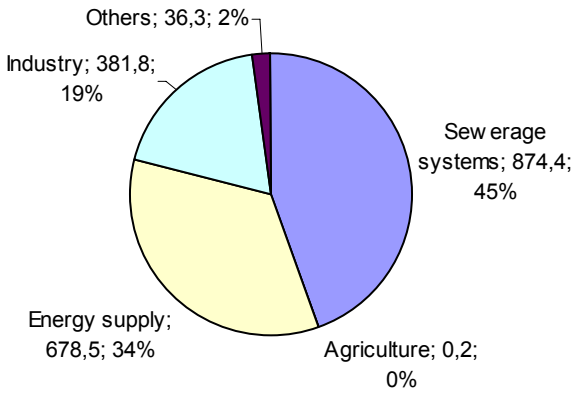
Waste and mining water discharge between 1980 and 2005



Source: Ministry of Agriculture

Graph III.2.13

Structure of waste and mining water discharged into surface water (volume in million m^3)



Source: Ministry of Agriculture

III.2.7.2 Drinking Water Supplies

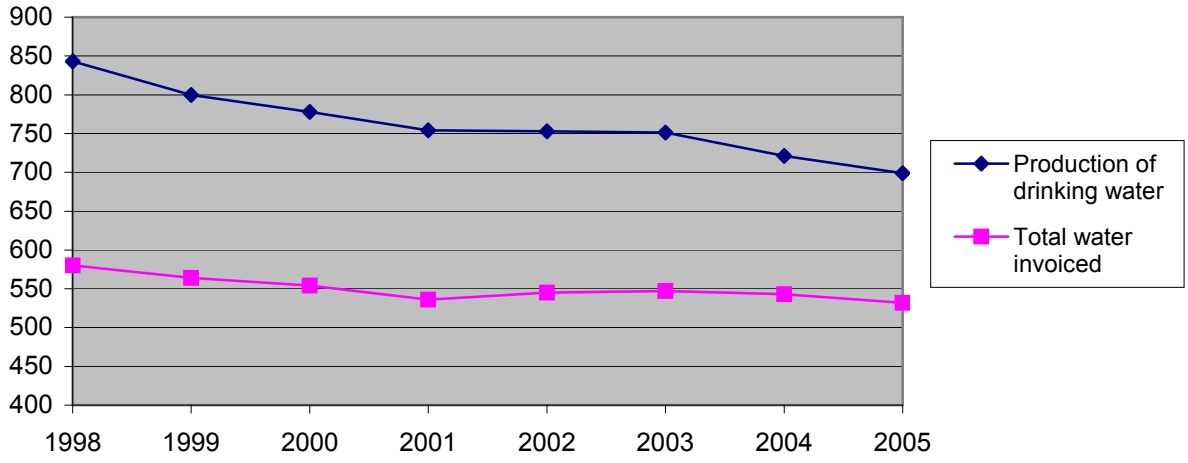
9,376,000 inhabitants were supplied with public drinking water in the Czech Republic in 2005, i.e. 91.6% of the whole population. The biggest percentage of people supplied with water from public water lines was in Prague (99.5%), the smallest in the Plzeňský and Středočeský regions (81.2 and 82%).

A total of 698.9 million m^3 of drinking water was produced in all public water lines, which means a year-to-year decrease in production by 21 million m^3 and a continuing downward trend since 1989 down to almost one half of the 1989 value (precisely 55.9%). Groundwater sources covered 335 million m^3, i.e. almost 50% of the total production. 531.6 million m^3 of drinking water were sold (billed), out of which 338.6 million m^3 of drinking water was used for households, which means a year-to-year drop in both the cases by approximately 2% compared to 2004. The biggest part of unbilled drinking water is made up by water losses in the pipeline system, which was about 150 million m^3. The trend of water production from water lines for public use is shown in Graph III.2.14.

The specific volume of billed water per capita is 155 l/person/day, the specific consumption of drinking water per household was 98.9 l/person/day.

Graph III.2.14

Production of direct supply water for public consumption between 1998 and 2005 (million m^3/year)

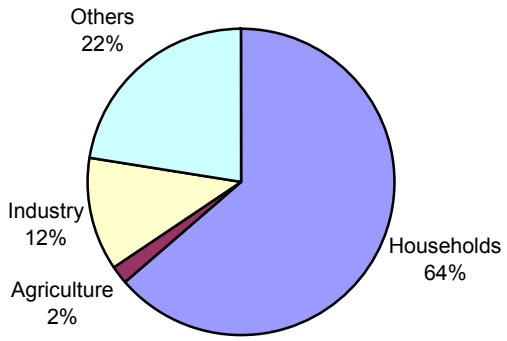


Source: CSO

Households were the biggest consumers of drinking water from public water lines in 2005. Their share in the total billed volume of drinking water was 64%. The shares of agriculture and industry were significantly lower, other consumers (non-production facilities, services) accounted for 22% of the consumed drinking water (see Graph III.2.15).

Graph III.2.15

Users of direct supply water for public consumption



Source: CSO

The length of the water grid was extended in 2004 by 4,761 km in total to 69,358 km. There were altogether 1,866 water treatment plants in the Czech Republic. There is an interesting disproportion between a relatively high number of water treatment plants in the Vysočina region (450 for 27 million m3 of produced water) and in Prague (3 water treatment plants for 132 million m^3 water).

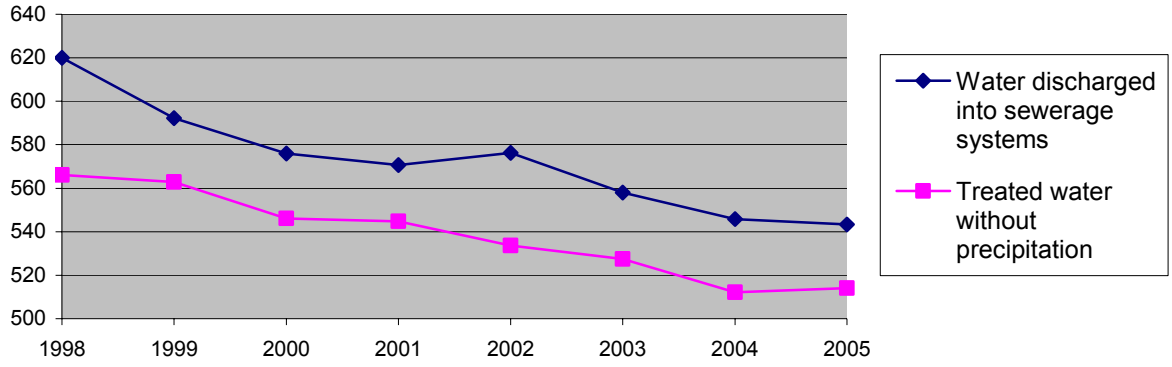
III.2.7.3 Municipal Waste Water Drainage and Treatment

In 2005, 8,099,000 people lived in buildings connected to the sewage system, which is 79.1% of the population of the Czech Republic. The number of inhabitants connected to the sewage system increased on the year-to-year basis by 61,000, which is almost a 1% increase. The biggest number of people connected to the public sewage system was in Prague (99.2%) and in the Karlovarský region, the smallest number in the Středočeský and Pardubický region (63.6 and 68.5%). The length of the sewage system was extended by 5,462 km on the year-to-year basis to 36,233 km.

A total of 543.4 million m^3 waste water was discharged into the public sewage system in 2005, which brought mitigation of the downward trend from the past years. Out of that volume, 94.6% of waste water was treated in WWTP (excluding precipitation). The total volume of water discharged into the sewage system and the volume of treated waste water is shown in Graph III.2.16. While the volume of discharged water first sharply grown and then slightly drops amounting to 61.9% of the 1989 figures in 2005, the percentage of treated waste water has not changed significantly since 1998.

Graph III.2.16

Water discharged into the sewage system for public use (excluding precipitation) between 1998 and 2005 (million m^3/year)



Source: CSO

There were 1,994 WWTPs in the Czech Republic in 2005 with a total capacity of 3.736 million m^3/day. 21 WWTOP in the city of Prague have the biggest total capacity (634,000 m^3/day), the lowest WWTP capacity is in the Karlovarský region (122,000 m^3/day).

The following WWTP for pollution sources of 2,000 equivalent inhabitants (EI) were finished in 2005 [N = nitrification, DN = denitrification, BP = biological phosphorus removal, CHP = chemical phosphorus removal]:

New municipal WWTP (21,156 EI in total):

Třemošnice (5,083 EI, N, DN, CHP)
Brušperk (3,240 EI, N, DN)
Budišov nad Budišovkou (2,423 EI, N, DN)
Bratronice (Běleč, Bezděkov) (2,100 EI, N, DN)
Mosty u Jablunkova (2,100 EI, N, DN)
Poříčí nad Sázavou (2,100 EI, N, DN)
Šitbořice (2,060 EI, N, DN)
Český Dub (2,050 EI, N, DN)

In addition to that, the following WWTP were renovated or extended in 2005:

Existing WWTP:

Havířov (75,000 EI, N, DN, CHP)
Chrudim (50,000 EI, N, DN, CHP)
Prachatice (33,000 EI, N, DN, CHP)
Rokycany (25,000 EI, N, DN, CHP)
Kaplice (18,880 EI, N, DN, CHP)
Tišnov (18,000 EI, N, DN)
Frenštát pod Radhoštěm (15,000 EI, N, DN, CHP)
Vlašim (15,000 EI, N, DN, CHP)
Vrchlabí (12,150 EI, N, DN, CHP)
Aš (11,500 EI, N, DN, CHP)
Vrbno pod Pradědem (6,500 EI, N, DN, CHP)
Petřvald (5,275 EI, N, DN, CHP)
Žacléř (5,050 EI, N, DN, CHP)
Telnice (4,000 EI, N, DN)
Starý Plzenec (3,900 EI, N, DN, CHP)
Cvikov (3,500 EI, N, DN, CHP)
Psáry (3,500 EI, N, DN, CHP)
Vestec (3,000 EI, N, DN, CHP)
Měnín (2,800 EI, N, DN)
Zbýšov (2,400 EI, N, DN)
Čerčany (2,350 EI, N, DN, CHP)
Opařany (2,200 EI, N, DN)
Golčův Jeníkov (2,150 EI, N, DN, CHP)
Velké Karlovice (2,100 EI, N, DN, CHP)
Jiříkov (2,000 EI, N, DN)
Mikulášovice (2,000 EI, N, DN)

Existing industrial WWTP:

Asanace Žichlínek (9,967 EI, N, DN, CHP)

Olšanské papírny Jindřichov (15,800 EI)
Letiště Praha-Ruzyně sever (6,200 EI)

A WWTP using at least the basic chemical-biological treatment was built in all the agglomerations over 10,000 EI in the Czech Republic. (Note: A finished WWTP is one with technical operability of the technological line regardless of the date of test or permanent operation.)

The situation regarding waste water treatment was not satisfactorily solved in Kunovice in the category of municipalities between 5,000 and 10,000 EI in 2005. WWTP project documentation is being prepared in Kravaře; the construction of a WWTP connection to the sewage system was started in Šenov. Waste water treatment has to be solved in the suburbs of Ostrava (Kunčičky and Kunčice, approx. 5,500 people) and Bohumín (Pudlov, Skřečoň, Starý Bohumín, Vrbice).

The main problem in the Czech Republic is the construction of sewage systems and WWTP in municipalities of 2,000 to 5,000 EI, and redevelopment or modernization of the existing WWTPs of all categories. This priority has been considered in the subsidy policy of the State Environmental Fund and the state budget since 2000. The next step will be to build the adequate WWTP in municipalities of less than 2,000 EI, including the sewage system connections.

III.3 Soil and Geological Environment

III.3.1 Soil Balance, Situation and Trends of the Agricultural Land Resources

III.3.1.1 Situation and Year-to-year Changes of the Land Fund

Soil is one of the basic components of the environment, important to the existence of plants and animals. The protection of land fund is one of the basic approaches of the sustainable strategy development.

As of 31 December 2005 the total area of land fund was 7,886,713 ha, of which the agricultural land is 4,259,480 ha, i.e. 54 % of the land fund of the Czech Republic.

There is 0.417 ha of agricultural land (of which 0.298 ha of arable land) and 0.259 ha of forest land per capita in the Czech Republic as provided in Table III.3.1.

Table III.3.1

Trends in the agricultural and forest land fund as of 31 December 2005 (thous. ha)

	Soil						
	Total	Non-agricultural land		Agricultural land			
		Total	Forests	Total	Arable	Permanent grassland	Cultivation (%)
1995	7,887	3,606	2,630	4,280	3,143	902	73.43
2000	7,886	3,607	2,637	4,280	3,082	961	72.00
2004	7,887	3,622	2,646	4,264	3,054	972	71.62
2005	7,887	3,627	2,647	4,259	3,047	974	71.54
Difference 2004/2005	-0.1	+5	+1	-5	-7	+2	-0,08

Source: COSMC

The table shows that the area of arable land has been decreasing, while the permanent grassland has been increasing. The increase is mainly due to the subsidies of the Ministry of Agriculture and the Ministry of the Environment. The area of forests has been also slightly increasing.

Agricultural Land Appropriation

The post-1990 agricultural land appropriation as reported by the COSMS is relatively low (a decrease by 29,000 ha, 17,000 ha of which are agricultural land transformed to forest land). However, the Land Register does not reflect quickly enough all the approved changes in the type of land related to industrial and housing development, linear structures sports activities and mining.

III.3.1.2 Trends in Land Reclamation

Mining has a negative impact on the environment, disturbs the water management balance, devastates agricultural land in many cases, and deteriorates the habitats of fauna and flora, species as well as the landscape patter.

The date concerning the areas affected by mining and the extent of land reclamation between 2000 and 2005 is shown in Table III.3.2.

Table III.3.2

Area affected by mining and the extent of land reclamation 2000 – 2005

Year	Area affected by mining (ha)	Completed reclamation (ha)		Reclamation in progress (ha)	
		Since the beginning of mining	In the years in question	Total (ha)	In the years in question
2000	72,025	15,082	867	9,772	399
2001	68,711	15,558	527	9,468	729
2002	67,990	15,541	586	9,058	584
2003	68,565	16,040	378	9,482	740
2004	69,679	16,854	430	11,083	1,807
2005	63,795	16,967	934	9,639	489

Source: CGS - Geofond

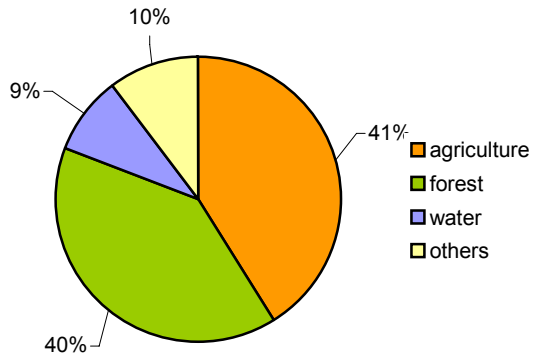
The area affected by mining has been around 70,000 ha, but in 2005 it dropped under 64,000 ha, with mining areas accounting for 73%.

While the total extent of land reclamation after mining (completed and in progress) reached 1,266 ha in 2000, in 2005 it was 1,423 ha.

The following chart shows the shares of different reclamation methods in the total completed reclamation in 2005.

Graph III.3.1

Completed reclamation after mining in 2005



Source: CGS - Geofond

III.3.2 Risk to the Soil Quality

III.3.2.1 Substance Inputs into the Soil

The monitoring of some substances that enter soil after the application of fertilisers, from treated sludge from waste waster treatment plants (WWTPs), pesticides and atmospheric deposition, is described in this chapter from the perspective of risks to the soil quality and environmental risks and possible public health risks.

Mineral Fertilisers and Plant Protection Products

Compared to 2004 the nutrient consumption in mineral fertilisers dropped in 2005. As results from table III.3.3, the total nutrient consumption fell by 7.8 %. The total consumption of net nutrients in mineral fertilisers was 92.6 kg per 1 ha of agricultural land.

Table III.3.3

Nutrient consumption in kg per 1 ha of agricultural land – mineral fertilisers

Year	N	P_2O_5	K_2O	Total/ha	Tonnes of total nutrients
2004	75.8	13.7	9.9	99.4	401.708
2005	**73.2**	**11.7**	**7.7**	**92.6**	**370.529**

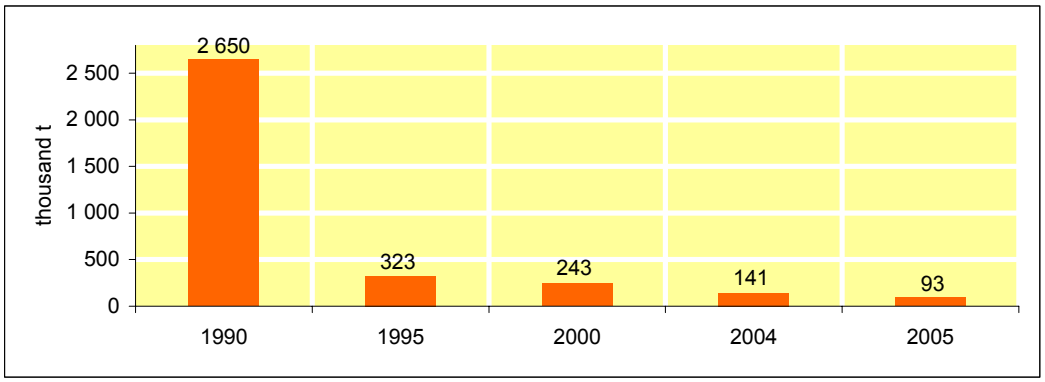
Source: MA

Consumption of Calcium-Containing Preparations in the Czech Republic

Soil liming was significantly reduced in the early 1990s in the Czech Republic, while the decreasing trend of the inputs into forest soil has continued. The decrease is caused mainly by changes in the agriculture and forestry, such as property restitution, price increase, lower intensification, legal regulations, etc. There are different opinions of soil liming from the environmental point of view. However, it is clear that liming causes losses of unrenewable natural source.

Graph III.3.2

Trends in the consumption of calcium-containing preparations in the Czech Republic



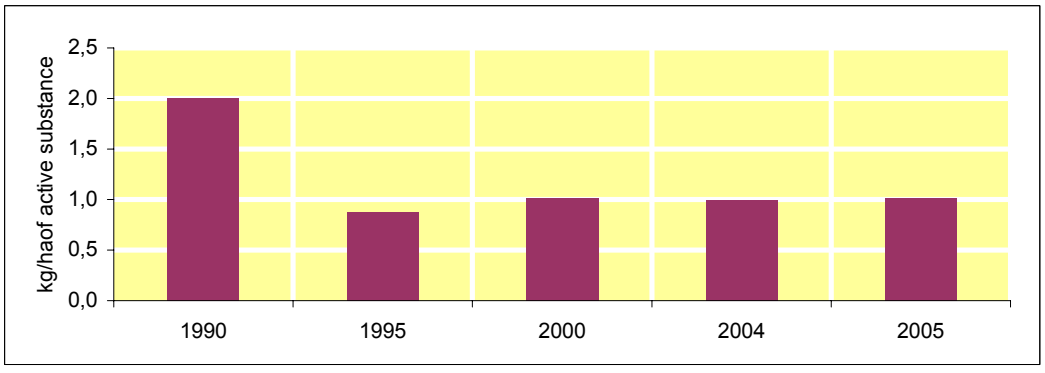
Source: Ministry of Agriculture

Plant Protection Products

Serious inputs into the soil also include the application of plant protection products. The consumption is shown in Graph III.3.3. The total amount of plant protection products applied in 2005 to agricultural land was at 50% compared to 1990. The consumption of active substances per 1 ha of agriculture land has been approximately 1 kg/ha for the last three years, while in 1990 it was 2 kg/ha. After the changing intensity of usage of 1 ha of agricultural land since 1990, the application of active substances per 1 ha can be considered stable for the last 6 years.

Graph III.3.3

Trends in the use of plant protection products



Source: SPA

Sludge from Wastewater Treatment Plants

Sludge from wastewater treatment plants (WWTPs) belongs to one of the risk substances applied to the soil. Sludge can only be applied to the soil when treated and when complying with the limited content levels of hazardous elements and hazardous substances. In such cases it can be a safe source of organic substances required for a quality plant growth.

Sludge from WWTPs was subject to analysis by the CISTA in cases when sludge was to be used on agricultural land. The content levels of individual elements in sludge were evaluated pursuant to ME Decree No. 382/2001 Coll., on the Conditions for Treated Sludge Utilisation on agricultural land.

Hazardous Elements in Sludge from WWTPs

Table III.3.4

Percentage of excessive content levels of hazardous elements in WWTP sludge between 2003 and 2005

Year	Total samples		As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
Limit values ($mg.kg^{-1}$ of dry sample)			30	5	200	500	4	100	200	2500
Monitored content			Excessive content levels in analysed samples as per Decree No. 382/2001 Coll.							
2003	number	103	6	3	8	6	15	4	5	3
	%	-	5.8	2.9	7.8	5.8	14.6	3.9	4.9	2.9
2004	number	103	6	6	7	6	15	7	9	4
	%	-	5.8	5.8	6.8	5.8	14.6	6.8	8.7	3.9
2005	number	100	7	5	8	2	10	4	8	4
	%	-	7.0	5.0	8.0	2.0	10.0	4.0	8.0	4.0

Source: CISTA

According to the median there was a downward tendency in Cd and Zn between 1994 and 2005. For other elements the content levels were rather balanced (despite year-to-year fluctuations) during the period in question.

In terms of hazardous elements, the number of unsatisfactory sludge samples was reduced in the past five years. The number of samples with excessive contents of at least one hazardous element in WWTP sludge was 41.7% in 2001, 39.5% in 2002, 35.0 % in 2003. 34% of the samples failed to comply with Decree No. 382/2001 Coll., and in 2005 it was 29% samples (the highest values were observed in the Liberecký and Ústecký regions).

In 2005 the most frequently exceeded limit values were those of Hg (10.0%). For other elements, the number of samples with excessive content remained below 9%. The second most problematic element in 2005 was Pb together with Cr, whose content exceeded the limit in 8% cases.

Organic Pollutants in Sludge from WWTPs

Within the monitoring system, a total of 36 samples of WWTP sludge were analysed by CISTA for PCB, PAH and AOX content.

Polychlorinated biphenyls – PCB[4]

In 2005 the sum of 6 PCB congeners was determined in 36 samples of WWTP sludge and was detected in the wide range from 9.2 to 336 μg.kg^{-1}, with the arithmetic mean being 127 μg.kg^{-1} and the median being 122 μg.kg^{-1}.

Compared to the period of 1998–2005, the sum of 6 congeners was lower in 2005 (by 36% for the arithmetic mean and by 21% for the meridian).

None of the total 36 samples exceeded the value of 0.6 mg PCB.kg^{-1} of dry matter in 2005, which (pursuant to Decree No. 382/2001 Coll.) is the limit value of the concentration of the sum of 6 PCB congeners in sludge, which restricts the use of such sludge in agriculture.

Polycyclic aromatic hydrocarbons – PAH

The PAH have from 2 to 6 condensed benzene nuclei (i.e. different patterns formulas and names). Similarly to PCB, the monitoring was determined for 16 hydrocarbons with similar characteristics according to an international convention. The CISTA does not monitor all of the 16 individual hydrocarbons such as required e.g. by the US EPA, as the quantity of the 16th missing hydrocarbon (acenaphtylene) in the soil is insignificant. In order to evaluate the PAH content in sludge, 11 hydrocarbons were selected out of which 10 are monitored by the CISTA.

In 2005 the PAH content was determined in 36 samples of WWTP sludge. The statistical data for 2000 – 2005 is provided in Table III.3.5.

Table III.3.5

PAH Content in WWTP Sludge between 2000 and 2005 (v μg.kg^{-1} of dry sample)

Year	15 PAHs		10 PAHs	
	Arithmetic mean	Median	Arithmetic mean	Median
2000	12,534	7,794	10,192	6,367
2001	13,975	9,247	11,286	7,583
2002	10,085	7,504	8,129	6,097
2003	10,086	6,113	8,603	5,077
2004	10,438	6,865	8,561	5,618
2005	9,042	5,361	7,453	4,322

Source: CISTA

Compared to 2004, a decrease was observed in 2005 in the determined median of the sum of 1 5 PAHs by 22% and in terms of the arithmetic mean by 13%, while the median and the arithmetic mean decreased against 2000 (when PAH monitoring in sludge started) by 31% and 28% respectively.

The assessment of the PAH content in sludge with regard to its utilisation in agriculture is currently only provided by the draft EC directive laying down the maximum permissible

[4] PCB is a mixture of individual congeners (chemical individuals) that differ from one another by the number of chlorine atoms and their position in the aromatic biphenyl orbits. According to the number of chlorine atoms and their position, the PCB are internationally numbered from 1 to 209. The monitoring of so-called indicative congeners that are most common in technical PCB mixtures was established internationally as the quantification of all 209 PCBs existing in mixtures is not technically possible. First, 6 congeners were determined (28, 52, 101, 138, 153, 180), and late a seventh one was added (118), which is toxic and is similar to dioxines. The sum of 7 congeners has been monitored since 2002 and applies both to sludge and to soil.

value of 6 mg.kg^{-1} of dry matter for the sum of 11 individual PAHs. Of the 11 hydrocarbons the CISTA laboratories assess 10. The above-mentioned value was exceeded in 13, i.e. 36% of the 36 analysed samples. This number is the lowest one for the last 6 years and indicates a reduction in the number of unsatisfactory sludge samples by 4% (compared to 2004 and 2003) and 23% (compared to 2001).

Absorbable Organic Halogens – AOX

The AOX content is used as an indicator of the organic pollution of soil and waste. Decree No. 382/2001 Coll., on the Conditions for Treated Sludge Utilisation on Agricultural Land determined the maximum AOX content in WWTP sludge as 500 mg.kg^{-1} of dry matter. This value was exceeded in one of the 36 samples analysed by the CISTA in 2005.

In 2005 the median of AOX content was 231 mg.kg^{-1} and the average 289 mg.kg^{-1}. Both the average and the median decreased 18% and 17% respectively, compared to 2004.

Atmospheric Deposition

Atmospheric deposition constitutes a non-negligible component of the substances inputs in soil. The annual atmospheric deposition values are monitored by the CISTA on a set of 49 monitoring areas. The annual atmospheric deposition levels of hazardous elements for the period of 2000 – 2005 are shown in Table III.3.6.

Table III.3.6

Annual atmospheric deposition of hazardous elements between 2000 and 2005 (g.ha^{-1})

	As		Cd		Pb		Cr		Cu		Zn	
	mean	median	mean	median	mean	median	mean	median	mean	median	mean	median
2000	4.2	3.5	0.9	0.8	23.0	20.9	8.9	7.0	24.5	24.2	520	517
2001	3.5	3.1	1.1	0.8	41.6	19.0	6.9	5.7	165[a)]	22.6	573	573
2002	5.3	3.6	1.5	0.8	46.7	18.7	9.1	6.9	157[a)]	26.3	546	449
2003	3.4	3.2	0.8	0.6	30.5	15.2	5.3	4.5	68.5	23.6	515	428
2004	3.3	2.9	1.0	0.7	36.6	16.5	5.9	5.2	28.5	24.4	489	440
2005	3.1	2.1	1.0	0.6	43.9	15.8	5.6	4.6	57.8	24.9	520	436

a) higher values are likely to have been caused by the application of products containing Cu in hop fields

Source: CISTA

With regard to the development of the annual atmospheric deposition of hazardous elements, the statistical values show that during the 1990s there was an apparent clear downward trend for most of the monitored elements, mainly the hazardous one; however, this trend has virtually stopped in the past 7 – 8 years. Decrease in As, Cr, and Zn amounts can be seen in 2005 against the 2000 figures, on the other had the Pb amount grew. The Cd amount remained unchanged.

The annual input of macro-elements has remained rather unchanged in the past 7 years, with the range being 13 – 21 in nitrogen, 0.9 – 1.7 in phosphorus, 3 – 4 in potassium, and 7.5 – 9 in sulphur (kg.ha^{-1}.year^{-1}).

The comparison of the basic areas with the contaminated areas does not show any significant difference in the monitored parameters.

Amounts of Hazardous Elements and Organic Pollutants in Agricultural Soil

In addition to monitoring the basic agrochemical values, the CISTA also monitors, within its agrochemical testing of agricultural lands, the content of hazardous substances and hazardous elements.

The summary of the excessive content levels of hazardous elements in agricultural soil is provided in Table III.3.7.

Table III.3.7

Hazardous elements in agricultural soil in the Czech Republic between 1990 and 2004 (2M HNO_3 extract)

Hazardous elements		As	Be	Cr	Cd	Co	Cu	Hg*	Mo	Ni	Pb	V	Zn
% of above-limit soil samples	CZ soil	7.2	0.7	1.9	2.4	0.6	0.8	0.7	0.0	2.1	1.3	1.8	0.9
	Light soil	10.0	0.2	4.8	11.1	3.6	0.6	0.4	0.0	5.6	1.0	12.8	2.2
	Other soil	6.9	0.7	1.5	1.1	0.2	0.8	0.7	0.0	1.6	1.4	0.3	0.7

* *total Hg content*

Source: CISTA

Most of the 12 monitored hazardous elements in the agricultural soil of the Czech Republic in the 2M HNO_3 extract exceeded the limits in less than 2% of the analysed samples, with more unsatisfactory samples occurring only for As (7.2%), Cd (2.4%) and Ni (2.1%).

The excessive content levels of certain hazardous elements were more frequent in light soils, with the percentage even exceeding 10% (Cd 11.1%, V 12.8%).

Since 1998 the hazardous elements are also monitored in the aqua regia extract. As results form Table III.3.8, the limits in the analysed hazardous elements were exceeded mainly in light soils (Cd – 8.7%, Cr – 7.6% and Ni – 3.9%). The biggest percentage of over-limit samples in other soil types was identified in As (4.6%).

Table III.3.8

Hazardous elements in agricultural soil in the Czech Republic between 1990 and 2004 (aqua regia extract)

Hazardous element		As	Be	Cr	Cd	Co	Cu	Mo	Ni	Pb	V	Zn
% of above-limit soil samples	CZ soil	4,4	0,2	2,6	3,2	0,8	1,4	0,4	2,3	0,8	1,0	1,4
	Light soil	2,0	0,0	7,6	8,7	3,1	0,7	0,0	3,9	0,4	1,3	2,3
	Other soil	4,6	0,2	2,0	2,5	0,5	1,5	0,4	2,1	0,9	1,0	1,3

Source: CISTA

When assessing the soil in terms of the content of hazardous elements, it is important to take into account specific conditions of a given location and the commutation of hazardous elements.

Organic Pollutants in Agricultural Soil

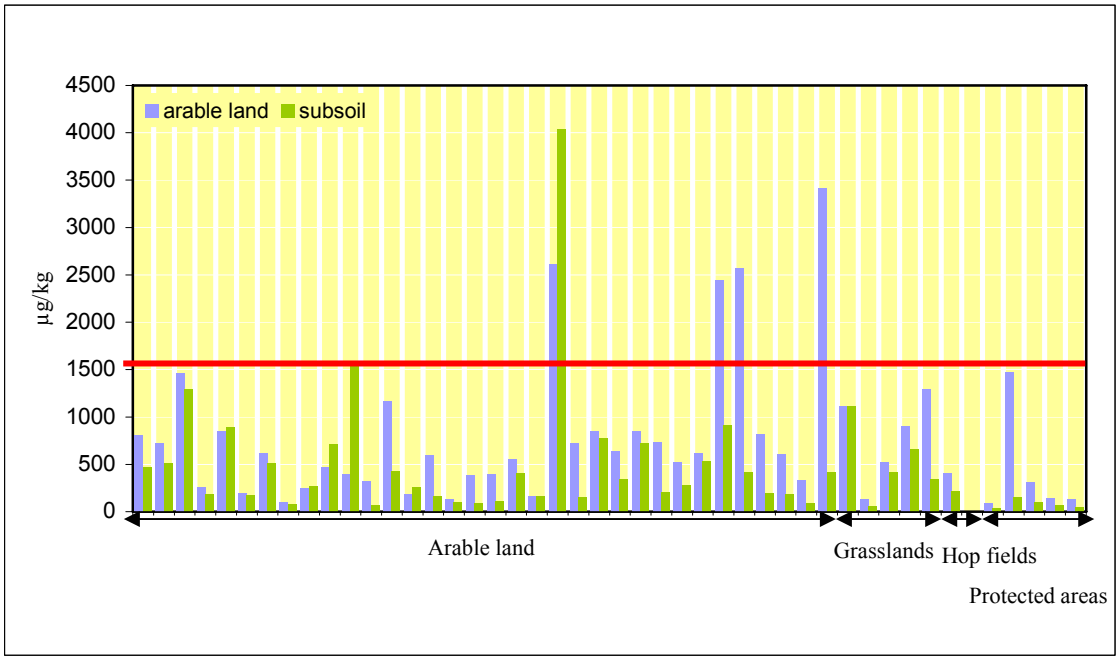
The organic pollutant content levels in soil is monitored by the CISTA at 10 selected monitoring areas of agricultural land (these areas include the subsystem of monitoring areas with increased load by hazardous elements and organic extraneous substances) and five areas in protected areas. The monitoring concerns: PCB, PAHs and OCP (persistent organochlorine pesticides). Their monitoring is important due to the risk they pose for food chains and living organisms.

The OCP content level in soil has been monitored by the CISTA since 2000 in a stable set of 45 monitoring areas – 40 areas of agricultural land (34 arable land, 5 permanent grassland, 1 hops field) and 5 of them in protected areas. The CISTA monitors these areas in co-operation with the Agency for Nature Conservation and Landscape Protection, Brno. Information about the number of with excessive content of OCP in arable land between 2000 and 2005 is provided in Table III.3.8.

Information about the numbers of samples with excessive content of PAH organic pollutants is shown in the following graphs.

Graph III.3.4

Comparison of average content levels of the sum of 15 PAHs in topsoil (upper layer) and subsoil (lower layer) of the basic monitoring areas and in the soil of protected areas in 2005 (µg/kg of dry sample)

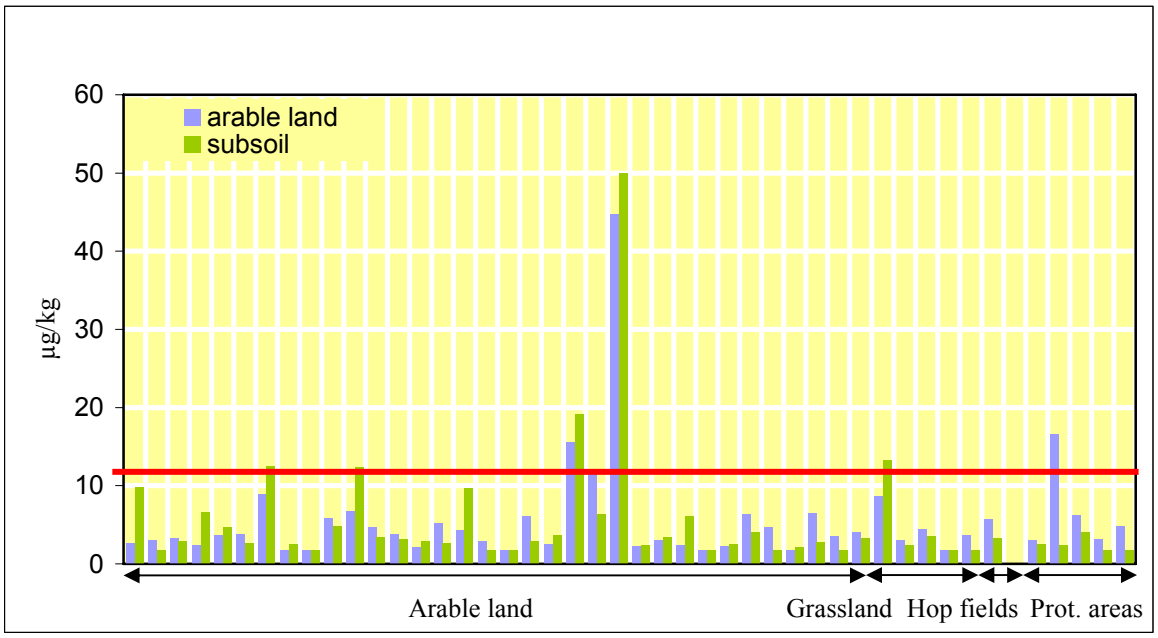


Note: The thick line indicates the limit value according to Decree No. 13/1994 Coll.

Source: CISTA

Graph III.3.5

PCB content levels (the sum of 7 congeners) in topsoil (upper layer) and subsoil (lower layer) of the basic monitoring areas and in the soil of protected areas in 2005 (µg/kg of dry sample)



Note: The thick line indicates the limit value according to Decree No. 13/1994 Coll.

Source: CISTA

As results from the analysis of 45 samples of the soil monitored in 2005 the medians of the sum 15 PAHs for the 9-year period (1997 – 2005) were between 600 – 700 µg/kg in the topsoil, while in the subsoil it was between 300 – 400 µg/kg. The PAH content limits slightly dropped in 2005 compared to the last 3 years.

The PCB content is slightly higher in the topsoil than in the subsoil. The average content of the sum of 7 PCB congeners in agricultural land between 2000 and 2005 was around 5.5 µg/kg, while in 2004 there was an increase to 8.4 µg/kg, which was probably caused by the implementation of a new analytical device. In 2005 the limit value for PCB (10 µg/kg) was exceeded in 9 samples (same as in 2004).

Table III.3.9

Cases of exceeded OCP limits in arable land from 34 monitoring areas between 2000 and 2005, T – topsoil, S - subsoil

OCP	Limit µg.kg^{-1}	2000		2001		2002		2003		2004		2005	
		T	S	T	S	T	S	T	S	T	S	T	S
HCB	**10**	0	1	3	1	6	4	3	3	3	3	3	1
DDT	**10**	32	27	20	13	20	15	19	14	17	14	22	14
DDE	**10**	13	8	19	10	19	15	18	13	17	12	15	13
DDD	**10**	5	3	5	4	2	3	4	4	2	3	2	1
HCH	**10**	0	0	0	0	0	0	0	0	0	0	0	0

Source: CISTA

No samples were found exceeding the HCH (hexachlorocyclohexane) or HCB (hexafluorobenzene) limit value in the topsoil and subsoil of the 40 monitoring areas of agricultural land in 2005. DDT (dichlorodiphenyltrichlorethane) levels significantly exceeded the limit values – in 2005 the limit set by Decree No. 13/1994 Coll. was exceeded by 65% in the topsoil and by 42% in the subsoil. Also DDE level (DDT metabolite) continued exceeding the limit values (in 2005 44% of topsoil samples were above the limit value, while in subsoil

it was 38%). The number of DDD above-limit values (metabolite DDT) was lower in 2005 compared to 2003.

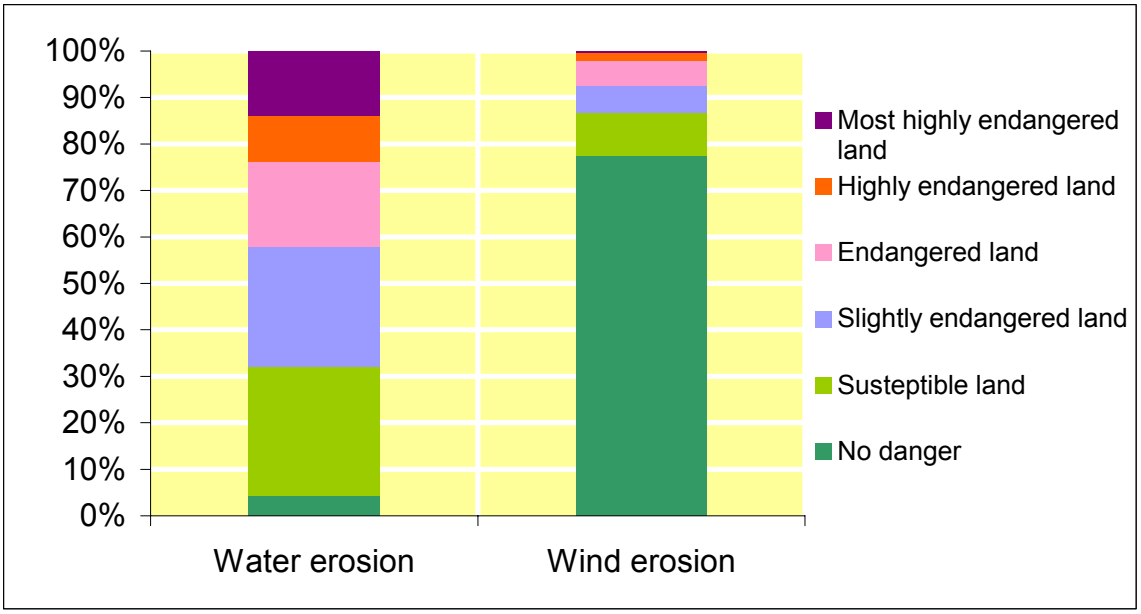
III.3.2.2 Soil Erosion

Wind and Water Erosion

According to information of the Research Institute of Ameliorations and Soil Conservation (RIASC), erosion poses a serious risk to agricultural land and requires special attention, particularly in term of water erosion. The exposure of soil to wind and water erosion is not being systematically monitored at present, and no regular annual measurements are therefore conducted. Due to that the RIASC experts established the potential exposure of soil to water and wind erosion, based on the BPEJ database (ecologically valuated soil units), which provides data on the slope and soil characteristics. Information regarding the potential exposure of soil to water and wind erosion is presented in Graph III.3.6.

Graph III.3.6

Potential exposure of agricultural soil to water and wind erosion



Source: RIASC

Water Erosion of Soil

Sloping agricultural land, inappropriate cultivation methods and surface run-off following heavy rainfall and the ensuing soil erosion pose a risk of the removal of soil particles and the substances contained therein, which impairs soil fertility. Erosion losses deteriorate surface water quality.

According to the RIASC, 42% of agricultural land is significantly exposed to water erosion and two-thirds of the area of agricultural land is exposed to erosion if low exposure is also concerned.

The water erosion situation is not being monitored by the RIASC or other organisations.

Wind Erosion of Soil

The current exposure to wind erosion depends mainly on the climatic conditions during the given season. Typically, wind erosion affects the drier and warmer climatic areas with light soil types. During the year, wind erosion is more frequent in higher temperatures and stronger winds in spring and autumn when the soil is not protected by vegetation and is thus more exposed to erosion.

A total of 8% of agricultural land is potentially exposed to wind erosion; together with the low-exposure category, the figure is 13%.

Erosion Control Measures and their Development

Erosion Control and Complex Land-Use Measures

Erosion control belongs to the measures of environmental elements protection which are implemented within the complex land-use measures (CLM), or within simple land-use measures (SLM). Erosion control is a mandatory part of CLM and increased erosion in an area of interest may become the reason for taking land-use measures.

According to the information provided by the Ministry of Agriculture (the Central Land Authority), a total of 571 CLM were taken as of 31 December 2005 (98 of which were completed in 2005 and 467 were in progress).

A total of CZK 1,060.3 million was spent on land-use measures in 2005 (19% of which was spent on simple measures and 81% on complex measures), with CZK 430 million from the OP Agriculture.

The following measure were implemented: water and wind erosion protective measures (approx. CZK 19 million), environmental measures (approx. CZK 13 million) and water management measures (approximately CZK 18 million) and others.

Erosion Control and Landscape Care Programmes

Within the Landscape Care Programme of the Ministry of the Environment several projects were implemented in 2004 focusing on the protection of landscape against erosion according to the following measures of Sub-programme 1 (areas outside special protected areas):

A 1 Redevelopment and stabilisation of the manifestations of extensive and rill erosion, a total of 22 projects requiring expenditures of CZK 10.8 million;

A 2 Creation of biological erosion control measures, a total of 181 projects requiring expenditures of CZK 23.6 million.

In total, 230 projects were implemented with an expenditure of CZK 34.4 million in order to protect the landscape against erosion in open landscape.

Subsidy item b) River System Revitalisation Programme also covered subsidies granted for "Erosion control measures connected with the improvement of the stability of the water regime"; however, their extent is not recorded separately.

III.3.3 Geological Environment

III.3.3.1 Geomorphologic Risks, Landslides, Rock Falls

Natural geological risks belong to environmental geo-factors monitored by the Ministry of the Environment, solved by the Czech Geological Service. The solutions involve expert support to the public administration in relation to the project "ISPROFIN No. 215124-1 Documentation and Mapping of Slope Movement Hazards in the Czech Republic between 2004 and 2007", which follows the previous project "Slope Deformations of the Czech Republic". The project was commissioned by the Ministry of the Environment with the objective of regionalisation of the area in terms of slope movements based on geological mapping 1: 10 000.

In 2005, a total of 30 map sheets were under preparation. The map sheets form two thematic maps: engineering-geological map 1:10 000, showing all landslides, and a map showing the tendency of an area to slope instability 1:10 000, classifying the area according to the landslide risks.

The mapping is in progress in the regions of Vsetín, Zlín, Mladá Boleslav and Frýdek Místek. In 2005. the mapping was completed in the Vsetín region, in the Zlín region it will be completed in 2006. Systematic monitoring also includes slopes with rock outcrops along the Elbe, mainly near Hřensko, where the risk of rock falls is very high.

The intensive landslide activity in Mladá Boleslav, Vsetín, Zlín and Frýdek-Místek regions is caused by favourable geological preconditions and the character of the relief of this elevated cretaceous Czech basin and the Carpathian area in Moravia. The main starting mechanism were heavy rainfall and over-saturation of the upper rock layer with water. Each landslide area has its own specifics, and apart from natural characteristics they also include human behaviour. The maps of České Středohoří are being prepared.

The areas of model locations are studied as to the theoretical preconditions of landslides form in terms of geological (erosion, lithologic, structural, geochronological, hydrogeological, petrophysical, geotechnical and geochemical – clay minerals) preconditions, vegetation and hydrometeorology.

For this purpose a total of 6 drill hole from 20 to 60 m were made in 2004 and in order to explore the internal structure of big landslides geo-radar profiles were measured. Samples from these drill holes are used for detailed studies, dedicated to specific landslides. In 2005 special surveying was carried out in the area of Helfštýn near Lipník nad Bečvou, Kněhyně near Frýdek-Místek, Vaculo-Sedlo, Lidečko-Kopce, Pulčín-Hradisko, Halenkovice and Nedašov near Zlín.

III.3.3.2 Landslide-Prone and Underground Mined Areas

Landslide and undermined areas belong to risk areas with negative impact on the environment and risks to human lives. For that reason the CGS-Geofond, acting as a legal entity authorised by the Ministry of the Environment to perform the function of an archive, documentation, information, and study centre of the national geological service (within the meaning of Section 17 of Act No. 62/1988 Coll., on Geological Works and the Czech Geological Authority, as amended, prepares maps of registered landslides and undermined areas that might impact the regional planning documentation. These maps are continuously updated and published regularly in the regions to provide information to the regional planning and proceeding bodies when preparing technical documentation (Sections 7 and 37 of Act No. 50/1976 Coll., on Territorial Planning and Building Regulations, as amended). In 2005 new landslide maps of Liberecký, Královéhradecký, Pardubický and Vysočina regions were prepared as well as maps of undermined areas of Ústecký, Moravskoslezský and Zlínský regions.

Information from the registers is used to assess area stability in surveying and other activities.

Register of Landslides and Other Dangerous Slope Deformations

The actual Register of Landslides was created in the early 1960s when the areas with frequent slope deformations were surveyed and mapped. Landslides were drawn into a unified map 1 : 25 000 and the most important data was concentrated in data registration sheets. Later the Register was systematically updated and modernised. At the end of 2005 it included 7,685 items.

With regard to their activity, landslides are classified as active, potential, stabilised, removed and buried.

The number and size of registered items is provided in table 1. Generally, we can say that the registered area affected by landslides has slightly grown. Minor landslides under 100 m are not considered. The table includes block landslides and rock falls.

Table III.3.10

Size and number of individual landslide types in the Czech Republic as of 31 December 2005

Landslide type	Number of sites in database	Surface in km²
Active	2,642	80.2
Potential	4,653	254.8
Stabilised	342	38.5
Buried	23	1.5
Other	25	1.6
Total	7,685	376.6

Source: CGS – Geofond

An increased number and much bigger size of landslides compared to 2004 are caused solely by further surveying activities which became more intense, especially after the big floods in the Czech Republic in 1997, mainly in Moravia. For the above reason a growing number of landslides can be expected in the future.

Register of Undermined Areas

Undermined areas, i.e. areas with documented or assumed existence of underground mines, started to be registered in 1983. At that time the basis for the Register of Undermined Areas was created. The Register has been updated and modernised up to the date.

In order to specify individual graphic plots, relational interconnection with the database of the major and historical mine works was employed.

As of 31 December 2005 the Registered of Undermined Areas contained 5,362 objects in the Czech Republic of a total area of 1,982.8 km².

III.4. Nature and Landscape

III.4.1 Current Status of Nature and Landscape (Development Trends and Landscape Character)

In the Czech Republic, as elsewhere in Central Europe, the cultural landscape is predominantly influenced by intensive anthropogenic activities. The impact of humans has caused the emergence of several unique landscape types, in which a number of special ecosystems remained or were created. Those ecosystems are threatened by further intensification of agricultural and industrial protection. The result is the diminished retention capacity of the landscape, the decreased biodiversity of agricultural ecosystems, low biodiversity of monoculture forests, unsuitable landscape structure and erosion.

The water regime of landscape was seriously disturbed in the past, mainly due to melioration. The negative impact of extreme climatic conditions, such as floods, heavy rains or long-term droughts, has been increasing. The condition of water eco-systems has been deteriorating. The adjustment of water courses from 1997 and 2002 did not improve the condition. In order to remedy the situation the Ministry of the Environment established the River System Revitalisation Programme in, the purpose of which is the revitalisation of the natural functions of the water courses and the landscape retention capacity or the construction of fish passes. The quality of surface water has been improving thanks to the development and redevelopment of WWTPs.

A persistent factor is the reduced water retention capacity of forest soil resulting from changes to the topsoil and intra-skeletal erosion in monoculture and clear-cut cultivated spruce forests, prone to damage caused by wind, snow or pest. The status of forests is particularly marked by monoculture management, unsuitable age structure, bad condition, air pollution, old ecological burdens and other factors The majority of forests have a significantly altered species and spatial composition.

The agricultural landscape is threatened by the long-term absence of extensive forms of farming on meadows and grazing lands, and by the erosion of inappropriately cultivated arable land. Intensive farming on meadows and grazing lands, as well as the other extreme, allowing these lands to lie fallow, leads to the diminishment of their biodiversity. Currently, the Ministry of Agriculture is trying to remedy the situation by a system of subsidies for the non-production functions of agriculture. At the Ministry of the Environment, the Landscape Care Programme (LCP) is intended for this purpose. The LCP goals are to protect against erosion, maintain the cultural status of the landscape nad to support the diversity of flora or fauna.

Intensive farming is the cause of very low biodiversity of fish ponds, which do not have favourable living conditions for the majority of macrophytes, native fish species, or water birds.

The changes in the landscape structure, growing greenfield constructions, linear structures, building fences and other activities, mainly in the last twenty years, have been decreasing the pass through landscape, creating migration obstacles. The implementation of elements of the territorial ecological stability or complex landscape-use measures has not been sufficient. The direct effects of mining (dustiness, transport) have been reducing only very slowly and the reclamation progress has also been slow. Environmentally unsuitable ways of mining have prevailed in some areas.

Character of Landscape and Its Protection

Maintaining the natural, cultural-historical, and landscape-aesthetic values of the landscape requires protection and care during all activities and at all levels.

Problematic interference with the landscape character includes: large-scale landscaping and pylon construction (including wind power plants), inappropriate locations of solitaire constructions and groups of buildings in open landscape, inappropriate development areas of urban sites, development of recreational zones, mainly ski slopes, or linear structures. The Ministry of the Environment is preparing a methodical guideline for nature conservation bodies in relation to the issuance of building permits as well as other permits for constructions that might deteriorate or alter the landscape character.

III.4.2 Nature Protection

III.4.2.1 General Protection of Nature

Territorial Systems of Ecological Stability

The territorial system of ecological stability if the landscape (TSES) is defined as the interconnection of natural and altered (yet closely associated with nature) ecosystems that maintain natural balance. Pursuant to Section 4.4 of Act No. 114/1992 Coll., on Nature and Landscape Protection (hereinafter the Nature and Landscape Protection Act), the protection of TSES is in the public interest and involves land owners, municipalities and the state. The TSES becomes generally binding when it is approved in regional planning documentation or decision.

TSES are delimited in plans which should include especially a map entry or the existing bio-centres and bio-corridors, specifying specially protected areas in the scale 1: 50 000 or bigger for supra-regional and regional TSES, and in 1: 10 000 or bigger for local TSES. The information should also include a table and a description of the characteristic functional and spatial indicators with an explanation including the framework measures aimed at the TSES preservation or enhancement. A TSES plan is used as an underlying document for the projects of ecological stability systems, land-use, regional planning documentation, forest management and water management plans and other landscape protection and renewal documents.

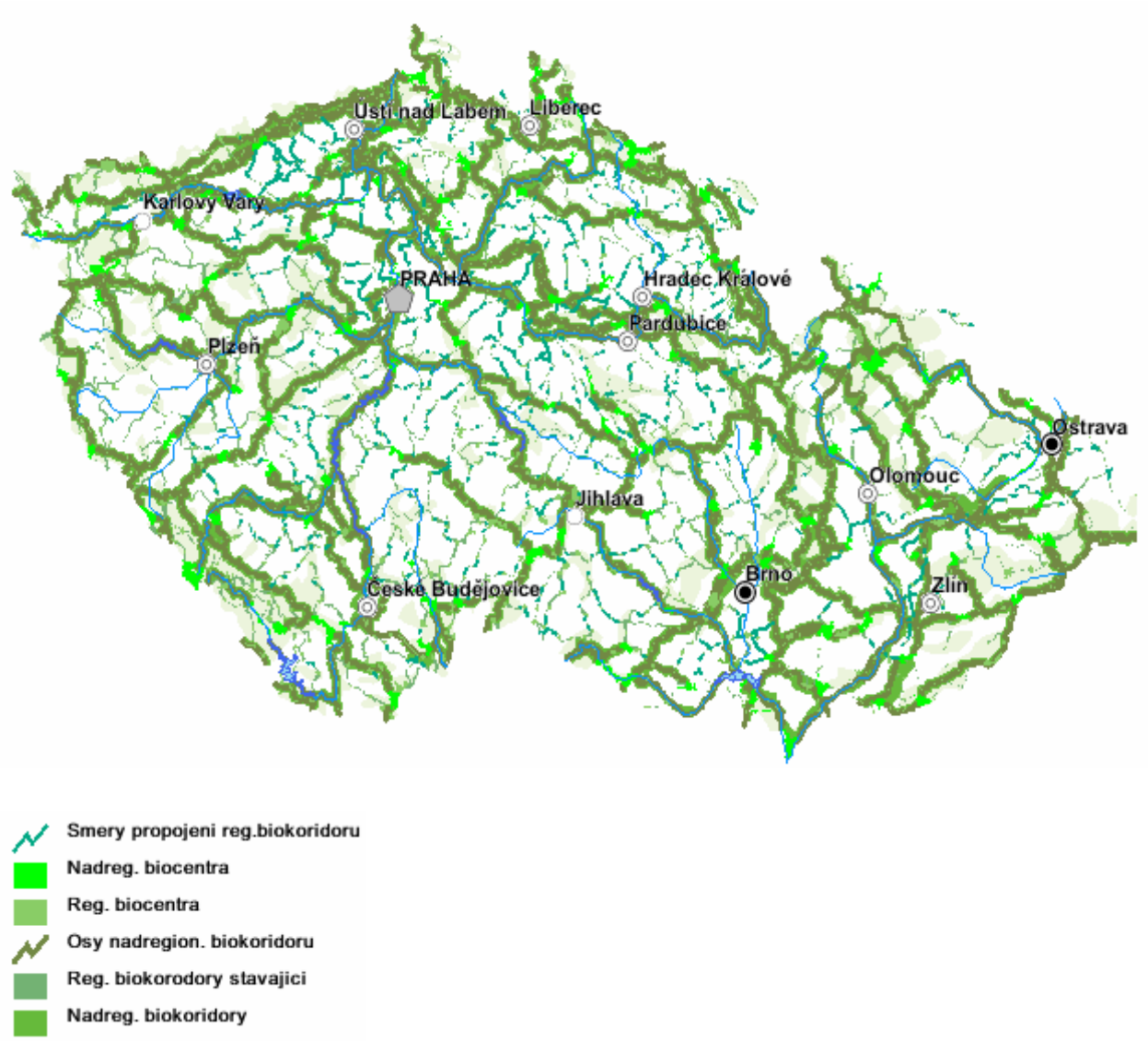
The definition and evaluation of local TSES is in the competence of municipal offices with designated powers, with the exception of national parks and protected landscape areas which have their own administration bodies. Regional authorities are responsible for the definition and evaluation of regional TSES at the level of national parks and protected landscape areas. The supra-regional TSES definition and evaluation is made by the Ministry of the Environment. The Agency for Nature Conservation and Landscape Protection of the Czech Republic administers and stores the supra-regional TSES documentation, prepares the documentation of the supra-regional bio-centres and creates the IT structure of TSES, acting as a consulting body in this area.

The TSES implementation in the Czech Republic is financed from several resources. The main TSES support programmes are the Landscape Care System and the River System Revitalisation. Significant instruments of the TSES implementation also include complex land-use measures. However, at the moment there are no central and precise records of the resources spent on the TSES implementation, a register of implemented projects or monitoring tools.

The actual state of the TSES in the Czech Republic is shown in the following figure.

Figure III.4.1

Territorial Systems of Ecologically Stability of the Czech Republic



Source: Geoportal CENIA

Protection of Significant Landscape Elements (SLE)

A significant landscape elements (SLE) , as defined in Section 3.1*b* of act concerning nature and landscape protection, is an ecologically, geomorfologically or aesthetically valuable part of landscape modelling the character of the landscape and promoting its stability.

Pursuant to the above act, SLEs include all forests, peat bogs, water courses, fish ponds, lakes and flood plains**.** Any other part of landscape can become a registered SLE, mainly wetland, steppe grass, field thicket, baulk, permanent grassland, place of deposits and fossils, artificial and natural rocks, outcrop or exposure or even a valuable vegetation area in an urban unit, such as a historical garden or a park.

An inventory of SLE has been in progress since 2004 when the agenda of registered SLE was transferred from districts to authorised municipal offices. With the entry of the Czech Republic into the EU, some SLE became parts of bird areas.

As in the past, the majority of problems noted in SLE concern water courses, flood plain and fish ponds. The cause is chiefly the low level, or even absence, of sustainable methods of farming on SLE lands, which results especially into legislative ambiguities concerning precise definition and demarcation of these landscape elements (mainly the definition of the ecological stabilisation and determination of a standard level).

Protection of Trees Growing outside Forests

Trees growing outside forests are generally protected under Section 7 of act concerning protection of nature and landscape, according to which it is forbidden to destroy or damage trees. Permits to cut trees from the relevant municipal office level are set in Section 8 of the above act. Significant trees and groups of trees can be registered as significant landscape elements. The strictest form of tree protection is designation in the category of memorial tree by the appropriate nature protection body.

The main risk to trees growing outside forest is construction work during which trees are often cut without permission or regardless of such permission.

As of 31 December 2005 there were 5,500 entries in the register, of which individual trees account for 3,479, and there are 645 groups of 2 to 5 trees amounting to 1,717 trees. There are altogether 298 groups of more than 5 trees, amounting to 17,690 trees (5 groups do not specify the number of trees). The register is not completed. In 2005 there were 162 new entries of memorial trees and 46 entries were deleted from the central register.

Spread of Non-Native Plant and Animal Species

The spread of invasive species represents one of the biggest risks to nature protection. Invasive species are those that are not native in a given area, were introduced by people (intentionally or accidentally), spread intensively and their spread has negative impacts on the bio-diversity of native societies, causing economic losses. A big part of invasive species was introduced to the Czech Republic intentionally in the past for the purpose of agricultural production or similar (often as decorative plants) and later these species escaped or were directly planted into the nature. After the initial adaptation to the local conditions they started to spread randomly into the surroundings and thanks to their high competitiveness, reproduction, growth, adaptability to the environment and regeneration they compete with a number of native plants and animals in the Czech Republic. Since these species are relatively new in the Czech Republic, no specific pests, diseases or competing species have developed. The spread of the non-native plants is associated with the degradation of habitats, a decrease in their natural value or a reduced number of species.

The liquidation of habitats of invasive species has become an employed management measure. The biggest attention is paid to *Heracleum mantegazzianum*, *Reynoutria* sp. and *Impatiens glandulifera*; in some specially protected areas also to some non-native tree species: *Robinia pseudoacacia*, *Pinus strobus*, the non-native *Quercus rubra* or some poplar species.

The main risk associated with animal invasion is the transmission of serious diseases (mainly the non-native crayfish species transmit the so-called crayfish plague, a fungus disease *Amphanomyces astaci* which is one of the biggest reasons of gradual extinction of native crayfish). Attention is focused on the impact of the most important invasive species *Mustela vison* and non-native crayfish species on the original species. Recently there has been an increased number of *Trachemys scripta elegans* which is released into nature by breeders. Management measures on the suppression of non-native animal species have been introduced only exceptionally, mainly due to difficult feasibility and defects of the existing legal regulations (the inability to catch the most problematic invasive species, especially the mink, which is restricted to a limited number of people pursuant to the Gamekeeping Act).

In 2005 the R&D project VaV/SM/6/37/04 continued (Non-native species in the Czech Republic: Assessment of status, the vision of development with a special focus on possible long-term changes in bio-diversity, research and management strategy defining in specially protected areas, NATURA locations and open landscape); the purpose of the project is to provide a comprehensive overview of the area. The project will be finished in 2006.

III.4.2.2 Special Areas of Conservation

Territorial protection is laid down by the Act on Nature and Landscape Protection, and its implementary Decree No. 395/1992 Coll. Pursuant to the Act, an area of natural or aesthetic significance can be declared a special area of conservation including the conditions of its protection.

The protected area in the Czech Republic is divided into large and small specially protected areas.

Large Specially Protected Areas

The category of large specially protected areas includes national parks (NP) and protected landscape areas (PLAs). The overview is provided in the following table. Compared to the previous year the number of PLAs increased by on – the PLA Český les which was declared on 1 August 2005.

Table III.4.1

Overview of Large Specially Protected Areas in the Czech Republic as of 31 December 2005

	NP	PLA	Total
Number	4	25	29
Area (km^2)	1,195.5	10,898.2	12,093.7
% of area of the Czech Republic	1.52	13.82	15.34

Source: Agency for Nature Conservation and Landscape Protection

National Parks

National parks (hereinafter NP) are large areas, unique from the national or international point of view, made up by natural ecosystems or ecosystems not influenced by human behaviour, where the plants, animals and inanimate nature have an extraordinary scientific or educational importance (Section 15, subsection 1 of the Act on Nature and Landscape Protection). Any use of these areas is subject to preservation and improvement of natural conditions in compliance with scientific and educational purposes pursued by the declaration of a national park.

National parks and their protective zones are administered by administrations. The competence of the administration is stipulated by law. The administrations keep statements from the central list of nature protection within their territorial competence. They can reserve the competence of a municipality because of serious reasons; they deal with and impose fines for offences and unlawful activities in the area of NP. They are entitled to issue a decree on the establishment of natural reserves and natural memorials, they review the decisions of municipal bodies in relation to nature and landscape protection. Within their territorial competence they also issue permits for bird areas covered by the NP, providing care for bird areas and granting exemptions from the protective conditions for specially protected species. The administrations are also entitled to issue regulations within their competencies and perform other obligations pursuant to Section of the Act on Nature and Landscape Protection. The administrations also act as professional nature protection organisations in their territory. They also carry out required inventory natural research, documentation and investigation with respect to nature conservation, co-operating with research and scientific institutions and providing guarding, information and cultural and educational functions. Their competence also covers specially protected areas and fishing and agricultural and fund protection. The NP administrations prepare care programmes of the NP, issue decrees on rules for the visitor to the NP, approved research work in the territory of the NP and establish a council.

Krkonoše National Park (www.krnap.cz)

In 2005 the NP was dealing with the problem of light pollution related to night skiing. A big study assessing the impact of artificial light on nature in general and on the landscape character in selected ski resorts in Krkonoše was commissioned and partly delivered. Prior to the termination it was decided do install lower intensity lights along one slope

As far as mountain meadows abounding with flowers are concerned, 71.81 ha of grass were harvested in 2005 within the Care for Landscape Programme, which is 10.5 ha more than in 2004. Comparing the costs of the implemented measures with 2004, pastureland and manual mowing was largely supported in.

The care for forest ecosystems of Krkonoše includes the reduction and liquidation of invasive geographically non-native plant species. At the present, the inhibition management is focused on *Rumex alpinus*, *Reynoutria* and *Alnus viridis*. The most dangerous invasive species include *Rumex alpinus* which has spread practically all over the Krkonoše NP (even in mountain pine areas). In 2005 an inhibition measure was implemented against *Rumes aplinus* in the total area of 24 ha of forest land. However, successful liquidation is very hard and usually requires chemicals, namely Roundup, which penetrates the leaves and gets to the roots and liquidates the plants. The substance is inactivated in contact with ground. Different types of Roundup application were tested in 2005.

In 2005 a GIS project for Krkonoše/Karkonosze was implemented in 2005 within the EU pre-accession programme CBC Phare. The main objective of the project was to start the process

of transboundary Czech-Polish integration and homogenisation of digital geographical data in the GIS and its accessibility to the public on both sides of the border via an Internet map server. The project resulted into internet applications that are used not only internally by the NP employees, but also by the general public.

Since 2002 the KRNAP administration in co-operation with the Centre of Epidemiology and Microbiology of the National Institute of Public Health has been involved in monitoring the altitudinal occurrence of *Ixodes ricinus* in the Krkonoše Mountains. The main objective of the project is to obtain data for assessment of the potential risk of the occurrence of the tick and the risk of transmission of both the diseases. The research shows that ticks were not only able to survive in the altitude between 920 and 1080 m above sea level, but also developed successfully, which confirms the assumption that the tick is able to reproduce and develop also near the upper forest borders. In order to maintain the continuity of the research a project proposal "Experimental verification of changes in the altitudinal occurrence of *Ixodes ricinus* and the risks of integration of the tick-transmitted diseases into the mountain ecosystems" was submitted to the Czech Science Foundation in 2005. The project was approved and the NP administration together with the National Institute of Health and the Institute of Post-Graduate Education in Health obtained a three-year grant.

The NP administration organised a number of events for the NP visitors within the environmental education and awareness in 2005. The events included 564 lectures, 254 excursions, competitions for young people, summer camps of young nature conservationists, student summer-jobs, seminars for teachers and their families and others. The administration also participated in the development of a nature trail in Vrchlabí and a nature trail in Hostinné.

The project "Regional Products Labelling", one of the outputs of Natura 2000 – People, Nature, People for Nature has been developed. The project was implemented by the Regional Environmental Centre between 2004 and 2005. The main objective of the labelling of regional products is bigger visibility of regions with well-preserved nature and the use of socio-economic advantages. The label brings a new value to the products – an origin in an exceptional region (natural beauties, healthy environment, local culture and traditions) and prevents from the abuse of the name and symbols of the region by external producers. First ten products have complied with the certification conditions.

Šumava National Park (www.npsumava.cz)

In 2005, the administration of the Šumava NP prepared a document called "Vision, Mission, Strategic Goals and Steps" that was approved as a main strategic document of the Šumava NP for the following ten years by the ME. The administration and the region did not agree on the document, but they continued implementing a joint document "O Šumavě společně" (Of Šumava Together), prepared by the representatives of the Jihočeský and Západočeský regions, the ME, the NP administration and the administration of the PLA Šumava..

An important step of 2005 was the preparation of underlying documents for new zoning of the NP and changes in the management of the NP forests. Based on the methodical guidance of the ME and in compliance with the criteria approved for different zones of the NP, 33% of the NP area was proposed to be integrated into Zone I, 57% into Zone II and 4% into Zone III. In addition to the territorial delimitation of the zones, a database and a comprehensive document summarising the natural conditions in Zone I were prepared, the priorities were defined and basic management measures were proposed for care of the delimited territories.

The project Revitalisation of Šumava Peat Bogs continued. 1,500 dams were built in the drainage channels which contributed to the improvement of the water regime near Hučiny,

Cikánské slatě and Luzenského údolí. Biskupská slať was revitalised within an international project with the Bavarian Forest with the help of volunteers.

The mots important internal research in 2005 included the project of deer telemetering, which brought the first results of the movement of deer and roe deer in both the national parks (i.e. Czech and German parts). First seasonal data was obtained in the project of monitoring the changes in the water regime of peat bogs. A project focused on the definition of optimum management interventions in the non-forest parts of the NP continued. Research projects performed in co-operation with external research workplaces continued. The projects are focused on long-term monitoring of the water regime (so-called experimental catchment in the ecosystems of the Šumava lakes and a number of projects focused on the development and renewal of mountain forests.

Bigger attention was paid to the occurrence of the bark beetle *Ips typographus* in spruce grove and in forests with an increased percentage of *Picea abies*. The reclamation of blowdowns and breaks of standing trees affected with the bark beetle was performed in compliance with the decisions issued by the state administration, like in past years. 38,343 m^3 of wood affected by the bark beetle was processed. In Zone I it was 2,183 m^3 of wood affected by the bark beetle and 807 m^3 of affected blowdown. 256 standing trees were debarked.

The annual game count showed that the number of deer (*Cervus elaphus*) has been slowly decreasing, while *Capreolus capreolus* has been increasing. The growing trend can be seen also in *Tetrao urogallus*, the population of which has been reinforced by artificial breeding since 2002. On the other hand, the number of *Lepus europaeus*, *TetraoLyrurus tetrix*, *Lynx lynx* and *Lutra lutra* has been decreasing.

The administration of Šumava NP and PLA provided information and services to the visitors, as every year. Holiday and weekend public bus services were organised in co-operation with regional carriers, with the possibility of bicycle transportation, as well as spring and autumn bus trips " Šumava Accessible" organised in co-operation with ČSAD Sušice, which allowed also older or immobile visitors to get to inaccessible parts of Šumava.

The administration of the Šumava NP and PLA also participated in all activities of Europarc, maintaining closer contacts with TANAP and the Bavarian Forest NP. An amendment to the Memorandum on Co-operation between the Šumava NP and the Bavarian Forest NP was signed. The Memorandum is used in joint projects.

Podyjí National Park (www.nppodyji.cz)

Ten important monitoring projects of animate and inanimate nature were performed in the Podyjí NP in 2005 and fifteen long-term research activities continued. Because of the temporary water decrease in the Znojmo and Vranov reservoirs, research into the vegetation of uncovered bottoms was performed in the locations, which brought a number of important findings. The most important of them is the confirmed occurrence of *Heleochloa alopecuroides* which returned to Moravia after many years.

There was extensive sheep pasture in the moors and meadows of 90 ha between April and October 2005, provided by contractual farmers. Several minor centres of *Impatiens glandulifera* were liquidated along the Dyje River (60 km). Since there have been only individual plants for three years, it can be said the long-term effort to eliminate this invasive species from the ecosystems along the river was successful.

As far as water management is concerned, the approved repairs of the Znojmo and Vranov reservoirs continued in 2005. In autumn 2005 the mud from the Čížovský forest lake was removed.

České Švýcarsko National Park (www.npcs.cz)

In the field of research the NP administration continued in projects that started after the establishment of the park in 2000, focused on geological, geomorphologic, fauna and botanical research.

Typological mapping of the NP forests was very important to the NP administration. A new typological map of 1:5 000 will be the key document for the preparation of a care programme and a forest management plan for the next period. Also the monitoring of forest eco-systems continued as well as the monitoring of the population of *Falco peregrinus* and other selected endangered species. Permanent monitoring of unstable rock massifs is crucial; based on the monitoring four redevelopment plans were performed in 2005.

An important measure of species protection was the completion of two fish passes in the Kamenice River. These fish passes were built in relation to the project Salmon 2000, but will have positive impact also on other fish species.

Forest management of the NP is focused mainly on the elimination of geographically non-native species, especially *Pinus strobus* and their change to spruce monoculture.

As far as public relations are concerned, a new information portal was put into operation in 2005 (www.npcs.cz).

An important aspect of nature protection in the České Švýcarsko NP is the implementation of the project "Integrated Ecosystem Management in Northern Bohemia", which is subsidised form the Global Environment Facility via the United Nations Development Program. The project is implemented by a public benefit corporation České Švýcarsko in Doubice, Hřensko, Chřibská, Janov, Jetřichovice, Krásná Lípa, Růžová, Srbská Kamenice and Staré Křečany from April 2005 to March 2008. The objective of the project is to support environmentally friendly development of the České Švýcarsko NP and its surroundings, that would counterbalance nature protection and social and economic interests of the above municipalities.

A total of 2,500 participants took part in the programmes of environmental education last year and the excursions and seminars were attended by approximately 1,500 more.

Visitors monitoring was performed in the NP from April to the end of the year with the use of special turnstiles, the purpose of which was to document the number of visitors in selected locations.

Protected Landscape Areas (www.ochranaprirody.cz)

Protected landscape areas (hereinafter PLA) are defined by the Act on Nature and Landscape Protection as large areas with harmoniously shaped landscape, characteristic relief, a significant share of natural ecosystems of forests and permanent grassland, numerous tree species, or preserved monuments of historical settlements. These areas are used from agricultural point of view according to protection zones, which helps maintain and improve their natural condition and preserve their optimal ecological functions. Recreational use is allowed if the natural values of PLAs are not disturbed.

Similarly to NP administrations, the PLA administrations perform the role of the state administration in relation to nature and landscape protection. The administrations keep statements from the central list of nature protection within their territorial competence. They can reserve the competence of a municipality because of serious reasons; they deal with and impose fines for offences and unlawful activities in the area of NP. They are entitled to issue a decree on the establishment of natural reserves and natural memorials, they review the decisions of municipal bodies in relation to nature and landscape protection. Within their territorial competence they also issue permits for bird areas covered by the PLA, caring for them and granting exceptions from the protective conditions of specially protected plant and animal species (outside the PLAs, NPs and their protective zones and the areas designated for state defence they also grant exemptions from critically endangered species). The administrations are entitled to issue regulations within their competencies and perform other obligations pursuant to Section of the Act on Nature and Landscape Protection. The administrations also act as professional nature protection organisations in their territory. In 2005 the PLAs issued 4,185 administrative decision and 16,905 approval and opinions.

Care for nature and landscape in PLA was performed by the Nature Conservation Administration (NCA) through 23 regional offices – PLA administrations. As of 31 December 2005 the NCA ceased to exist and the competencies were transferred to the Agency for Nature Conservation and Landscape Protection. A new PLA Český les was declared in 2005.

Český les is a borderline mountain range stretching from Domažlice to Dyleňský les. Geomorfologically, it is a continuation of the Šumava Mountains. Until 1990 a big part of the area was located in the border zone and therefore any agricultural activities were significantly restricted. With the displacement of the Germans, most settlements ceased to exist, which means the area is relatively undisturbed with human activity. Large-scale protection of this area was not considered in the past because of the existence of the border zone. At the present, Český les is important because of the nature protection of native forest systems in different habitats that are valuable for their condition for the whole Czech Republic. The systems include different beech and fir societies including water-logged spruce groves and dry moors with *Pinus uncinata*.

Care for nature and landscape in PLAs is differentiated into zones. The most valuable parts of territories are classified as Zone I, which represents 8% of all PLAs. Zone II represents 30%, Zone III 49% and transitional lands into urbanised and intensively use landscapes make up Zone IV with 13% of all PLAs.

In 2005, as well as in the years before, practical measures to improve the environment of the PLAs were subsidised from the Care for Landscape Programme of the Ministry of the Environment. The amount of subsidies to be allocated at the beginning of the year was CZK 73 million for PLAs and CZK 15 million for national categories of specially protected areas outside the PLAs. The above subsidies were used for the implementation of the following management measures: production and installation of sign posts marking the border of Český kras, renovation of pathways in the Bílá Opava valley in Jeseníky (after a windthrow calamity in 2004), irregular linear construction along municipal roads in Žďárské vrchy, foundation of permanent grassland on the right river bank of the Berounka in Český kras (reclamation of floods from 2002), grassing of a hole including tree and bush planting as an anti-erosion measure in Moravský kras, manual mowing in the nature reserve Volákův kopec in the PLA Žďárské vrchy, treatment of *Castanea sativa* in the nature reserve Kaštanka in the PLA Železné hory, support of critically endangered *Ophrys holosericea* by considerate mowing in the PLA Bílé Karpaty, relocation of endangered anthills into the genostation Ivanova školka

in the PLA Jizerské Mountains and many others. More than 90% of the total amount of CZK 4.3 million was drawn from the regional subsidy programme Forest Stabilisation in the Jizerské Mountains and Ještěd in 2005. The big part of the amount (80%) was used to plant natural tree species (mainly beech and fir) and for individual protection of these plantations. The resources were also used to prepare studies and documents for care programmes, some of them also for mowing and pasture of the valuable locations. The River System Revitalisation Programme is used to finance investments into the water regime of the areas. In 2005 two constructions worth CZK 23.6 million were financed in the PLAs.

An important aspect of the PLA protection are care programmes that are intended to regulate and influence human activities with respect to the mission of PLAs and determination of middle and long-term nature protection plans. The legislative basis of the programme is the Act on Nature and Landscape Protection. The care programmes are proposed by PLA administrations and approved by the ME. In 2005 a care programme for the PLA Pálava was prepared for 2006 – 2015. In addition to that the validity of care programmes of the PLA Blanský les and the PLA Třeboňsko were renewed until 2011 and 2010 respectively.

Small Specially Protected Areas

Small specially protected areas in the Czech Republic include four categories: national nature reserves, national nature memorials, nature reserves and nature memorials. National nature reserves and national nature memorials (outside NP and military areas) are administered by PLA administrations. National nature reserves and national nature memorials are declared by the Ministry of the Environment; nature reserves and nature memorials are declared by a decree of regional authorities, PLA administrations, PS administrations or cities with extended powers.

National nature reserves (NNR) are territories designated for the protection of natural and nearly natural ecosystems or their groups, significant and unique on a state-wide or international level. There is a total of 111 NNR covering an area of 28.1 km^2. The high demand on quality is also why their numbers don't change significantly. However, changes are being brought about by revisions to the legal provisions which established their protection.

National nature memorials (NNM) are intended to protect unique geological-geomorphologic formations and features, excavation with rare natural products (rocks, minerals, paleontological remains), stands of rare or endangered species in fragmented ecosystems or segments of nature with rare human artefacts. There are 104 areas protected ion this category, with a total area of 2,730 ha. Not even this category has exhibited large growth over the years.

Nature reserves (NR) are territories with natural or slightly disturbed ecosystems typical for a specific geographic area; their significance is regional. Like other SAC they largely contribute to the ecological stability of the landscape.

Natural memorials (NM), as the lowest category of significance, are similar to NNM, but with regional significance.

The numbers shown in Table III.4.2 for NR and NM are as of 31 December 2005 in the Central Register of Nature Conservation.

Table III.4.2

Year-to-year changes in the number and size of small specially protected areas in the Czech Republic as of 31 December 2005

	NNR		NNM		NR		NM		Total	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Number	110	111	103	104	772	775	1,189	1,191	2,174	2.181
Area (km^2)	28.0	28.1	2.7	2.8	36.0	36.3	27.2	27.3	93.4	94.5
% of the area of the Czech Republic	0.35	0.36	0.03	0.04	0.46	0.46	0.34	0.35	1.19	1.21

As results from Table III.4.2, the number of small specially protected areas in the Czech Republic in 2005 decreased slightly compared to 2004 in all categories and by 7 new areas in total.

Source: Agency for Nature Conservation and Landscape Protection of the Czech Republic

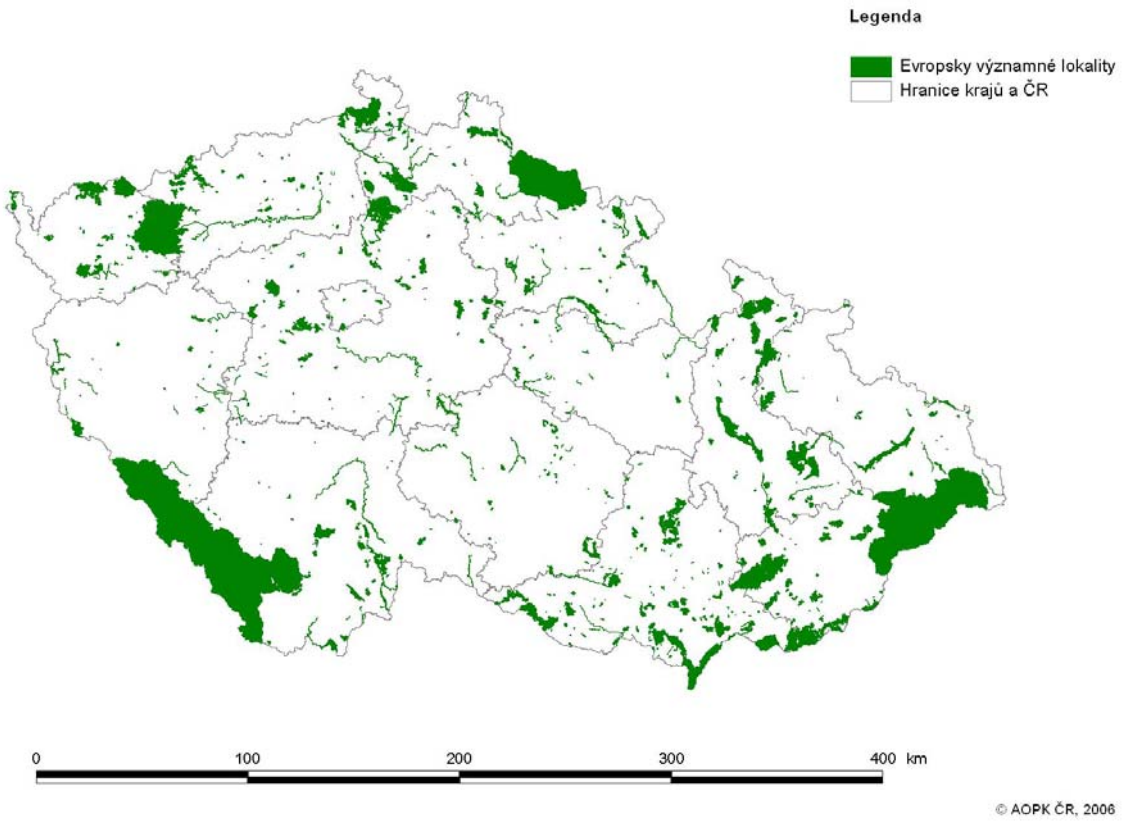
Natural parks (generally protected areas pursuant to Act No. 114/1992 Coll.) play an important role in the territorial protection, mainly in the protection of the landscape character. Natural parks are established by a decree of regional authorities; such a decree restricts any activities that might disturb, damage or destroy the condition of the area valuable for its landscape character and concentrated esthetical and natural values. In the past so-called rest areas used to be established. These areas used to restrict negative impact on the recreational use of the areas. Rest areas were automatically transferred to natural parks.

Natura 2000 (www.natura2000.cz)

Natura 2000 is a system of protected areas created by the EU member states according to uniform principles. The establishment of Natura 2000 is provided in two most important EU nature protection regulations: Directive 79/409/EEC on the conservation of wild birds (Birds Directive) and Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive). The requirements of both the directives were incorporated into the Nature and Landscape Protection Act, as amended by Act No. 218/2004 Coll. Bird areas are declared pursuant to the Birds Directive and sites of European significance pursuant to the Habitats Directive. Up to the date, the Government has approved 38 bird areas. Furthermore, the National List of Sites of European Significance was approved by an Government order and submitted to the European Commission. The list includes 863 areas of European significance. The European Commission in co-operation with the Czech Republic and other member states will prepare an European list, a definite agreement on what sites of European significance shall be protected by the Czech Republic within Natura 2000. The sites included in the European list shall be declared specially protected areas by the Czech Republic within 6 years after the approval by the Council of the European Union or shall be protected contractually. Only after their declaration or completion of a contract, the sites form the European list become part of Natura 2000, which includes also bird areas pursuant to the Birds Directive.

Figure III.4.2

National list of sites of European significance in the Czech Republic



Bird Areas

In the second half of 2004 and at the beginning of 2005 bird areas were defined (as a legal term) in the Czech Republic pursuant to the requirements of Directive 79/409/EEC on bird areas (BA). Out of the 41 proposed bird areas the Government approved 38, and in one case it was rejected (BA Heřmanský stav-Odra-Poolší) and in two cases it was postponed (BA Dehtář and BA Českobudějovické rybníky).

Pursuant to the Act on Nature and Landscape Protection general protection applies to bird areas meaning that bird areas are not a category of SAC and there are not basic protective conditions established for them. Bird areas are established by a government order in which it is possible, for purposes of securing protection goals, to establish activities bound to the approval of nature protections authorities (protection conditions). Protection conditions have a direct link to securing the protection of bio-types significant for the species which are subject to the bird area protection, as well as to securing the health of individual specimens of the targeted species during nesting period (if necessary collecting and wintering). The existing degree of territory protection was taken into consideration during the formulation of protection conditions in order to prevent duplication of protective measures.

Based on the authorisation provided in the Act on Nature and Landscape Protection, the Ministry of the Environment can prepare a summary of recommended measures for bird areas to ensure positive development of the populations of bird species that are subject to protection. Summarised recommended measures for bird areas that overlap with large specially protected areas shall be included in care programmes of these areas. In other bird areas the summarised measures shall be prepared as independent documents published in the

Information Bulletin of the ME. In 2005 the preparation of summarised recommended measures started for five areas (BA Eastern Giant Mountains, BA Rožďalovické rybníky, BA Komárov, BA Králický Sněžník, BA Soutok-Tvrdonicko).

Sites of European Significance

In 2005 the European Commission started the assessment of adequacy of the national lists of sites of European significance of the new EU member states for different types of natural sites and species from appendices I and II of the Habitats Directive. The European Commission evaluates the adequacy of the national lists of the EU member states at bio-geographical seminars. The Czech Republic belongs to two bio-geographical areas – the Panonian one (4% of the area of the Czech Republic) and the continental one (96% of the area of the Czech Republic).

The seminar for the Panonian bio-geographical area was held on 26 and 27 September 2005 in Sarród (Hungary). As results from the seminar, the Czech Republic will have to complete the list of the sites of European significance. The completion for the Panonian bio-geographical area will be carried out in 2006 so that the sites could be verified during the vegetation season. After that the new sites and the existing sites with a different protection status will be discussed with the relevant owners and in a interdepartmental proceedings. The national list will be completed by amended Government Order No. 132/2005 in 2006/2007. The whole process will be similar for the continental bio-geographical area.

Table III.4.3

Statistics of sites of European significance and bird areas in the Czech Republic

	Czech Republic	Continental	Panonian
Area (ha)	7,886,739	7,546,285	340,454
Number of site of European significance (SES)	863	768	108
Area of all SES (ha)	724,412	693,220	31,180
% of SES	9,2	9.2	9.2
Number of bird areas (BA)	38	31	8
Area of all BA (ha)	693,622	657,764	3,585
% of BA	8.8	8.7	10.5
% of Natura 2000 sites (SES +BA)	13.3	13.2	15.2
% of SES outside PLA	3.03	2.83	7.47
% of BA outside PLA	3.2	3.1	7.0

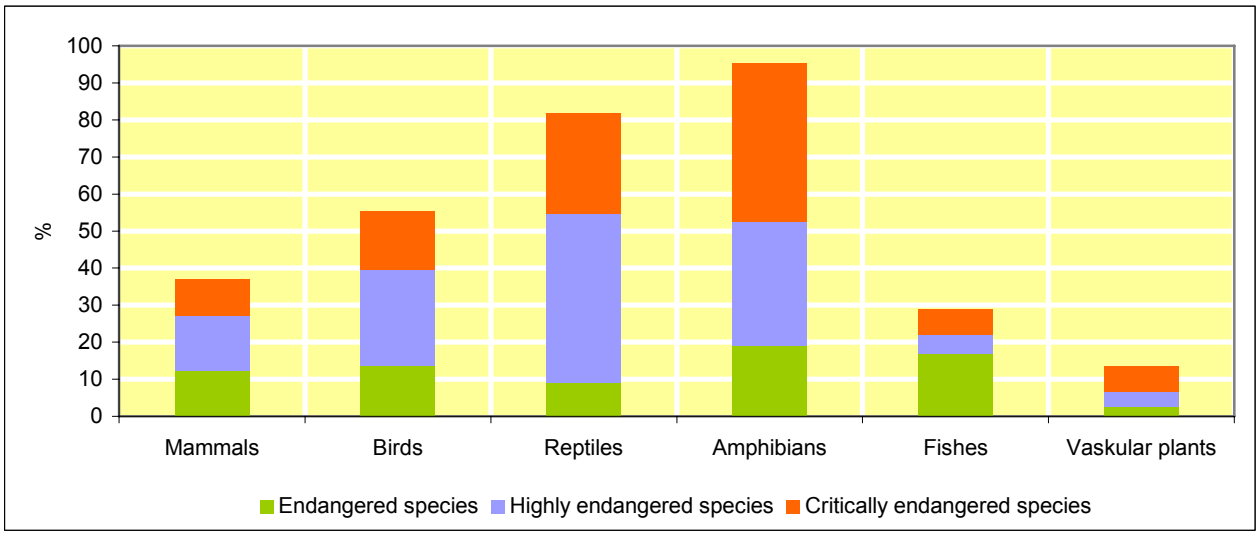
Source: Agency for Nature Conservation and Landscape Protection of the Czech Republic

Specially Protected Animal and Plant Species

In 2005 an amendment to the lists of specially protected wild animal and plants species was prepared, resulting from the need to complete the transposition of the EC directives (Species Protection pursuant to Appendix IV to Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). At the same time revision and update of the lists of specially protected animal and plant species continued, taking into account the changes in the risk level that were made in 1992 when the list of specially protected species was created. The analysis also includes taxons not specified in Decree No. 395/1992 Coll., such as bryophytes or lichens. The purpose of the revision and update is to reflect the current trends in the endangered species populations and secure the required degree of protection.

Graph III.4.3

Percentage of endangered species in the total number of known species according to the valid red list



Source: ME

As results from Graph III.4.3, the number of species with different risk degrees is relatively high in the Czech Republic. Recently the low number of big beasts and birds of prey has been caused not only by the decrease in biotopes, but also by poachers and poisonous baits (Dead Sea eagles and other bird species).
Specific tools of care for specially protected species are conservation programmes (Section 52 of the Act on Nature and Landscape Protection). In compliance with the IUCN (the World Conservation Union) principles these programmes are currently viewed as comprehensive sets of instruments focused on the conservation of species and the management of their populations. At the present, the following conservation programmes are approved by the Ministry of the Environment and implemented: two programmes for critically endangered animal species *Margaritifera margaritifera* and *Tetrao urogalus* and two programmes for critically endangered plant species (*Angelica palustris* and *Potamogeton praelongus*).

At the end of 2005 the Agency for Nature Conservation and Landscape Protection of the Czech Republic prepared proposals of other conservation programme for the following animal species: the ground squirrel (*Spermophilus citellus*), the great bustard (*Otis tarda*) and endangered butterflies (*Euphydryas maturna, Euphydryas aurina, Parnassius mnemosyne*), as well as conservation programmes in the narrower sense of meaning and programmes known as care programmes (or management plans) for the European otter (*Lutra lutra*) and big beasts (*Lynx lynx, Canis lupus* and *Ursus arctos*) and the European beaver (*Castro fiber*). Conservation programmes for *Dianthus arenarius subsp. bohemicus* and *Gentianella bohemica* will be finished and submitted to the Ministry of the Environment in 2005. In 2006 the conservation programmes are supposed to be submitted to the Ministry of the Environment for approval and started.

In 2005 the preparation of large monitoring and assessment system of the condition of sites and species of European significance was started with respect to their protection. The definition and assessment of the condition with respect to the protection is made by the Agency for Nature Conservation and Landscape Protection of the Czech Republic, authorised by the ME. The main effort is aimed at methodologically uniform monitoring of the condition and trends of significant natural phenomena, as specified in the appendices to Directives 92/43/EEC and 79/409/EEC. The obligation concerning the monitoring of biotopes and

species under the above directives was implemented into the Czech legislation by the provisions of Section 45f of the Nature and Landscape Protection Act. Apart from phenomena of European significance, the monitoring will also involve the mots endangered species and biotopes significant for the Czech Republic. Special methodologies are prepared for the phenomena that would enable transparent assessment of their long-term condition and development.

III.4.3 Forest

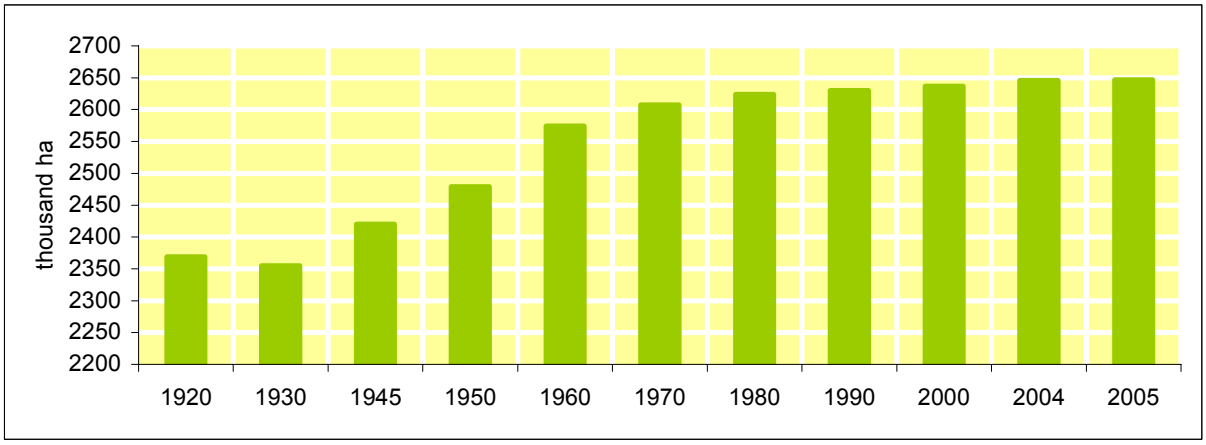
III.4.3.1 Condition of the Forest Fund

Trend in the Forest Sizes

Forest areas were at 2,647,000 ha in 2005, representing an increase of approx. 1,679 ha from 2004. Moderate growth in forest areas can also be assumed for the coming years.

Graph III.4.4

Trends in forest areas between 1920 and 2005



Source: Czech Office for Surveying, Mapping and Cadastre

In comparison with 2004 the area of forest lands in 2005 increased by 27,000 ha, i.e. from 2,564,261 ha to 2,590,903 ha. Forest coverage (area of forest lands) reached 32.8% of the Czech Republic in 2005. The most heavily forested regions are: Liberecký (42.7%), Karlovarský (42.1%) and Zlínský (38.9%). The regions with the lowest coverage are the capital Prague (9.5%), Středočeský (27.2%) and Jihomoravský (27.4%) regions.

A positive phenomenon is the forestation of unfavourable agricultural land, which has been subsidised from the Operational Programme "Rural Development and Multifunctional Agriculture" of the structural funds of the EU within measure 1.3 – Forest Management. The subsidies are provided in 3 forms – for the foundation of a forest, for the care for forest during 5 years starting in the year of forestation and the compensation for the forestation of agricultural land over 20 years starting in the year of forestation.

Table III.4.4

Development of agricultural land forestation between 1999 and 2005 (ha)

	1999	2000	2001	2002	2003	2004	2005
Area	493	908	1 091	1 203	940	570	658

Source: MA

Categorisation of Forests Based on their Functional Use

Recently the significance of the function of public benefit, which also reflects the development of forest designations into individual categories such as timber, protective, and special function, has been increasing. This trend will most likely continue.

Table III.4.5

Development of forest categories between 1980 and 2005

	Forest category (%)		
	Timber forest	Protective forest	Special-function forests[a)]
1980	78.2	4.0	17.8
1990	58.4	2.5	39.1
2000	76.7	3.5	19.8
2004	75.3	3.1	21.6
2005	76.1	2.9	21.0

[a)] Until 1996 the category of special function forests also included forests affected by air pollution. After this year these forests were categorised according to their main function.

Source: Forest Management Institute

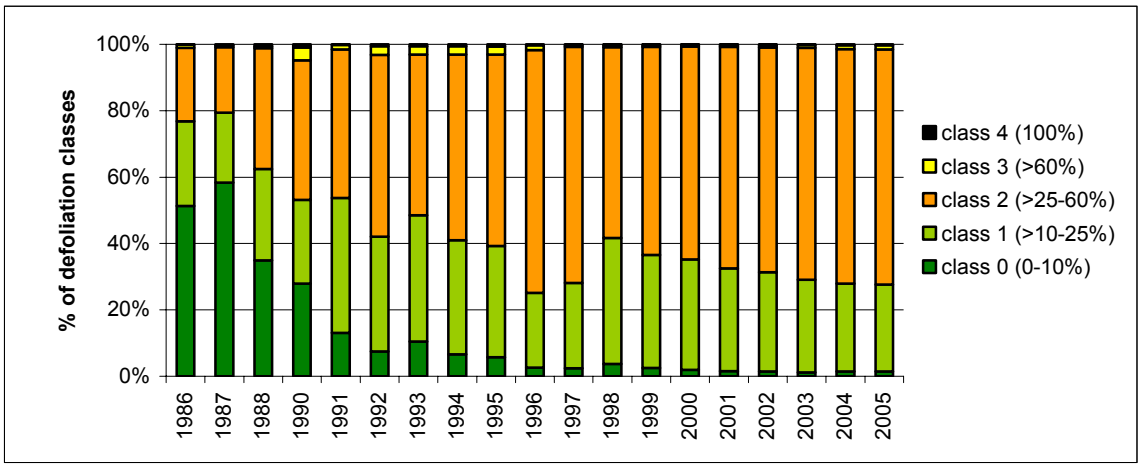
Forest Health

The programme of the UN European Economic Committee, shortly referred to as ICP Forests, has been followed by a new European co-operation project since 2004 called "Forest Focus", which results from the Regulation 2152/2003 of the European Parliament and Council of 17 December 2003 on forests monitoring and the environmental impact on forest systems. Currently, the health of the forests has been monitored regularly within a systematic network of this programme in the Czech Republic, basic areas of 16 × 16 km and selected areas of 8 × 8 km, 306 areas in total have been monitored. Basic stand and vegetation conditions are determined for each area. The following expert monitoring is performed in regular intervals (1–5 years): treetop health (defoliation, colour changes, etc.), social status, dendrometric parameters and phytosociological screening. Additional irregular monitoring includes leaf, tree ring and soil analyses.

One of the most important parameters observed in the forest health monitoring is the defoliation, which is caused mainly by adverse changes in the forest ecosystems due to long-term and excessive air pollution. Defoliation is provided in percentage with the accuracy of 5 % and is divided into 5 classes.

Graph III.4.5

Defoliation of coniferous trees – forests of 60 or more years (between 1986 and 2005)

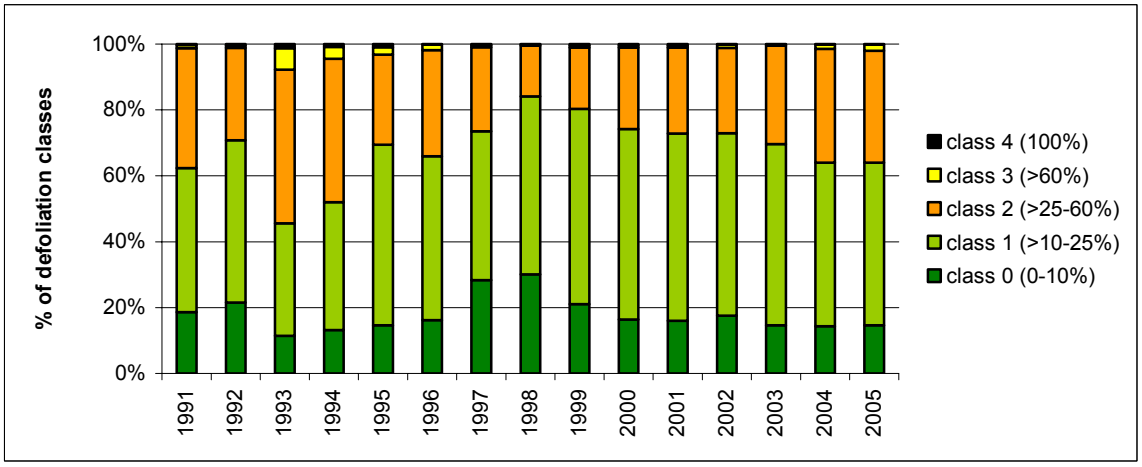


Source: FGMRI

The main tree species *Picea abies* in forests older than 60 years has not shown any significant changes since 2001. Spruce groves less than 59 years have slightly improved due to a bigger percentage of trees in class 1 (11–25%) and a lower percentage of trees in defoliation classes 2–4 (26–100%). There were insignificant changes in *Pinus sylvestris* and *Larix decidua* of both age categories caused by a slight increase in class 2 (26–60%). The most significant changes were registered in *Abies Alba* in forests under 59 years, where the mean defoliation increased from 0.0% to 35.0% compared to the previous year. Fir groves over 60 years show an improvement as it was in the year before, defoliation of classes 0 and 1 increased (0–10%), while class 2 decreased, but the decrease was not as significant as in 2004.

Graph III.4.6

Defoliation of deciduous trees – forests of 60 or more years (between 1986 and 2005)

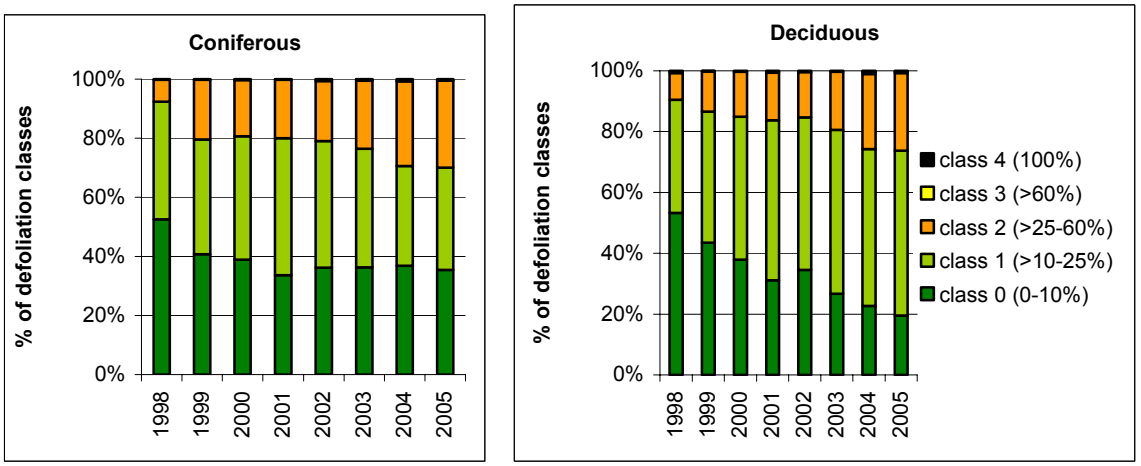


Source: FGMRI

Compared to the previous year, there were no significant changes in the main deciduous species (*Quercus* sp. and *Fagus sylvatica*) of both age groups. The percentage of trees with defoliation over 25% (class 2–4) in oak groves older than 59 years remains very high and was at 67.4% in 2005. The same category of beech groves was at 18.0%.

Graph III.4.7

Defoliation of coniferous and deciduous trees – forests younger than 60 years (between 1986 and 2005)



Source: FGMRI

Forests in Specially Protected Areas

Taking into account the long-term effort to maintain the forestation in the Czech Republic at a stable level, mainly in specially protected areas, the figures had not changed for a long time. On the other hand, the degree and intensity of systematic care for forests and tree composition in PLAs have been improving towards a natural forest or virgin forest, with respect to the objective and subject of protection of specially protected areas.

Table III.4.6

Forests in specially protected areas

Category	LSPA		SSPA			
	NP	PLA	NNR	NR	NNM	NM
Number	4	25	111	775	104	1191
Area (thus. ha)	119,5	1089,8	28,1	36,3	2,8	27,2
% of the area of the Czech Republic	1,52	13,82	0,36	0,46	0,04	0,35
Area of forest land (thous. ha)	104,0	588,5	23,0	16,0	1,6	19,0
Forest coverage (%)	87	54	82	44	59	70

Source: Agency for Nature Conservation and Landscape Protection

III.4.3.2 Wood Production and Forest Renewal

Wood Production

The total wood production decreased on the year-to-year basis by 0.6% (15.51 million m^3 in 2005 compared to 15.6 million m^3 in 2004), which means the discontinuation of a long-term trend of increasing production.

Table III.4.7

Wood production intensity (%)

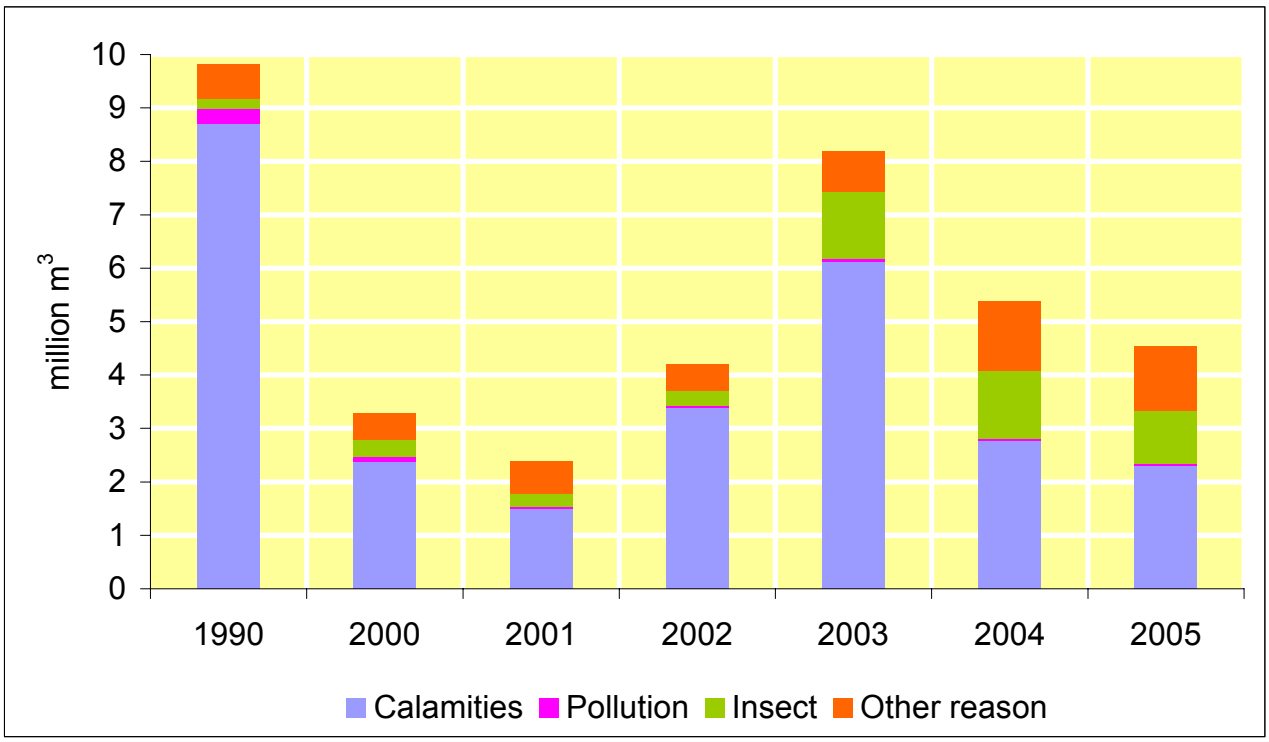
	1990	2000	2004	2005
Share of wood production in the volume increase (%)	81.78	85.95	90.70	89.70

Source: FMI, CSO

As results from table *III.4.7*, the total wood production does not reach the total average volume increase, which proves the actual total wood production for one year in the Czech Republic. The forests of the Czech Republic have been used within the production capacity (sustainable yield).

Graph III.4.8

Salvage felling in the Czech Republic



Source: CSO

The total random wood production has dropped significantly compared to the situation in the early 1990s and regular forest management has prevailed over the elimination of forest damage. While in 1990 random wood production was at 9.8 million m^3, 10 years later it was "only" approx. 3.3 million m^3. The lowest random production over the past five years was registered in 2001 (approx. 2.4 million m^3), and the biggest production was in 2003 (approx. 8.2 million m^3) , mainly due to natural wind disaster and subsequent bark beetle attack of spruce groves. Compared to 2004, the volume of random production has decreased in 2005 in all monitored categories, in total it was a drop exceeding 15%.

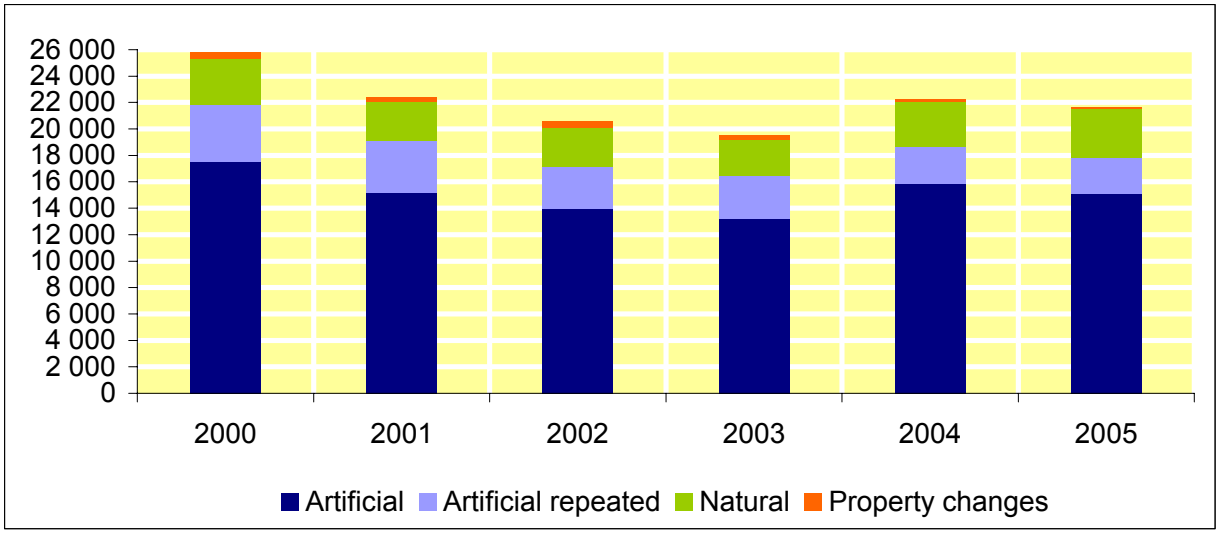
Renewal

The area of renewed forests has decreased by 4.1% compared to 2004. The renewal rate is by approximately 10.1% lower that the minimal rate is supposed with respect to permanent and

balanced production. The fact that the percentage of coniferous trees in renewals has decreased is positive.

Graph III.4.9

Forest renewal (ha)



Note: Forestation of glades.

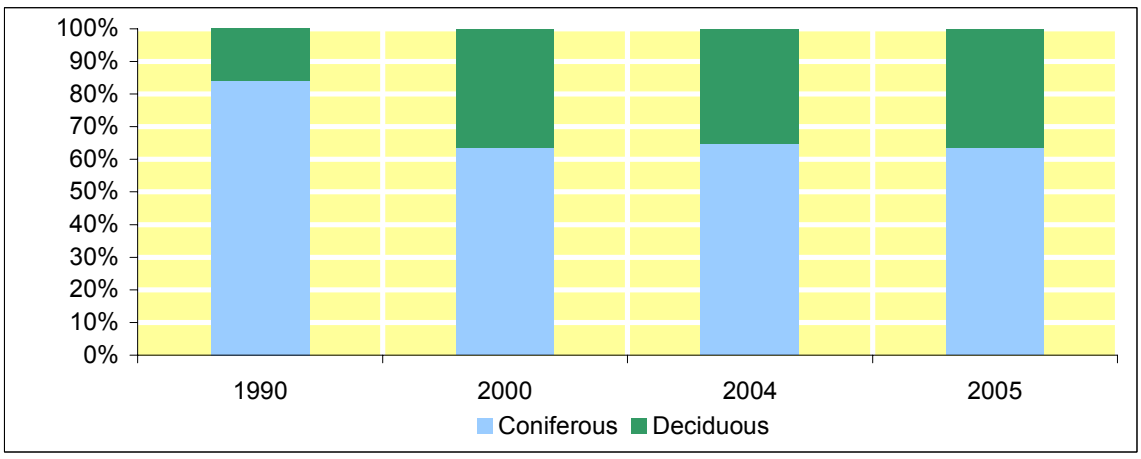
Source: FMI, CSO

As results from Graph III.4.9, the natural renewal rate increased in 2005 (by 6.7% compared to 2004). The FMI experts believe that the increase may be related to the type of stands and the possibility to use natural renewal by seeds.

The artificial forest renewal involves systematic introduction of melioration and solidifying tree species, such as the beech, oak, maple, rowan, and fir. The long-term change in the species composition is in favour of deciduous trees and the fir is the main criterion for drawing the National Environmental Fund resources. An increased percentage of deciduous trees in forest ecosystems is a long-term goal of the forest management.

Graph III.4.10

Artificial forest renewal with coniferous and deciduous trees in the Czech Republic (1990 – 2005)



Source: CSO

As results from Graph *III.4.10,* the percentage of deciduous trees has increased substantially in artificial forest renewal since 1991. As far as individual species are concerned, the percentage of beech has increased to the prejudice of pine and spruce. However, the natural tree composition of the Czech Republic has not been reached yet.

IV Economic Sectors and the Environment

IV.1 Energy

IV.1.1 Quantitative Power Engineering Indicators

Table IV.1.1 represents the consumption and market share of individual types of primary energy sources (PES) and power effectiveness in relation to GDP. PES consumption in the last three years shows only a slight growth; PES consumption in relation to the GDP unit dropped, which proves a more effective use of energy. Energy intensity, in comparison to the "old" EU-15 average, is still relatively high. Nevertheless it is falling in accordance with one of the main aims of the State Energy Policy.

Table IV.1.1

PES, fuel composition and energy use efficiency indicators between 2003 and 2005

	2003	2004	2005
PES (PJ)	1,813	1,842	1,910.7
Shares of fuels in %			
- solid	50	49	49.4
- liquid	18	20	20.6
- gaseous	19	18	17.8
- primary heat and electricity	13	13	12.2
GDP (billion CZK) [a)]	1,694.7	1,774.2	1,879.8
PES.GDP^{-1} (PJ. billion CZK^{-1})	1.07	1.04	1.02
PES.GDP^{-1} index (2003 = 100)	100	97.2	95.3

[a)] Data in fixed prices of 1995; see preliminary data for 2005 on www.mfcr.cz

Note: Primary energy sources (PES) are an aggregate of domestic or imported energy sources. Primary heat refers to heat generated in nuclear reactors, geothermal and solar heat. Primary electricity is electricity generated in water, wind and photovoltaic power stations plus the electricity import / export balance. Gaseous fuels are recalculated to energy units (PJ) through the calorific value.

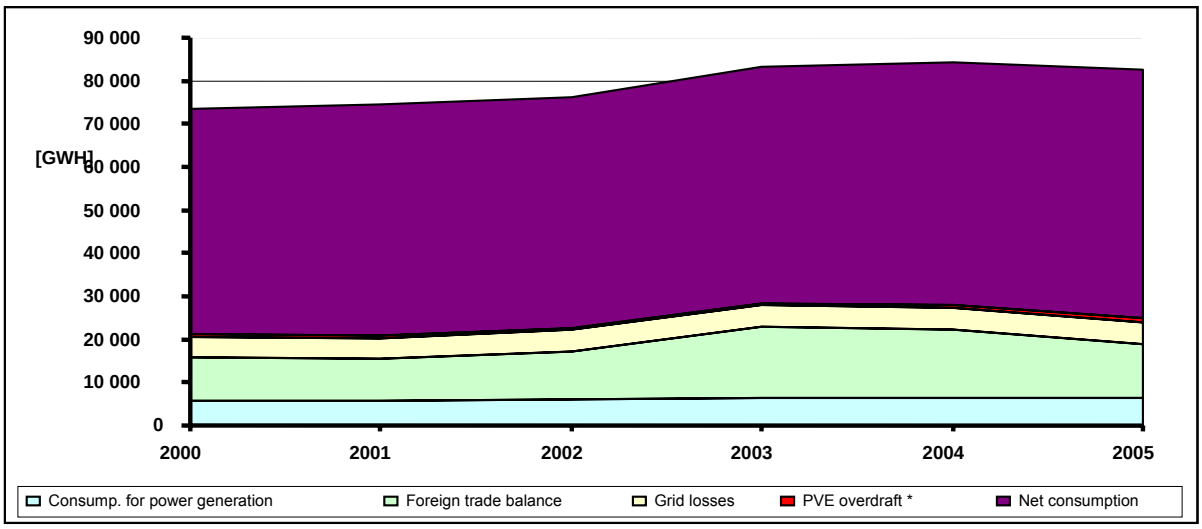
Source: Czech Statistical Office, 2005 – Ministry of Industry and Trade estimate

One of the main reasons for the stagnation of energy conversion effectiveness is the age and efficiency of lingering coal-fired power plants and heating plants, the restoration of which is planned after 2010. Graph IV.1.1 represents the electricity balance, which shows that in 2005 more than 15% of produced electric power was exported from the Czech Republic.

Electric power engineering has undergone organisational changes. Companies ČEZ, a.s., and E.O.N. took control over distribution companies and new companies were established, respecting Directive 2003/53/EC on the opening of the electricity market, i.e. regulated power distribution had to be separated from other activities. These newly-founded companies concentrate services which each distribution company used to perform separately.

Graph IV.1.1

Electricity balance



Source: ERO

* Pumped-storage power generation

The Czech Republic has a big potential for an increase in economic power efficiency, which could cause lower power consumption. It is important to improve system tools affecting a higher use of power saving potential both in energy conversion and in final consumption, such as heat saving in buildings, use of power saving appliances and means of transport.

IV.1.2 Influence of Power Engineering on the Environment

The power engineering sector is the largest element in sharing emissions from stationary sources. Table IV.1.2 shows emissions of selected pollutants (SO2, NOX and SPM) from power-producing fuel combustion (electricity and heat production) and combustion of fuels for technological heating. Construction of facilities for reducing emissions (desulphurisation, fly-ash separators) and renovation of boilers, related to optimisation of their operation and increased efficiency markedly reduced total emissions from stationary sources between 1995 and 2000. The table also shows CO2 emissions, to which great attention has been paid in the last years in connection with climate changes (greenhouse effect).

Table IV.1.2

Emissions of selected pollutants from fuel combustion in stationary energy sources

	1990	1995	2000	2001	2002	2003	2004	2005 *
SO_2 emissions (thous. t)	1,808.4	1,080.7	256.0	242.8	228.4	219.0	219.3	221.0
NO_X emissions (thous. t)	386.7	217.4	160.0	161.1	161.6	153.1	158.4	154.2
SPM emissions (thous. t)	606.1	183.9	45.5	41,5	45.8	40.6	38.6	40.6
CO_2 emissions (million t)	137.9	108.2	104.3	104.3	99.0	101.0	99.1	-

** Preliminary data*

Source: CHI

Power engineering plays an important role in water take-off. Surface water take-off for energy purposes in 2005 topped 805 million m3, which is more than 50% of the total take-off. The year-on-year decrease in power engineering take-off was terminated by surface water take-off

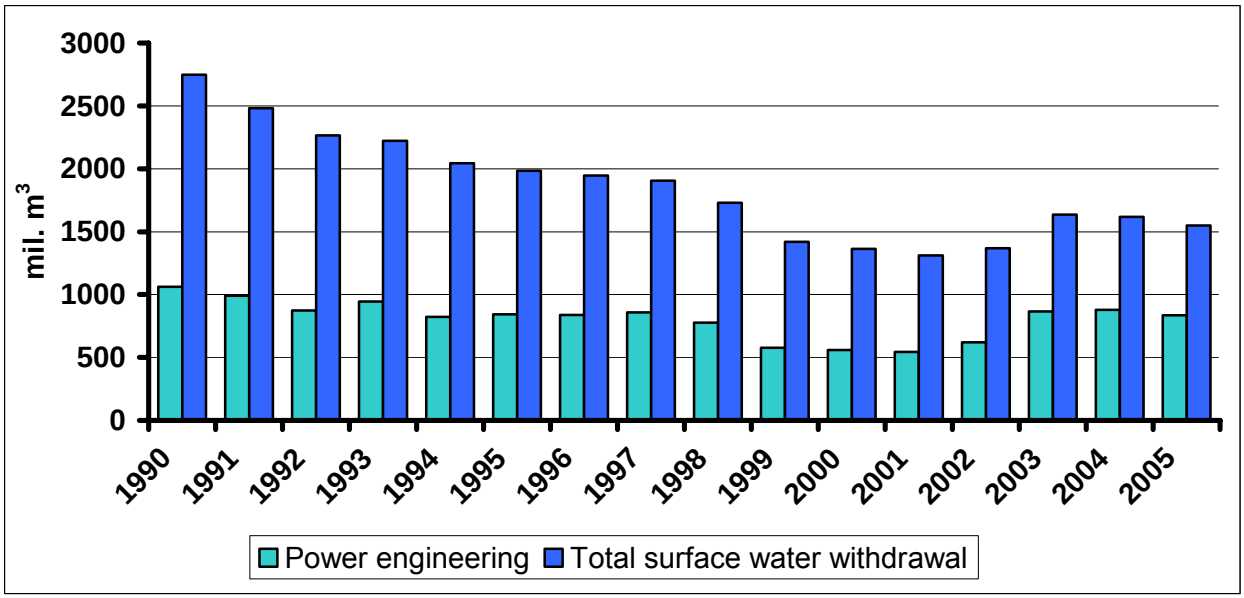
between 2001 and 2004 (see Graph IV.1.2). Groundwater withdrawal from the power engineering sector is not significant (approx. 0.6% of all take-off).

Surface water is used mainly for cooling purposes, feeding of power-station and heating plant boilers and completing primary and secondary circuits of nuclear power plants. Underground and drinking water is taken mostly for employees' personal consumption.

Power engineering also is a significant producer of technological waste water caused by heat and electricity production.

Graph IV.1.2

Power engineering surface water withdrawal



Source: WRI

IV.1.3 Renewable Energy Sources

One of the methods to reduce the negative effects of energy production on the environment is to use economically available renewable energy sources (RES). Table IV.1.3 shows data on electricity production from RES.

Table IV.1.3

Gross energy production from renewable energy sources

GWH	**2004**	**2005**[a)]
Water power stations	2,016.3	2,379.9
Solid biomass	564.5	560.3
Biogas	138.8	160.9
Wind power	9.9	21.4
Solid municipal waste (BDW)	10.0	10.6
Photovoltaics	0.3	0.3
Total	2,739.8	3,133.4
Market share in gross domestic electricity consumption (%)	4.0	4.5

[a)] *2005 preliminary data*

Source: MIT

Higher attention is paid to the use of RES. The Czech Republic has determined an indicative objective of 8% market share in gross 2010 electricity consumption. In 2005, the market share of gross energy production from RES in the gross domestic electricity consumption was 4.5% and in the total gross domestic electricity production was approx. 3.8%. The increase in energy production from RES related mainly to water power stations; on the other hand, there was a slight decrease in energy production from biomass – the decrease was caused mainly by the reduction of energy production from biomass and brown coal co-combustion in ČEZ, a.s. power stations.

The use of RES in heat production is much bigger (see table IV.1.4). The balance includes also the estimate of biomass use for heating purposes in households.

Table IV.1.4

Gross heat energy production from RES and secondary resources

TJ	2004	2005[a)]
Solid biomass	40,230	40,892
Biogas	968	1,010
Solid municipal waste	2,052	1,979
Industrial waste	-	990
Solar collectors	100	103
Heat pumps	500	545
Total	**43,850**	**45,519**

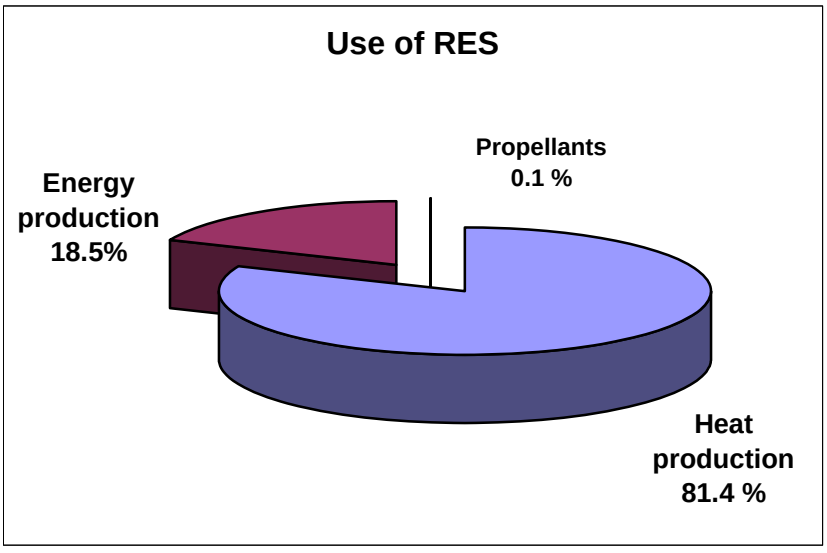
[a)] *2005 data are preliminary*

Source: MIT (Methodology, see the MIT Energy Statistics)

Currently, approximately 82% of the energy from RES in the Czech Republic is used in heat production, roughly 18% in energy production and 0.1% as propellants (Graph IV.1.3).

Graph IV.1.3

Use of RES



Source: MIT

The use of RES in the Czech Republic has been increasing slowly and the objective of the State Energy Policy for 2005 (5 – 6% of RES for gross electricity production) was not accomplished, although the passed legislative provisions (Act No. 180/2005 Coll., on the Promotion of Electricity Production from RES) create stable conditions for their use. The

share of energy from RES in primary energy source in 2005 was approx. 3.4 – 3.5%. Based on statistical solutions it cannot be anticipated that this share would significantly increase in the near future.

IV.1.4 Legislation and Programmes

On August 1, 2005, Act No. 180/2005 Coll., on the Promotion of Electricity Production from RES became effective with the objective to support a higher use of RES, ensuring a constant increase in the RES share in the consumption of primary energy sources, which would create conditions for the accomplishment of the 8% indicative objective in 2010, to which the Czech Republic agreed.

National Programme of Economic Energy Management and Use of Renewable and Secondary Energy Sources for 2006 – 2009, passed by Governmental Resolution No. 884 of 13 July 2005, is a mid-term four-year programme to meet the objectives of the State Energy Policy and the State Environmental Policy of the Czech Republic. The priorities of the National Programme are the maximisation of energetic and electric power efficiency, the higher use of energy savings and the rising use of renewable and secondary energy sources and alternative fuels in transport. The accomplishment of the priorities of the National Programme will result in lower environmental burdens, contributing to the process of keeping the national emission ceilings. The Ministry of Industry and Trade and the Ministry of the Environment, as well as other public administration authorities carry responsibility for the objectives of the National Programme.

IV.2 Extraction of Raw Materials

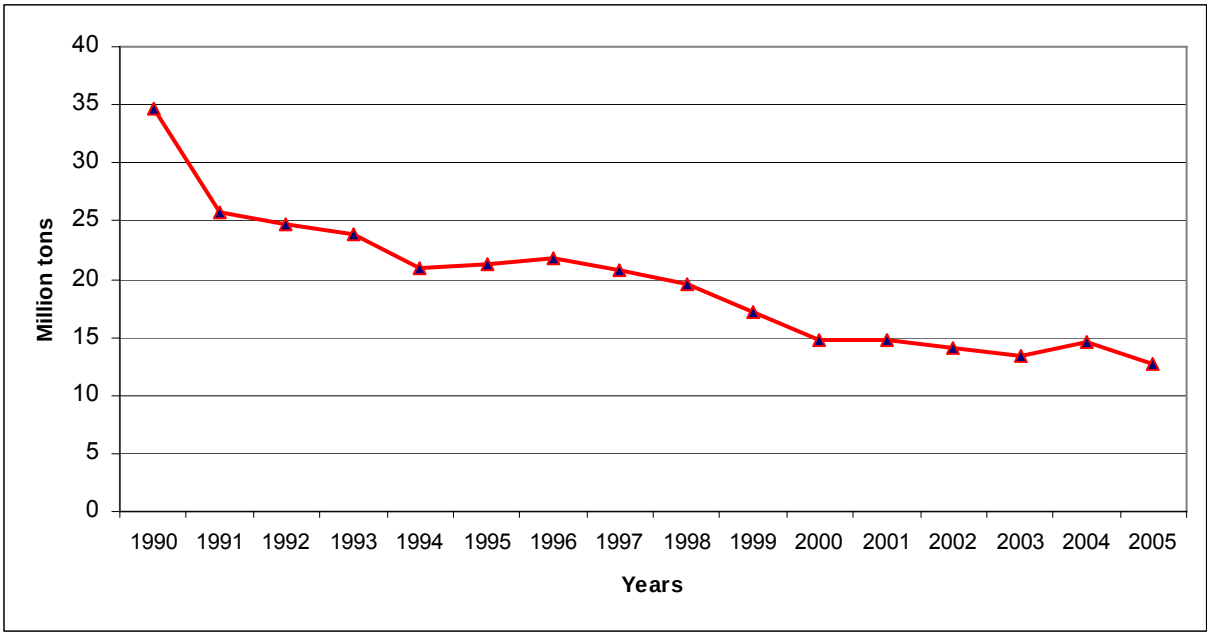
In 2005, 214 mining organisations extracted a total of 134.986 million tons of mineral resources in 531 exclusive fields in the Czech Republic. The amount of non-exclusive extraction in 2005 was at 12.944 million tons. All data related to the reserves of mineral resources are available in the Czech Geological Survey (Geofond) and provided in the so-called Balance of Inventories made for individual years.

IV.2.1 Black Coal

Black coal mining in the Czech Republic is currently linked mainly to the Upper-Silesian coalfield; the mining in the Inner-Sudetic coalfield is of dozen thousands of tons. In 2005, the black coal mining in the Czech Republic was 12.778 million tons, which in comparison to 2004 (14.648 million tons) is a fall of approx. 13% and follows the down trend of the early 1990s. In comparison to 1990 (30.714 million tons), the black coal mining is currently almost 58% lower (Graph IV.2.1). It is caused by the cutback of activities and mining in more complicated geological mining conditions.

Graph IV.2.1

Total black coal mining in the Czech Republic (1990 – 2005)



Source: CGS – Geofond

In 2005, the mining area was 334.35 km^2. Nowadays, almost 100% of black coal in the Czech Republic is mined in the Ostrava-Karviná Coalfield (OKD), mainly in the Karviná part. The lifetime of mined reserves in the coalfield may be difficult to determine precisely from today's point of view, but it is probably less than 15 years. The outlook of some mines is less than a half of that time. Out of the total black coal mining in the OKD in 2005, 93% comes from the Karviná part. The whole area of the former Karviná district (347 km^2) is protected mineral estate and almost a half is made up by mining areas (MA) of active mines.

In the Upper-Silesian coalfield there are 10 active coal fields; the remaining 56 are not used and 38 unused black coal fields are made up non-balance reserves.

In 2005, redevelopment and reclamation work in the MA Louky Dul CSM (CMD, a.s.) continued, the sludge basins of the MA Dul Lazy was redeveloped and the reclamation of the premises of Jindřich in the MA Dul ČSA was terminated. Also biological reclamation of the setting tank Pilik 3 in the MA Dul Paskov (OKD, a.s.) was initiated and some mines in non-efficient parts of the mining areas of OKD, a.s., were closed down, e.g. Dul Darkov and Doly ČSA (liquidation of the area of Doubrava – shafts Doubrava I and II) and CSM (reclamation of the area of Louky – stage 8 and 9, reclamation of sludge basins and reclamation of Darkov, stage 10).

IV.2.2 Brown Coal and Lignite

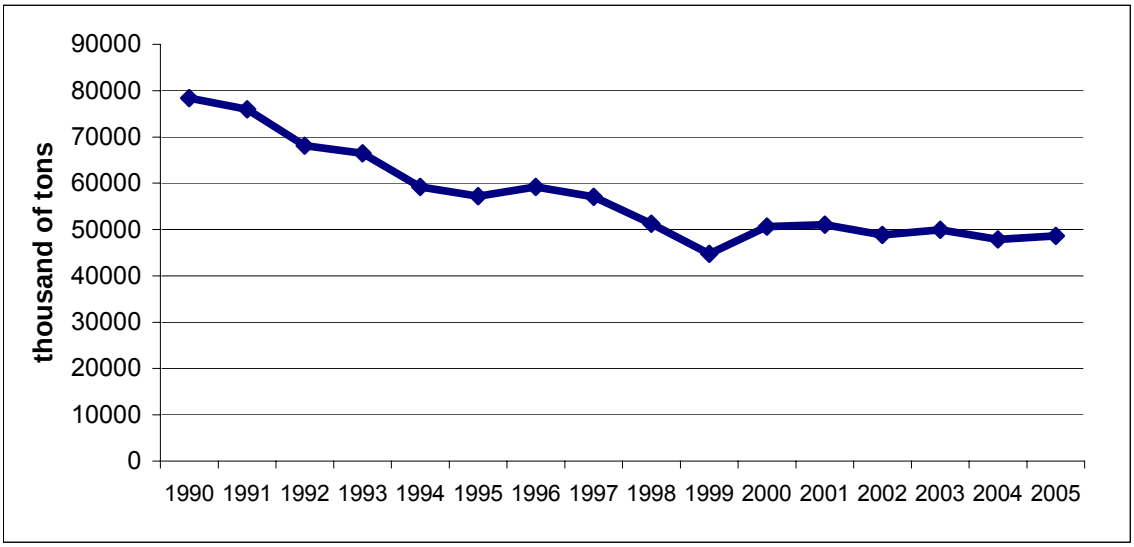
In 2005, the volume of brown coal mining in the Czech Republic was 48.658 million tons, which in comparison to 2004 (47.840 million tons) means a slight growth by approx. 1.7%. In comparison to 1990 (78.391 million tons), brown coal mining is currently almost 38% lower (see Graph IV.2.2).

Most brown coal (approx. 99.1%) is found in the North Bohemian field (SHP) and Sokolov field (SP) and it is mined in five surface mines. Only 0.9% of mining in SHP in 2005 was mined underground in the mine Dolní Jiřetín – Centrum where the annual production in 2005

reached 469 thousand tons. Non-mining organisation Palivový kombinát Ústí, s.p., associates inhibiting locations – former giant opencast Chabařovice where the technical liquidation was completed and the Ležáky mine and the underground mine Koh-i-noor from 1 January 1 2004 within the meaning of the resolution of Government of the Czech Republic Nos. 395/2003 and No. 1128/2003.

Graph IV.2.2

Total brown coal mining in the Czech Republic (1990 – 2005)



Source: CGS – Geofond

The largest active opencast mines Tušimice – Libouš and Bílina – Velkolom M. Gorkij are administered by the company Severočeské doly, a.s. (SD, a.s.), the remaining active opencast mines Ervenice – Velkolom ČSA, Holešice – J. Šverma, Vršany and the underground mine Dolní Jiřetín – Centrum belong to the organisation Mostecká uhelná, a.s. (since 2005 Mostecká uhelná, a.s., hereinafter MUS, a.s., Most). The operation of the underground mine Centrum and the Jan Šverma – Holešice mine will be stopped around 2008. For prospective mining in the SHP territory Libouš (Nástup Tušimice) in the Chomutov region, Vršany and Čs. armády in the Most region and Bílina in the Teplice region will remain open. The extraction extent is limited by Government Resolution No. 444 of 1991 on territorial and environmental mining limits. From the long-term perspective, mining can be relocated into the corridor Komořany-Hořany-Býlany (the boundary of mining area Vršany and Slatinice) only Vršany. Due to the potential use of reserves in the forefront of the opencast mine Libouš – Tušimice in 2002 the redevelopment of the railway Březno – Chomutov was started, as well as the construction of a railway tunnel at Březno in the Chomutov region, the route of which is on the border of the binding territorial environmental limits.

Technical liquidation is being completed in the field Most – Ležáky and reclamation will be finished close to the town of Most and the residual shaft will be flooded.

In 2005, MUS, a.s. reported a total of 5,599.2 hectares of reclaimed areas, out of which 1,508.45 ha represent agricultural reclamation, 2.781.87 ha forestry reclamation, 134.27 ha water and 1,174.61 ha represent other reclamation including parks.

16 exclusive unused brown coal fields in SHP can be viewed as a potential raw material reserve; approx. 19 fields with non-balance reserves are currently of no economic significance. In 2005, exclusive field Chomutov-pilíř was closed due to a conflict of interest

with urban development authorities and the remaining reserves were transferred to the field Droužkovice-vychod.

The former opencast mine Medard – Libík marked the termination of technical reclamation of the residual shaft by covering up with soil and sealing the bottom to the design level, restoring southern, western and eastern reverse slopes. The planned area of hydric reclamation at the operation level of 401 m above sea level will be of 501.4 ha. At the present the reclamation of Medard – Libík with burrows Lítov – Boden and Gustav belong to the urban solution and has been largely developed. Out of the whole area of 1,183 ha, 83.61 have been completed. The reclamation of 492.68 ha has not been finished and 606.71 ha are finished as of the commencement in 2005 of which 497.88 ha represent hydric reclamation. The suggested reclamation in Lítov – Boden is also developed to a high degree. Out of the total area of 723 ha finished reclamation as of 1 January 2005 represents 378.42 ha; reclamation in process represents the area of 334.88 ha; only 9.7 ha remained at the beginning in 2005. In 2005, the framework of reclamation work in the former mine Michal included the termination and operation of construction objects Vodní areál Michal. The active opencast mine Jiří is assumed to undergo optimum hydric reclamation within the coverage of mining activities and combined agricultural and forestry reclamation will be carried out in the opencast mine Družba.

Energy lignite is also mined by Lignit Hodonín, s.r.o., in the only mine of Hodonín u Mikulčic in Moravia with total annual production of 467,000 tons. Lignite is used by the redeveloped power station Elektrárna Hodonín, which takes off 98% of the production. The total of 9 exclusive lignite fields in the Czech Republic may be considered a possible raw material reserve; only two fields Ježov – Pokrok – Barbora 2 and Radčice – Chvaletice with non-balance reserves are of no economic significance.

Brown coal is and will be the main source for the electricity production, although the development of mining and its surface extent were limited by the state. The extent of restoration of coal power stations is depending on the availability of brown coal, which is limited by Government Resolution No. 444/1991. Territorial environmental limits are a key part of the recovering programme of the North Bohemian region handicapped by mining and they are a presumption of a possible change in the economic development of the Ústecký region.

One of the main objectives of the Raw Material Policy of the Czech Republic approved by the Government Resolution No. 1311/1999 is “to secure the protection of brown coal reserves past the environmental limits and keep it as a reserve in case of its use by future generations”. In 2005, the Government decided on the progress of the Československé armády mines (MUS, a.s.) only.

Within the territorial environmental limits of mining a total of 3.476 billion tons of utilisable brown coal reserves are blocked. In 2005, the Ministry of the Environment received a proposal for the depreciation of reserves by transferring them into the category of non-balance reserves past the territorial environmental lines determined in the field Ervenice – Velkolom ÈSA and the mining areas Komořany, Ervenice, Záluží and Dolní Jiřetín

IV.2.3 Uranium Ores

Since 1945 approx. 109,000 tons of uranium has been extracted in the Czech Republic. Since the end of the 1980s pitchstone mining has declined due to the exploitation of some fields and mainly due to a significant consumption decrease. Current mining is carried out only in one

field (Rozna) and the mining activities are planned to stop in 2008. In 2005, 82,000 tons of radioactive resources were extracted from that field.

The principal and primary task of uranium mining, both in field extraction and in mine liquidation and elimination of the consequences of mining, is to minimise the negative impact of radioactive nuclides and other dangerous pollutants, which form part of the mineral succession of individual uranium fields, on the environment and public health.

Even though most mines have been extracted, significant reserves of pitchstone have remained in North Bohemia and in some smaller locations of Western Moravia (Brzkov, Veznice etc.). The liquidation of uranium underground mines and the elimination of mining consequences and treatment lies in the liquidation and security of shaft pumps or the free space after underground mining, in the creation of a new regime of mine water, the demolition or a new use of surface objects, the reclamation of dumps, synclines and downthrows, and mainly the development and reclamation of sludge pits of chemical preparation plants. A specific problem is the redevelopment of chemical mining in the field Stráž pod Ralskem (mining stopped in 1996). The elimination of acid solutions from underground collectors and the redevelopment of rock environment will last several dozen years.

IV.2.4 Oil and Natural gas

Oil and natural gas fields are interconnected. The extraction of oil has risen since 2001 and stabilised at approx. 300,000 tons per year. In 2005 the extraction of oil was 306,000 tons. The extraction of oil in the Czech Republic covers only 4 – 5% of the domestic consumption. Czech oil is of a high quality because it has almost zero sulphur content and therefore it is suitable e.g. for the pharmaceutical industry. The extraction of natural gas has also been significantly revived. In 2005 the volume of natural gas extraction was 356.2 million m^3, which is a 103% increase in comparison to 2004 (175.3 mil. m^3); nevertheless, the domestic production covers only 1 – 2% of the domestic consumption.

IV.2.5 Limestone

Limestone extraction has had a long tradition in the Czech Republic. In the last years, the standard use of limestone has been accompanied by limestone treatment for desulphurisation of heat power stations. The development of the extraction in the last 10 years and in comparison to 1990 is provided in the following table.

Table IV.2.1

Limestone extraction in the Czech Republic (thousands of tons)

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
High percentage limestone	7,439	4,151	4,406	4,536	4,526	4,673	4,784	5,071	5,017	4,573	4,629	4,199
Other limestone	6,470	5,097	5,287	5,346	5,216	5,189	5,138	4,186	3,632	4,444	4,666	4,500
Clay limestone	1,054	713	832	1,058	1,353	1,429	1,380	1,183	1,150	1,174	1,215	1,190
Carbonates for agricultural purposes	233	131	85	72	74	87	74	83	73	45	58	23
Cement and corrective rocks	796	658	643	241	260	296	267	222	163	201	232	278
Dolomites	293			294	389	325	430	364	314	416	345	419
Total	16,285	10,750	11,253	11,547	11,818	11,999	12,073	11,109	10,349	10,853	11,145	10,609

Source: CGS, Balance of Inventories – Geofond

The total amount of extraction in 2005 compared to last year showed a slight decrease (roughly 3%) and a shift of extraction towards less valued raw material. The extraction of high-percentage limestone decreased on the year-to year basis by approx. 9.3%. Nevertheless, the total production was almost by a third lower than in 1990.

IV.2.6 Extraction in Protected Countryside Areas

The extraction of mineral resources in protected countryside area has negative impact on the environment. Since the early 1990s the extraction in the protected countryside areas has markedly decreased. In 1994 the mining was at less than 50% compared to 1990 and in 2005 approx. at 25% compared to 1990 as far as mining in protected countryside areas is concerned (Table IV.2.2). Black coal and clay extraction was completely stopped; as far as other raw materials are concerned the extraction in protected countryside areas was gradually dropping. Currently it is mostly limestone that is mined in the protected countryside areas, the reserves of which are concentrated in the areas of Bohemian and Moravian karst areas where the mining, primary treatment and transport of final products significantly influence individual elements of the environment and cause other negative impact on the most valuable areas of both karst regions. In this relation, it is important to say that in the 1960s and 1980s vast mining areas were identified, with some exceptions, in a number of fields before the establishment of relevant protected countryside areas.

Table IV.2.2

Extraction of exclusive fields of selected mineral resources in protected countryside areas (thousands of tons)

Raw material	1990	1995	2003	2004	2005
Limestone	6,632	3,529	3,382	3,427	3,096
Black coal	915	454	0.0	0.0	0.0
Natural gas	0.0	1.0	3.0	3.0	4.9
Clay	205	105	0.0	0.0	0.0
Natural sand	13.0	8.0	0.4	0.4	0.0
Feldspar	86	97	269	296	296
Total	**1,219**	**665**	**272.4**	**299.4**	**300.9**

Source: CGS – Geofond

IV.3 Manufacturing and Building Industry

IV.3.1 Manufacturing industry

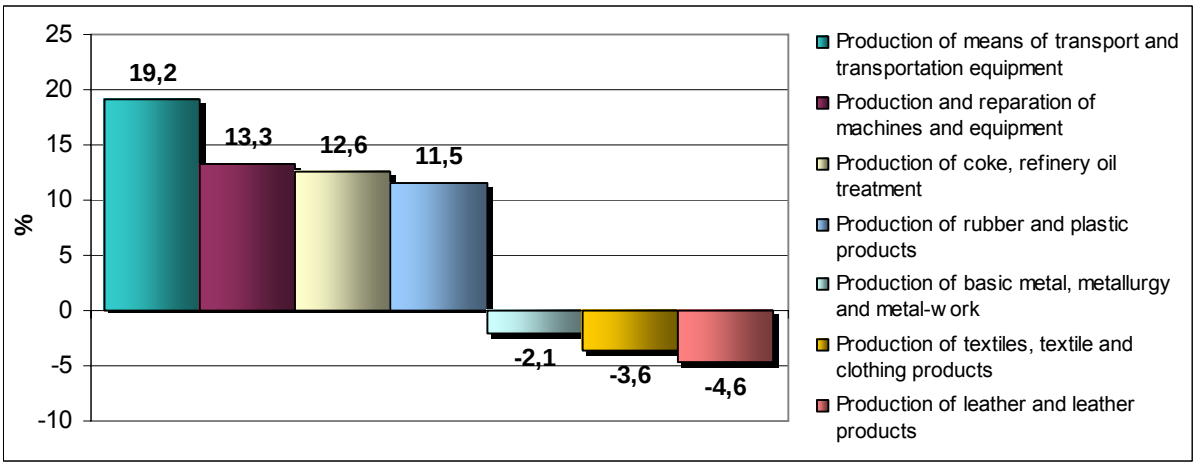
In 2005, there was a continuing increase in industrial production (measured by industrial production index of 105.7%), however, the growth rate was slower than in 2004 (109.5%). The decisive factors of the development of the industry in 2005 were mainly the entrance of other foreign investors, the start of new production capacities mainly in automobile industry, a significant growth of industrial company export, stable fuel and energy supplies for the

existing and new production capacity or a significant growth in labour productivity, mainly of new capacities.

Factors with negative effects on the growth of industrial production include the growth of prices of imported raw materials for the manufacturing industry (oil) and competition import of cheap consumer goods, which marked mainly a decrease in the production in textile and leather manufacturing industries (see Graph).

Graph IV.3.1

Growth / fall in industrial production of selected manufacturing industry branches in 2005



Source: CSO

In the manufacturing industry[1] there have been significant structural shifts. One of the major factors that contributed to the increase in engineering production was a high rise in the production of means of transport (19.2%) and also the production and repairs of machines and equipment (13.3%). The increase in the production of coke and refinery oil treatment and the production of rubber and plastic products was also significant, which add or substitute metallurgy and metal-working products, the production of which decreased by 2.1%.

Automobile industry and related branches became key sectors and the successfulness of Czech economy depends on automobile industry more than in the majority of other Central European countries.

IV.3.1.1 Industrial Zones

In the Czech Republic industrial zone areas have been expanding mainly due to advantageous geographical position and the position of the country on the crossroads of European transport corridors. Industrial zones have to be linked to the national highway network. Therefore a biggest number industrial parks are being built in the Czech Republic along highways, the highways D1 Prague – Brno, D5 Pilsner – Rozvadov and D8 Prague – Dresden being the most important ones. In Nošovice near Ostrava, a new industrial zone is being built, in which the car factory Hyundai will have its European plant.

[1] It is necessary to distinguish between the industry and the manufacturing industry: **industry** = mining and treatment of mineral resources + **manufacturing industry** (generally the production of final products) + production (treatment) and distribution of electricity and gas, heat and water (power engineering).

The development of industrial zones is never without negative impact on the environment, mainly in relation to prospective possible risks to the environment connected to the operation of industrial zones and relating processes – building of transport infrastructure and establishment of other logistic centres. This is connected to an increase in freight, the noise load from traffic and transport, currently monitored emissions, odour including the definite appropriation of agricultural land for a new zone (green fields). Therefore in 2002, the support of regeneration of the existing unused lands was started (brown fields – e.g. in former industrial areas, landscape damaged by mining, deserted military areas and agricultural objects). Within the regeneration of brown fields in 2005, the **Programme to Support the Development of Industrial Zones**[2] (PPRPZ) was used to support two projects – regeneration of the industrial area Škoda Plzeň and former military airport at Žatec – SPZ Triangle with a sum exceeding CZK 521 million. On the basis of the CzechInvest Strategy for 2004 – 2006 (provided to the Government on 12 May 2004), CzechInvest expects that in this period regeneration of 330 ha of brown fields will be supported.

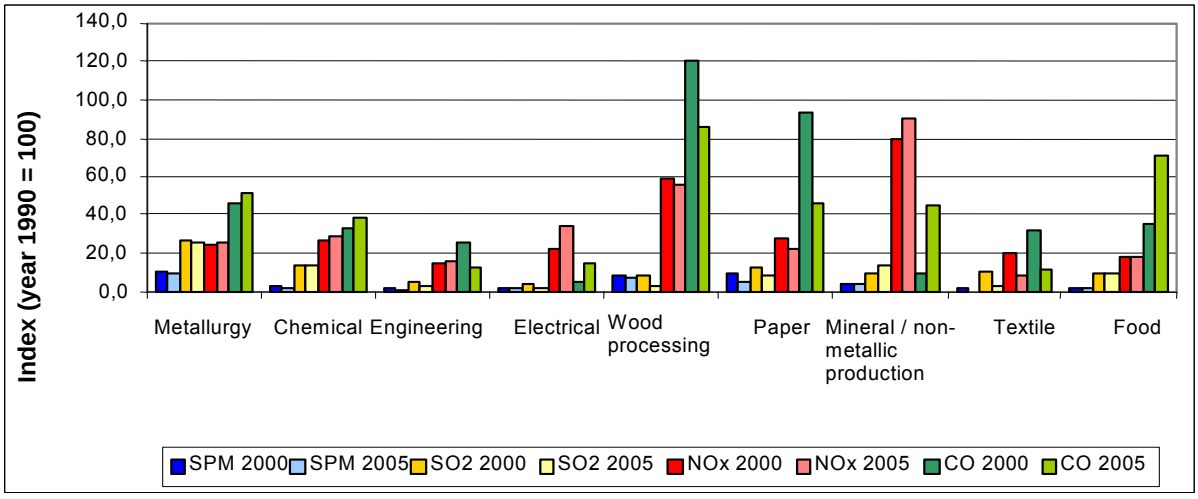
In 2005, in order to support the development of industrial zones within the PPRPZ, CZK 1.367 million were used from the state budget, due to which 14 industrial zones of 1.597 ha were supported (out of which 12 meant the continuation of former support projects). According to the extent of the project and the amount of the grant, five of these industrial zones have a strategic significance to national economy.

IV.3.1.2 Manufacturing Industry Emissions

Graph IV.3.2 shows the comparison of the development of the emissions of selected pollutants in the air between 1990 and 2005 classified according to branches (Branch Classification of Economic Activities). The developing trends of emissions of individual branches are dependant on e.g. the production cutback (textile industry); they are also influenced by significant investments in the installation of equipment to decrease emissions (SPM and SO_2 in metallurgy).

Graph IV.3.2

Emissions of selected primary pollutants in selected industrial branches (extra big and big air pollution sources) between 2000 and 2005* in comparison to 1990 (index 1990 = 100)



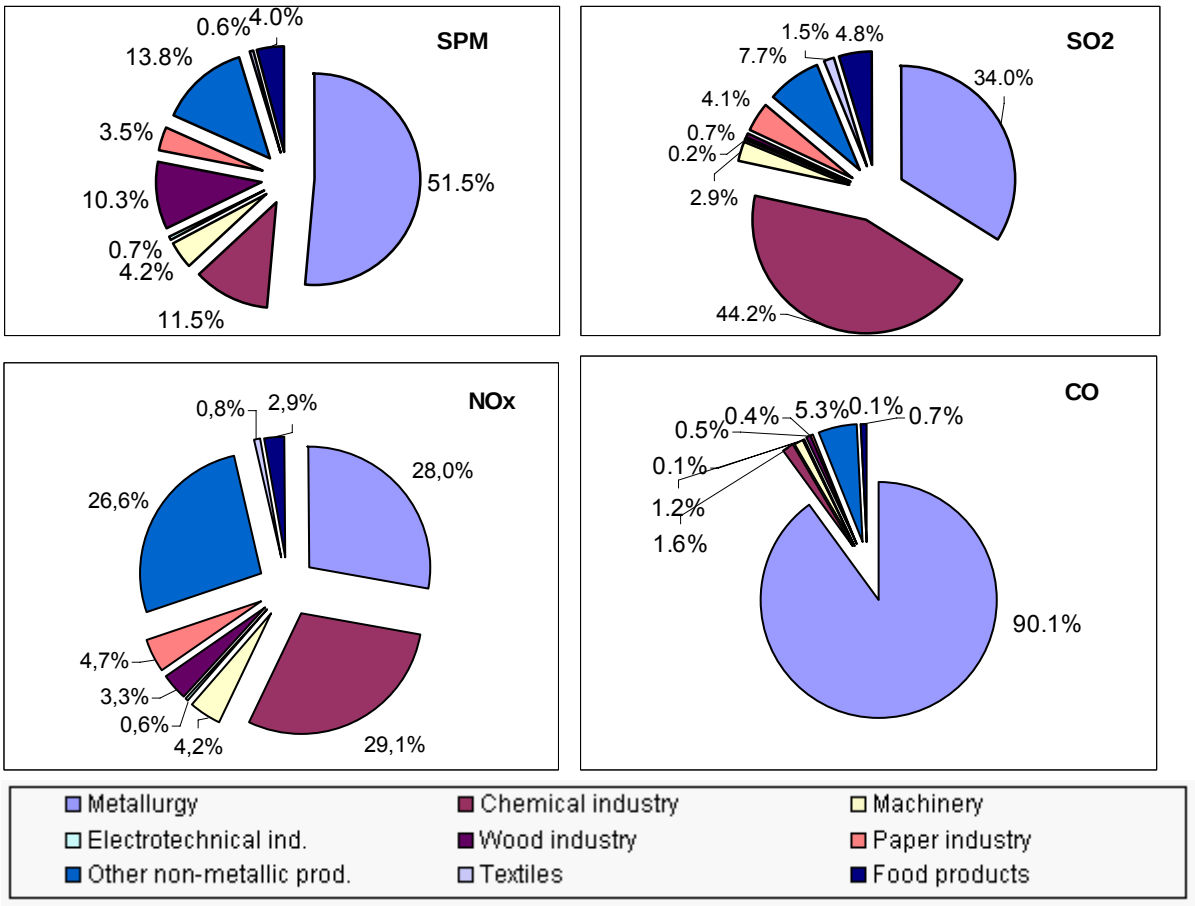
** Preliminary data* *Source: CHI*

[2] The programme was announced by the MTI. CzechInvest participates in the implementation.

In spite of that the amount of emissions between 2000 and 2005 cannot be noted e.g. in the production of mineral non-metallic products, chemical, food or electrical industry, which is connected to the development of the relevant branch. It is also obvious that the current emissions in any branch do not reach the same level as in 1990. The increase in emissions of nitrogen oxides in glass industry and in the production of cement has significant. In 2005 the emissions from these branches represented more than 26% of all nitrogen emissions of the manufacturing industry.

Graph IV.3.3

Share of selected manufacturing industry branches in total emissions, SPM, SO_2, NO_X CO in 2005* (% of all emissions from large and extra big sources)



Source: CHI

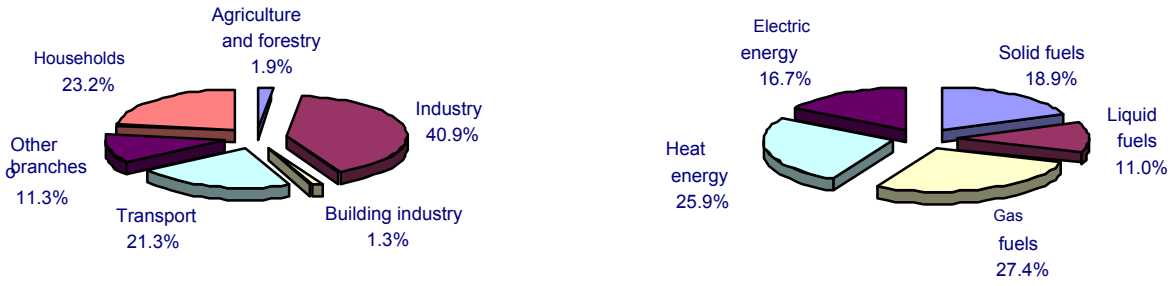
The share of SPM, SO_2, NO_X and CO emissions from selected branches in the total emissions of the manufacturing industry is represented in Graph IV.3.3. The metallurgical, chemical and mineral / non-metallic industries account for the biggest share of exhaust emissions. The metallurgical industry dominates the SPM and CO emissions – in case of CO more than 90% participate in the emissions. In case of SO_2 and NO_X emissions the largest pollutant is the chemical industry.

IV.3.1.3 Energy Consumption and Industrial Energy Intensity

In relation to the final consumption[3] of fuels and energy, the share of industry in the final consumption in 2004 was 40.9% (see Graph IV.3.4). In comparison to 2002 the share decreased by almost 2% mainly as a consequence of a massive increase by 21.7% in the final consumption within the transport sector. Despite this relative decrease, the final industry consumption kept rising due to its increasing efficiency, and between 2002 and 2004 the increase was almost 3%.

Graphs IV.3.4; IV.3.5

Share of sectors in the final consumption (%) (2004); Share of the final fuel and energy consumption in the total final consumption in industry (%) (2004)

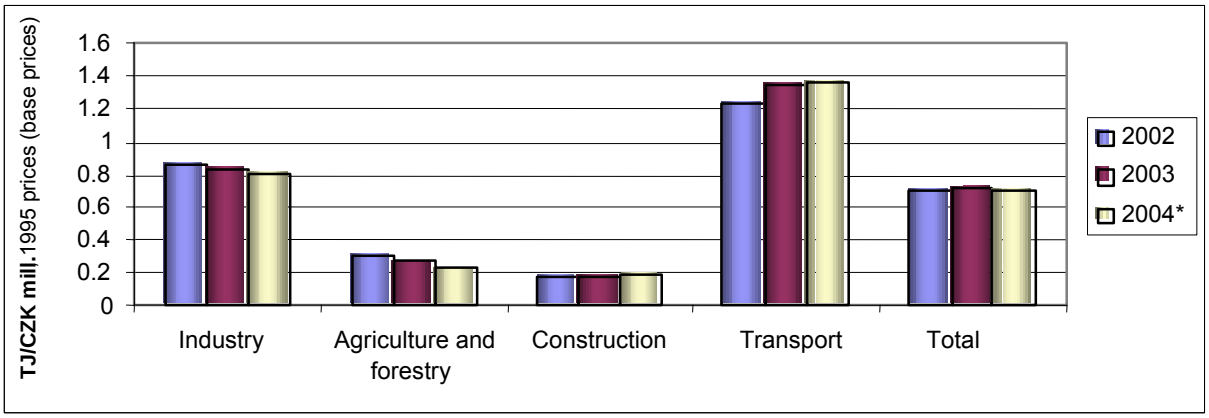


Source: CSO

The increasing consumption of gaseous fuels (mainly natural gas) in comparison to solid fuels (mainly black and brown coal) is assessed positively with regard to the environment within the air, water and soil emissions. As shown in Graph IV.3.5, the largest share of the total final consumption was made by the consumption of gas fuels (27.4%) in 2004, which in comparison to 2002 meant an increase by almost 2%. Solid fuels then form roughly a 19% share of the total consumption in industry, with an approximate 2% decrease since 2002.

Graph IV.3.6

Energy intensity[4] of industry and other selected sectors (2002–2004)



Source: CSO, CENIA calculation

[3] The final consumption is the consumption determined before the input into appliances, in which it is used for the final utility, not for the production of other energy (except for secondary energy sources).

[4] Energy intensity is calculated as a proportion of the final energy consumption and GDP in base prices.

Graph IV.3.6 shows an obvious decrease in the industrial energy intensity, which is necessary not only to increase its competitiveness, but also to fulfil the requirements of new environmental and energetic legislation, and it is connected mainly with the introduction of new production low-emission and low-waste technologies of minimal energetic and raw material intensity by increasing the share of renewable energy and raw material sources and by achieving high effectiveness not only in the final use of energy, but also in mining, treatment, processing, transformation and energy distribution. On the other hand, energy intensity of transport has been growing, mainly due to a massive increase in the consumption of liquid fuels in the ever-growing car transport and their inefficient use as a result of the decreasing average load of cars and trucks.

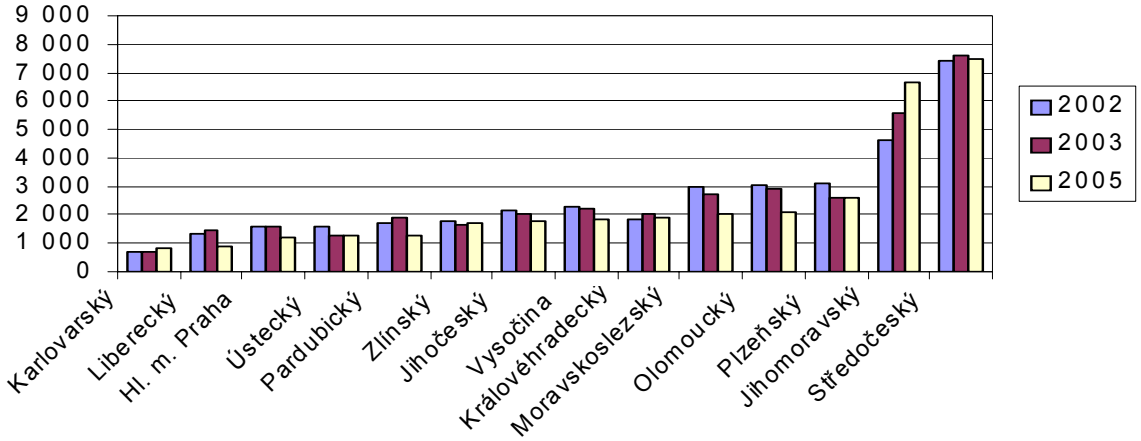
IV.3.2 Building Industry

IV.3.2.1 Impact of Building Industry on the Environment

The building industry share in the creation of GDP dropped from 6.3% of 2004 to 6.1% in 2005. Building industry participates in the improvement of the environment due to the construction of sewage water treatment plants, municipal incineration houses, recycling plants, controlled dumps and desulphurisation facilities. Graph IV.3.7 shows a slight decrease in the number of issued building permits for the above mentioned facilities from 36,187 of 2002 to 33,691 in 2005.

Graph IV.3.7

The number of issued building permits for environmental protection facilities in the regions in 2002, 2003 and 2005



Source: CSO

The negative impact of the building industry on the environment also includes, besides construction materials mining, the process of construction and operation of buildings, highways and speed roads and the production of building and demolition waste, which form approx. 40% of all waste. Producers of the building materials are among significant polluters and main consumers of unrecoverable material and energy sources and quality drinking water.

IV.3.2.2 Impact of Construction Materials Mining on the Environment

Mining of building blocks, gravel and brick raw materials damages some of the protected countryside areas – e.g. the Protected Countryside Area of České středohoří, Broumovsko, Blanský les, Třeboňsko and the Protected Countryside Area of Litovelské Pomoraví. The main negative impacts of the construction materials mining are mainly the unrecoverable change of the countryside and the influence on biosphere, land appropriation, accumulated dust and noise emissions and an exceeding load of the road network with freight.

The mining of construction materials would not have such negative impacts on some elements of the environment, if the material from demolished buildings was recycled in a bigger extent.

The following Table IV.3.1 shows a decrease in the mining of mineral resources in exclusive fields of protected countryside areas, when the total mining of selected raw materials decreased more than by 60% within the last 15 years.

Table IV.3.1

Mining of selected mineral resources in exclusive fields of protected countryside areas (thousands of tons)

Raw material	1990	1995	2000	2001	2002	2003	2004	2005
Building block	7,744	3,318	3,169	2,601	2,470	2,865	2,752	3,171
Gravel	6,271	2,797	1,532	1,343	1,676	1,663	1,672	1,649
Brick raw materials	293	20	0	0	70	63	27	99
Ornamental stone	187	185	102	28	28	39	33	37
Total	14,308	6,135	4,701	3,944	4,216	4,591	4,451	4,919

Source: *CGS – Geofond*

The mining of the three most demanding building raw materials is annually slightly increased in exclusive and non-exclusive fields by 5% compared to 2004 – see Table IV.3.2. The increasing consumption of such materials is connected to projects of new residential and non-residential buildings, the construction and modernisation of engineering constructions (railway corridors, railway network, water constructions) and repairs of damage caused by 2002 floods. In addition, since 2002, the demand for quality grain composition of gravel material has increased, whereas investors' pressure on the opening of higher quality gravel fields is growing mainly for the construction of speed communications and international highways.

This data shows that the structure of building material mining brings a year-on-year increase and a desirable decrease in the gravel share (from almost 55% of 1990 to 45% in 2005) in favour of ground rocks (from 38.7% of 1990 to 45% in 2005), the mining of which poses lower risks to the environment. The highest year-on-year growth of mining was the one of building stone (8 – 9%), followed by mining of gravel (3%). Compared to 2004, the production of brick raw materials decreased by approx. 6%. The production of building blocks in non-exclusive fields represents a growth of almost 30% compared to 2004. In the EU countries, mining in opencast mines is frequently substituted by materials of natural renewable sources. According to the Eurostat data, some EU countries recycle over 80% of building and demolishing waste, while in the Czech Republic it is less than 15%.

Table IV.3.2

Mining of construction raw materials in exclusive and non-exclusive fields as of 1 January each year [thousands of m ^{3}]

Type of raw material	1990		2003		2004		2005	
Exclusive fields (EF) / Non-exclusive fields (NF)	EF	NF*	EF	NF	EF	NF	EF	NF
Building blocks	16,209	800	11,210	960	11,972	875	12,822	1,268
Gravel	20,711	3,500	9,105	4,300	8,859	4,793	9,075	4,994
Brick raw materials	2,622	100	1,626	175	1,554	326	1,543	216
Total construction raw materials (excl./non-excl.)	39,542	4,400	21,941	5,435	22,385	5,994	23,440	6,478
Whole production of construction raw materials	43,942		27,376		28,379		29,918	

** Data on mining in non-exclusive field is only approximate*

Source: CGS – Geofond

IV.3.2.3 Construction Materials of the Supporting Structures of Family and Apartment Houses

Family and apartment houses are distinguished according to the type of supporting structures into walled, assembled, wooden and other types of used material (including combinations). According to Table IV.3.3, which describes the influence of building constructions on the environment, steel is considered to be the most emissive material and the least emissive material is wood (related to kg or m³). The order changes when considered from the viewpoint of material capacity (related to solidity MPA unit). Brickwork uses the highest amount of energy (1 470 $MJ.m^{-3}.MPa^{-1}$).

Table IV.3.3

Specific ecological parameters of building constructions

Parameter	Unit	Steel construction	Brickwork	Wood construction
Energy consumption	MJ/kg	30.0	6.0	4.0
SO_2 Emission	g/kg	1.8	1.0	0.0
Particulate matters emissions	g/kg	5.0	0.5	0.0
Water consumption	m³/t	55.0	0.8	0.0

Source: Pytlík Petr, Ekologie ve stavebnictví

Development and Conditions of Supporting Structures in the Czech Republic

As Table IV.3.4 shows, family houses completed between 1997 and 2005 were, similarly to more recent supporting walls, mostly made of bricks and shaped bricks. Gradually by 2005 the popularity in wooden material had been rising and their share grew to 3.0% out of the total of 12,833 family houses. The biggest number of family houses was built in the Moravskoslezský, Zlínský, Pardubický, Liberecký and Středočeský regions.

The supporting structures of newly completed houses developed differently. Walled constructions remain to be the most used supporting material, but their share is dropping. In the stage of transformation of the Czech economy, the transfer from panel technologies used before 1990 into walled constructions meant the biggest change in the material of walled construction in housing development. Wooden constructions play an important role in building of apartment building.

Assembled family houses were mostly built in the Středočeský and Ústecký regions and show a declining trend similar to apartment building.

Table IV.3.4

Types of supporting structures in finished family and housing units between 1997– 2005 [v %]

Year	Supporting structures of family houses				Supporting structures of apartment building			
	walled	assembled	wooden	other	walled	assembled	wooden	other
1997	93.7	2.7	1.4	2.2	58.5	22.5	-	19.0
1998	93.7	2.4	1.5	2.4	65.3	10.6	0.1	24.0
1999	94..6	2.5	1.1	1.8	52.0	19.8	0.7	27.5
2000	95.4	1.3	1.3	2.0	70.3	9.4	-	20.3
2001	95.0	1.6	1.6	1.8	71.3	2.8	-	25.9
2002	94.3	1.7	1.4	2.6	63.7	6.8	0.5	29.0
2003	93.9	1.7	2.4	2.0	68.0	9.7	0.1	22.3
2004	94.1	1.6	2.6	1.7	75.9	4.6	0.5	19.0
2005	93.5	1.7	3.0	1.9	63.8	6.2	0.8	29.2

Source: CSO

IV.3.2.4 Environmentally Friendly Construction Materials

Over the last years there has been an increasing trend to use construction materials made from natural renewable raw material sources (RS). A natural material from RS is a technologically processed organic material of plant or animal origin. Waste products from agricultural or industrial production are used as a raw material for the production of construction materials, e.g. straw, which is used as filling of wooden frames or ceiling insulation, sheep's wool as insulation blankets, granulated cork, wooden shavings, etc.

In 2005 new progressive construction materials started to be used in the Czech Republic, complying with strict heat technical criteria of minimal environmental burden, 100% recyclable and of a long life-time. Construction materials are produced on the basis of natural mineral resources, during the chemical mechanical reaction of silicon, sodium and water compounds. Due to the great fraction extent, they have a wide spectre of use in the building industry from the production of plaster, mortar, stucco mixtures, including light concrete, heat insulation plates, granular fill and inflammable paintings and adhesives.

IV.3.2.5 Low-energy and Passive Houses

Recently sustainable construction and minimisation of negative impacts on the environment have started to appear on the Czech market in form of low-energy and passive houses.

Classically built houses use 160 kWh/m^2/year for heating (according to the ČSN standard) whereas a low-energy house requires < 50 kWh/m^2/year and a passive building needs even

less energy for its operation (< 15 kWh/m^2/year). These environmental houses produce neither CO_2 emissions, nor emissions of other pollutants, which are created from energy conversion, and due to controlled airing they have healthy inside environment and low heating overhead expenses. Due to excellent heat isolation, the walls and windows of the interior have a constant surface temperature around 20°C. Special emphasis is laid on the air-tightness of all parts of the building. This house uses and recuperates waste heat produced by inhabitants and electrical devices together with solar energy.

IV.3.2.6 Impact of Linear Construction on the Environment

Building of linear constructions and their operation in the Czech Republic represents, similarly to other developed countries, one of the main factors with negative impact on the quality of the environment. The largest proportion in this sphere applies to road transport, the negative influence of which is reflected mainly in the production of air polluting emissions, high noise levels and, last but not least, in the appropriation of the land during the construction or redevelopment of road and highway networks.

The Czech Republic is one of the EU member countries, the transport infrastructure of which is the densest within both the railway transport and the road transport. However, the technically neglected state remains to be a problem, reflecting the unsuitable parameters, transport defects, insufficient capacity and quality.

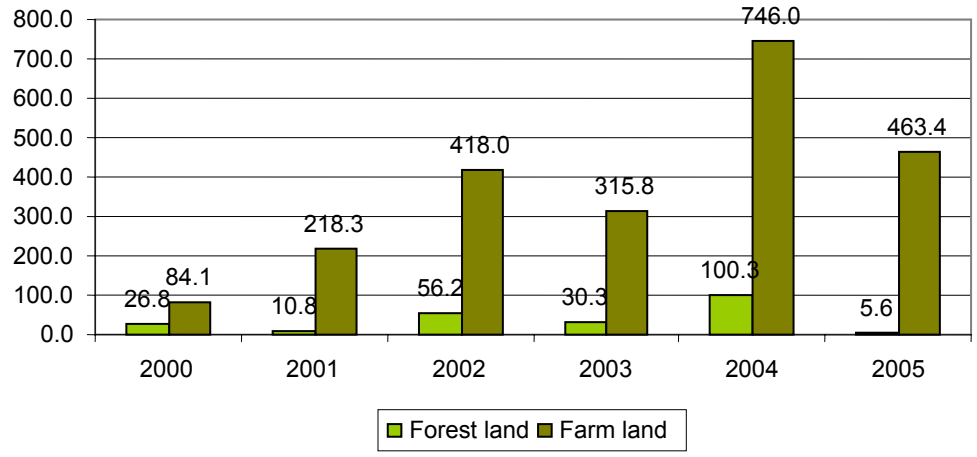
Land appropriation for individual means of transport differs. The largest part of the land is taken by road transport (78%) and railway transport (approx. 21%), which have shown a slight increase from 9,444 km in 2000 to 9,613 km of railway routes in 2005. As results from Graph IV.3.8, the total appropriation of forest and farm land due to the road network dropped from 846.3 ha in 2004 to 469.0 ha in 2005, when the total length of highways and 1st, 2nd and 3rd class roads (excluding local roads) was 55,510 km year (5.56 ha taken by 1 km of a four-lane highway, 3 – 4 ha by additional construction; total 8 ha by 1 km of a highway).

The construction of roads in many cases leads to a vast change of the landscape, esthetical quality of the territory, damage to the ecological stability of the territory and valuable natural elements (Territorial system of ecological stability, natural parks and important countryside elements). The operation itself influences both the fauna and the flora and leads to unrecoverable countryside fragmentation and interruption of migration routes. During the construction of highways, speed roads and other transport areas (e.g. park places for trucks), the negative impact is even bigger. It is determined by the width, construction and traffic intensity of the roads.

Countryside fragmentation restrictions may be achieved by an efficient use of the existing transport capacities and routes, co-ordination during the construction of transport infrastructure and a quality evaluation of the use of countryside in favour of the environment and nature protection.

Graph IV.3.8

Appropriation of forest and farm land by road infrastructure between 2000 and 2005 [ha]



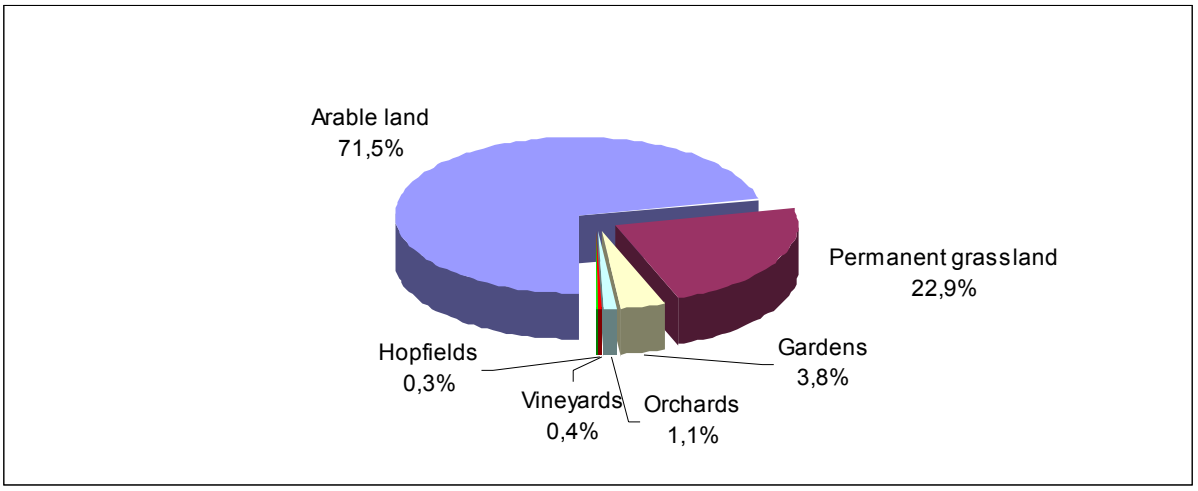
Source: Road and Motorway Directorate of the Czech Republic

IV.4 Agriculture

Agriculture is one of the most important factors effecting the structure and function of countryside. As of 31 December 2005, the area of agricultural land in the Czech Republic was 4,259,000 ha, i.e. 54% of the area of land resources of the Czech Republic, which means an annual fall of 6,000 ha. Of the total area of agricultural land, more than 71% was the arable land, the area of which has slightly dropped by approx. 7,000 ha since 2002. On the contrary, permanent grass vegetation has slightly increased in recent years. The following graph shows the structure of agricultural land resources in 2005.

Graph IV.4.1

Land resources structure in the Czech Republic in 2005 [1,000 ha]



Source: ČÚZK

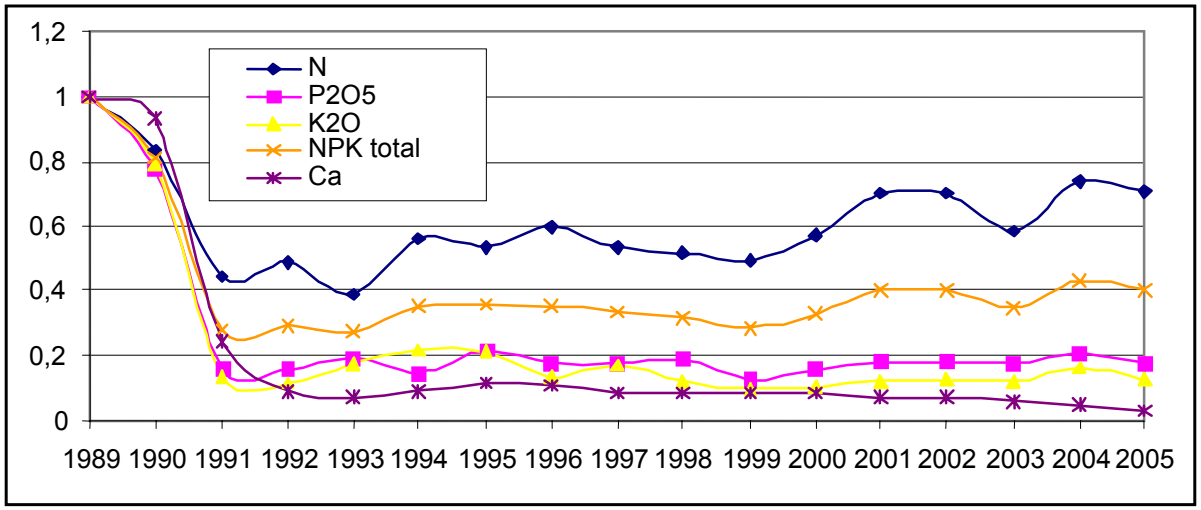
According to the information from the Research Institute of Ameliorations and Soil Conservation, in 2005 approx. 20,000 ha of agricultural land could be irrigated (the total area of the irrigation system and thus of land potentially capable of irrigation is 155,000 ha, but currently a substantial part of irrigation is not functional).

A positive phenomenon in agriculture is a slight increase in integrated systems of crop cultivation. This cultivation system uses environmentally and economically acceptable provisions, which positively regulate fruit production and fruit quality with special regard to minimising the contents of foreign substances in fruit and with a preferential use of natural plant protection factors (resistant species, biological and non-chemical protection methods). The integrated fruit cultivation is of the highest significance, in relation to the ranges of these areas (9,312 ha, 178 business) followed by the integrated system of vine cultivation (6,822 ha, 163 producers). In the forefront there also is the issue of the integrated system of vegetable cultivation – in the Czech Republic this cultivation system has been occupied by vegetable-growing specialists for almost 2 years in the so-called transition period (3,357 ha, 38 producers).

The estimate of the area, in which minimising and soil-protecting technologies are used, remains at the same level as in 2004 (approx. 30% of arable land), although further slight enlargement of this cultivated area is assumed.

Graph IV.4.2

Consumption of NPK nutrients in industrial fertilisers (kg/ha of agricultural land) and consumption of calcium fertilisers (mil. t), Czech Republic, 1989–2005 (index, year 1989 = 1)



Source: MA

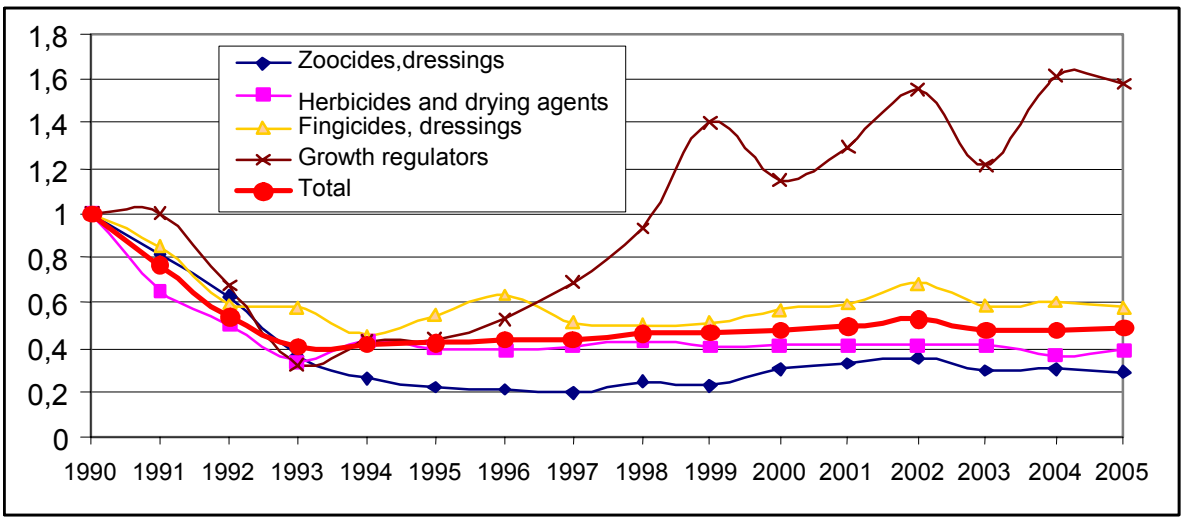
Compared to 2004 the consumption of fertilisers slightly decreased in 2005 after a growth in the consumption of mainly nitrogenous fertiliser between 2003 and 2004, as apparent from Graph IV.4.2. The consumption of calcium was significantly lower as well. Besides, 4,259,000 tons of farm fertilisers was used on the agricultural land, which represents another 54.4 kg of clean nutrients/ha of agricultural land.[5]

Compared to 2004, the use of active ingredients in the plant protection preparations slightly increased in 2005, mainly due to an increased use of herbicides and drying agents. The category of growth regulators represented a significant decline, the consumption of which is still approximately 60% higher than in 1990, see Graph IV.4.3.

[5] For further information see Chapter III.3.2.1 Soil permeability.

Graph IV.4.3

Total consumption of plant protection preparations according to the purpose of use (kg of active ingredient) in the Czech Republic, 1990-2005 (index – year 1990 = 1)



Source: MA. The reports on pesticides are classified according to FAO

Pursuant to the Resolution of the European Commission 2004/248/EC Atrazine has been prohibited to use since 1 August 2005. This Resolution is binding for the Czech Republic, too, and became part of the Czech legislation. This substance contains triazine herbicides and it represents the most common water pollutant in the Czech Republic from those that are monitored.

In 2005 agricultural production caused 9 accidents of the total 264 reported to CEI; 2 were caused by forestry and one by fishing production. The number of accidents caused by agriculture keeps decreasing.

According to the estimate of the Agricultural Technology Research Institute energy, consumption in agriculture was 16 million GJ in 2005. The data cannot be compared to the previous year, because there was a change in the calculation method. Motor oil consumption was 508.1 million litres.

In 2005 61 decisions issued related to integrated permits were issued in agriculture within the meaning of Act No. 76/2002 Coll., on Integrated Prevention (69 decisions in 2004 and 5 decisions in 2003). Besides, the IPPC also enforces measures to decrease the animal production odour.

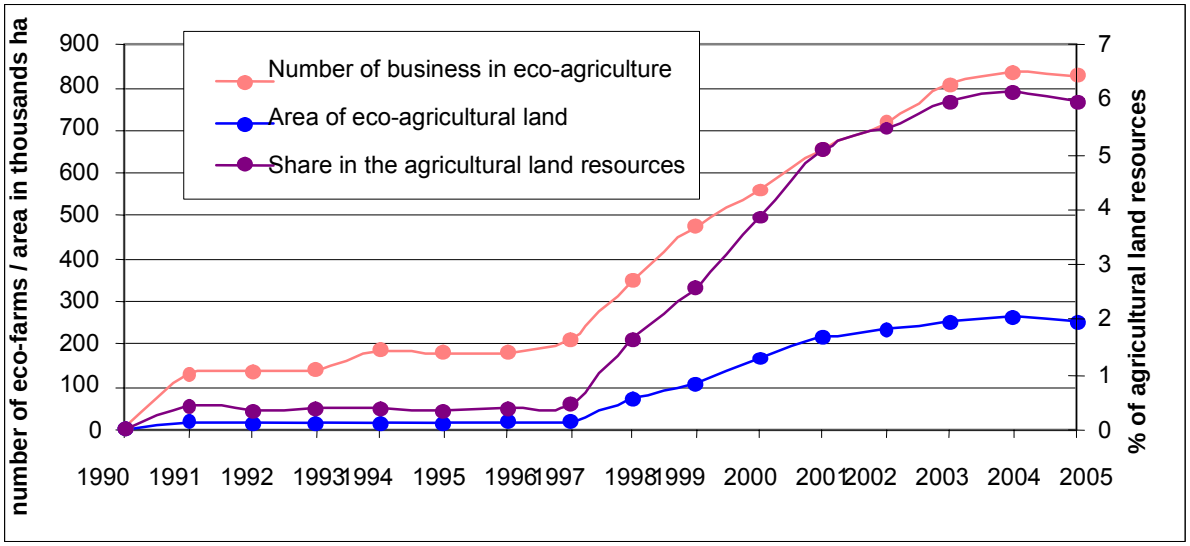
An important agricultural factors of the Czech Republic are the subsidies provided from the state budget and mainly from the EU funds within the CAP.

Ecological Agriculture

In 2005, the area of ecologically cultivated land decreased on the year-to year basis; its share in the agricultural land resources is still almost twenty times higher than in 1992 (from 0.36% to approx. 6%); see the following graph.

Graph IV.4.4

Development of ecological agriculture in the Czech Republic between 1989 and 2005



Source: Ministry of Agriculture

The largest growth of ecological agriculture came between 1998 and 2001 in connection to the changes in the policy for subsidies for ecological farmers in 1998. Since 2004, ecological agriculture has been supported by the Horizontal Agricultural Development Plan of the Czech Republic. Almost 90% of ecological agriculture is on permanent grass vegetation; the share of arable land is approx. 7.5%. Animal production prevails, mainly beef cattle breeding.

IV.5 Transport

IV.5.1 State and Development of Transport Capacities

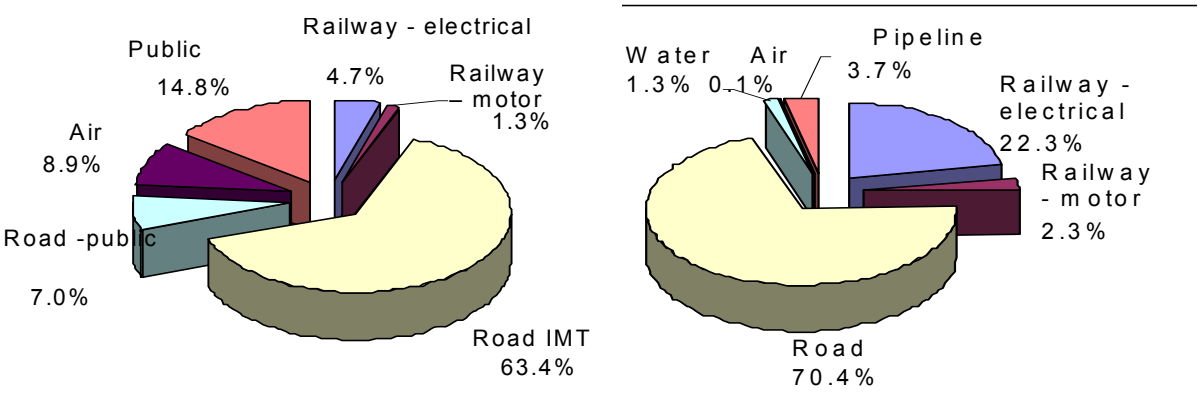
Structure of Passenger Transport and Freight in the Czech Republic in 2005

Passenger transport in 2005 was dominated by individual automobile transport (IAT) accounting for 63.4% of the transport volume. Public transport kept a relatively good position with 14.8% of the transport volume. Air transport contributes to passenger transport with 8.9%, road public transport (regular line buses) with 7% and passenger railway transport with 6%.

The freight in the Czech Republic in 2005 was dominated by road freight with 70.4%. The second place was taken by railway freight with 24.6%. The share of pipe, water and air transport was small.

Graphs IV.5.1 – 2

Capacities of individual means of passenger transport in millions of persons/ km (IV.5.1) and freight in mil. tkm (IV.5.2) in the Czech Republic in 2005 (% of total capacity)



Note: *IMT= individual motor transport (= indiv. automobile transport)*

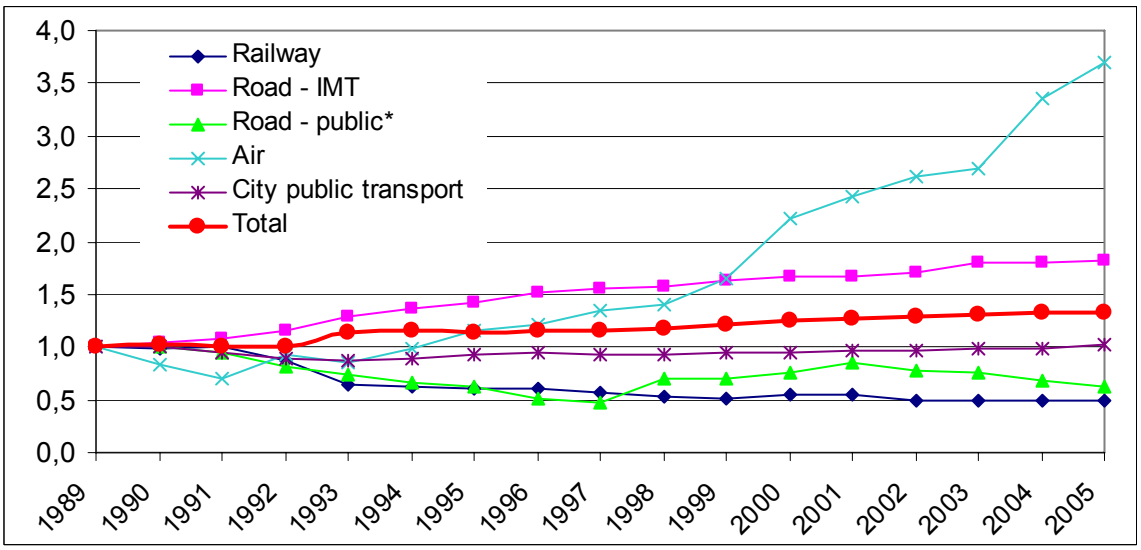
Source: Study on the development of transport in relation to the environment in the Czech Republic in 2005 (CDV Brno)

Development of the Volume of Passenger Transport and Freight in the Czech Republic

Compared to 2004, passenger transport showed a continuing increase in the volume of air transport in 2005. The volume of IAT and railway transport slightly grew. The reported decrease in regular line bus transport and the growth in public transport volume are caused by the fact that approx. 60 smaller public transport companies previously reported as regular line buses have been reported as public transport buses since 2005 (see Graph IV.5.3).

Graph IV.5.3

Capacity development index of the means of passenger transport in the Czech Republic between 1989 and 2005 (index, year 1989 = 1)



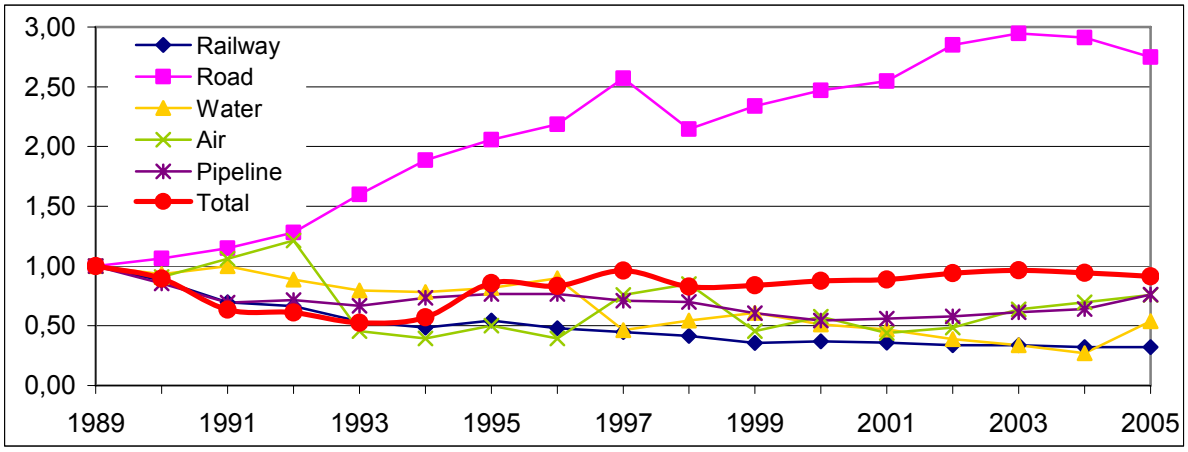
**) index 2005/1990*

Note: *1989 CSO, Study on the development of transport in relation to the environment in the Czech Republic in 2005, CDV Brno, Transport Yearbook, public transport between 1989-1994 data recalculation from the Statistical Yearbook, then taken from the Transport Yearbook of the CZE*

Source: CDV Brno, MT, CSO

Graph IV.5.4

Capacity development index of the means of freight in the Czech Republic between 1989-2005
(index, year 1989 = 1)



Note: For railway these are net tariff kilometres; since 1997 data for road freight according to Eurostat methodology; pipe transport in the Czech Republic 1989-1991 was calculated in the sum of transport as 1/3 of the Czechoslovak Federal Republic.

Source: CDV Brno, MT, CSO

Graph IV.5.4 shows that in comparison to 2004 the changes in the freight volume in the Czech Republic were relatively small in 2005 and because of the complicated monitoring methodology (in air and water transport and road freight, the capacities of transport companies registered in the Czech Republic are monitored, together with their capacities abroad, but without the capacities of foreign carriers in the Czech Republic) they are difficult to evaluate, too. It has been the second year, in which the volume of road freight decreased. The question is whether it really is a decrease, as the accession to the EU helped international road transport significantly, which was reflected in 2004 in the GDP increase in the transport sector. This trend may be expected in 2005 as well. In 2005, the volume of railway and air freight stagnated. The increase in the volume of river freight which almost doubled is surprising, but it is important to realise the starting level was rather low.

Number of Vehicles

As of 31 December 2005, 794,000 one-track vehicles, 3,959,000 passenger cars and vans, 415,000 trucks and 20,000 buses were registered in the Czech Republic. The total was 5,188,000 vehicles excluding special vehicles. The growth in the number of vehicles with the exception of buses continued, which reflects a growing demand for the road network and growing space needs of the road transport, which is not desirable with respect to the environment. The number of vehicles using alternative fuels as of 31 December 2005 is not known; it probably stagnated at a very low level with the exception of trolley-buses.

IV.5.2 Environmental Aspects of Transport

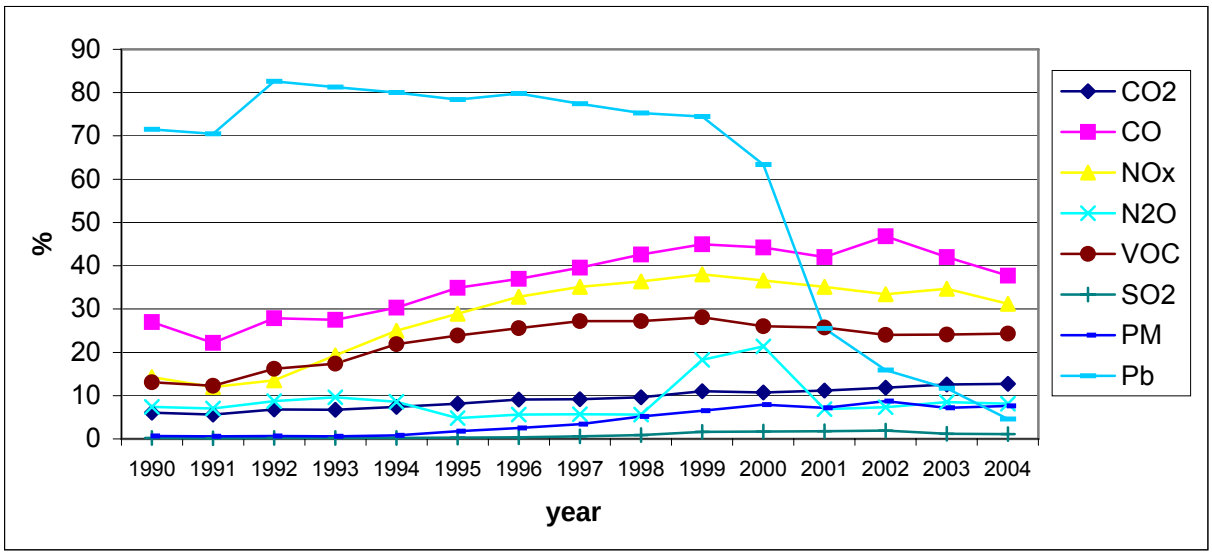
Transport Emissions

With the exception of lead, the emissions of which practically disappeared after the restrictions on leaded petrol in 2001[6], the share of transport emissions in total emissions of different pollutants has been stagnating or slightly rising since 1990 – see Graph IV.5.5, which is caused by a drop decrease in emissions of some pollutant from big stationary sources. For CO and NO_X emissions there has been a favourable decreasing trend monitored since 1999. In 2005 there was a substantial decrease in the allowed sulphur content in motor oil, which was reflected in the positive decrease in SO_2 emissions.

Even though the year-on-year changes of emissions of transport pollutants are not important, there has been a significant increase since 1990 (PAH by 140 %, CO_2 by 72 %, SPM by 32 %), as well as decrease (Pb by 98,4 %, PCDF by 28,6 % (2003), PCDD by 26,4 % (2003), CO by 19,5 %, VOC by 15 %, SO_2 by 10 %). While vehicles with petrol engines showed a decrease in most emissions due to the wider use of vehicles equipped with three-way catalytic converter, in vehicles with oil engines the volume of emissions grew directly in proportion to the capacity of road freight.

Graph IV.5.5

Share of transport in the total air pollution in the Czech Republic between 1990 and 2004



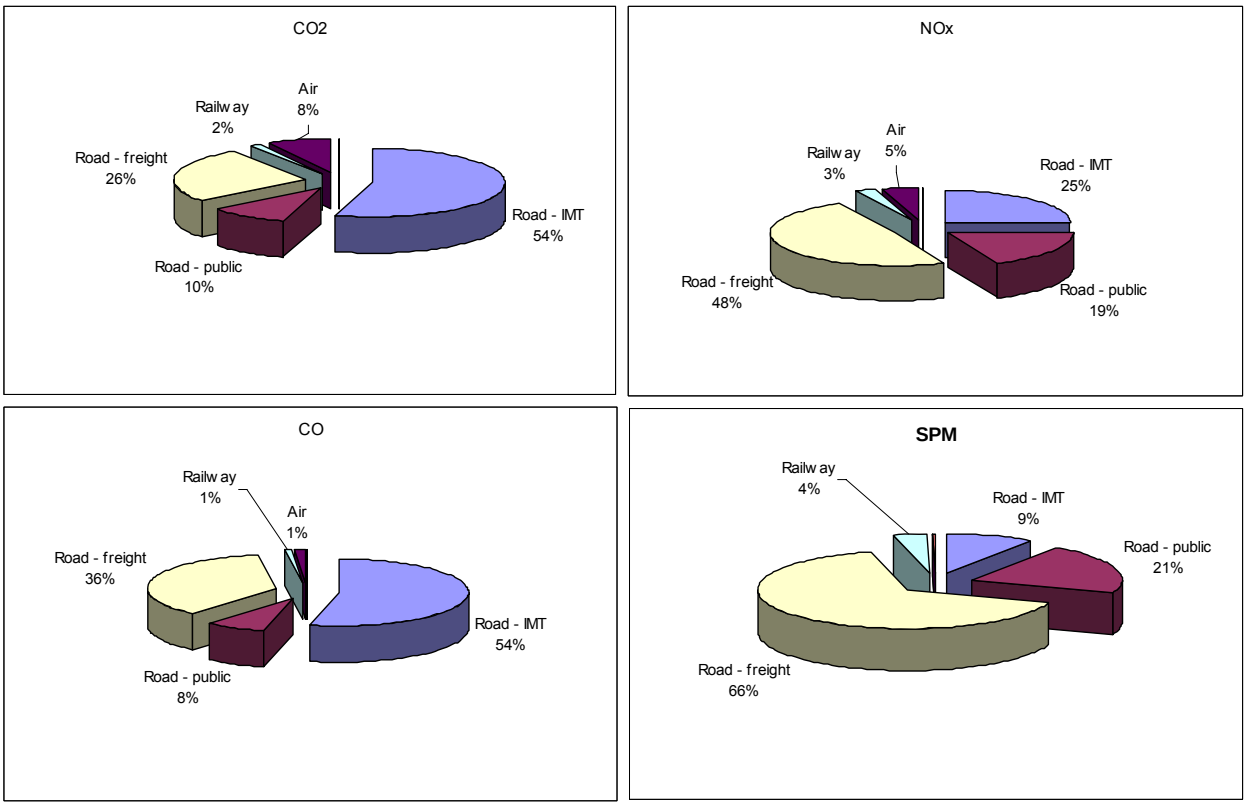
Note: 2005 data is not available. N_2O emissions were recalculated in the whole time line.

Source: CHI, CDV

[6] The sale of leaded petrol is prohibited in the Czech Republic by the Decree of the Ministry of Transport No. 244/1999 Coll.

Graph IV.5.6

CO_2, CO, NO_X and SPM emissions from transport in 2005 according to the means of transport



Source: CDV Brno

Graph IV.5.6 shows that individual motor transport is a dominant source of CO_2 and CO emissions, while the main source of NO_X emissions and solid particulate matters is the road freight. The shares of motor railway, air and water transport in the emissions of monitored pollutants are small[7] when compared to road transport.

In 2005 the Czech Statistical Office became responsible for fuel consumption monitoring according to the different types of transport from the Czech Association of Oil Industry and Market (ČAPPO) and made significant methodical changes. The fuel consumption of water transport dropped to 20%, in motor railway to 40%, air and bus transport consumption slightly dropped as well, the fuel consumption of passenger cars and trucks slightly grew and the so-called pumping tourism was subtracted. 2005 data and resulting emissions data became difficult to compare with older data.

Specific Emission Intensity of Individual Types of Transport in the Czech Republic in 2004

Table IV.5.1 shows the specific emission intensity of basic types of freight in the Czech Republic in 2004. Tables IV.5.2-4 show specific emission intensity of basic types of passenger transport in the Czech Republic in 2004.

[7] For more detailed information on emissions please refer to chapter III.1.2.

Table IV.5.1

Freight capacity [million tkm], emissions (t) and specific emission intensity (number of tkm per 1 kg of emissions) in the Czech Republic in 2004

Emission type	Road	Motor railway	Electric railway	Water
Transport volume	46,010	1,690	13,040	410
CO_2 absolute	4,120,000	167,511	526,027	9,000
Capacity tkm/kg CO_2	11,167	10,089	25	45,556
CO absolute	72,882	1,055	587	59
Capacity tkm/kg CO	608,598	1,601,896	22,228	6,949,153
NO_X absolute	48,571	1,812	920	102
Capacity tkm/kg NO_X	947,273	832,486	14,178	4,019,608
VOC absolute	16,415	250	75	14
Capacity tkm/kg VOC	2,802,924	6,756,217	174,199	29,285,714
SO_2 absolute	919	28	852	2
Performance km2/kg SO_2	50,065,288	61,187,545	15,303	205,000,000
SPM absolute	3,702	140	45	8
Capacity tkm/kg solid	12,428,417	12,071,429	291,159	51,250,000
PAH absolute	8.43	0.087	0.0005	0.02
Capacity tkm/kg PAH 2003	5,457,889	19,416,360	27,977,129,000	20,500,000

Source: CENIA calculations on the basis of the Study on the development of transport in relation to the environment in the Czech Republic in 2005; CDV Brno; ČD, a.s., ČEZ yearbooks.

Table IV.5.1 shows that electric railway was the most environmentally-friendly type of freight in the Czech Republic in 2004, in terms of capacity in CO, NOX, VOC , SPM and PAH emissions; in SO_2 and CO_2 it was river freight. The most intense with respect to the emissions was road freight, the air emissions of which could be decreased at certain transport capacities and with a certain car pool by strengthening the electrical railway on the account of road and motor railway transport. From the viewpoint of the decrease in emissions, the development of water transport has sense only if it is on the account of road freight and motor railway.

Table IV.5.2

Passenger transport capacity (million pkm), CO_2, CO and NO_X (t) emissions and specific emission intensity (pkm/kg CO_2, CO and NO_X emissions) in passenger transport in the Czech Republic in 2004

Type of transport		Capacity	CO_2 emissions	pkm/kg	CO emissions	pkm /kg	NO_X emissions	osbkm /kg
Individual motor transport		68,370	8,874,000	7.7	119,224	573	26,904	2,651
Regular line bus		8,520	829,000	10.3	9,272	918	9,983	853
Railway	**Electrical**	5,030	272,033	18.5	30	167,917	476	10,575
	Motor	1,560	86,360	18.1	543	2,871	934	1,671
Public transport	**Underground**	3,841	72,351	53.1	8	482,114	126.5	30,364
	Trolley-bus	4,885	164,394	29.7	18	269,854	287.43	16,995
	Tram	1,104	47,868	23.1	5	209,445	83.7	13,191
	Bus	5,598	674,000	8.3	6,536	856	8,081.7	693
Air transport		8,810	1,069,000	8.2	2,663	3,308	3,963	2,223

Source: CENIA calculations on the basis of the Study on the development of transport in relation to the environment in the Czech Republic in 2005; CDV Brno; ČD, a.s., ČEZ yearbooks.

Table IV.5.3

Passenger transport capacity (million pkm), VOC, SO_2 emissions and SPM (t) and specific emission intensity (pkm/kg) (t) VOC, SO_2 and SPM emissions in passenger transport in the Czech Republic in 2004

Type of transport		Capacity	CO_2 emissions	pkm/kg	CO emissions	pkm /kg	NO_X emissions	pkm /kg
Individual motor transport		68,370	24,665	2,772	1,118	61,154	503	135,924
Regular line bus		8,520	3,033	2,809	185	45,947	659	12,928
Railway	**Electrical**	5,030	39	129,937	441	11,415	23	216,918
	Motor	1,560	129	12,106	19	80,495	72	21,643
Public transport	**Underground**	3,841	10	373,059	117	32,773	6	622,818
	Trolley-bus	4,885	23	208,813	266	18,344	14	348,729
	Tram	1,104	7	162,069	78	14,238	4	270,565
	Bus	5,598	2,054	2,725	148	37,934	510	10,976
Air transport		8,810	661	13,328	66	133,484	0	Not polluting

Source: CENIA calculations on the basis on the data of the Study on Transport Development in relation to the Environment in the Czech Republic in 2005, Brno Centre for Traffic Research , ČD, a.s. ČEZ yearbooks.

Table IV.5.4

Performance in personal transport (million persons/km), PAH emissions (kg) and specific emission demands (persons/km/g PAH emission) in personal transport in the Czech Republic in 2003

Means of transport		Performance	Emission	Persons/km/g PAH
Individual bus transport		67,300	11,460	5,873
Route bus		8,887	430	20,667
Railway	**Electrical**	3,361.4	0.278	12,091,367
	Motor	3,148.6	112.96	27,874
Public transport	**Underground**	3,417	0.068	50,250,000
	Tram	5,146	0.2	25,916,600
	Trolley-bus	1,110	0.0553	20,073,567
	Bus	5,863	320	18,322
Air transport		7,081	0	**Not polluting**

Source: CENIA calculations on the basis on the data of the Study on Transport Development in relation to the Environment in the Czech Republic in 2005, Brno Centre for Traffic Research, ČD, a.s. ČEZ yearbooks .

As results from the above tables, the lowest specific emissions CO, VOC, NO_X and CO_2 were measured in the underground, followed by trams, trolley-buses and electrical trains in the passenger transport in the Czech Republic in 2004. The positive contribution of electrical public transport for the cleanness of the air in and outside the towns is obvious. According to CDV Brno, the most environmentally-friendly transport, which does not produce SPM emissions and PAH, dioxines and furans, is air transport. Air transport seems to be the most environmentally-saving as to the SO_2 emissions.

Energy Consumption in Transport

In comparison to 2004, the traction energy consumption in motor transport in 2005 increased by 5.8% from 187,858 TJ to 198,760 TJ. Table IV.5.5 shows that in addition to IAT all monitored types of transport were important for the growth – thus not only road and air transport, but also railway and water transport. Road transport accounted for 90% of energy consumption. Compared to previous years, the methodology was changed, which is reflected in a decrease in reported values of diesel oil consumption in water and motor railway transport. The change of methodology led to a decrease in the values of kerosene consumption by air transport.

Graph IV.5.7 shows the total increasing trend of energy consumption mainly in case of air and public road transport. On the other hand, a decreasing trend appeared in railway and water transport. As for other types of transport there has been stagnation of the development of energy consumption.

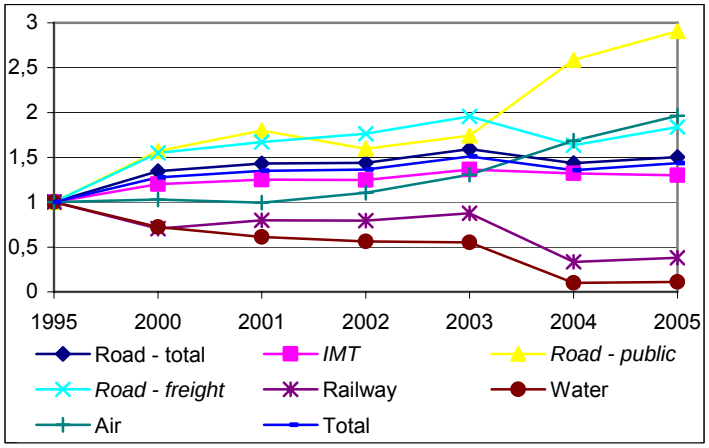
Table IV.5.5

Traction energetic intensity of motor transport [TJ] (2004 – 2005)

Type of transport	Year	
	2004	2005
Road – total	170,642	178,813
IAT	91,484	89,794
Road – public	21,042	23,663
Road –freight	58,116	65,356
Railway	3,443	3,918
Water tr.	128	145
Air	13,645	15,884
Total	187,858	198,760

Graph IV.5.7

Development of traction energy consumption of motor transport (2000 – 2005) (index, year 1995 = 1)



Source: CDV

Traffic Noise Load

There is a constant lack of reliable concepts to determine the development of traffic noise load in the Czech Republic. It can be reasonably assumed that the noise load from the decisive road transport kept slightly increasing due to the extension of traffic into previously quiet areas. The noise load from railway transport was slightly decreasing due to the renovation of selected line by rail cushioning, the construction of noise barriers or also the installation of noise-protection windows and electrification of other lines.

A negative aspect of the development of transport is also the appropriation of land for the needs of road infrastructure, which is discussed in detail in chapter IV.3.2.5 Impact of Linear Construction on the Environment.

Transport Safety

Also in 2005 transport safety was a serious problem. Within 30 days 1,286 people died in road accidents and another 32,211 were injured. The number is smaller than in 2004 (1,382 dead and 34,254 injured), but the balance is still very unfavourable and it highly exceeds similar balances of the EU countries and of many new EU countries. Other types of transport report a minimum of caused accidents and their victims. Public air transport in the Czech Republic reports a long-year operation with no losses of lives.

IV.5.3 Economic Relations of the Impact of Transport on the Environment

The impact of transport on the environment has not been clearly and precisely defined from the economical point of view. However, there are some concepts attempting to calculate the impact of transport on the environment. One of them is the concept of transport externalities. Such externalities include an economic aspect of personal injuries caused by accidents (losses caused by forced work absence and medical treatment costs), excessive traffic noise, emissions of SPM, SO_2, NO_X, VOC and CO, damage caused by climatic changes due to carbon dioxide emissions and damage caused by slowdown of public transport due to traffic

jams. An example of a possible calculation of these externalities is stated in Tables IV.5.6 for freight and Table IV.5.7 for passenger transport in 2003.

Table IV.5.6

Specific economic externalities of four basic types of freight traffic in the Czech Republic in 2003 [CZK per million tkm]

Type of externality	Road	Motor railway	Electrical railway	Water
Accidents	60,691	5,076	502	0
Noise	106,893	75,902	28,631	0
Common emissions	194,279	38,920	775	3,972
Ground ozone	26,870	33,391	0	776
Global warming	39,018	1,867	18,342	7,756
Caused jams	10,738	0	0	0
TOTAL	**438,489**	**155,156**	**48,250**	**12,504**
Capacity in million tkm	46,564	1,403.37	14,190	515.7

Source: CENIA calculations primarily for SUDOP, a.s., Prague 2005.

Table IV.5.6 shows that in 2003, each average clean ton-kilometre of road freight in the Czech Republic was loaded by 43.8 halers of economic externalities; in motor railway it was 15.5 halers, in electrical freight railway it was 4.8 halers and for water transport it was 1.3 halers.

Table IV.5.7

Specific economic externalities of individual types of passenger transport in the Czech Republic in 2003 [CZK per million of person-kilometres]

Type of externality	Road IAT	Road line bus	Air	Electrical railway	Motor railway	PT - Underground	PT – Trolley-bus	PT - Tram	PT - Bus
Accidents	366,064	5,838	0	2,119	2,262	0	13,332	5,929	8,639
Noise	73,958	33,578	565	31,889	6,675	0	0	241,100	53,550
Emissions	104,445	234,634	10,929	3,273	8,497	4,048	10,122	7,840	351,527
Ground ozone	10,298	27,217	2,943	0	22,463	0	0	0	35,077
Global warming	58,146	14,328	66,536	78,953	12,201	8,755	21,892	16,956	50,694
Caused jams	22,288	0	0	0	0	0	0	0	0
TOTAL	625,929	315,596	80,973	116,235	52,097	12,803	45,345	271,825	461,287

Source: CENIA calculation primarily for SUDOP, a.s., Prague 2005.

Table IV.5.7 shows that underground had the lowest externalities in the passenger transport in the Czech Republic in 2003 (1.3 halers/person-km), the highest specific externalities were those of individual automobile transport due to high accident rate (62.6 halers/person-km).

IV.5.4 Reduction of Negative Impact of Transport on the Environment

The aim to reduce negative impact of transport on the environment concentrates to the effort to develop and put into operation more environmentally friendly vehicles. This effort has had certain success in passenger transport in vehicles with petrol engines, where three-way catalytic converters significantly reduce emissions of some pollutants. As of 31 December 2005 the number of vehicles equipped with three-way catalytic converters reached 2,244,000, i.e. 56.8%.

In order to decrease the noise load of rail transport it has been effective to introduce vehicles with quiet disc brakes and to renovate railways by cushioning. The construction of noise barriers along main roads and railways or the installation of noise-protection windows, mainly in the vicinity of airports, has also been successful to a certain degree.

IV.6 Waste Economy

IV.6.1 Current Situation and Development

Waste economy of the Czech Republic is defined mainly by Act No. 185/2001 Coll., on Waste and amendments to some other acts, as amended, Act No. 477/2001 Coll., on Packages and amendments to some other acts (Act on Packages), as amended, and their implementing regulations.
2005, the Act on Packages was amended by Act No. 7/2005 Coll., which transposed the Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances electrical and electronic equipment and Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment. With regard to the number of amendments to the Act on Waste, its full version was announced under No. 106/2005 Coll.

In connection to amendments of the Act on Waste, implementing regulations were also amended. An important change of 2005 was the publication of a separate decree on the conditions of waste deposit in landfills and their use on the terrain surface. Another separate decree was published regarding the management of electrical equipment and electrical waste and more detailed condition on waste management financing.

An important change in relation to the waste economy monitoring is the amendment to Decree No. 381/2001 Coll., which specifies the Waste Catalogue, the List of Hazardous Waste and lists of waste and countries of waste export, import and transit and the procedure for granting consent to waste export, import and transit. According to the Waste Catalogue, which (apart from several differences) fully corresponds to the list of EU waste and distinguishes only between two waste categories (hazardous and other), the classification of individual types of waste is carried out, as well as records of waste production and waste management. Due to the legislative changes made in a short ten-year period it is difficult to compare the development of waste production and management over the years and time lines.

The whole framework of waste management is determined by the Waste Economy Plan of the Czech Republic for the period of 2003 – 2012, approved by the Government of the Czech Republic.

The evaluation of waste production and management usually uses data provided by the Ministry of the Environment, collected by the Waste Management Centre, which is completed with figures of the Czech Statistical Office. Data for the chapter of packaging waste was provided by EKO – KOM, a.s.

The production of waste in the Czech Republic has oscillated between 36 and 39 million tons in recent years. In 1995, 66.3 million tons of all waste were produced; in 2002 it was 37.9 million tons, in 2004, 38.8 million tons and in 2005, 29.8 million tons. The largest share of this amount is taken by construction waste, industrial and energy waste, as well as municipal waste.

In 2005, a total of 17.9 million tons of all waste was recycled and used as a secondary material. Waste disposal facilities have sufficient capacity, mainly facilities for waste landfilling and, which remains to be the most common disposal method, mainly for municipal waste.

The amount of waste burned in and used for energy purposes remains to be small. In 2005, a total of 748,500 tons of waste was energetically used. In the Czech Republic, there are three incinerators of municipal waste in Prague, Brno and Liberec. The number of incinerators of hazardous waste is higher, usually of a small capacity, but some of them have been closed.

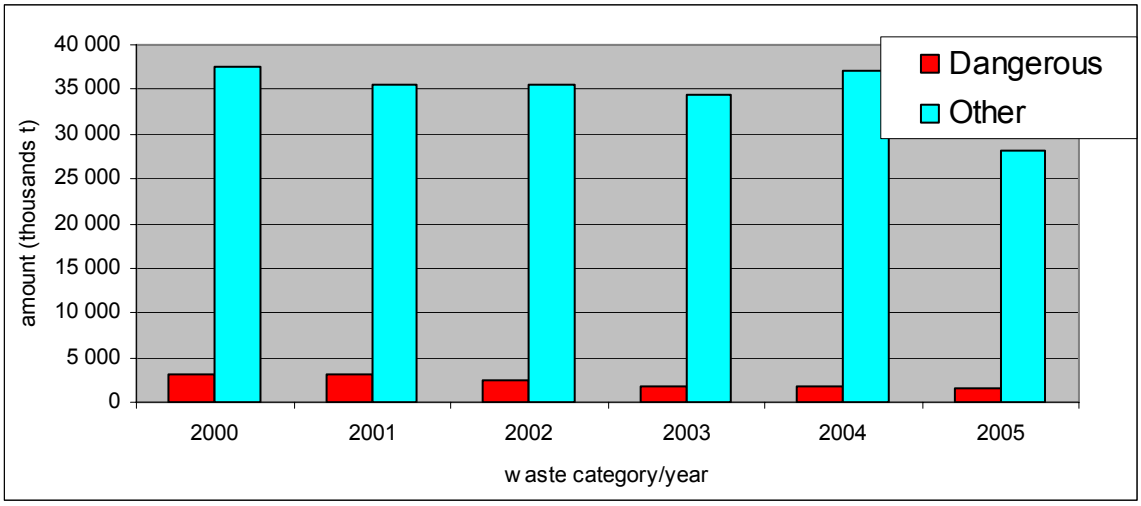
The amount of separately collected usable municipal waste and dangerous components of the municipal waste has been growing.

IV.6.2 Waste Production According to Categories

Pursuant to the Act on Waste, waste producers and persons authorised to handle waste are bound to send reports on waste production and management to a competent municipal office with extended powers. After being checked and validated, the data is entered into the national Information System of Waste Management database and pursuant to existing legislation it can be used to fulfil the obligation to report pursuant to the Regulation of the European Parliaments and the Council 2150/2002/EC on waste statistics. Graph IV.6.l shows reported waste production between 2000 and 2005 classified into categories of other and dangerous waste.

Graph IV.6.1

Waste production classified according to waste categories, 2000 – 2005



Source: WRI, CeHO

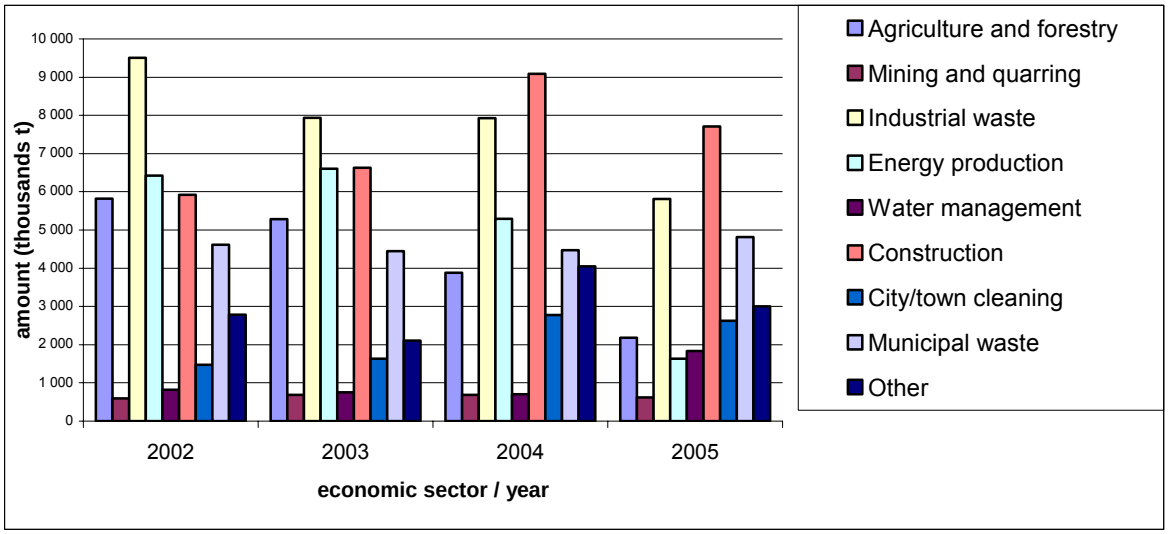
The reported hazardous waste production cannot be clearly compared until 2001 due to big differences in the number of types of waste, which were according to the applicable legislation considered hazardous. Since 2002, when new legislation became effective and the Czech Republic adopted the EU Waste Catalogue, the production of hazardous waste can be compared on the year-on-year basis, but only with those EU states, which also apply this Waste Catalogue. The reported decrease in dangerous waste production between 2001 and 2002 is caused by changes in the Waste Catalogue.

However, as results from the comparison, since 2002 the production of hazardous waste has slightly decreased and 2004 was the only year of increase according to the Czech Statistical Office data. According to the CeHO data, since 2002 the production of dangerous waste has been permanently decreasing. Due to the current constant growth of economy and industrial production not only in economic, but also in material indicators, a possible growth in the amount of produced waste may be assumed, but the decrease in this amount of produced dangerous waste may be caused by increasing waste disposal costs. The reason for differences in the reported data is necessary to be searched probably in different criteria of waste producers, to which the monitoring or the obligation to report apply.

As the following graph IV.6.2 shows, the largest stable waste producers within the Czech Republic are building industry, industry and power engineering. Since the building industry was under stronger economic pressures connected to the EU accession in 2004 and the subsequent construction boom, the year-on-year decrease in the building waste production can be viewed as return to the previous state. In comparison to 2003, there was a slight growth in waste production in the building industry, which only supports the conclusion.

Graph IV.6.2

Waste production in relation to the origin according to the OECD classification, 2002 – 2005



Source: *WRI – CeHO*

An important fact is the permanent decrease in the production of waste in industry, power engineering and agriculture. Mainly in industry and power engineering there has been a very positive phenomenon where the decrease in waste production is not caused by a general decrease in the production volume. On the other hand, in 2005 industrial production grew and the assessment of raw material has become more comprehensive, the production reaches higher material efficiency and losses are reduced. In power engineering the waste is more widely used, e.g. in form of construction materials. All these phenomena may be assessed positively.

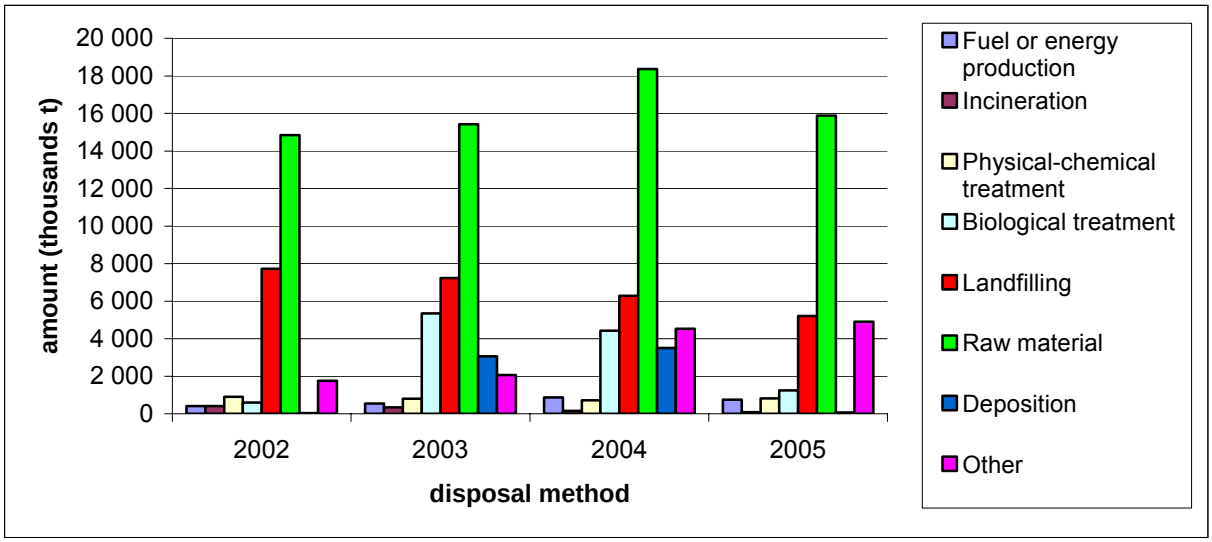
Although the amount of waste placed in landfills has been dropping, the use of waste will probably have to be supported in a bigger extent so that the amount of waste deposited in landfills continues dropping.

IV.6.3 Waste Disposal

The trend of depositing less waste in landfills continued last year. However, the share of waste, used as secondary material decreased and the use of most other waste disposal methods grew. The comparison of waste disposal between 2002 and 2005 is provided in Graph IV.6.3. It is obvious that the use of waste is increasing and on the other hand, the amount of waste deposited in landfills is decreasing.

Graph IV.6.3

Waste disposal classified according to the disposal method, 2002 – 2005



Source: WRI – CeHO

IV.6.3.1 Recycling – Material Use

Compared to previous years, recycling and the use of waste as secondary material in 2005 decreased. The total amount of recycled and used waste in 2005 was 17.9 million t, i.e. 59.9% against 63.3% in 2004. In relation to waste disposal, the largest share of 30.6% (out of the total volume of produced waste) refers to the use of waste for reclamation and area finishing (N1 code), 8.8% refer to recycling and re-gaining of other inorganic material (code R5) and 5.7% refer to recycling and re-gaining of metal and metal compounds (R4 code). Other types of re-used include plastic, glass and paper waste. Recycling of construction materials is carried out usually by means of mobile facilities. In the Information System of Waste Management report there are 328 facilities for the material use of waste of a total designed capacity of approx. 72 million t per year. The capacity of the facilities for material use exceeds the amount of waste which is currently materially used more then four times.

IV.6.3.2 Landfills

Landfilling is becoming an increasingly used method of waste disposal due to relatively low costs, including low charges for depositing waste in landfills. Currently operated landfills were mostly established after 1996 and by 2009 their full compliance with the current legal regulations is supposed to be ensured, fully harmonised with the EC legislation (Council Directive 1999/31/EC on landfills).

There are problems at currently operated landfills mainly within the requirements for their seal and degasification. On the basis of the Waste Economy Plan of the Czech Republic (WEP CZ) all operated landfills were examined, the results of which are being assessed. It is assumed that approx. 60% of landfills, which will have to be closed down and redeveloped, do not correspond to the standards set by the Council Directive 1999/31/EC for the period from 2009. The number of landfills has been decreasing. Now the total of 306 landfills is in operation, out of which 34 landfills have a designed capacity for the deposit of hazardous waste of approx. 10 mil. m^3. The total capacity of landfills both for municipal waste and for other types of waste, including hazardous waste, is sufficient also with future perspective.

IV.6.3.3 Waste Incineration

The percentage of waste in the Czech Republic which is energetically used or incinerated remains to be low. This refers mainly to hazardous waste. In 2005, only 2.5% of the total production of waste was energetically used and 0.3% was burnt. Currently, 38 hazardous waste incinerators are in operation as well as 3 municipal waste incinerators. In addition to waste incineration in special incinerators, waste was used as an energy source in four cement factories.

Municipal Waste Incinerators

In the Czech Republic, three municipal waste incinerators are in operation: SAKO in Brno with a capacity of 240,000 t of waste per year, incinerator Pražské služby in Prague – Malešice with a designed capacity of 310,000 $t.year^{-1}$ and TERMIZO in Liberec with a designed capacity of 96,000 $t.year^{-1}$.

In 2005, the total amount of combusted and energetically used municipal waste was 418,000 t, i.e. 8.7% of the total waste production.

Hazardous Waste Incinerators

Since 2001, the number of operated incinerators has been reduced. Currently, 38 hazardous waste incinerators are operated and it may be expected that their number will keep going down. Hazardous waste incinerators burn mainly industrial hazardous waste and medical waste. In 2005, the total number of energetically used and incinerated hazardous waste was 108,100 t, i.e. 6.7% of the total production (according to the CeHO data).

IV.6.3.4 Hazardous Waste Disposal

According to the Czech Statistical Office the total amount of produced hazardous waste was 1,372,000 t in 2005, which is 75,000 t less than in 2004. Business accounted for 1,344,000 t and municipalities produced 28,000 t of hazardous waste. According to the results of statistical reports Odp 5-01 from 2005 the total amount of disposed hazardous waste was 1,670,000 t (in 2004 it was 1,659,000 t and in 2003 it was 1,430,000 t). Graphs IV.6.4 a,b,c show the production, use and disposal of hazardous waste between 2002 and 2005.

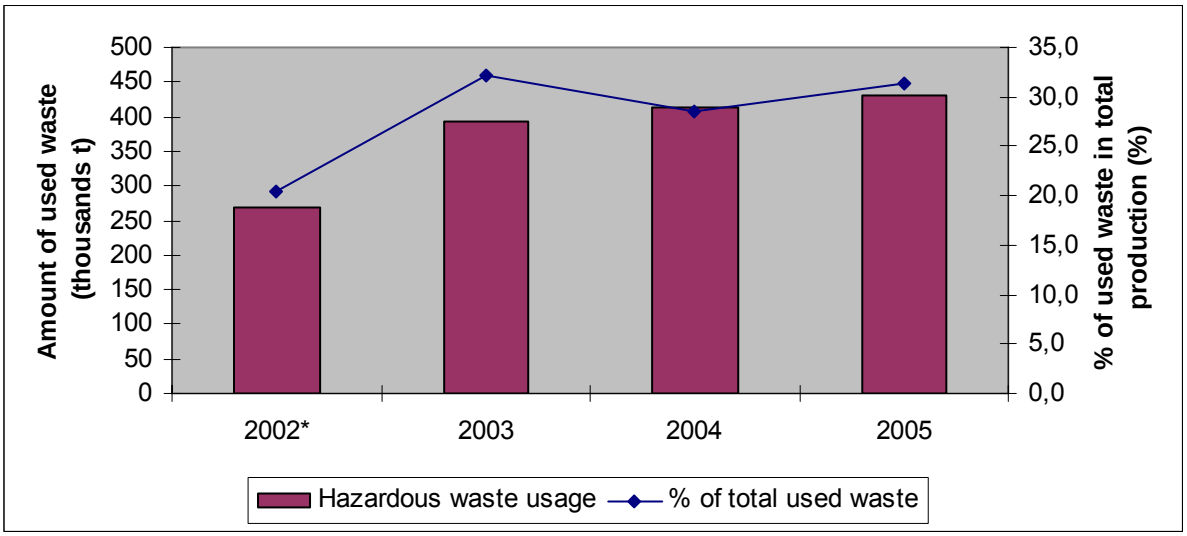
Graph IV.6.4a

Hazardous waste production between 2002 and 2005

Source: CSO

Graph IV.6.4b

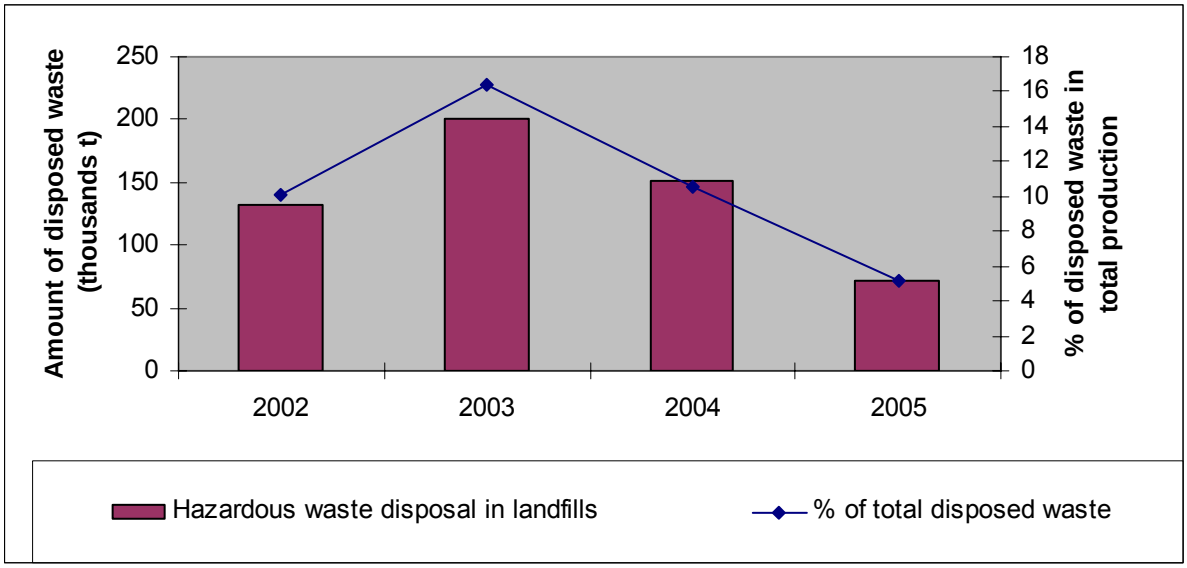
Hazardous waste usage between 2002 and 2005



Source: CSO

Graph IV.6.4c

Hazardous waste disposal in landfills between 2002 and 2005



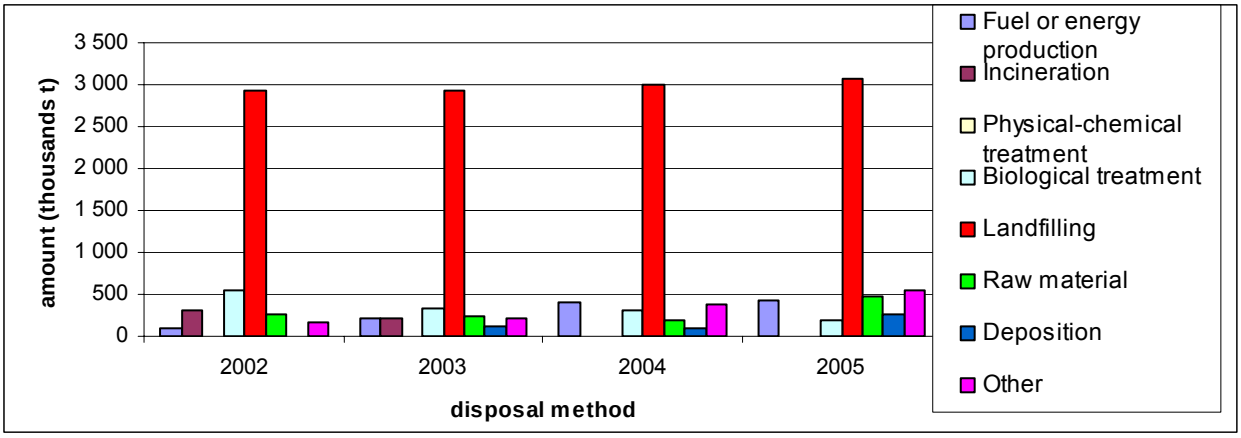
Source: CSO

IV.6.3.5 Municipal Waste Disposal

The production of municipal waste between 1995 and 2002 slightly grew to 4.6 million t, although the data from 1995-1998 is incomplete. In 2003, 4.4 million t of municipal waste were produced; in 2004 the production slightly increased, the total production volume was 4.7 million tons. In 2005 the production slightly dropped again to 4.5 million tons. As shown in Graph IV.6.5 the most common method of municipal waste disposal is landfilling. In 2003, 61.5% of the whole municipal waste production was deposited in landfills; in 2004 the proportion was 67.0% and in 2005 it was 63.9%. The share of incinerated municipal waste including the energy use, which was 9.9% in 2003, dropped to 8.7% in 2004 and remained at the same level in 2005. The increase in the amount of separately collected components of municipal waste, used subsequently as materials, is viewed positively.

Graph IV.6.5

Municipal waste disposal classified according to the disposal method, 2002 – 2005



Source: WRI – CeHO

IV.6.4 Transboundary Shipment, Import and Export of Waste

Since the Czech Republic accession to the EU, i.e. since 1 May 2004, the Council Directive 259/93/EEC on the supervision and control of shipments of waste within and outside the EC has been fully applicable. By the Directive the EC implements the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal and OECD Council Decision C(92)39/FINAL concerning the Control of Transfrontier Movements of Wastes Destined for Recovery Operations. The EC legislation strictly distinguishes between waste designed for disposal and waste designed for further use.

The transboundary shipment and import of waste in the Czech Republic for the purpose of their disposal is prohibited even after the accession to the EU, subject to exceptions. The overview of transboundary shipment, import and export of selected types of waste between 2001 and 2005 is provided in Tables IV.6.2 and IV.6.3. The waste selected for the tables is considered hazardous pursuant to Act No. 185/2001 Coll. on Waste and other waste includes only waste which is subject to the supervision regime pursuant to the above Act. The transboundary shipment, import and export of waste has not yet reflected the effect of the Czech Republic's accession to the EU, and the cancellation of some exceptions, as the decisions of the Ministry of the Environment, which gives approves transboundary shipment, import and export, are issued with one-year validity.

Since the effective date of Act No. 185/2001 Coll., i.e. since 1 January 2002, a new Waste Catalogue has been valid. Some types of waste in the Catalogue are classified under different waste codes than in 2001; therefore it is difficult to compare imports and exports of waste in individual years and time lines.

Table IV.6.2

Transboundary shipment and import of selected types of waste in the Czech Republic between 2001- 2005 (t)

Waste code	Type of waste	2001	2002	2003	2004	2005
11 05 02	**Zinc ash**	-	40	41	62	59
14 06 03	**Other solvents**	-		84	101	-
16 01 03	**Tyres**	13,216	6,895	3,796	784	30
16 06 01	**Leaded accumulators**	190	1,212	2,765	2,782	2,231
16 06 02	**Nickel – cadmium accumulators**	-	-	-	-	177

Source: WRI- CeHO

All imported waste was designed for material use in the Czech Republic except for used tyres, which were imported for both re-treading and energetic use (cement works) until the end of 2001. Act No. 185/2001 Coll., as amended from 1 January 2002 to 30 April 2004, prohibited the import of waste for energetic use. Since 1 May 2004 the shipment of waste into the Czech Republic for energy purposes has been allowed.

Table IV.6.3

Transboundary shipment and export of selected types of waste from the Czech Republic in 2001 - 2005 (t)

Waste code	Type of waste	2001	2002	2003	2004	2005
06 01 01	**Sulphuric acid and sulphurous acid**	-	-	-	282	472
10 03 08	**Aluminium pyrometallurgy waste – saliferous slag**	-	35	957	13	-
10 05 04	**Metallurgical zinc treatment waste – other dust**	322	253	382	468	337
10 06 03	**Ash and remains containing copper**	-	640	-	-	736
11 01 07	**Metal finishing waste – not specified alkali**	45	57	63	46	70
11 01 09	**Sludge and filter cakes containing hazardous substances**	-	-	-	48	102
13 02 05	**Non-chlorinated mineral oils**	-	-	48	144	51
14 06 03	**Waste solvents and their mixtures (acetone)**	-	232	304	315	317
16 06 02	**Nickel – cadmium accumulators**	-	20	120	78	99
19 02 05	**Condensation sludge containing metals**	-	53	142	189	240
19 10 06	**Non-magnetic fraction from metal waste crushing**	-	-	-	1,307	1,730
20 01 33	**Classified dry cells – ZNC and MnAl**	-	-	-	-	44

Source: WRI – CeHO

All waste exported from the Czech Republic was designed for material use except for waste containing PCBs, which was exported (between 1995 and 2002) partly for disposal purposes. Waste designated for disposal, for which a processing capacity is available in the Czech Republic, is exported from the Czech Republic in compliance with the Basel Convention.

There are differences between the CeHO and the CSO data, caused by different processing methodologies. This problem is being solved on a long-term basis, e.g. within the assignment "Prepare a draft amendment to the relevant legal regulations in order to simplify the

obligations of waste producers in relation to waste reporting and to unify the forms of the Ministry of the Environment and the Czech Statistical Office", assigned by the Government Resolution No. 1401/2005.

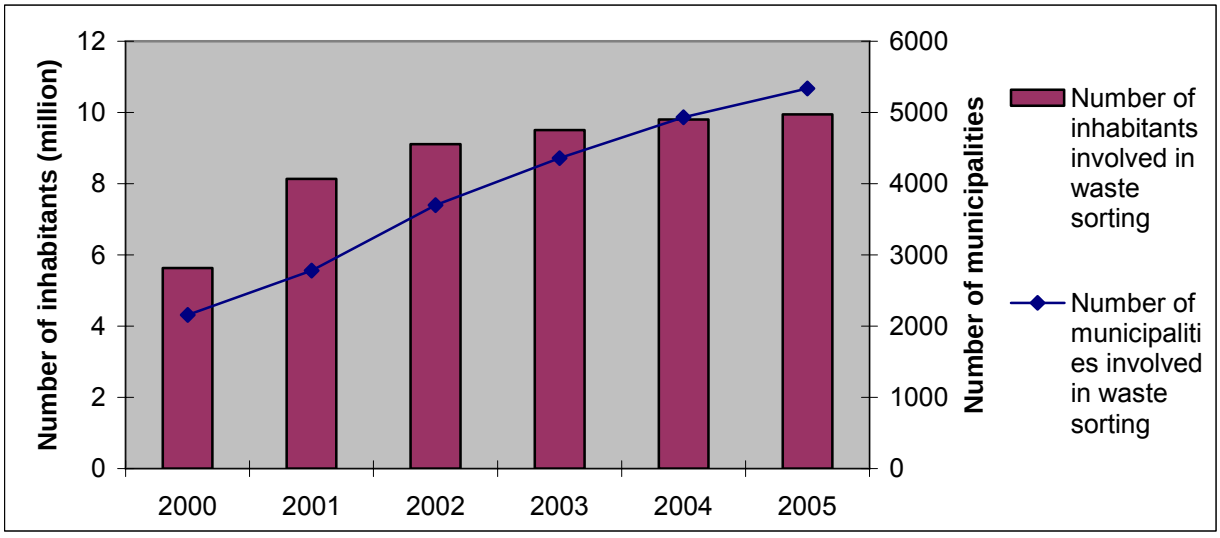
IV.6.5 Package and Package Waste

In 2005, approx. 850,000 t of package were placed on the market in the Czech Republic. Out of this amount, 59% were recycled, which is 3% more than in 2004. The most widely recycled package was paper package waste (84%); the second place is taken by recycled glass package waste (75%). According to the available information the Czech Republic achieved results comparable with Austria, Denmark or Sweden in total package waste recycling. As far as the recycling of plastic package waste is concerned, the Czech Republic ranked second among the EU states. As also results from the comparison, the Czech Republic reported one of the lowest amount of disposed package waste of the EU countries in 2005, and especially the amount of incinerated package waste is significantly lower. In 2005, approx. 5.6 kg of package waste per inhabitant were burnt in the Czech Republic, which is 6 times less than in Germany, France or Belgium and even 9 times less than in environmentally-oriented Sweden.

In 2005, the number of municipalities involved in the waste sorting of usable municipal waste components increased to 5,377, which meant the increase in population coverage by 1% to 97% of all inhabitants. It is one of the highest population coverage in Europe. The total number of inhabitants of the Czech Republic involved in waste sorting was 9.95 million. The long-term development of the number of municipalities and inhabitants involved in waste sorting is shown in Graph IV.6.6. The number of companies dealing with waste disposal was about 21,500 during the year.

Graph IV.6.6

Number of inhabitants and municipalities involved in waste sorting



Source: EKO – KOM, a.s.

The total utilisation percentage of waste sorted by the inhabitants in 2005 reached 36.2 kg of sorted waste per inhabitant, which means a year-on-year increase by 6.8%. The sorted package waste accounted for 17.8 kg per inhabitant out of the above figure. In 2005 the total amount of sorted waste was 360,000 t of usable municipal waste components (8% of the total municipal waste production), out of which approx. 47% was sorted package waste. In addition

to a increasing number of collection places, the improving environmental education and advertising campaigns aimed at waste sorting can be considered important to the sustainable positive development. Public opinion polls show that 87% of inhabitants of the Czech Republic considers waste sorting to be and 67% of Czech inhabitants sort waste regularly.

IV.7 Old Ecological Burdens

There were no significant changes in the issue of old ecological burdens (OEB) and the role of the Ministry of the Environment in 2005, with the exception of the transfer of financing from the National Property Fund to the Ministry of Finance at the end of 2005. In this relation it is necessary to emphasise that the situation when the Ministry of the Environment is not the nation-wide authority responsible for old ecological burdens did not change in 2005. The below public authorities and institutions has been engaged in the issue, often independently of the Ministry of the Environment:

- Ministry of Defence;
- Ministry of Trade and Industry and CzechInvest;
- Ministry of Transport and Czech Railways;
- Ministry for Regional Development;
- Office of the Government Representation in Property Affairs;
- National Property Fund of the Czech Republic, as from 1 January 2006, the Ministry of Finance in position of its successor;
- State Environmental Fund of the Czech Republic;
- Regional authorities.

IV.7.1 Overview / Evaluation of the Number of Locations with Old Ecological Burdens according to the Origin

The total number of locations with old ecological burdens in the Czech Republic has been gradually identified. Their number can be only estimated on the basis of available data. The most important of them is reporting of contaminated sites provided regularly by the Ministry of the Environment to the EEA. Tables IV.7.1–3 show the state of the records as of the middle of 2005, when the EEA report was issued. The provided data represents only information available to public administration authorities and regional authorities, data on private investors is not available.

Table IV.7.1

Old environmental burden records in 2005

Knowledge of the location		Number of locations
Registered locations	Total estimate	> 10,000
	Registered locations	9,675
Preliminary survey	Estimate	5,000
	Work performed	1,150
Survey and rehabilitation performed	Estimate	1,000
	Survey performed	804
	Rehabilitation performed	741
Finished rehabilitation		163

Source: ME

Table IV.7.2

Overview of the number of locations with old ecological burdens according to the origin

Main types of contamination sources		Representation of individual sources [%]
Landfills	**Municipal landfills**	65.7
	Industrial waste landfills	5
Industrial and business activities	**Industrial companies**	17.5
	Territories affected by mining of mineral resources	0.2
	Power stations	2.2
Military zones and bases		3.1
Storage sites	**Oil processing and oil material storage sites**	3.5
	Manure pits	1.1
Long-term groundwater accidents	**Oil material leakage**	0.3
	Contamination caused by other harmful substances	0.5
Others		0.9
TOTAL	**100% (identified locations)**	100

Source: ME

Table IV.7.3

Proportional share of industrial activities in the contaminated sites in the Czech Republic

Industrial branches	% representation of individual branches
Energy production	8.24
Oil industry	11.75
Chemical industry	15.62
Metallurgical industry	25.14
Electrical industry	2.15
Glass industry and ceramics manufacturing	2.08
Textile and leather manufacturing	1.79
Wood processing and paper industry	2.65
Food industry, production of organic compounds	9.95
Others	20.63
TOTAL	100

Source: ME

IV.7.2 Overview of Old Environmental Burden Removal Costs

According to information provided to the EEA in 2005 over EUR 210 million from the state budget of the Czech Republic was spent in 2004. The highest share in this amount refers to the expenses of the National Property Fund of the Czech Republic allocated to the removal of old ecological burdens caused before privatisation, which is CZK 3,563.27 million or EUR 127.3 million. In that period the Ministry of the Environment spent CZK 75.81 million on the removal of old ecological burdens after the departure of the Soviet Army, which represents EUR 2.71 million.

The overview of locations which will require the highest costs for the removal of OEB, is available at the web sites of the above ministries and institutions. The Ministry of the Environment considers the rehabilitation of the former Soviet Army base, Hradčany airport, to be the greatest problem. The rehabilitation costs are estimated at CZK 229 million. The total sum for the removal of this OEB is approx. CZK 436 million.

IV.7.3 Efficiency of the OEB Removal

Efficiency within the competence of the Ministry of the Environment is ensured by its role of an authority responsible for solving this issue under privatisation and by direct investor supervision over events subsidised by the Ministry of the Environment. An integral part of efficient management of the state budget resources is the determination of priorities for this process, because the complete removal of all OEB from the past in a short time period is not realistic and it will inevitably be a long-term and financially demanding process. Therefore the selection of priorities of the Ministry of the Environment is considered to be the most important element of a complex and systematic attitude towards the OEB issue.

At the end of 2005 the Ministry presented a proposal of a new system of priority selection for public comments. This methodology classifies all OEB locations according to the principles

of risk analysis (see the Guideline of the Ministry of the Environment No. 12/2005) into several basic categories according to the actual requirement. Future steps are clearly set by the type of consequences or possible consequences of the site contamination. The system does not create numerical series as before, but it puts individual locations into groups according to the knowledge of the contamination and according to the state of the official steps required at a given moment in order to continue the process of OEB removing.

IV.7.4 Current Development of Normative, Economic and Institutional Instruments; Transposition and Implementation of EU legislation

In 2005, the system of public supervision over the OEB removal improved. The R&D project SM/4/93/05 called *The Research into Systematic Approach to the Selection of the Priorities of OEB Locations* was launched within the update of *the Regional List of Priority Selection in OEB Removal* in 2005, the output of which was the proposal of a new strategy for the priorities of OEL removal (see the Efficiency of the OEB Removal). An integrated landfill and OEB database called *the Registration System of Contaminated Sites* is also used to improve the system of public OEB supervision. The development of the database was finished in 2005 . The database is available to the public administration and the general public at 2 places – officially, the database was transferred under the administration of CENIA where it is published on http://sez.cenia.cz/mapmaker/sez/. The database is also available on http://prgmap.vuv.cz/website/vuv/index_sez.php.

Methodical guidelines of the Ministry of the Environment were updated in 2005 to ensure the process of OEL removal – 2 new methodical guidelines were issued for risk analysis and research into contaminated areas.

The state of the OEB legislation did not changed. A major change is expected after the approval of the Environmental Code which deals with the issue of old ecological burdens in a more comprehensive way.

The partial objective of the SEP of the Czech Republic (3.5.4 SEP 2004 – 2010) “to accelerate the process of removing old ecological burdens caused before privatisation” was not accomplished in 2005. The NPF of the Czech Republic did not announce any public tenders exceeding CZK 2 million in 2005. This long-term idleness of the NPF of the Czech Republic, or the Ministry of Finance of the Czech Republic (as from 2006), is the most serious problem within the process of OEB removal. This can result into the devaluation of the financial resources that have been invested; the administrative decisions of the Czech Environmental Inspectorate are not complied with and the affected acquirers are discriminated in this way.

V Instruments of Environmental Protection

V.1 Legislation

In 2005 a set of statutes and other regulations came into force. The most important ones are:

In the field of air protection an act, amending Act No. 86/2002 Coll., on Air Protection and amending some other acts (the Air Protection Act), as amended, effective from 1 October 2005. This amendment is primarily of technical legislation nature and it has been aimed at better application as well as specification of the purpose of some provisions of this Act concerning mainly the regulation of air quality and the procedures of public administration bodies involved.

In the field of geology Act No. 3/2005 Coll., amending Act No. 62/1988 Coll., on Geological Works, as amended, Act. No. 44/1988 Coll., on Protection and Exploitation of Mineral Resources (the Mining Act), as amended, Act No. 61/1988 Coll., on Mining Activities, Explosives and the State Mining Authority, as amended, and Act No. 20/1978 Coll., on State Care of Historical Monuments, as amended, effective from 6 January 2005. This amendment transposed the Directive 94/22/EC of the European Parliament and of the Council of 30 May 1994 on the conditions for granting and using authorisations for the prospecting, exploration and production of hydrocarbons into Czech legal order. It regulates the special legal regime for issuing decisions on establishment of exploratory areas for prospecting and exploration of petroleum and natural gas deposits.

In the field of nature and landscape protection the Government Order No. 132/2005 Coll., laying down a list of European significant areas; effective for 15 March 2005. This Government Order is a statutory instrument to implement Act No. 114/1992 Coll. (as amended by Act No. 218/2004 Coll.), delimiting the individual European significant areas of the National List including their borders and additional detailed information and proposed categorisation of the areas in Appendices No. 1- 863.

Further, in the field of nature and the landscape protection a set of several government orders has implemented the provisions of Section 45e, subsection 1 and 2 of Act No. 114/1992 Coll. (as amended by Act. 218/2004 Coll.), delimiting individual bird areas including the objects of their protection. On 1 February 2005 the Government Order No. 51/2005 Coll. came into force, laying down species and number of birds, for which the bird areas had been established. Another significant regulation to implement Act No. 114/1992 Coll., on Nature and Landscape Protection is Decree No. 166/2005 Coll., that implements some provision of Act No. 114/1992 Coll. with respect to the establishment of the system of NATURA 2000. This Decree came into force on 28 March 2005.

In the field of renewable energy sources Act No. 180/2005 Coll. on the Promotion of Electricity Production from Renewable Energy Sources and on amending some acts (the Act on Promotion of Use of Renewable Sources); effective from 1st August 2005. The Act transposed **Council** Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market into the Czech legal order. The Act regulates the methods of promotion of the production of electricity from renewable energy sources and of mine gas from closed mines, as well as the execution of the state administration and rights and duties of natural persons and legal entities related thereto. The

Act particularly sets the prerequisites for fulfilment of the indicative objective which is the share of the electricity from renewable energy sources in the gross consumption in the Czech Republic in the amount of 8% in 2010 and the prerequisites for further increase of this share thereafter.

In the field of organic agriculture Act No. 553/2005 Coll., amending Act No. 242/2000 Coll., on Organic Agriculture and amending Act No. 368/1992 Coll. on Administrative Charges, as amended, as amended by Act No. 320/2002 Coll.; effective from 30 December 2005. By the amendment the provisions of Act No. 242/2000 Coll., that were in the scope of the legal power of Council Regulation 2092/91/EEC, were repealed and only those were left in the national legislation, which fell into the competency of individual EU Member States (that is the case of the administrative and supervisory system of organic agriculture and certification and labelling the products of organic agriculture).

In the field of waste disposal Act No. 7/2005 Coll., amending Act No. 185/2001 Coll. on Waste and amending some other acts, as amended (consolidated wording of Act No. 185/2001 Coll. was published in the Collection of Laws as No. 106/2005 Coll.); effective from 6 January 2005. By the amendment, the new Part 8 (Section 37f et seq.) was supplemented that imposed legal duties on producers, final vendors and distributors of electric and electronic devices that belong to the categories defined in Appendix No. 7 to the Act, as well as legal obligations of processors of such electric and electronic devices that become waste. Hence, the Ministry of the Environment has specified, in form of a statutory instrument (Decree No. 352/2005 Coll., on details of disposal of electric devices and electric waste and detailed conditions of financing the disposal of them, the list of products that fall in the categories of electric and electronic devices mentioned in the appendix No. 7 to the Act on Waste. Furthermore, in the second half of 2001 Decree No. 294/2005 Coll. came into force, determining completely new rules for depositing waste in landfills and their re-use on the terrain surface, by which the Council Decision 2003/33/EC was fully implemented.

In the field of chemical substances Act No. 345/2005 Coll., amending Act No. 356/2003 Coll., on Chemical Substances and Chemical Preparations and amending some acts, as amended; effective from 13 September 2005. By this amendment, the regime of legal obligations of individuals engaged in putting the chemical substances or preparations on the market after they had been manufactured or imported within the EU was altered. In the case it does not concern the import, marketing. Further, the Regulations No. 304/2003/EC of the European Parliament and the Council concerning the export and import of dangerous chemicals and 648/2004/EC on detergents and 850/2004/EC on persistent organic pollutants and amending the Council Directive 79/117 EEC were fully implemented by the above amendment.

In the field of genetically modified organisms Act No. 346/2005 Coll., amending Act No. 78/2004 Coll., on the Use of Genetically Modified Organisms and Genetic Products; effective from 13 September 2005. By this amendment the Regulation No 1830/2003/EC of the European Parliament and the Council concerning the traceability and labelling of genetically modified organisms and traceability of food and feed products produced from genetically modified organisms and amending Council Directive 2001/18/EC and also the Regulation No 1946/2003/EC of European Parliament and the Council on transboundary movements of genetically modified organisms were adapted into the Czech legal order. Act No. 78/2004 Coll. was thereby supplemented by provisions determining competence of the state administration authorities and by new punitive provisions. Part of the amendment has been

made up of provisions, which had emerged to be necessary from the application of Act. No 78/2004 Coll. and also from the need to bring it into accord with the regime of business secret of the Commercial Code.

In the field of free access to information Act No. 6/2005 Coll., amending Act No. 123/1998 Coll., on Free Access to Information on the Environment, as amended by Act No. 132/2000 Coll.; effective from 6 January 2005. By this amendment the Directive No 2003/4/EC of the European Parliament and the Council of 28 January 2003 on public access to the information on the environment and repealing Council Directive 90/313/EEC and also requirements resulting from the so-called Aarhus Convention were transposed into the Czech legal order. The amendment introduced some alterations in the procedure of providing access to information upon request and also as to reasons for refusal of the access to the information and contains also the so-called active dissemination of information by obligated entities (see newly added provisions of Section 10a). Apart from the transposition provisions, the obligations of particular entities in the field of environmental education were introduced by this amendment.

In the field of GHG emission allowance trading Government Order No. 315/2005 Coll., on National Allocation Plan of the Czech Republic for 2005 – 2007; effective from the date of promulgation that is 5 August 2005. The Government Order pronounced the National Allocation Plan of the Czech Republic in which it determined the total number of allowances that it would grant to individual operators of facilities (Appendix No. 2) for this time period.

As far as the overall evaluation for 2005 is concerned, the most significant progress has been made particularly in these fields:

- Renewable energy sources – the Act on Promotion of Use of Renewable Energy Sources is an up-to-date law even so in comparison with other Member States legislation and its enactment and final shape have been generally favourably accepted by business subjects as well as non-governmental organisations.

- Nature and landscape protection – adoption of the Government Order, by which the National List of European Significant Areas was determined, has been a very important step toward consistent protection of localities enlisted in the pan-European Natura 2000 system.

- Free access to information on the environment – by the regime of so-called active dissemination of information by the due entities the amendment has strengthened the importance of quality as well as exhaustive environmental information as a prerequisite for full-value participation of public in the decision-making of the state administration authorities and for control over the state administration in wide sense at the same time.

- Electric and electronic devices – by the amendment of the Act on Waste and by subsequent statutory instruments the specific obligations of entities working in this field have been set, having considered the fact, that electric and electronic devices were a specific kind of waste that constituted a significant risk to the environment.

- Waste landfills and the reutilization on the surface – new standards in this field have been adopted by passing of the above-mentioned Decree.

The European Law has been employed to a constantly increasing degree during the preparation of laws in the field of environmental protection, which means both the EU laws as such and also their interpretation carried out by the European Court of Justice (e.g. actual judgements that have been conductive substantially to the latest amendment of the EIA Act). As far as the EU laws are concerned the influence has not been unidirectional, because the Czech Republic as a full member of the EU has had the right to influence their shape during their preparation, possibly also whether they would be adopted at all.

Viewing the Czech environmental law in a complex way we doubtlessly deal with a system of unusually numerous and considerably splintered laws comparing to other branches of law, that is not formed into a consistent unit and not even its individual parts are adequately integrated. From the historical point of view, this phenomenon was caused by very hurried formation of new legislation after 1989 and later by accelerated adoption of European legislation before joining the EU. The field of environmental protection – notwithstanding the valid principle of subsidiarity – belongs to the widest branches of law legislated at the EU level. Insufficient congruency of environmental law also causes the individual segment laws established their own systems of various administrative deeds (permits, approvals, statements) that were required as a prerequisite for realisation of some projects or for keeping constructions, facilities etc. In addition to the necessity to transform new EU legislation in the Czech legal order, the current shape of the Czech environmental law makes the orientation of its addressees considerably difficult – concerning not only common citizens but also professionals working in the field (no matter whether on the part of investors, or public administration, or NGOs).

The above-mentioned reasons together with foreign experience result in the preparation of a unified act on the protection of the environment (or the intended subject-matter of the law) that shall be aimed at transparency of the law in field of environmental protection.

V.2 Economic Instruments

In 2005 the following charges (payments) belonging to the economic instruments of protection of environment were effective:

- Air protection: the charges for air pollution (concerns operators of extra large and large stationary pollution sources, medium stationary sources and small stationary sources),

- Water: charges for taking groundwater, charges for releasing waste into surface water, charges for permitted releasing of waste water into groundwater and charges for taking water in consideration of watercourse management and basin management,

- Waste and packaging: charges for depositing waste in landfills, for promotion of collecting, processing, utilising and disposal of car wreckage, for operation of collection system, collection, transport, sorting, utilising and removal of municipal waste, for registration and for yearlong record in the list of authorised entities according to the Act on packaging,

- Minerals: charges for mining area and for mined minerals in exclusive field or for reserved minerals after their treatment and refinement,

- Soil: for withdrawal of soil from agricultural land fund and for withdrawal according to the Forest Act.

In 2005 there was only one modification. By the way of amendment to Act. No. 44/1988 Coll. on the Protection and Utilisation of Mineral Resources (the Mining Act) alterations in yearly charges for mining area were carried out. The charges will gradually amount to CZK 100-1,000 per each hectare of the mining area according to the degree of environmental protection of the particular area (see Section 32a – Charges). This new system of payments for mining areas differentiates the amount of yearly charges in relation to actual or potential impact of mining activities and therefore at least partially reflects environmental losses that are related to land appropriation.

The preparation of the concept of the environmental tax reform continued in 2005, in compliance with the governmental policy statement. The concept follows the principle of tax yield neutrality, which means that every gain from the increase of indirect tax (excise duty on fuels and energy, whose rate are derived from Council Directive 2003/96/EC) has to be compensated by a decrease of direct tax. The Ministry of the Environment prepares this motion together with the Ministry of Finance and submission to the Government is envisaged during 2007. Since 1st January 2008 the Czech Republic has been obliged to introduce, according to the requirement of EU directive, new excise duties on fuels and electricity. Two new acts are being prepared now – act on solid fuel taxation and act on tax on electricity. The legislation under preparation will comply with the proposed concept of the environmental tax reform.

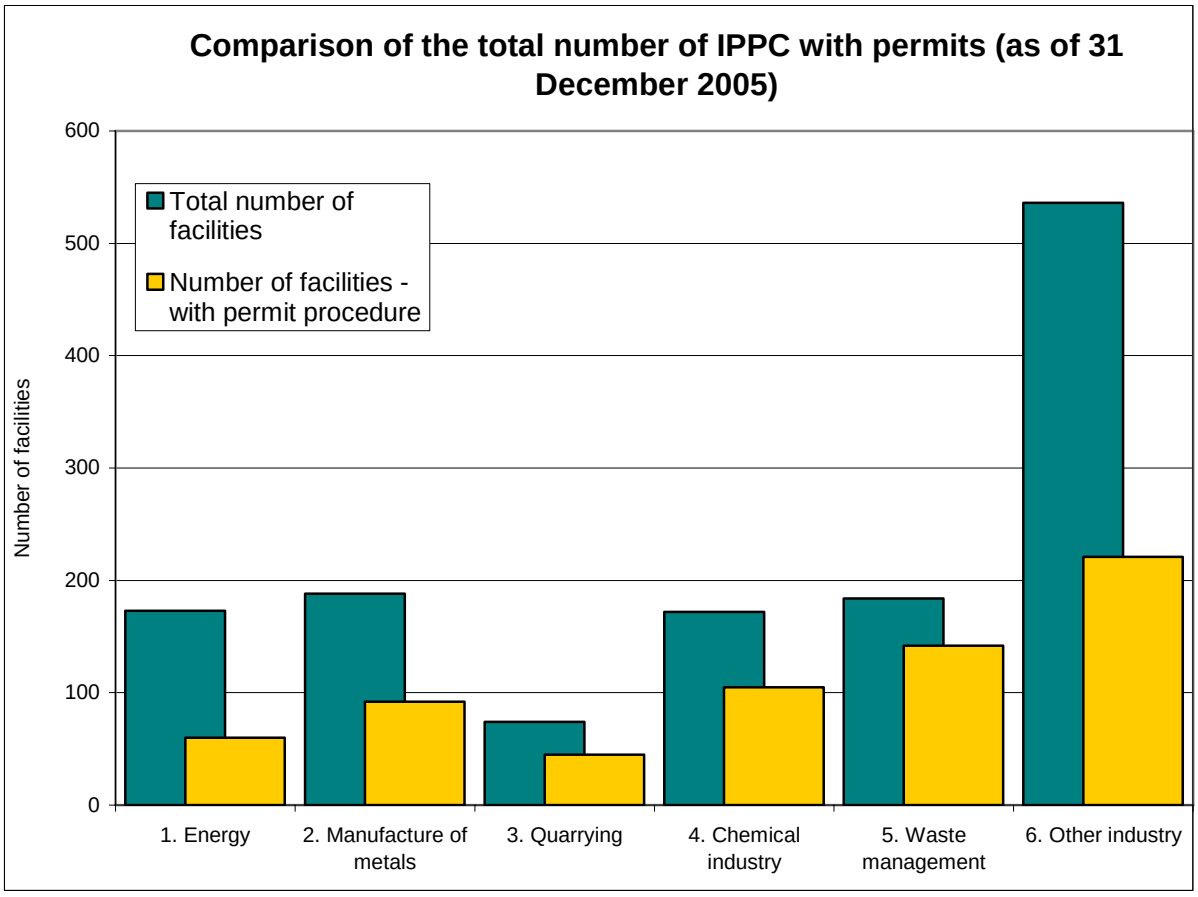
V.3 Integrated Prevention and Pollution Control (IPPC)

IPPC in the Czech Republic is under regime of Act No. 76/2002 Coll., on Integrated Prevention and Pollution Control, on Integrated Pollution Register and amending some acts (Integrated Prevention Act), as amended, which came into effect on 1 January 2003. By this Act the Council Directive 96/61/EC on Integrated Pollution Prevention (Integrated Pollution Prevention Control – IPPC) was transposed into the Czech legal order. In 2005 the preparations of amendment of the Act on integrated prevention continued (enacted on 25 April 2006 under No. 222/2006, came into force on 1 May 2006).

The total number of facilities in the Czech Republic, that fall into the applicability of the law on integrated prevention, is approximately 1,300. During 2005, 307 applications for integrated permits were submitted, amounting to 708 IP applications together with years 2003 and 2004 as of 31 December 2005. In 2005, a total of 178 IP was granted and together with years 2003 and 2004 450 IPs were granted as of 31 December 2005.

Graph V.3.1

Comparison of the total number of IPPC facilities with the total number of facilities where the permit procedure in progress or had been finished as of 31 December 2005.



Source: ME

Individual regions significantly differ in their numbers of IPPC facilities in their territories. The smallest number is found in the City of Prague (27), the biggest number in the Středočeský (224). Also as to the number of submitted applications for integrated permits, the regions show significant disproportion related to the prevailing types of facilities (see Graph V 3.1). The following table indicates the distribution of IPPC facilities under licensing procedure in the individual regions together with the current number of IP applications.

Table V.3.1

Number of submitted applications and number of issued decisions in individual regions in 2003, 2004, 2005

Region	Number of submitted applications			Number of issued final decisions		
	2003	2004	2005	2003	2004	2005
City of Prague	1	1	10	0	2	0
Jihočeský	16	9	20	4	13	15
Jihomoravský	27	10	45	17	14	23
Karlovarský	3	7	13	2	4	6
Královéhradecký	19	18	13	11	15	15
Liberecký	15	7	8	1	14	7

Moravskoslezský	34	12	31	6	17	22
Olomoucký	13	8	20	2	12	11
Pardubický	21	12	22	8	14	12
Plzeňský	13	7	18	6	4	15
Středočeský	38	16	37	6	31	15
Ústecký	28	15	35	5	24	17
Vysočina	19	13	23	5	16	16
Zlínský	17	2	12	3	16	4
Total	**264**	**137**	**307**	**76**	**196**	**178**
	708			**450**		

Source: ME

The IPPC information system (www.env.cz/ippc) contains information on submitted IP applications and on the degree of progress of these applications, as well as documents relating to these applications and the amending procedure of the permits issued earlier. In 2005 a new form of the information system started to be prepared – particularly as to the extension of the existing functions.

According to Section 16.3 of Council Directive 96/61/EC an obligation was established to evaluate the stage of implementation of the Directive and to apply the best available techniques (BAT) and to report the implementation of the Directive as well as its efficiency, in comparison with other environmental instruments of the European Communities, to the European Commission. First report from the Czech Republic includes years 2003-2005 and was submitted to the Commission on 30 September 2006.

The existing information shows, that the majority of technologies regulated by the IPPC Act complies with the high environmental protection standards. The advantage of an integrated permit is the reduction of administrative burden, as only one integrated permit is issued instead of an set of partial permits.

V.4 Environmental Impact Assessment

The environmental impact assessment (EIA) is regulated by Act No. 100/2001 Coll., on Environmental Impact Assessment and amending some related acts (the Environmental Impact Assessment Act), as amended by Act No. 93/2004 Coll. The object of assessment are construction projects, activities and technologies listed in Appendix No. 1 to the Act, as amended. Assessment of these projects is provided by the Ministry of the Environment (134 notifications in 2005) or regional authorities (823 notifications in 2005). The following tables quote the number of processes completed in 2005 and projects classification according to the branches of industry.

Table V.4.1
Number of processes completed in 2005

	Not subject to further procedure	**Statement**		**Finished for other reasons**
		Affirmative	**Non-affirmative**	
ME	55	60	2	5
Regional authorities	666	46	4	59

Source: ME

Table V.4.2

Projects classification according to the industrial branches since the effective date of Act No. 100/2001 Coll. (31 December 2005)

Power engineering	47
Transport structures	41
Industry	230
Commercial and warehouse premises including car parks	232
Waste management	147
Agriculture	90
Mining industry	44
Other	127
Total	958

Source: ME, CENIA

The amendment of Act No. 100/2001 Coll., Act No. 93/2004, on Environmental Impact Assessment, brought *inter alia* the environmental impact assessment of concepts (effective as of 1 May 2004). In addition to a big number of notified intentions of municipal planning and their modifications, 9 proposals of large area development plans and modifications were notified in the period between the legal force of the Act and 31 December 2005. Table V.4.3 shows the number of notified concepts between the date of legal force of Act No. 93/2004 Coll. and 31 December 2005 and the number of statements issued by responsible authorities in 2005 (all statements were affirmative).

Table V.4.3

Concepts notified between the legal force of Act No. 93/2004 Coll. and 31 December 2005 and statements issued by responsible authorities in 2005.

Number of notified concepts between 1 May 2004 and 31 December 2005	**Ministry of the Environment**	**Regional offices**
	23	19
Number of statements issued in 2005	**Ministry of the Environment**	**Regional offices**
	5	2

Source: ME, CENIA

At the level of the Ministry of the Environment statements to the following conceptions were processed in 2005:

- Waste Management Plan of the City of Prague;
- Transport Policy of the Czech Republic for years 2005-2013;
- Sustainable Development Strategy of the Liberecký Region for years 2005-2020;
- Economic Growth Strategy of the Czech Republic;
- Agriculture Policy and Developments of the Country in the Olomoucký Region for years 2006-2012.

The process of environmental impact assessment constitutes a significant component of preventive instruments of environmental protection as well as an important part of the environmental policy at the same time. The amendment of Act No. 93/2004 Coll. brought, besides changes in some provisions relating to project assessment, new rules for concept assessment. Concerning the assessment of projects a significant and progressive increase in number of notified projects (in total 958 notified projects) occurred in the time period after Act No. 100/2001 Coll., on Environmental Impact Assessment, came into force on 1 January 2002. At the same time consequential increase of completed processes took place, whether in form of that the project is not subject to further assessment, or in form of issuing a statement. The assessment of concepts proceeds according to the amendment of the Act at the national level (concepts and development programmes), regional level (territorial plans of large regions) and local level (local plans of municipalities).

Information and documents obtained during the assessment process are being published also on the internet in the EIA/SEA information system, which is accessible from the web site of the Ministry of the Environment (http://www.env.cz) and CENIA (http://www.cenia.cz).

V.5 Inspection Instruments and the Czech Environmental Inspectorate

The inspection of the environment is secured, apart from regional and local authorities, primarily by the Czech Environmental Inspectorate (hereinafter the CEI or inspection).

In 2005 the CEI issued a total of 8,583 administrative decisions (whereof 8,495 were final), which is by 1,237 less than in 2004 (in 2004 there were 9,732 administrative decisions whereof 9,661 final). The CEI imposed altogether 2,861 fines in 2005, whereof 2,560 were final in this year. The total sum of fines amounted to CZK 92,724,736, which indicates a decrease (CZK 94,330,161 in 2004, CZK 81,140,275 in 2003). One of the reasons was a decrease in the total sum of fines imposed by final decisions in the area of waste management, which was partially caused by the strategy of the inspection to investigate problematic cases, where it often proceeds to imposing high fines. A part of these cases are currently in the stage of appeal and the inspection awaits decisions of the appellate body.

The average rate of a fine imposed by a final administrative decision in 2005 was CZK 36,221. The fine was a result of inquiry of the inspection in 14.8% cases. In 21.75% cases the decisions were subject to appeal. 0.62% of cases were solved in the way of error coram nobis. In addition to that, 634 decisions on corrective measures and 37 decisions to stop the operation were issued in 2005.

Table V.5.1

Structure of the CEI activities in 2005 according to the components of the environment

Department		AP	WP	WM	NP	FP	TOTAL
Number of inspectors		99	85	92	70	60	406
Inspections, revisions		4,525	3,903	3,101	3,620	1,800	16,949
Statements, audits		7,477	2,027	758	1,105	501	11,868
Issued administrative decisions	Charges	0	9,446	0	0	0	9,446
	Sanctions (fines)	454	712	883	525	165	2,739
	Corrective measures	135	154	17	30	298	634

	Withdrawal	0	0	0	51	0	51
	Operation discontinued	6	0	0	31	0	37
	Approval + authorisations	53	0	0	0	0	53
Proposed motions		0	0	0	139	0	139
Complaints already processed or under procession		316	247	256	494	82	1395
Processed applications for information		46	17	9	14	3	89
Investigated accidents		0	114	10	0	0	124

Note: The table contains only information from expert departments (air protection – AP, water protection – WP, waste management – WM, nature protection – NP and forest protection – FP; it does not include applications for information submitted to the headquarters and IPPC. The number of 2,739 administrative decisions (not final) comprises just those from expert departments again without IPPC.

Source: CEI

Although the sphere of obligations of the CEI (mostly as a result of adopting European legislation) has been increasing, the number of inspectors decreases. In 2005 the inspection was employing almost 6% less inspectors than in 2004.

IPPC Inspection

In 2005 the CEI carried out 111 comprehensive integrated inspections (IC), 97 compliance inspections of duties set by Act No. 76/2002 Coll. and of integrated permissions (IP) with operators, who already had obtained IP, and 90 inspections of facilities without previous IP. In several cases the inspection found out serious defects, e.g. in municipal waste landfills – deposit of hazardous waste, releasing of harmful waste water or unsecured warehouses and deposits of harmful substances, etc. Fines ranged from CZK 10,000 to 200,000. The total sum of fines in legal force came to CZK 1.3 million.

Air Protection Inspection

In 2005 more than 4,000 inspections were carried out whereof 454 sanctions and 135 corrective measures were imposed. A breach of obligations (according to the number of imposed fines and corrective measures) were detected in less than 10% of inspected stationary sources in 2005. A decreasing trend, compared the period before 2000, may be considered to be the result of systematic and long-term pursuit of the requirements of air protection by the CEI, which lead operators of the sources to adjust to them. In 2005, in comparison with previous years, more infringements related to above-limit emissions of scent substances were detected.

Efficient enforcement of air protection requirements by the CEI is also reflected in a decreasing trend of total air pollutant emissions from stationary sources, which along with other influences, for instance lower energy consumption, preference to use high-grade fuels and limiting production in obsolete establishments, significantly contributed to the improvement of air quality.

Inspection of Compliance with the Obligations Related to the Ozone Layer Protection

There were 443 inspections carried out in 2005 and the CEI discovered infringements of duties in 100 cases. Safe for exceptions, just infringements of administrative obligations were the matter – failure to submit or late submission of reports on the quantity of regulated substances, that the entitled person was handling with during the period in question (thus, there was no infringement of duties directly affecting the ozone layer).

Water Protection Inspection

The compliance with the requirements of permits to release waste water from either large or small pollution sources shows a slight improvement compared to the previous year. The proportion of waste water treatment plants (WWTPs), operated by specialised companies, was rising in smaller sources of 500-10,000 equivalent inhabitants, and therefore the overall quality of their operation improved. In 2005, the CEI proved infringements of regulations in 9% of tested sources in this category.

In the category of the most important WWTPs of size above 10,000 equivalent inhabitants, that comprise 201 in the Czech Republic, infringements of law were found in 11 cases. Even in this category of WWTPs we can observe a descending trend in the number of discovered infringement of laws despite the same number and quality of accomplished inspections, which is primarily a result of more competent operation of these sources by large companies.

There were 254 detected accidents in 2005. The most frequent ones are those caused by transportation (74) and the rate of these accidents has been rising (28% of all accidents). However, these accidents usually do not have significant impact on the environment. Fish died in case of 25 accidents in 2005, which represents 9.5%. The origin of the accidents was revealed in 147 cases in 2005 (56%), whereof 77 were caused by petroleum products.

The cases of long-term accidents affecting groundwater are monitored continuously, at the end of 2005 the CEI registered 428 unresolved accidents including so-called old ecological burdens, where the pollution incurred before the privatisation in Czech Republic has been removed on the basis of a contract between the new owner and the National Property Fund.

Pollution monitoring or reconstruction of pollution was completed in 23 localities in 2005, three localities were newly registered. The CEI imposed 38 corrective measures in cases of old ecological burdens; there have been altogether 881 decisions issued since 1993 corresponding to the total of 272 contractual guarantees approved to the new owners by the Government. A number of organisational detainment, mostly on the side of the NPF, resulted in delay or decline in the reconstruction work, which endangered the deadlines set by the CEI, as can be observed in 62 cases, where the reconstruction work did not continue according to the plan for 2005, in spite of the imposed measures. Nonetheless, the fulfilment of imposed measures proceeded successfully in a number of significant areas (e.g. completion of reconstruction in a former coking plant in Ostrava or of soil reclamation of the Bílina river in the premises of Chemopetrol Litvínov, a.s.).

Waste Management Inspection

The CEI followed up with the results from previous years and centred on the spheres of occurrence of hazardous waste. In some areas, e.g. waste disposal in incinerators, a significant

improvement took place in comparison with previous years. In 2005, there were 26 incinerators inspected and infringement of the Act on Waste was revealed in 3 cases (11%).

The CEI accomplished 33 inspections of landfills and imposed a fine only in one hazardous waste landfill. Beyond the terms of the task, inert and other waste landfills were inspected (in total 48) and in 11 cases fines were imposed, which implies unsatisfactory conditions of this kind of landfills.

In 2005 a total 77 inspections of hospitals and medical facilities were carried out and infringements of law were found in 35 cases, i.e. in 45%, which is alarming. Furthermore, inspections beyond plan were carried out in hospitals and medical facilities in 2005 and 92 of them were found to breach the law.

Inspections of scrapyards were accomplished with 102 entities in 2005, infringements were detected with 32 of them (31%). The inspections confirmed that a legislative problem of unambiguous determination of when a car becomes wreckage (and consequently waste) from the point of the Act on Waste still remains.

Before the end of 2005 the CEI encountered first ever cases of unauthorised transboundary waste shipment. First cases occurred on the border between the Czech Republic and Germany (in the Plzeňský, Liberecký and Ústecký regions). The waste was shipped from Germany and in a large scale deposited in facilities that were not authorised to receive the waste and handle it. In some cases the CEI proved fault on part of the German dispatchers. The main reason for the above-mentioned situation can be seen in fact that import of waste into Czech Republic is forbidden for the purpose of its liquidation, but lawful for the purpose of its utilising.

Packaging Inspection

In 2005 the CEI carried out 309 inspections according to Act on Packaging. A big part of the inspections (31%) was made on basis of initiatives by the Ministry of the Environment, which were obtained by the CEI during October and November 2004. Infringements were found in 58 cases (18%). Most of the infringements were found with entities fulfilling legal duties on their own by entry into the Register of Entities, not by a contract on associated performance with the authorised packaging company EKO-KOM, a.s. Praha. Failures to maintain records or to submit annual reports were the most frequent infringements. Further problems, which were detected during the inspections, consisted in the determination whether an entity markets packaging for consumers or for other end user. Sometimes it was even difficult to determine whether a substance is or is not packaging.

Inspection of Chemical Substances Disposal

The requirements of Act No. 356/2003 Coll., on Chemical Substances and Chemical Preparations, were inspected in 2005 in 81 producers, importers and distributors, who carried out distribution of hazardous chemical substances and preparations (hereafter HCHSP) designated for consumers. Infringements were found in 9% cases. We can conclude that primarily Czech producers have a high-level knowledge of law and all detected imperfections in HCHSP labelling were related to imprecise wording of R-sentences and S-sentences.

Inspection of Biocidal Preparations Disposal

Within the scope of inspections directed on the compliance with Act No. 120/2002 Coll., on Conditions for Placing Biocidal Preparations and Active Substances on the Market, there were 50 selected entities inspected, whereof 40 put biocidal preparations on the market in the Czech Republic. Inspections showed that biocidal preparations were packaged in compliance with statutory requirements; however, the requirements for labelling the products were not yet fully met. Three entities were imposed a total fine of CZK 96,000.

Inspection of Nature and Landscape Protection

The CEI has the competence to provide inspections within the framework of four basic acts, which are Act No. 114/1992 Coll. on Nature and Landscape Protection (ANLP), Act No. 100/2005 Coll., on Trade in Endangered Species (CITES), No. 78/2004 Coll., on Handling of the Genetically Modified Organisms (GMOs) and No. 162/2003 Coll., on Conditions for Operating Zoological Gardens.

The CEI carried out a total of 3,620 inspections in this field in 2005. The main objective of these inspections remained general, regional and species protection according to ANLP (71% of inspections and 68% of fines). An increase took place as to the number of inspections and imposed sanctions oriented on general protection on significant landscape elements (SLE) and landscape character (LCH) to the exclusion of orientation on unauthorised woodcutting and harmful chopping of trees outside forests.

The inspections were focused also on the compliance with legal duties in the field of growing and breeding particularly protected plants and animals species and on possession and trade in internationally protected species CITES (about 25% of inspections). After a certain decrease in the number of handled cases and reorganisation related to the accession to the EU, the activities of inspection got stabilised, which brought partial successes in co-operation with the police in capturing large illegal traders and smugglers of protected species. In addition, breeders who did not observe deadlines set by the law were penalised with minor sanctions (mostly in form of an administrative order) while the initiatives thereto were obtained from registrar bodies (mostly from regional authorities).

In the field of GMO, the inspection was closely co-operating with the Department of Environmental Risks of the Ministry of the Environmental and the Czech Commission for GMO. After joining the EU the activity was centred primarily on regular annual inspections of subjects, which had obtained a permit to dispose of GMOs, and also on inspections of field experiments, which are not very abundant in the Czech Republic at the moment. Moreover, after a period in which the subjects were only adjusting to the relevant national legislation in this field in past years, the situation has changed considerably just on the basis of regular inspections by the CEI and therefore primarily minor formal imperfections were found.

The inspections of compliance with of Act No. 162/2003 Coll., on Conditions of Operating Zoological Gardens were without sanctions in 2005.

Forest Protection

In the sector of the forest protection the CEI accomplished altogether 1,800 inspections in 2005. The rate of comprehensive inspections focused on observance of all statutory

obligations by forest owners increased. Compared to the trend before 2004, when the number of administrative decisions kept rising every year, there was a decrease by approximately one fifth in 2005. Even though in 2005 the total sum of imposed fines rose in comparison with 2004 almost by 14%, there was a decrease compared to the previous years, which was mostly caused by a decrease in the cases of illegal woodcutting. Whereas until 2003 the CEI lodged in average 13 complaints with the police on illegal woodcutting annually, there were only 3 in 2005.

The administrative procedure to impose a fine was most frequently initiated on the grounds of failure to obey measures to protect the forest against bark beetle or on the grounds of not complying with the statutory limits for forest renewal. There were 165 decisions on fines issued, the total sum of fines in legal force amounted to approx. CZK 4.9 million.

The main objective of the CEI is to prevent damage to the forest functions, in many cases also consulting activity, mostly with small forest owners. In compliance with that the CEI preferentially imposed corrective measure (307), possibly preliminary ruling (36). Altogether 4 complaints were lodged to the police, namely for illegal woodcutting, failure to afforest glades and neglected protection of forest against the bark beetle.

The main tasks for the CEI in this field in 2005 were inspections of the conditions of glades after illegal woodcutting from 2002 and inspections of forest protection against bark beetles. The total detected area of glades in question was 299 ha, out of which the CEI inspected a total of 217 hectares (72.5%) in 149 inspections. The result was a negative finding that altogether 119.7 ha. i.e. 55.2% of the glades, were not afforested in the statutory two-year limit and in this context the CEI imposed 17 fines and 47 corrective measures.

As far as the problem of the bark beetle is concerned, the CEI found many cases of their occurrence within the scope of more than 1,000 inspections, however, the condition was usually normal. The hypothesis of their increased occurrence in 2005 as a result of favourable climate for their progression in summer 2004 did not come true. Failures were found mostly with small owners and municipalities in processing and redevelopment of infested wood in cases where they did not husband in the woods practically at all. The CEI imposed a total of 79 fines, 96 corrective measures and 36 preliminary rulings for imperilling and damaging wood as caused by the bark beetle in 2005.

From the perspective of factual trends, an increasing number of cases of damage to standing trees not intended for woodcutting was detected, which consisted in carving in them by an unknown perpetrator, in the result thereof the state administration of forests was liable to issue a permit to cut it down. There were 9 such cases under investigation by the CEI together with the state administration of forest of a total area of 17.2 hectares. The Police of the Czech Republic, as far as a crime suspicion is concerned, always investigated the case, nevertheless in 2005 no person was apprehended who had done the damage.

A number of state forest administration bodies falling under local authorities in charge of the state administration accomplished supervisory activities, particularly toward the forests in their ownership, in a considerably limited extent or with inadequate vigour. In such regions the CEI remained more or less the only supervisory body in forests, which was in consideration to its capacities difficult to manage (generally 1 inspector in the forest protection sector is responsible for 50,000 ha of forest).

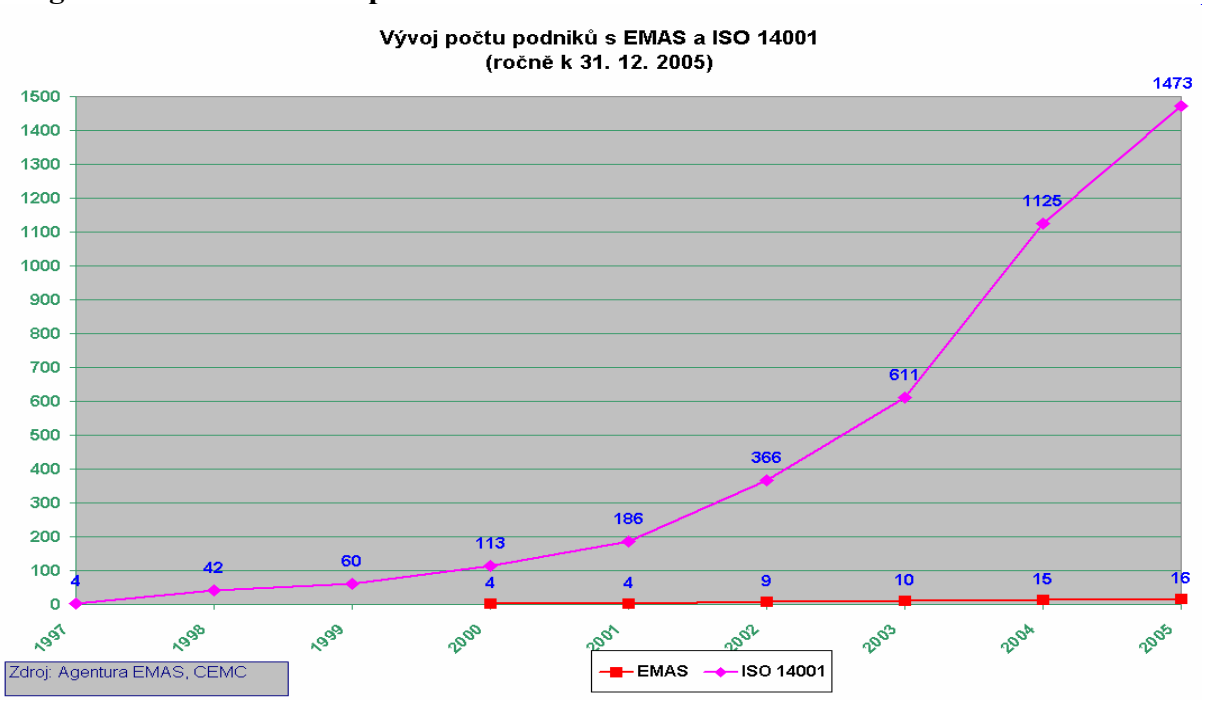
V.6 Voluntary Instruments

The voluntary instruments enable to accomplish the strategy of twofold gain (win-win) – economic and environmental at the same time when economic savings bring environmental benefits and vice versa. These groups of activities go beyond the domain of law and entrepreneurs adopt them on the basis of their voluntary and free decisions while promoting conduct towards sustainable consumption and production.

V.6.1 Corporate Certifications

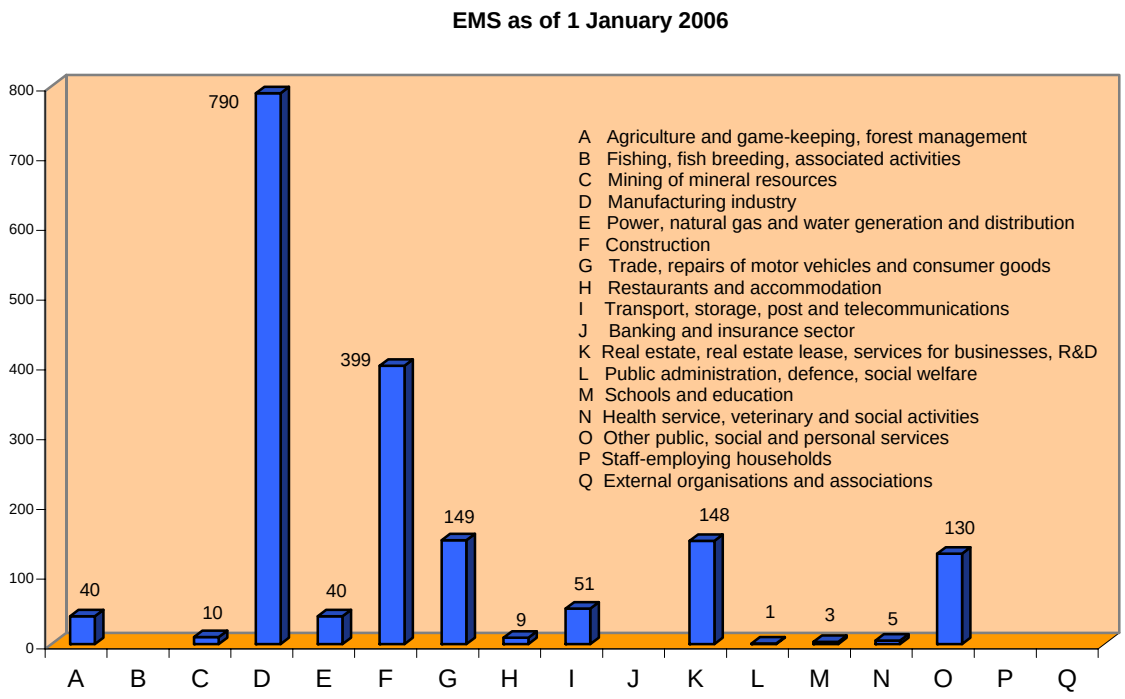
Economic subjects of both production and non-production spheres in the Czech Republic apply two voluntary instruments in the field of environmental protection – international standard ISO 14001 or the system of environmental company management according to the Regulation No 761/2001/EEC of the European Parliament and the Council (**EMAS).** Before the end of 2005 altogether 1,473 subjects introduced management according to ISO 14001 (in 2005 the number of holders increased by 348) and 16 introduced the EMAS – see the following graphs.

Graph V.6.1
Progress of number of companies with EMAS and ISO 14001



Graph V.6.2

EMS systems introduced as of 1 January 2006

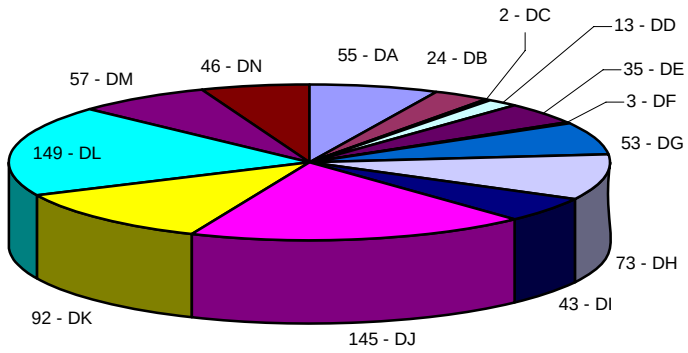


Source: EMAS, CEMC

Graph V.6.3

EMS introduced in the manufacturing industry

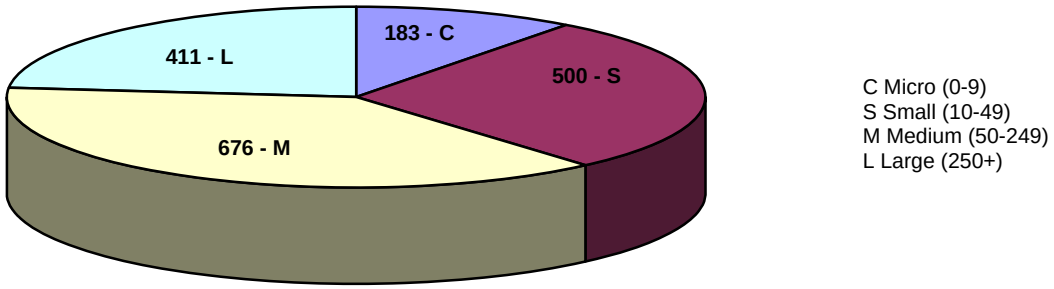
DA	Food and tobacco industry
DB	Textile and clothing industry
DC	Leather manufacturing
DD	Wood processing industry
DE	Paper and printing industry, publishing
DF	Coking, refinery oil processing, production of nuclear fuels, radioactive elements and compounds
DG	Chemical and pharmaceutical industry
DH	Rubber and plastic-making industry
DI	Glass, ceramics, porcelain and construction materials
DJ	Metallurgy and metallurgical products
DK	Production of machinery and equipment
DL	Production of electrical and optical devices
DM	Production of vehicles
DN	Other manufacturing industry



Source: EMAS, CEMC

Graph V.6.4

EMS introduced in companies according to the number of employees



Source: EMAS, CEMC

V.6.2 Product Certifications

Product certifications in the Czech Republic include the National Programme for Labelling Environmentally Friendly Products and Services and the EU Eco-labelling Programme. The requirements of tested and then certified products are laid down not only from the viewpoint of their influence on the environment during their life cycle, but also from the viewpoint of their utility, qualitative parameters and their impact on consumers' health. The eco-label of the Czech Republic "The environmentally friendly product" and the eco-label of the European Union "The Flower" are in the picture below. The certification is guaranteed by the Ministry of the Environment (for detailed information see www.ekoznacka.cz).

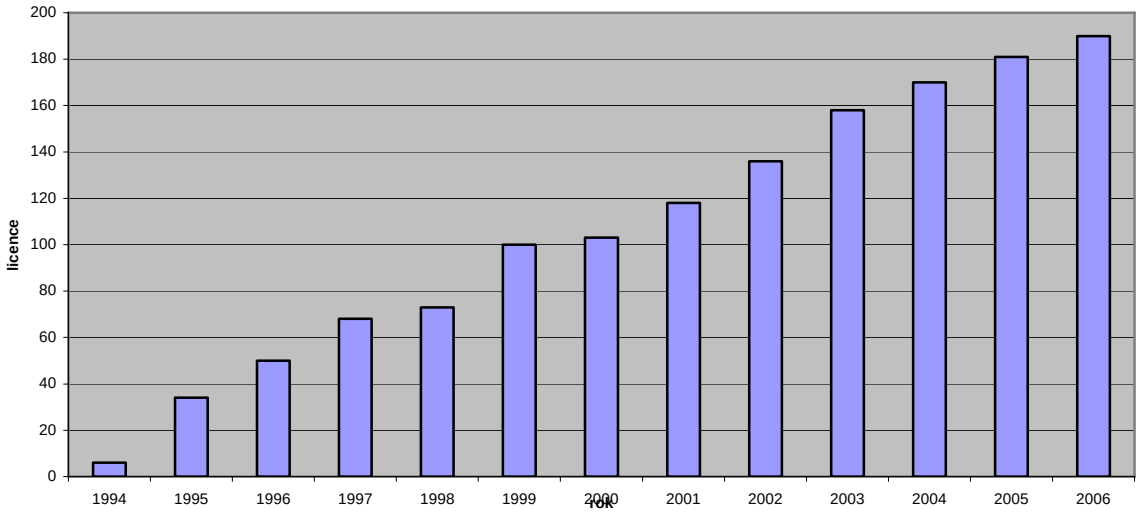
Figure V.6.5

Eco-labels of the Czech Republic and the EU

By the end of 2005, 81 companies, producers, importers or service providers were included in the National Programme for Labelling Environmentally Friendly Products and Services, who submitted their products or services for assessment and obtained the right to use the eco-label. These companies successfully took the advantage of the offer of 45 categories of products/services for which the requirements and criteria of the eco-label were specified in 2005.

Graph V.6.6

Number of licences for using eco-labels in the Czech Republic



Source: ME/CENIA

The graph shows the development of the number of licenses granted for the use of eco-labels in the Czech Republic. Currently 190 licences have been granted, which represent more than 350 labelled products on the Czech market.

In the year 2005 the first Environmental Product Declarations (EPD), i.e. declarations of 3rd type eco-labelling, were released. Such a declaration contains quantified environmental data cited in accordance with pre-set categories of parameters and it is one of the ways of product eco-labelling, evaluated according to ISO 14025.

V.6.3 Green Shopping

Close attention is paid to green shopping in the world, especially within the state administration. In 2000 the Government of the Czech Republic adopted Resolution No. 720/2000 concerning the promotion of sales and usage of environmentally friendly products. Green shopping can be promoted also by means of Act No. 40/2004 Coll. on Public Tenders. This law enables the contracting authority to select environmental or functional qualities of the object as a partial criterion for bid assessing. Eco-labelled products have these parameters on a very high level. Green shopping, though, applies to individuals too. Eco-labels belong to the simplest guides for a consumer while shopping.

The Government departments have been reporting these data for several years already. According to the reports submitted to the Ministry of the Environment, the following results were achieved: Within the state administration organisations, products marked as "Environmentally friendly" valued at CZK 119 million were purchased. This represents 79% of all purchases made in those groups of products where eco-labelled products were actually available. For example, in 2005 the total sum of CZK 53 million was spent on stationery products. Out of this sum, CZK 20 million were spent on graphic paper for writing, printing and copying, on notebooks, notepads and similar products, CZK 27.7 million were spent on hygienic paper articles and CZK 1.1 million on envelopes, paper bags and sacks. According to the data from individual departments the percentage of eco-labelled stationery products of all purchases was very high (89%).

Office furniture purchased by the state administration in 2005 cost CZK 53 million whereas eco-labelled products accounted for 84%. Other major groups of products purchased by the state administration were textile products (CZK 20.1 million), painting materials (CZK 6.2 million), cleaning agents (CZK 4.1 million), gas boilers for central heating (CZK 1.9 million), detergents (CZK 0.6 million), cosmetic products (CZK 0.3 million) and adhesives and putties (CZK 0.3 million).

V.6.4 Voluntary Agreements

Voluntary agreements are defined as contracts or contractual obligations between a public authority (on various administrative levels) and a private subject that are beyond duties set by effective laws, or they can also substitute laws where these are missing. These agreements may take various forms: unilateral obligations, public voluntary programmes, and voluntary environmental agreements. They can regulate many specific cases and environmental problems. The basic principle, on which the voluntary agreements are founded, is negotiation.

There were altogether six agreements concluded by the end of 2005; currently the following voluntary agreements with the participation of the Ministry of the Environment are in force:

- Agreement on packaging (1999);

- Agreement on co-operation with the Confederation of Industry of the Czech Republic (1999);

- Agreement on re-collection of used portable batteries (2001);

- Voluntary agreement on reduction of environmental stress caused by mercury waste from stomatological facilities (2001);

- Agreement on co-operation with building industry (2002);

- Agreement on co-operation with the Economic Chamber of the Czech Republic (2005);

- Agreement on principles of co-operation and mutual relationships between the Ministry of the Environment and the Czech Confederation of Commerce and Tourism (2006);

- Agreement aimed at the wider use of natural gas as an alternative fuel in transportation (2006) – the Ministry of the Environment as a partner.

V.6.5 Cleaner Production

Cleaner production is defined as “continuous application of an integral preventive strategy of environmental protection to processes, products and services with the aim to increase their efficiency while reducing risks to both humans and the environment.” Cleaner production can

be put into effect within both manufacturing and non-manufacturing spheres and its applicability is independent of both the size and the character of an enterprise.

The functions of the National Centre for Cleaner Production of the Czech Republic (NCCP) and the Agency of the National Programme for Cleaner Production have been carried out since 1 January 2005 by CENIA (Czech Environmental Information Agency). The NCCP has created a web site on cleaner production (www.cenia.cz/CP), it participated in preparations of a new national programme for cleaner production and of guidebooks on cleaner production. The significance of introducing cleaner production increases to the extent that it is followed by introduction of ISO 14 001 standards.

In the field of practical application of cleaner production in companies, the Centre of Cleaner Production in Brno has maintained its prominent position. The Centre applies the techniques of cleaner production primarily in succession with the integrated permits to operate within the meaning of the Directive on IPPC and within the terms of application of good agricultural practice. Cleaner production has been newly established in six companies. All these companies managed to achieve both positive environmental and economic effects at the same time. The average financial saving came to 1.1 million CZK/year and the average return on investment ranged from 2 to 7 years. All these companies also took non-investment measures.

In 2005, a new model of introducing the techniques of cleaner production, which consisted in paying from the savings, was set up in the Czech Republic. Within the EMPRESS project, financed by GEF through the UNEP and currently implemented in the Czech Republic by the Czech Centre for Energy Management and ENVIROS, s.r.o., first contracts on the introduction of the system of energy management by the method of cleaner production called "monitoring and targeting" have been signed. According to the contracts, expenses on introducing the system shall be paid from the savings this system shall generate. "Monitoring and targeting" method enables monitoring of real efficiency of energy and materials exploitation in manufacturing processes and also makes responsible employees/workers who really influence it.

V.7 Environmental Accounting

In the Czech Republic, the problem of environmental accounting is approached on macroeconomic as well as microeconomic levels (the level of a single company). In these fields a whole range of activities are being developed, there have been enterprising participation in activities of both national and international organisations and good results have been steadily achieved (many of these activities and their outputs are fully comparable to similar outputs in other EU member states).

In 2005, projects of the Ministry of the Environment concerning the problem of application of environmental accounting belonged to the most significant activities in this field. During this year a number of countrywide and international meetings, courses or conferences were held on the problems of environmental accounting.
The following achievements belong to the important results of activities in the field of **environmental accounting on the macroeconomic level** in 2005:

- The first calculation and compilation of a time line (1986-2003) of investments into the environmental protection in the Czech Republic (calculated in fixed prices of 2000).
- The first calculation and compilation of a time of common expenses on conservancy activities connected to the supply of tangible capital for this protection in the Czech

Republic for the period 1995-2003. A qualified appraisal of the common expenses linked to conservancy activities was carried out using the "capital method", where common expenses were estimated as the proportion indicator against capital reserve.

- Analysis of eco-industry – description of performance, employment and foreign trade. In the Czech Republic, this analysis was implemented using the methodological approach based on the information about the supply of products and services for conservancy activities (i.e. the supply-oriented approach).
- Analysis of environmental taxes and charges in the Czech Republic and their share in the GDP.

In the accounting of environmental assets, activities oriented on underground assets in economic conditions of the Czech Republic accenting especially fossil resources were developed in 2005.

Environmental accounting on a level of a company promoted gradual implementation of the monitoring and evaluation of environmental expenses and benefits and other indicators, which support penetration of the concept of economic-environmental effectiveness into practise of industrial companies and other organisations.

The interconnections among the system of environmental accounting and systems of environmental management and environmental company reporting seem to be very useful.

During the year 2005 extensive research took place in companies that had introduced the system of environmental management. This research has unequivocally confirmed that companies were well aware of the importance of information about environmental expenses and that they considered this information useful for both economical and environmental company management. For this reason the environmental expenses have been monitored and assessed in the companies. The practical experience of the companies which have introduced the environmental accounting confirm the power and positive effects of this instrument.

General awareness of the problems of environmental accounting was supported in 2005 by publishing several publications on this topic as well as by conferences held by the Ministry of the Environment.

V.8 Local Voluntary Instruments

The international programme Local Agenda 21 (LA21) is a voluntary instrument exercised on the level of cities, towns and regions and intended to improve the quality of life and the environment. It is a programme (a strategic plan) for the development of a city/town/region that carries out the principles of sustainable development and caters for local problems. This programme is created with participation and co-operation of citizens.

The national co-ordination of Local Agendas 21 comes under the LA21 Task Force of the Government Council for Sustainable Development. At the beginning of 2005 the processing of a set of 21 Criteria of the LA21 by which the quality of the LA21 process in cities, towns and regions is to be assessed in the future was finished in this Task Force

The LA21 criteria are divided into four or five categories as the case may be. **The Interested Subjects category** involves all registered subjects interested in the LA21 problems. Not only municipalities but all subjects actively involved in the LA21 implementation may register

with this category. **Category D: "START"** anticipates arrangement of organisation of the LA21 process. **Category C: "STABILISATION"** counts on active public involvement and political support of the LA21 process. **Category B: "SYSTEM OF MANAGEMENT"** qualifies the introduction and usage of municipal management according to the principles of LA21. The highest **Category A: "LONG-TERM PROCESS"** anticipates strategic and long-term development of municipalities with active public participation founded on the principles of sustainable development that leads to a better quality of life of the citizens.

The LA21 criteria were tested in 2005 on basis of public tender from the Ministry of the Environment which was executed by the National Network of Healthy Cities of the Czech Republic (NNHC). CENIA has created a new LA21 database for testing and fulfilment of the LA21 criteria. In total 19 municipalities entered this database in the course of the year 2005.

The monitoring of indicators of sustainable development in towns, cities and regions of the Czech Republic is also an integral part of the Local Agenda 21. The monitoring of a set of ten European Common Indicators (ECI) is covered by TIMUR organisation (http://www.timur.cz/) which was joined by 13 cities in 2005. The ECI set is measured according to European methodology, more than 164 towns and cities have involved into the continuous monitoring all over Europe.

Besides administering the LA21 Database (http://ma21.cenia.cz/) and forming both the organisational and professional background for the LA21 Task Force the CENIA works on promotion and general awareness of the Local Agenda 21 also by running the web site www.ma21.cz. This web site offer both up-to-date and general information about the Local Agenda 21. CENIA also publishes an on-line Magazine of Local Agenda 21 and sends out "hot" information about what's happening in this field and provides expert consulting.

Most municipalities that have joined the LA21 are associated in the National Network of Healthy Cities of the Czech Republic (http://www.nszm.cz/). The purpose of this association is to systematically support the quality of public administration, of strategic planning and to guide the municipalities in the direction of sustainable development. As of 31 December 2005, 65 municipalities were associated in the NNHC out of which 23 were advanced members and 42 were beginners. Comparing to 2004, 14 municipalities have newly joined the NNHC– 2 advanced members and 12 beginners.

The LA21 members can associate on pan-European level within the framework of the European campaign of sustainable towns and cities. Czech cities could join this campaign by signing the Aalborg Charter (1994), which three Czech cities – Vsetín, Hlučín and Hradec Králové – did. In 2004 a new document was signed, Aalborg Commitments, the Aalborg Charter being part of it, at the conference Aalborg+10 (http://www.aalborgplus10.dk/). This document has arisen as a consequence of important political changes in the field of sustainable development. As of 31 December 2005, the Aalborg Commitments were signed by 296 European cities and towns, while no municipalities from the Czech Republic have joined in yet.

The Ministry of the Environment has elaborated a scheme of grants "The Network of Environmental Information and Consulting" within the frame of the OP Human Resources Development. Within this scheme, six projects significantly promoting realisation of LA21 in the Czech Republic were supported during the year 2005 by a total sum over CZK 80 million. The Ministry of the Environment also supported six projects of non-governmental non-profit

organisation promoting LA21 and sustainable development by the total sum of CZK 1.2 million.

V.9 Environmental Education and Awareness

This field is co-ordinated and guaranteed by the Ministry of the Environment, which continuously updates the National Programme of Environmental Education and Awareness of the Czech Republic (NP EEA CZ) by way of action plans for relevant periods. These plans are created on the basis of the Government Resolution No. 1048/2000 on the NP EEA CZ. This Resolution is binding for the state administration whereas for self-government is of a recommendation character. According to the Action Plan of this state programme, the Ministry of the Environment is liable to evaluate fulfilment of the particular tasks. On the basis of the NP EEA CZ Action plan for 2004-2006 some other ministries participate in fulfilling the tasks of EEA. According to the above-mentioned Government Resolution and Section 20.3 of Act No. 312/2002 Coll. on officials of territorial self-administering units and amending some acts, the head of a self-administration unit and consequently the Minister of the Interior is due to promote the environmental education of the administration employees.

As for the public environmental education, apart from state environmental administration also some other institutions participate in it, such as universities, scientific institutes, medical or cultural facilities, some tourist centres and other facilities. As far as the state administration institutions are concerned, the Agency for Nature Conservation and Landscape Protection of the Czech Republic was also involved in environmental education in 2005, as well as the administration of protected landscape areas.

The activities of non-governmental non-profit organisations, especially the environmental education centres (EEC), are of crucial importance to the realisation of the EEA. These organisations provide their services to schools and educational institutions and in the field of after-school education and their role in work with children and parents or public education are very important. The educational programmes aimed at involving the public into decision-making process on environmental matters and at community co-operation as well as for healthy lifestyle also have great significance. The National Network of Environmental Education Centres is supported by the Ministry of the Environment by announcing specialised public tenders of small extent for particular tasks since 1999.

The Ministry of the Environment commissioned a study on the state of environmental consulting in the Czech Republic and with a total sum of CZK 22 million promoted 108 projects of NGOs in 2005. Important awareness projects that have been supported by the Ministry of the Environment in the long term are “ecological” film festivals “Ekofilm” in Český Krumlov (31st year in 2005) and “Týká se to také Tebe” (It Concerns You Too) in Uherské Hradiště (29th year). The Ministry of the Environment and department organisations periodically publish educational and awareness materials.
In business sphere only a few organisations are engaged in the environmental education and awareness, e.g. the Innovation and Development Centre (IDC) or Czech Environmental Management Centre (CEMC).
The Government Resolution No. 1048/2000 was being fulfilled by many central administration authorities also in 2005.
The Ministry of Education, Youth and Sports held 6 courses and two conferences for the teachers and employees of regional and local authorities. It also runs regular courses on the

problems of EEA and sustainable development for regional authority employees. In 2005 the Ministry of Education, Youth and Sports supported the programme for development of environmental education centres, the international programme GLOBE, the ONE programme, the Volvo Adventure, the Sun to Schools and the Healthy School programmes. The Ministry participated in the UNECE programme Education Strategy for Sustainable Development and in sectoral sustainable development strategies. In 2005 environmental consulting activities were realised within three institutes of the Czech Academy of Sciences and within the framework of universities. Some primary and secondary schools have become, within the implementation of NGO projects supported by the Ministry of Education, Youth and Sports, information centres for EEA. In total, there were 23 projects supported through the Programme of Further Education of Pedagogical Workers by the total sum of CZK 10 million. Five NGO projects were supported within the frame of the ESF by over CZK 50 million.

A project of training the employees through e-learning continued at the Ministry of Finance in 2005. Within the scope of a programme called "Environmental Minimum" 460 employees of regional financial authorities and 176 employees of the Ministry of Finance were trained. Within the tuition of the Environmental Minimum 182 employees of the customs administration attended the "Basic Customs Course".

Courses and conferences were held for both general and expert public within the research projects of the Ministry of Culture in the field of natural sciences lectures at schools. The Ministry of Culture supported 18 research projects by the total sum of CZK 2 million. Film projects dealing with amateur films on the environment were subsidised in 7 cases by the total sum of CZK 260,000.

The Ministry for Regional Development supported four projects concerning environmental education and awareness through the INTERREG initiative (CZK 4.6 million).

Within Programmes for Support of Industrial Research and Development, the Ministry of Industry and Trade supported 56 projects focused on solving the problems of landscape management with a total sum of CZK 193 million. CzechInvest implemented the project "Consulting" which was aimed at help with introducing the European environmental rules in the Czech Republic.

A sum of CZK 7.2 million was spent on EEA activities with an environmental content within the agricultural sector and about 23,000 people attended them. About CZK 40 million were spent on research projects concerning environmental protection in 2005. The total sum spent on educational and consulting activities or research tasks in the agricultural sector amounted to about CZK 70 million in 2005.

The Office of the Government co-ordinated education of the employees of administration offices in the field of environment and ensured the environmental education through the educational offers of the Institute of the State Administration. In 2005 the Institute of the State Administration offered to the state administration employees an e-learning course called "Environmental Minimum" as a part of the programme of life-long learning. This course, which had been continuing at the administration offices for three years, was attended by 1995 employees.

According to Section 13.5 of Act No. 123/1998 Coll., the regional authorities are obliged to create the concept of EEA. According to an overview of EEA concepts which were

commissioned and financially supported by the Ministry of the Environment, all regional EEA concepts, except for the one of the Vysočina region, were finished and approved by the end of the year 2005.

More than CZK 92 million from the regional financial resources were spent on the EEA, out of which CZK 40 million came from the regional authorities and CZK 52 million from the municipalities and their voluntary associations. The increase in expenditures compared to 2004 is more than 40%.

V.10 Information Systems and Instruments

Act No. 123/1998 Coll. on access to Information on the Environment formally ensures the right of the general public to access the environmental information which should be timely and complete. All subjects participating in this field are obliged to make this information available, to keep and update electronic databases and to make the information sources available through the Internet.

Environmental Portal of the Czech Republic

Several tens of specialised information systems and thousands of databases open to the public are operated in the branch of the environment at present. Act No. 123/1998 Coll. imposes duty on the Ministry of Environment, among other things, to publish a list of information that should be available for the obliged subjects including references to entities that provide such information. In order to fulfil these legal obligations and to simplify the access to the environmental information, the Ministry of the Environment has been building up a specialised internet portal – the Gate to Environmental Information (http://portal.env.cz).

In July 2005 CENIA was entrusted with the management and further development of the Environmental Portal of the Czech Republic. The environmental portal is presently drawn up as a unified user interface for easy access to all information resources of the department.

GIS – Map Services in the Field of the Environment

CENIA operates and administers the Map Services of the Portal of the Public Administration of the Czech Republic (PA CZ) (http://geoportal.cenia.cz). These services serve as a public portal of spatially defined information from various sources and of various topics with emphasis on the environment. The Portal includes several separate tasks divided predominantly according to the content. Map services are primarily used by state map works, registers guaranteed and kept by the state, thematic sets and databases. At present, there are 30 map tasks available at the Map Services (PA CZ).

Within the branch of the environment the GIS of other subjects are available too, especially:

- GIS of the Agency for Nature Conservation and Landscape Protection which is a standard information system of the environmental protection,

- Map server of the Czech Geological Survey (CGS) which shows the geo-scientific layers within the territory of the Czech Republic,
-

- Map server of GEOFOND – a part of the CGS Information System – it contents for example spatial data on geological survey, landslides, raw material resources, mining activities in the Czech Republic, etc.;

- Map services of the Water Research Institute – a part of the WRI Information System;

- Map services of KRNAP (Krkonoše National Park) – spatially bound data on geology, flora, fauna and environmental preservation activities within the area of the park.

In 2005 another phase of the "Database of Risk Sources" for crisis management, which has been processed in the GIS form, was finished. The Information System is designed for purposes of the administration offices in the field of crisis management; in 2005 it was put into operation at the Ministry of the Interior and at the Ministry of Defence.

Meta-information System of the Ministry of the Environment (MIS)

The MIS (http://mis.env.cz) is a specialised information system that makes the meta-information available (i.e. information on information). It does not contain the data itself but their basic description. The main advantage of the MIS for the users is that it allows them to access the information of databases, information systems or geographical data from a single interface. Given a description the system enables to find, e.g. what data is available in the department, whether it is open to public, in what format, how good and up-to-date it is, how to access it, and if it is available on the Internet, it provides the user with a functional link. CENIA has been in charge of the management and development of the MIS since July 2005.

Data Collecting System Janitor

The Janitor System is intended to gain (collect), organise and administrate data and, coming up shortly, to analyse it too. Janitor enables working with data gathered by field research, saving it into a predetermined structure and connecting it with spatial co-ordinates. The system can be thus used for monitoring changes in the landscape, recording the discoveries of plants or animals in field, recording inanimate parts of the landscape, landfills, forests, parks, etc. The system itself is formed of independently utilisable but interconnected applications that are constructed in such a manner that enables to administrate data storage, filing and editing the data and working with spatial data (GIS), to modify the forms and compositions and to enable the field mapping and outputs by using modern vehicles (Pocket PC).
This system is being developed and run by CENIA. In 2005 tools for saving data in remote systems were finished and the project of Janitor implementation for collecting environmental data was initiated.

V.11 Integrated Pollution Register (IRP)

The IRP was established by Act No. 76/2002 Coll., on Integrated Prevention, as a public information system. The system provides information on escape of pollutants from industrial and agricultural establishments into the environment.

By establishing this register the Czech Republic fulfils the requirements of the European Commission and at the same time the right of both expert and lay public to access the information on the environment. Information reported to the IRP also enables the Czech Republic to fulfil its report duty towards the EU. It will also simplify the formulation of

environmental policy and strategies, support identification and assessment of potential risks to human health and will positively affect the behaviour of individual companies to the environment being under public control. The establishment of the IRP together with the establishment of the Central Registration Office of the Ministry of the Environment follows the pursuit of optimisation of the information flow within the department.

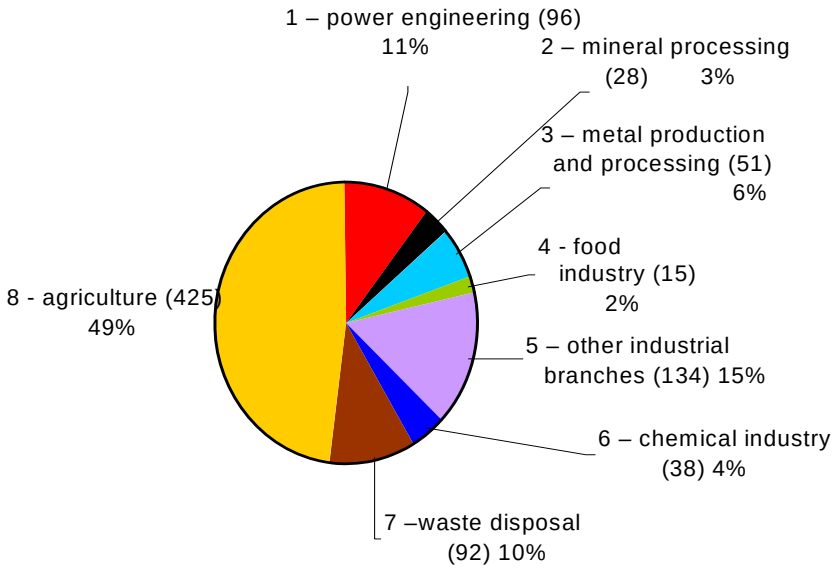
The IRP contains data on emissions of pollutants into air, water, soil and in so called transfers (waste water treated outside the source and waste). The duty to notify the IRP arises when the emission limits determined in the Government order No. 368/2003 on the Integrated Pollution Register, as amended, (which specified also the obligatory information to be notified) are reached or exceeded. Notifications must be submitted by the obligated subjects within one year.

In 2005 the obligation to notify for 2004 applied to 72 registered substances. The information about the amount of the released substance is directly linked to the particular operation which allows to simply look up the emissions or transfers of individual operation in IRP by its seat, by the environmental component of the environment in question, or by region. The data reported to the IRP during the year is published by 30 September of the next year on the web site www.irz.cz. The overall information is also published in form of an publicly available publication.

In 2005 IRP notifications for 2004 were submitted by 541 organisations for 879 establishments in total. The establishments are registered according to the economic activity (according to NACE) that causes the reported emissions of pollutants. The shares of establishments according to categories of activities are shown in the graph below.

Graph V.11.1

Establishments notifying into the IRP according to the branch of activity (number of notifications in brackets) (2004)



Source: CENIA (IPR notifications for 2004)

The highest number of industrial and agricultural establishments notifying to the IRP is located in the Středočeský region. The lowest number is found in the city of Prague. An overview of the establishments in individual regions is shown in the following table.

Table V.11.1

Number of notifications to the IPR per establishments according to the regions of Czech Republic

Region (NUTS 3)	Number of IPR notifications
City of Prague	12
Středočeský	120
Jihočeský	68
Plzeňský	57
Karlovarský	24
Ústecký	71
Liberecký	34
Královehradecký	59
Pardubický	56
Vysočina	74
Jihomoravský	103
Olomoucký	65
Zlínský	57
Moravskoslezský	79
Total	**879**

Source: CENIA

In 2005 56 out of the total number of 72 substances monitored in the IRP system were reported for 2004. In the category of air pollutants 36 materials were reported: in the category of water and soil pollutants 24 and 10, respectively, in transfers of waste water 32 and in transfers of waste 34 pollutants. As shown in the table below, most establishments reported air emissions (75%), the least of them (1.93%) reported soil emissions.

Table V.11.2

Number of notifications and number of reported substances according to the type of emission/transfer

Type of emission/transfer	Number of notifications	Number of reported substances
Soil emissions	17	10
Waste water transfers	23	32
Water emissions	62	24
Waste transfers	286	34
Air emissions	660	36

Source: CENIA

The widest range of substances was reported by establishments engaged in chemical industry (54), power engineering (32), waste treatment (28), agriculture (18) and processing of minerals (15). The least number of substances (14) was reported by establishments engaged in food industry. Other unclassified industrial branches reported 39 substances in total.

As for the category of so-called accident emissions, no such case was reported in 2005 (i.e. for 2004).

V.12 Research and Development

Research and development as an environmental policy instrument is aimed at continuous fulfilment of fundamental documents, especially:

- Basic Directions of Research and Development – priorities and objectives of the National Research and Development Policy of the Czech Republic for years 2005-2008 as they were approved by the Government Resolution No. 5/2004;

- Long-Term Basic Directions of Research and Development approved by the Government resolution No. 661/2005;

- State Environmental Policy for years 2004-2010 approved by the Government resolution No. 235/2004;

- department concepts of individual environment elements and concepts resulting from the international obligations of the Czech Republic in the field of the environment;

- objectives and measures of the National Innovation Policy of the Czech Republic for years 2005-2010 approved by the Government Resolution No. 851/2005;

- principles of the Lisbon Strategy in the field of promoted participation the private sector in financing R&D;

- concepts and contents of the National Research Programme II (according to the Government Resolution No. 272 of 9 March 2005);

- priorities in the field of the environment set by the 7th Framework Programme of the European Community for Research, Technical Development and Demonstration (2007-2013).

Public support provided to research and development is both special-purpose and institutional. It is regulated by Act No. 130/2002 Coll. on Research and Development Support from Public Funds and amending some related acts, and then by the Government Order No. 461/2002 Coll. on Special Support of Research and Development from Public Funds and on Public Tenders in Research and Development, and by the Government Order No. 462/2002 Coll., on Institutional Support of Research and Development from Public Funds and on Research Project Evaluation.

In 2005, four research projects were granted institutional support in the amount of CZK 230 million within the department of the environment, namely the projects of Silva Tarouca Research Institute for Landscape and Ornamental Gardening in Průhonice, Czech Geological Survey and of T. G. Masaryk Watermanagement Research Institute (2 projects).

In 2005, the priorities of research and development within the purpose support were focused especially on realising projects from the sub-programmes Future Landscape and Settlements,

Environment and Protection of Natural Resources, Rational Use of Energy and Renewable Sources, Atmosphere, Biosphere, Hydrosphere, Geosphere and Waste.

There were 168 R&D projects processed fulfilling the sub-programmes listed above with support from the purpose funds amounting to CZK 331 million. Out of this sum, CZK 111 million was assigned to 39 projects processed within department organisations. The remaining 129 projects were processed by legal entities (i.e. universities, public benefit companies, civil associations, limited liability companies, joint stock companies), individuals and external allowance organisations (outside the Ministry of the Environment). The financial support from purpose funds for these projects was CZK 220 million.

The R&Ds supported from the public funds of the Czech Republic, the outcomes of which have actual impact on the environment, have also been realised through state budget categories concerning other state administration bodies – e.g. the Ministry of Industry and Trade, The Ministry for Regional Development, the Ministry of Education, Youth and Sports and the Ministry of Agriculture.

V.13 Basic Strategic Documents

In 2005, two new strategic documents came in force: the State Environmental Policy 2004-2010 (SEP) and the Sustainable Development Strategy of the Czech Republic (SDS).

The SEP was approved by the Government of the Czech Republic by Resolution No. 235 on 17 March 2004 and it is the fundamental strategic document for the environment until 2010. This document is a follow-up to the previous state policy while it also takes note of relevant documents on both national (the National Development Plan, strategic documents of other departments, etc.) and international level (especially the 6th Action Plan of the European Community for the Environment, the Implementation Plan of the World Summit on Sustainable Development, the OECD Environmental Strategy in the 1st decade of the 21st century, the EU Sustainable Development Strategy). In accordance to the actual state of the environment and the basic principles of the environmental protection and sustainable development, the SEP is focused on four priority areas of the environment which are listed below:

- the protection of nature, landscape and bio-diversity;
- the sustainable exploitation of natural resources, flows of material and waste disposal;
- the environment and the quality of life;
- the protection of the climate system of the Earth and the reduction of long-distance transfer of pollution ;

The SEP defines a whole range of arrangements and objectives not only for the field of the environment but also for the fields of power engineering, mineral resources exploitation, industry, trade, transport, agriculture and forest management, protection and the use of water resources, environment and health, regional development, regeneration of country and tourism.

The individual priority areas and objectives of the SEP are further elaborated into definite tasks and arrangements according to specific programmes and plans (e.g. National Programme for Mitigation of Changes in the Earth Climatic System, National Programme for Emissions Reduction, the Plan of Waste Management, etc.).

The SEP constitutes, from the environmental point of view, a reference document for other sector and regional policies and presents an instrument for advancing the environmental policy into the sector policies. Generally, we can conclude that the integration of environmental aspects into the sector policies was very successful in 2005 (e.g. the Economic Growth Strategy of the Czech Republic, the National Lisbon Programme 2006-2008, etc.) Nevertheless, insufficient implementation of the SEP objectives still poses a problem in some areas. The evaluation of how the SEP objectives were fulfilled in individual environmental areas is part of particular chapters.

The Sustainable Development Strategy of the Czech Republic has been elaborated by the Government Council for Sustainable Development under the direction of the Deputy Prime Minister Jahn and was approved by the Government of the Czech Republic by Resolution No. 1242 on 8 December 2004. The general objective of this strategy is to ensure the inhabitants the highest possible quality of life and concurrently to create favourable conditions for good life of future generations by way of reducing the imbalance among economic, environmental and social development of the society.

This strategy sets, in basic term till 2014, strategic and particular objectives for six areas:

1) The economic pillar: to strengthen the competitiveness of the economy;

2) The environmental pillar: the protection of nature, environment, natural resources and landscape, environmental limits;

3) The social pillar: to strengthen the social solidarity and stability;

4) Research and development, education;

5) European and international context;

6) Public administration.

The first strategic objective of the environmental pillar of the Strategy is to ensure the highest possible quality of all components of the environment (including functioning of their basic links), to continue increasing it and thus to create conditions for gradual regeneration of the landscape, for minimisation or elimination of risks to human health and for gradual recovery of animated nature. At the same time it is necessary to preserve natural assets (non-renewable resources, biological and scenic diversity) of the Czech Republic as much as the economic and social reasons allow.

The second strategic objective is to minimise the conflicts of interests between economic and conservancy activities and to gradually achieve decoupling of economic growth from increase of negative impacts on the environment.

The third strategic objective is to contribute, proportionately to the potential and significance of the Czech Republic, to solving European and global environmental problems (especially the threat of climatic changes, thinning of the ozone layer and tapering of bio-diversity).

The fulfilment of the Sustainable Development Strategy of the Czech Republic is periodically monitored by situation reports based on the evaluation of a set of selected indicators

characterising the state and basic trends in the six major areas of the Strategy. The first report on fulfilment of the Strategy was submitted to the Government in November 2005.

The Sustainable Development Strategy of the Czech Republic represents the fundamental strategic framework for processing other concept materials and the starting point for making strategic decisions. The first evaluation of the progress of the Czech Republic towards the sustainable development in 2005 shows that the situation is generally improving in the economic pillar, where relatively significant and long-lasting growth of the GNP and productivity of labour is apparent. On the contrary, the degree of decoupling the economic output from the environmental stress, especially the material, energetic and transport burden related to the GNP is unsatisfactory. The same holds for negative trend in emissions of greenhouse gases, as follows from international comparison. In the social field the development in the context of quality of life can be regarded as moderately positive, although the rate of both registered and general unemployment is alerting. A noticeable positive trend occurs in the field of investment into R&D, in the quality of education and, on the international level of sustainable development in volume of international co-operation of the Czech Republic.

V.14 Trade in Greenhouse Gas Emission in the Czech Republic

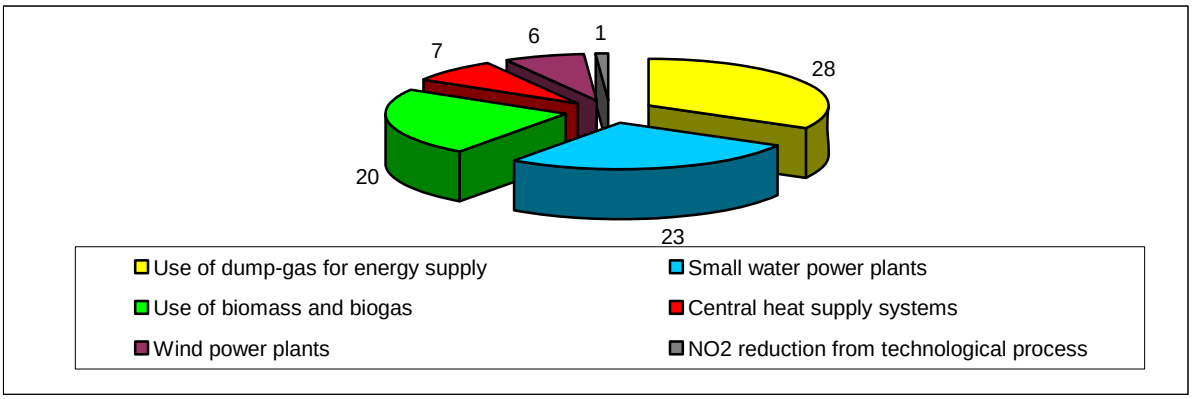
The emission trading belongs to new tools of conservancy activities. Presently, two systems of trading in emissions are being exercised in the Czech Republic. The first is based on so-called flexible (project) mechanisms of the Kyoto Protocol, which especially means the implementation of projects on decreasing the greenhouse gas emissions. These projects in turn produce tradable emission units, which represent the reduction of emissions that has resulted from the implementation of a particular project.

The second system consists in trading in greenhouse gases emission allowances within the European Community. The allowance system covers major producers of carbon dioxide, who must make up for the emitted gases by buying the equivalent number of allowances (1 ton of CO_2 = 1 allowance).

In 2005, the Czech Republic was active especially within the framework of the projects of the Joint Implementation pursuant to Article 6 of the Kyoto Protocol, as the host state. By the end of 2005, about 85 requests for inclusion of projects into the Joint Implementation project were registered. Some of them have moved to the implementation phase since then, whereas other projects have been awaiting further development (search for investor, choice of technologies, etc.)

The Czech Republic is in the phase of preparation for active integration into the International Emissions Trading according to Article 17 of the Kyoto Protocol. For this purpose a special methodology for this type of mechanism will be prepared (together with an update of the methodology for the Joint Implementation projects). The unambiguous objective is to employ this mechanism to support actual measures for decreasing the greenhouse gas emissions.

Graph V.14.1
Projects registered within the Joint Implementation



Source: ME

The Czech Republic is, as the member state, obligatorily engaged in the system of trading in allowances for greenhouse gas emissions. The fundamental legal framework is defined by Act No. 695/2004 Coll., on the Conditions for Trading in GHG Allowances and amending some acts, as amended, by Act No. 86/2002 Coll. on the Air Protection and amending some other laws (Air Protection Act), as amended, and by Act No. 455/1991 Coll. on licensed trading (Small Business Act), as amended. In 2005, there were 426 facilities of about 350 businesses engaged in this system in the Czech Republic. The dominant sector was the energy producing sector followed by metal production and processing and by cement and lime production.

The Czech Republic distributes among these facilities, according to the resolution of the European Commission, 97.6 million allowances per year. At the present approximately a year has already passed since the system was set up in the Czech Republic. The companies can already handle and trade in the allowances they have had on their accounts in the register of allowances.

The results of the GHG emissions inventory for 2005 have shown, that most countries had distributed more allowances than were the actual emissions in that year. This means that the companies had obtained more allowances than they needed to cover their emissions of carbon dioxide. In the Czech Republic this difference is 97.6 (allocation) – 82.4 (emissions) = 15.2 million allowances. This caused a vigorous response on the allowances market and the price of one allowance dropped down to 10 EUR. However, the situation on the market has stabilised again. It has become obvious that there is not necessarily a direct proportion between the number of allocated allowances and the amount of emitted CO_2, which means that higher allocations does not have to cause higher emissions. The companies treat the allowances as assets which influence their market behaviour. At present, the National Allocation Plan for the second trading period 2008-2012 is being prepared.

In relation to the connection of the European trading system and the Kyoto flexible mechanisms and the Council Directive 2004/101/EC of the European Parliament and the Council we can anticipate a growing interest of particular companies in the project mechanisms as well as in possible investments into projects within the Clean Development Mechanism according to Article 12 of the Kyoto Protocol. The Czech Republic as a country is not active in this field yet (it can only act as an investor). The interest in project mechanisms should be raised mainly by the opportunity to use the Kyoto emission units (Emission

Reduction Unit – ERU, Certified Emission Reduction – CER) as a compensation for emission allowances in the system of European trading. The interconnection of these two systems was transposed into the Czech legislative in 2006 by Act No. 212/2006 Coll., amending Act No. 695/2004 Coll.

VI Environmental Protection Expenditures

VI.1 Overview of Expenditures and Financing Methods

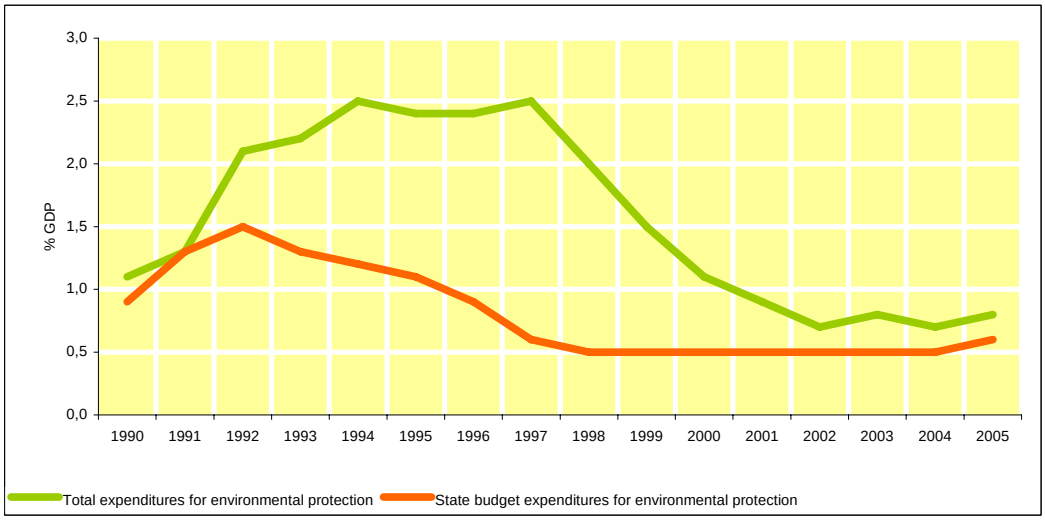
Until 2002, the only environmental protection expenditures monitored were investments. Since 2003, non-investment environmental protection expenditures and economic benefits of environmental protection activities (provided by the CSO) have been monitored as well. The data is derived from the annual statistical report ŽP 1-01, which is distributed to selected economic entities, as well as from the annual report VI 1-01, which is intended for the organisational units of the state, regional self-governing units, government-funded organisations and similar governmental agencies. Data on investment environmental protection expenditures are derived from the reports ŽP 1-01 and VI 1-01, whereas non-investment and economic benefits data is only taken from the report ŽP 1-01. In addition, environmental protection expenditures from public budgets (provided by the MF) as well as from the resources of the former National Property Fund (NPF) are monitored.

The total amount invested into environmental protection is available with a one-year delay (i.e. data for 2004 is available in 2006).

The development of environmental protection expenditures in relation to the overall economic performance (i.e. GDP) is a primary indicator for an overall assessment of the level of environmental protection expenditures. After 1990, statistically monitored investment environmental protection expenditures increased rapidly in proportion to GDP (amounting to 1.1% of GDP in 1990 and increasing to 2.5% in 1994). The proportion remained roughly at this level until 1997. After that, it decreased significantly and since 2003, environmental protection expenditures have amounted to about 0.7% of GDP. Budgetary environmental protection expenditures from central resources reached their maximum in 1992 (1.5% of GDP). Since then, their total amount decreased to 0.5% of GDP to remain at this level ever since 1998.

Graph VI.1.1

Environmental Protection Expenditures in % GDP



Note: The value of the total percentage of environmental protection investment in GDP in 2005 was obtained by an expert estimate. The official value of the total environmental protection investment for 2005 is not available yet.

Source: CSO

Central resources include the national budget, state funds and the former NPF. The following table sums up the funds coming from central resources in 2004 and 2005.

Table VI.1.1

Environmental protection expenditures from central sources

	State budget	State funds	NPF	Total
2004	6,613.8	4,203.2	3,563.3	14,380.3
2005	**7,547.5**	**3,448.2**	**6,022.0**	17,017.7

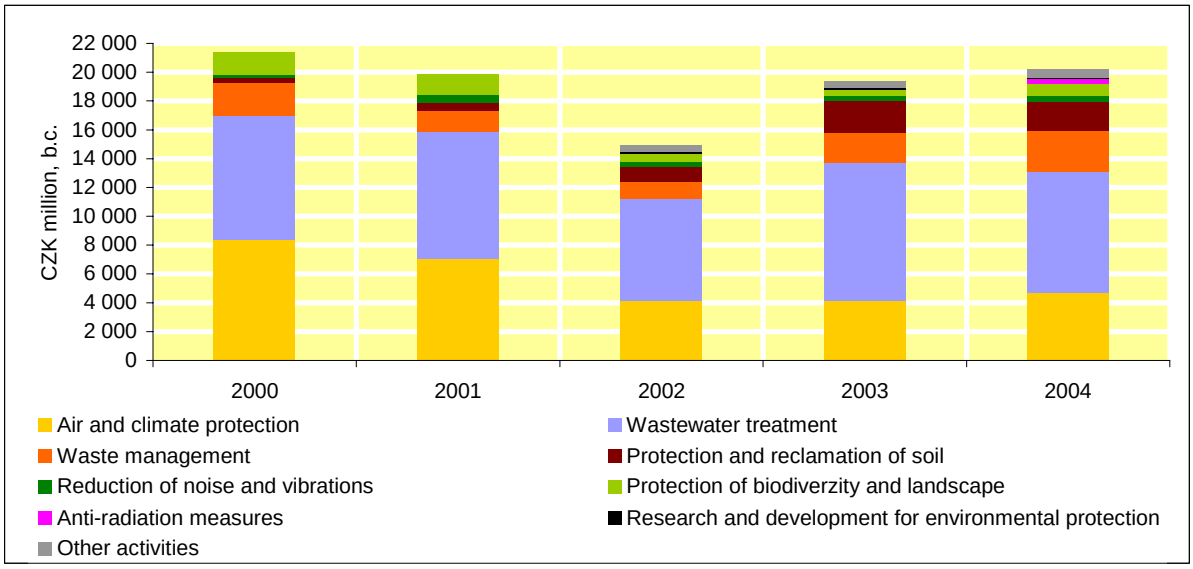
Source: MF, ME, SEF, NPF

Since 2002, investments into environmental protection have been divided into 9 environmental categories pursuant to the international classification CEPA 2000 and since 2003 this has also applied to non-investment expenditures and economic benefits (air and climate protection, wastewater treatment, waste management, protection and remediation of soil, ground and surface water, reduction of noise and vibrations (except for workplace protection), protection of biodiversity and landscape, protection against radiation, environmental research and development, other activities related to environmental protection).

Expenditures on investments into environmental protection are the overall indicator determining the total amount of financial resources spent on investments within a given year. Graph VI.1.2. illustrates the development of these expenditures.

Graph VI.1.2

Structure of expenditures for environmental protection



Note: Data for 2005 is not available yet.

Source: CSO

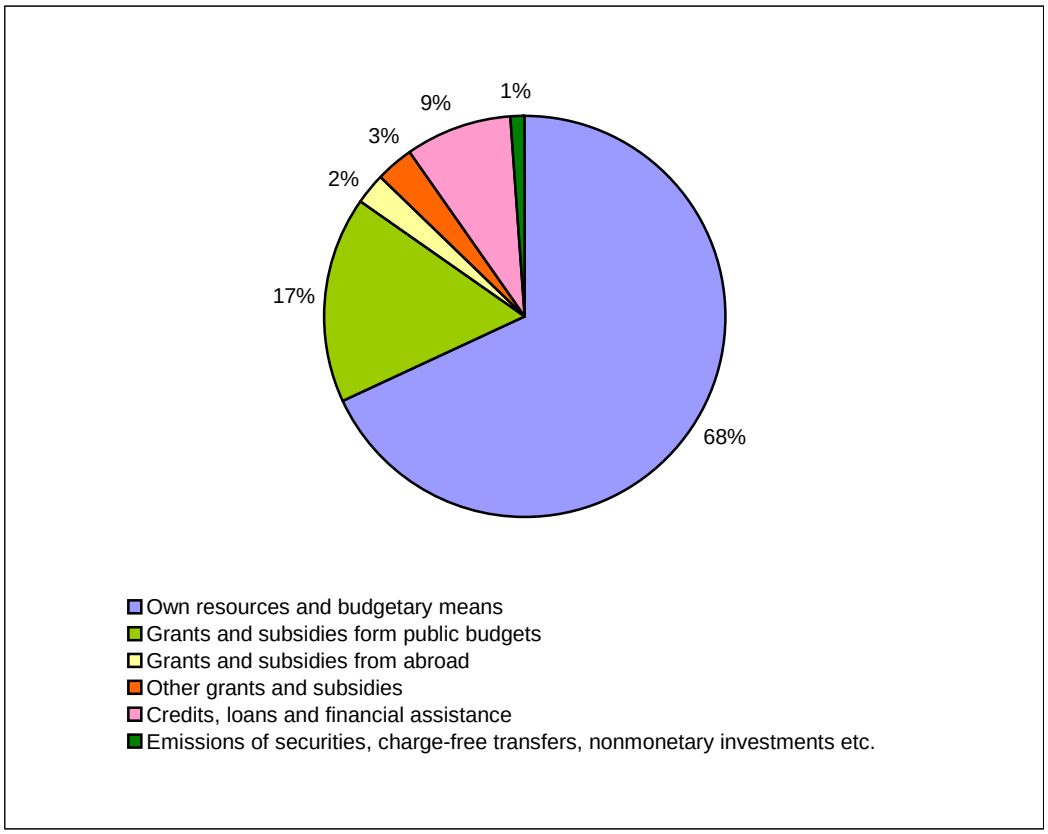
From the viewpoint of programme targeting, most resources were invested into wastewater treatment (CZK 8.4 billion) and air and climate protection (CZK 4.7 billion) in 2004. The amount of resources spent on waste management increased slightly against 2003 (an increase of CZK 0.7 million). Investments into protection of biodiversity and landscape increased

significantly (by 107% against 2003); however, they only amounted to approximately 4% of the total environmental protection investments.

In 2004, most investments into environmental protection were funded from own as well as budgetary resources (CZK 13.8 billion). These were mostly investments into wastewater treatment (CZK 4.9 billion) and air and climate protection (CZK 3.9 billion).

Graph VI.1.3

Acquired environmental protection investment based on source of financing in 2004



Note: Data for 2005 is not available yet.

Source: CSO

According to the CSO, the greatest investor in 2004 (besides section L "Public Administration, Defence, Social Insurance") was section E "Production and Distribution of Electricity, Gas and Water" with environmental protection investments of CZK 2.8 billion. Section I "Transport, Storage, Post and Telecommunication" follows with a total of CZK 1.8 billion. Other sectors contributing significantly to environmental protection were O "Other Public, Social and Personal Services" (CZK 1.4 billion) and DG "Chemical and Pharmaceutical industry" (CZK 1.3 billion).

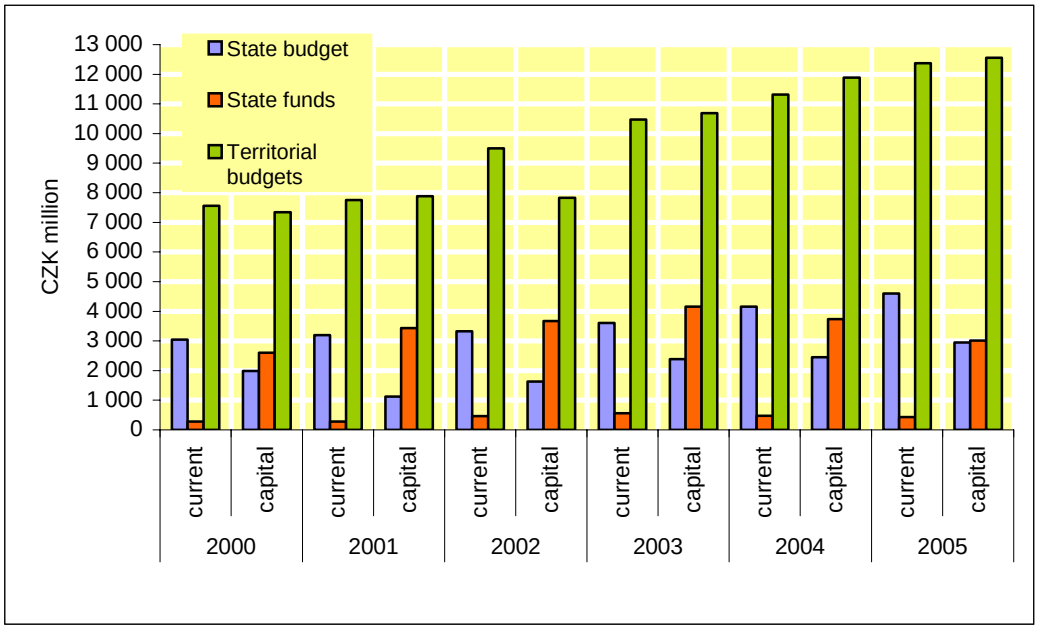
Non-investment environmental protection expenditures amounted to CZK 32.8 billion in 2004 (incl. internal expenditures of CZK 19.4 billion and external non-investment expenditures in the amount of CZK 13.3 billion). A year-on-year increase of more than CZK 10 billion confirmed the preliminary development projections for non-investment expenditures. From the viewpoint of program targeting, most resources were invested into waste management (CZK 18.3 billion) and wastewater treatment (CZK 7.1 billion).

Economic benefits of environmental protection activities amounted to CZK 28.1 billion in 2004 (including CZK 21.7 billion in revenues from sale of environmental protection services, CZK 5.7 billion in revenues from sale of by products of environmental protection activities and CZK 0.8 billion in savings from reuse of by products.) From the viewpoint of program targeting, the greatest economic benefit was reached in the area of waste management (CZK 22.5 billion) and wastewater treatment (CZK 4 billion).

As part of environmental protection financing, it is also important to monitor expenditures from public budgets, where the strongest position is held by local budgets. Expenditures at the municipal or regional level are made continuously based on the authority of municipalities or regions. These activities are mainly of local importance – e.g. wastewater discharge and treatment, air protection, waste management, soil and ground water protection, nature and countryside protection and measures related to appearances of municipalities and public greenery. The volume of resources coming from regional budgets has consistently exceeded the volume of resources provided from the national budget and state funds. Recently, this trend has been even more noticeable.

Graph VI.1.4

Current and capital expenditures from the state budget, state funds and regional budgets for environmental protection



Source: ME

VI.2 Programme of the Ministry of the Environment

VI.2.1 Programmes for Landscape Creation and Protection

As part of general nature protection, measures implemented within Ministry of the Environment programmes are also monitored. This applies to the "Landscape Care Programme", "River System Restoration Programme" and "Urban Environment Care Programme". These programmes fulfil general environmental, nature conservation, climatic,

hydro-stabilization, non-production, and social functions. Their implementation creates conditions enabling restoration of the natural optimization of processes leading to reduction in erosion, acidification, desertification, increase in water retention capacities, as well as restoration and maintenance of significant biotopes and to biodiversity protection. They also help in the area of care of green spaces in urban environments. Many of the measures also fulfil functions within anti-flood protection. In 2005, the grant policy of the Ministry of the Environment was more focused on the support for watercourses revitalization than projects of small water reservoirs. More than CZK 655 billion was spent within the below listed programmes for landscape creation and protection in 2005.

Landscape Care Programme (LCP)

Within LCP, non-investment financial resources were provided through two Sub-programmes: "Sub-programme for landscape protection" (measures A, B, and C) and "Sub-programme for protection of specially protected parts of nature" (measure D). The total budget for 2005 was approximately CZK 198 million (of which A – C CZK 65 million).

Financial resources were granted to individual measures:

A "Protection of Landscape against Erosion" aimed at reducing the risk of soil erosion through creation of anti-erosion measures and increasing landscape retention capacity (162 projects with subsidies totalling CZK 20.38 million);

B "Maintaining the Cultural Condition of the Landscape" aimed at maintaining the cultural condition, typical character and basic non-production functions of the landscape, reducing the spread of trees diseases, implementing revitalization measures in intensely farmed areas and supporting close-to-nature forms of agriculture (528 projects with subsidies totalling CZK 21.97 million);

C "Supporting Biodiversity" aimed at protection, preservation and restoration of biodiversity (94 projects with subsidies totalling CZK 16.06 million);

D Care for specially protected areas and bird areas (several thousand projects with subsidies totalling CZK 133 million).

Grants from the Sub-programme for preservation of special protected parts of nature were awarded to Special Protected Areas, i.e. National Parks, Protected Countryside Areas, in National Natural Monument, National Nature Preserves, Natural Monuments, and Nature Preserves and in their protected zones. Only organizations set up by the Ministry of the Environment qualified as recipients of grants.

River System Restoration Programme (RSRP)

The aim of the programme is to create conditions for restoration of the natural environment as well as of the resources used by man, which also includes resolving problems with sewerage and wastewater treatment. Gradual implementation of measures within this programme will lead to systematic increase in biodiversity, favourable water conditions and functional land use ensuring protection of natural as well as cultural landscape values.

Financial resources granted from RSRP are provided pursuant to the MF Regulation no. 40/2001 Coll., on participation of the national budget in financing property reproduction programmes. In 2005, the total of 208 projects was funded from RSRP, of which 100 were newly initiated and 108 continued from previous years. These projects received CZK 355.113 million from the national budget.

The programme is divided into individual Sub-programmes:

a) Restoration of natural functions of watercourses (215 112).
b) Creation and restoration of components of the ecological stability system bound to the water regime (215 113).
c) Removal of transverse obstacles in watercourses and support of technical solutions which do not contain such obstacles them – addition and construction of fish passages (215 114).
d) Restoration of the retention capacity of the landscape (215 115).
e) Reconstruction of technical elements and sludge removal from production ponds (215 116) – the Sub-programme was cancelled; no new projects were initiated in 2005.
f) Construction and restoration of WWTP and sewerage system, including creation of artificial wetlands (215 117).
g) Restoration of natural functions of watercourses including restoration of the retention capacity of the landscape (215 118) – i.e. a combination of Sub-programmes 215 112 and 215 115.

Sub-programmes 215 112 – 115, 118:

Grant applicants were physical and legal entities, municipalities, government-funded organizations, state bodies, state enterprises, etc.

Applicants were required to be owners of land or water management facilities, watercourse administrators, ANCLP CR, NCA, NP administrations when the lands were SPAs on the basis of authorization and consent of owners, land tenants, particularly if these tenants are NCA, ANCLP CR, or non-governmental non-profit organizations, with the written consent of the owner. Foreign citizens were excluded.

In 2005, the total amount received from the national budget by these projects was CZK 203,946 million. A total of 163 projects were implemented, of which 94 were newly initiated and 86 continued from previous years.

Sub-programme 215 117:

A primary condition for new grant applications was to demonstrate an exceptional impact on nature and landscape conservation (e.g. projects in SPA, on Natura 2000 territories, or at sites of extraordinary water protection interest).

Applicants could be municipalities or their unions and joint stock companies involved in water supply and sewerage systems providing waste water treatment services for municipalities.

In 2004 the total budget of this Sub-programme was CZK 177.6 million. A total of 46 projects were implemented, of which 20 were newly initiated and 26 continued from previous years.

Administration of Inalienable State Assets

This Sub-programme (215 012) is part of Programme 215 010 – Development and renewal of the material-technical basis of the ME management system. Sub-programme 215 012

supported preservation of state-owned lands in SPAs managed by the recipient. Drawing financial resources from this Sub-programme is therefore intended for organizations established by ME.

The Sub-programme was launched in 2003 with an annual budget of CZK 100 million, which was reduced to CZK 98.7 million for 2005. 92 projects were financed from this Sub-programme, 86 of which were newly launched.

Urban Environment Care Programme (UECP)

The subject of UECP is the care of green spaces in urban environments. Financial resources may be granted for feasibility studies (hereinafter "studies") for measures focused on:

a) Regeneration or creation of significant municipal or private green spaces, or their overall system conception (village squares, squares, parks, forest parks, recreational areas, green spaces of educational, social and hospital facilities, playgrounds, cycling and walking routes, cemeteries etc.).

b) Regeneration or creation of green spaces separating residential areas from industrial or commercial areas (zones) or busy transportation corridors.

c) Establishing municipal green spaces as a method of restoring the biological value of unused areas and areas damaged by past production, industrial, and transportation activities (so-called brownfields) in order to incorporate them into the landscape.

d) Setting up areas and corridors of residential green spaces in order to implement a regional system of ecological stability or as a component of green rings around residential areas.

e) Regeneration and planting of river bank vegetation in residential areas as part of implementing anti-flood measures.

Grant applicants can be private or public entities – owners of the relevant lands. Tenants of such lands can request financial resources only upon written consent of the owner.

In 2005 a total of 22 projects were funded by UECP receiving a total of CZK 2,907,000. Mainly cities and municipalities applied for these grants in order to regenerate significant areas of residential green spaces (parks, cemeteries, and school and hospital grounds) and buffer green spaces.

VI.2.2 Other Programmes

Rural Revival Programme

The programme aims at creating organisational and economic conditions and incentives for rural residents and self-governments of rural municipalities to strive for harmonious development of healthy environment, maintenance of natural and cultural values of rural landscape and development of environmentally sound farming. Supporting pilot projects of rural micro-regions should bring suitable innovations, new ways to use currently unused facilities. Besides, municipalities successful in the Village of the Year competition are also supported – as an example of good practice. The pilot projects are used to influence the attitudes towards rural revival at the regional level in order to promote the spread of good practice.

Grants are intended for rural micro-regions (unions of municipalities) and municipalities.

In 2005 the Ministry for Regional Development received applications from 102 applicants, the requested grants totalling CZK 79.107 million. 72 submitted applications were focused on projects with children and youth participation. 27 applicants focused on pilot projects and 3 applicants focused on projects for elimination of damages caused by local natural disasters.

Based on a recommendation of the inter-departmental steering commission of the Rural Revival Programme, the Minister for Regional Development Mgr. Radko Martínek decided to grant support to 81 applicants in a total of CZK 40.118 million.

The grants were awarded to 67 applicants with projects with children and youth participation, 11 applicants with pilot projects and 3 applicants with projects for elimination of damages caused by local natural disasters.

Horizontal Rural Development Plan (HRDP)

The main priority of the programme is sustainable development of agriculture, countryside and its natural resources. The following strategies should help achieve this priority:

a) maintain agriculture in disadvantaged areas, improve financial circumstances of farmers especially in less favourable areas and prevent their outflow from disadvantaged areas,
b) maintain and protect the environment (emphasizing its water component) and cultural landscape,
c) improve the structure of agricultural workers (age, education),
d) alternative use of farm land, especially planting forests,
e) associating producers in bringing their products to the market,
f) support of environmentally friendly renewable energy sources.

In 2005 five measures were implemented within HRDP, the **requested grants totalling approximately CZK 6.216 billion for an area of 1.896 million hectares**.

Measure “Early Cessation of Farming Activities” was first implemented in 2005. Applications were submitted by 285 self-employed farmers, who decided to hand over 19,057 ha of farm land. The applicants requested grants totalling approximately CZK 57.140 million, which represents 0.92% of all grants requested in 2005 for the entire programme.

For the measure “Less Favourable Areas and Areas with Environmental Limitations”, applications were submitted by 9,222 agricultural businesses, which maintain a grassland area of 707,491 ha. The total amount applied for exceeded CZK 2.821 billion, which represents 45.39% of grants requested in 2005.

Similarly to 2004, the largest amount of grants was requested for the “Agro-Environmental Provision” (AEP) in 2005. In total, 9 029 applicants submitted applications for an area of approximately 1.168 million ha. The total amount applied for within AEP exceeded CZK 3.296 billion, i.e. 53.04% of grants requested in 2005.

“Forestry” was the fourth measure implemented in 2005. In total, 595 applicants submitted applications for an area of approximately 673 ha. The total amount applied for exceeded CZK 40.437 million (i.e. about 0.65% of the grants requested for HRDP).

In 2005 the measure "Establishing Groups of Producers" (EGP) was made available, for which 24 applications were submitted for 54 commodities. The exact amount requested in 2005 cannot be determined, as the amount granted for EGP is specified based on yearly marketed production of the relevant agricultural commodity, for which a group of producers was included in the measure. The marketed production is first reported by the group of producers for the year 2005 and the amount granted shall be specified in 2006.

VI.2.3 Support of Non-Governmental Organisations (NGOs)

Grants from the national budget, from the Ministry of the Environment, are provided to NGOs, which participate in the implementation of state projects in the field "environmental protection and sustainable development" and help fulfil the goals of the State Environmental Policy.

Grants are awarded to civic associations or generally beneficial companies on the basis of an application submitted in the form of a project within tender proceedings. All projects are assessed which met the conditions of the tender on the basis of Government Decree no. 114/2001, on Governmental principles for provision of grants from the national budget to NGOs by central bodies of state administration, and Government decree on the Main areas of state grant policy with respect to NGOs, which is updated on a yearly basis.

As part of the support of NGOs, support was granted to 108 projects last year, amounting to CZK 22 million.

VI.3 State Environmental Fund of the Czech Republic (SEF CR)

The Fund was established and its activities are subject to Act No. 388/1991 Coll., on the State Environmental Fund of the Czech Republic, to which the following implementing regulations relate – the Charter of the Fund, Rules of Procedure for the Fund's Board, ME Guideline on Provision of Financial Resources from SEF CR and Annexes to the Guideline that regulate the conditions for provision of support in the relevant period. The Fund's administrator is ME.

The Fund's income consists primarily of fines for pollution or damage to the specific segments of the environment, instalments of loans provided and interest on such loans, as well as income from term-account deposits. Under the law, the Minister of the Environment decides on usage of the financial resources of the Fund on the basis of recommendations of a consultative body – the Fund's Board. This income is not included in the national budget of the Czech Republic.

In 2005, the Fund provided direct and indirect financial support in accordance with Sections 3 and 4 of Act No. 388/1991 Coll., on the State Environmental Fund of the Czech Republic in the form of:

- grants;
- loans;
- contributions to partly cover interest payments.

In 2005, the support covered measures according to programmes announced by ME in the following areas:

- water protection;
- air protection;
- nature and landscape protection, soil protection, utilisation of natural resources;
- waste management;
- technologies and products;
- utilisation of renewable energy sources;
- the European Union aid programmes ISPA (pre-entry structural policy tool), Cohesion Fund and OPI (Operational Programme Infrastructure).

Over the years 1992–2005, the total revenues of the Fund reached CZK 51.95bn, of which CZK 2.86bn relates to the year 2005. The revenues do not include the MUFIS loan drawing (CZK 500 million).

Over the years 1992–2005, the expenditures of the Fund reached CZK 49.2bn, of which CZK 3.47bn relates to the year 2005. (grants CZK 2.87bn, loans CZK 0.4bn, expenses of Fund's Office CZK 0.2bn).

The differences between revenues and expenditures (1992 to 2005) equalling CZK 2.65bn (excluding the assigned claim of CZK 0.6 billion and including the use of the MUFIS loan in the amount of CZK 0.5bn) are the resources used to cover the existing financial obligations of the Fund which were not settled in 2005 (calculation: 51.95-49.2-0.6+0.5 = CZK 2.65bn).

In the past period, the Fund ensured continuous supply of financial resources for projects of contractual support pursuant to valid internal regulations on the release of financial resources (invoicing principle), including the defrayal of the operating expenses of the Fund's Office.

Since 1 April 2005, SEF CR temporarily discontinued the admission of applications for national programmes announced by the ME. This was the result of a considerable excess of applications, which highly exceeded the financial capacity of the SEF CR.

The decision to suspend temporarily the admission of applications was made in view of the cost limit set by the government and participation in the co-financing of the EU funds. The SEF CR tries to find additional financial resources, on which the reopening of the admission of applications for national programmes depends.

Currently, the SEF CR meets the priority of the Czech Government, i.e. co-financing of investments from European funds. Applications for European funds within the Cohesion Fund were admitted throughout the year. Within the OPI, the Fund closed the 3rd Call as of 1 November 2005.

The Government of the Czech Republic, through its Resolution No. 617 of 23 June 2003, approved the use of the funds from the Housing Guarantee Programme (administered by Municipální finanční společnost, a.s.) up to CZK 500 million at the interest rate of 2.5% p.a. for financial support to projects contributing to environmental protection and improvement in the Czech Republic. As of 19 May 2004, the loan was drawn up to the agreed limit. Since the beginning of 2005, the loan has been repaid. In 2005, as of 31 December 2005, the Fund paid CZK 50 million in instalments and interest in the amount of CZK 12.4 million.

VI.3.1 Minister's Decisions Issued in 2005 and Ecological Benefits of Final Project Assessment (FPA) in 2005

VI.3.1.1 Air Protection

Decisions issued in 2005 approved the support to 35 projects, mainly in programme 2.1, in which 25 projects were supported. Five applications for the preparation of local emission and ground level pollutant reduction programmes were supported within the framework of programme 2.7.1 All applications focus on air quality in areas declared as areas with worsened air quality.

Table VI.3.1

Ministerial decisions issued in 2005

	Number	Costs	Subsidy	Loan	Support	SPM	SO_2	NO_X	VOC	CO	CO_2
		thous. CZK	thous. CZK	thous. CZK	thous. CZK	t/year	t/ year	t/ year	t/ year	t/ year	t/ year
2.1	25	17,953.6	8,106.4	1,035.3	9,14.,7	9.2	16.7	2.0	9.9	46.5	1,352
2.2	2	11,54.,5	3,667.1	3,160.6	6,827.7	0.5	0.6	0.1	0.7	3.0	107
2.7.1	5	2,235.0	1,341.0	0	1,341						
2.7.2	3	13,325.8	5,075.5	0	5,075.5	27.4	53.2	8.2	32.4	146.3	3,353
Total	**35**	**45,062.9**	**18,190.0**	**4,195.9**	**22,385.9**	**37.1**	**70.5**	**10.3**	**43.0**	**195.8**	**4,812**

Source: SEF

In 2005, two projects were approved within programme 2.8 for the evaluation of environmental measures leading to significant reduction in greenhouse gases; these projects are intended to enable domestic investors to reallocate, directly or indirectly, an agreed amount of actual reduction in greenhouse gas emissions, while using the mechanisms of the Kyoto Protocol. The expected annual rate of greenhouse gas emission reduction within these projects amounts to 612,000 tons of CO_2 equivalent.

Environmental benefits of projects where FPA was performed in 2005

Of the total number of 175 projects approved with final effect in 2005, in 102 cases (i.e. approximately 58%) the beneficiaries did not achieve the anticipated environmental effects. All projects where the contractually stipulated environmental effects were not achieved have been registered in programme 2.4. The total benefits in the air protection segment comparing reduction in main pollutants between the Support Contracts and the submitted FPAs represent the following eliminated pollution:

Table VI.3.2

Activities completed in 2005

	Number	Costs	Subsidy	Loan	Support	SPM	SO_2	NO_X	VOC	CO	CO_2
		thous. CZK	thous. CZK	thous. CZK	thous. CZK	t/year	t/year	t/ year	t/ year	t/year	t/year
2.1	56	57,519	29,205	7,161	36,366	45.0	77.7	8.6	42.2	180.0	6,276
2.2	6	81,661	19,217	18,662	37,879	63.4	76.6	11.5	26.0	112.1	4,931
2.4	106	831,592	415,548	7,615	423,162	2,594	3,936	432	1,978	8,494	206,637
2.6	4	13,754	13,754	0	13,754						
2.7.1	3	6,705	4,023	0	4,023						
Total	175	991,231	481,747	33,438	515,184	2,702	4,090	452	2,046	8,786	217,844

Source: SEF

The environmental effects listed under the heading of projects completed within programme 2.4 represent the actually achieved values, which amount to 64.3% of the contractual environmental effects. The contractual environmental effects are based on the documentation and proposals submitted by the beneficiaries to the Fund as supporting materials during contract conclusion. The fund requires that, as of the date of the Final Project Assessment, 90% of the stipulated values are complied with, in accordance with the Minister's Decision and the Support Contract concluded on its basis. In case of non-compliance, the granted subsidy is reduced with respect to the applicable method of sanctioning.

In the first half of 2005, the second Call for submission of applications within the OPI took place. A total of 13 applications were evaluated in measures 3.3.A and 3.3.B.

OPI 3.3.A – Utilisation of energy-saving technologies in combustion

Eight applications were assessed in this category of measures, of which 5 focused on boiler house reconstructions, one on installation of a co-generation unit and two applications focused on equipment of combustion plants in compliance with law. A total of 7 applications were supported, the support provided from the Fund amounts to CZK 20.432 million (investments) and CZK 5.763 million (support for preparation of project documentation). The implementation of these projects will make it possible to eliminate of the following emissions of pollutants and CO_2:

Table VI.3.3

Main pollutants and CO_2	t/year
Suspended matters	65.6
SO_2	57.4
No_x	17.9
C_xH_y	5.8
CO	16.7
Total	**163.4**
CO_2	6,843

Source: SEF

OPI 3.3.B – Reduction in volatile organic compounds (VOCs) emissions

Within this category of measures, 5 applications were assessed and subsequently approved for support. The Fund provided support in the amount of CZK 3 554 million (investments). The implementation of the projects will result in an anticipated reduction in VOCs emissions of **147.6** t/year including class I. and II.

VI.3.1.2 Water Protection

Environmental benefits of projects approved in 2005

In the water protection segment, the Minister issued 33 Decisions on provision of support for construction of water treatment plants and sewerage, of which 7 Decisions for projects within programme 1.1, 18 Decisions within programme 1.2 and 8 decisions within programme 1.5. The total implementation costs of individual projects (expressed as the base for the calculation of support) was CZK 906.3 million, while the total support granted from SEF CR will total CZK 657.8 million (of which grants were CZK 534.0 million and a loan with an interest of 1.5% CZK in the amount of 123.8 million). The provision of the financial resources will make it possible to eliminate the pollution of 986.83 tons COD and 493.23 tons of suspended solids per year.

Environmental benefits of projects where FPA was performed in 2005

The table below shows a summary of all projects approved for support with final effect in this period by the Fund, and expresses the actually achieved environmental effects, as compared to the designed parameters.

Table VI.3.4

Total benefits of 117 projects aimed at water pollution decrease, approved for final support in 2005, representing the subsequent pollution elimination

Pollutant	Decrease according to support contracts	Decrease according the submitted ZVA t/year	%
Unsolvable matter	2,035.6	1,976.8	97.11
BOD_5	1,056.9	998.7	94.49
COD	3,455.3	3,490.1	101.00

Source: SEF

The environmental effects stated in the contracts are based on the capacity of the facilities under construction as regards elimination of pollution discharged into surface waters. Upon conclusion of FPA, the Fund requires that at least 80% of the specified values are fulfilled; the remaining 20 % is considered a reserve capacity for the future development of the municipality.

VI.3.1.3 Nature and Landscape Conservation

Environmental benefits of projects approved in 2005

In the nature and landscape conservation segment, the Minister of the Environment issued 85 Decisions on support in this period. The total implementation costs of individual projects (expressed as the base for the calculation of support) amounted to CZK 257.507 million, while the total amount of support granted from SEF CR will amount to CZK 218.031 million.

In 2005, a total of 85 new projects were approved in the nature and landscape conservation segment. The total costs for their implementation were CZK 257.507 million, of which the support requested from the Fund in the form of grants amounted to CZK 218.031 million.

Environmental benefits

- Creation of the Territorial System of Ecological Stability 13.22 ha
- Park reconstruction 13.74 ha
- Tending of trees 1,962 pcs
- Planting of trees 1,359 pcs
- Renewal of hiking forest trails 9.28 km
- Removal of sludge from ponds 158.15 ha
- Re-purchase of land in specially protected areas 1 project
- Erosion control measures 1.7 ha
- Plans for care to improve the environment 12 projects
- Establishment of an environmental education garden 1 project
- Preparation of a landscape exhibition 1 project

Environmental benefits of projects where FPA was approved in 2005

In 2005, FPA of a total of 86 projects in the nature and landscape conservation segment were approved. The total aid approved from the Fund amounted to CZK 137.094 million.

Environmental benefits

- Park reconstruction 70.9 ha
- Tending of trees 1,795 pcs
- Planting of trees 4,469 pcs
- Creation of the Territorial System of Ecological Stability 8.46 ha
- Renewal of hiking forest trails 5.9 km
- Removal of sludge from ponds 75.96 ha
- Improving the flow capacity of a dead channel 1,470 m
- Renewal of head-race 642 m
- Dry polders 1.8 ha
- Erosion and flood control measures 10 ha

During this period, the Minister of the Environment also issued 35 Decisions (OPI 3.1 A) and 1 Decision (OPI 3.1 B) within the measure 3.1 – Rehabilitation of environmental functions of a territory.

OPI 3.1 A

The total implementation costs of individual projects (expressed as the base for the calculation of support) were CZK 329.149 million, while the total amount of support provided from the SEF CR will amount to CZK 36.983 million and the ERDF contribution will amount to CZK 263.319 million. By providing theses funds, it will be possible to revitalise 98.46 ha of fishponds, construct 11.34 ha of new retention reservoirs with an accumulation space of 53,852 cubic metres, and construct two polders with the total area of 6.353 ha.

OPI 3.1 B

The total implementation costs of individual projects (expressed as the base for the calculation of support) amounted to CZK 2.724 million, while the amount of support provided from SEF CR will total CZK 272 thousand (investment support) and CZK 2.18 million (ERDF contribution). By providing the funds, it will be possible to construct one fish passage.

VI.3.1.4 Waste Management, Technology and Support Programme for Environmental Education

Environmental benefits of projects approved in 2005

In 2005, a total of 46 Decisions of the Minister of the Environment were issued in the waste management, technologies and environmental education segment (incl. 6 exceptions). The costs for supported projects total CZK 164.911 million, the total support amounting to CZK 118.613 million consists of a grant amounting to CZK 105.591 million, and a loan amounting to CZK 13.022 million.

Table VI.3.5

Environmental Programmes

Programme	Programme name	No. of projects	Total costs	Support	Loan	Subsidy
4.1	Programme to support rehabilitation and closure of old landfills	4	74,711	56,944	13,022	43,922
4.2	Programme to support waste recovery and waste disposal	1	1,722	517	0	517
4.4	Programme to support car-wreck treatment	0	0	0	0	0
5.1	BAT programme	0	0	0	0	0
5.2	EMAS programme	29	9,952	4,061	0	4,061
8.1	Programme to support non-investment support of environmental education and awareness	7	10,416	6,516	0	6,516
P8.2	Programme to support investment support of environmental education and awareness	4	61,965	4,966	0	45,966

9.	Programme to prepares regional sustainable development strategies	0	0	0	0	0
N.Z.	Unclassified	1	6,146	4,609	0	4,609
	Total	**46**	**164,911**	**118,613**	**13,022**	**105,591**

Source: SEF

Table VI.3.6

Environmental benefit with positive decisions in 2005

Programme	No. of projects	Environmental benefit	
4.1	4	Landfill rehabilitation	147,674 m^2
4.2	1	Collection yards	461 m^2
5.2	29	EMAS	ČSN EN ISO 9000, 14 000, EMAS
8.1	7	Environmental education	Conferences, publications, consulting, education
8.2	4	Construction and renovation of environmental education centres	Environmental centres, workshop centres
N.Z.	1	Rehabilitation o environmental accidents	750 m^2

Source: SEF

OPI 3.4 – Waste management and elimination of old environmental burdens

In 2005, 47 Decisions were issued granting support from SEF CR and ERDF within measure 3.4 waste management and elimination of old ecological burdens. The total eligible costs of the supported projects amount to CZK 1,085.305 million. The ERDF support totals CZK 794.440 million. The support from SEF CR in the amount of CZK 138.908 million consists of a grant, a loan and a grant for project documentation.

Table VI.3.7

OPI 3.4 programmes

Category	Programme name	No. of projects	Total tax-deductible costs	ERDF	SEF total
3.4 A	Development of an integrated waste collection and recycling system	32	630,428	459,435	87,189
3.4 B	Reclamation and rehabilitation of old environmental burdens	15	454,877	335,005	51,719
	Total	**47**	**1,085,305**	**794,440**	**138,908**

Source: SEF

The implementation of measures based on Decisions on provision of support from SEF CR and ERDF within the measure 3.4 waste management and elimination of old environmental burdens makes it possible to fulfil the environmental benefits stated in the table bellow:

Table VI.3.8

Collection yards capacity, separated collection system	t/year	22,729,32
Collection yards area, catchment area	m^2	37,490,70
Number of collecting containers	pcs	474
Treated waste	t/year	4,660
Waste used for material	t/year	27,352
Waste sorting	t/year	21,810
Rehabilitated and reclaimed area	m^2	429,584

Source: SEF

VI.3.2 Renewable Energy Sources

Environmental benefits of projects approved in 2005

In 2005, a total of 84 projects were approved for support, in particular within the programme 3.A where 42 projects were approved. In addition to investment projects (programmes 2.A, 3.A, 7.A and 8.A), support was also provided to 4 non-investment projects focused on support of education and publication of materials (programmes 1.B and 2.B), and 26 projects focused on the demonstration of transformation of sun radiation to heat and electricity (programme 10.A). If all the projects are approved with final effect, the environmental benefits shown in the table below will be achieved. The biggest benefit of renewable energy sources is the reduction in greenhouse gases (CO_2).

Table VI.3.9

Environmental benefit of RES programmes

	No.	**Costs**	**Subsidy**	**Loan**	**Support**	**SPM**	**SO_2**	**NO_X**	**VOC**	**CO**	**CO_2**
		thous. CZK	thous. CZK	thous. CZK	thous. CZK	t/year	t/ year	t/ year	t/ year	t/ year	t/ year
1.B	3	1,633	1,201	0	1,201	Non-investment project –education support					
2.A	7	46,450	22,683	6,933	29,616	-43.0	6.0	-4.1	17.2	1.3	3,488
2.B	1	116	58	0	58	Non-investment project - publication					
3.A	42	97,849	84,204	129	84,333	6.9	5.5	4.1	9.9	2.1	1,004
7.A	2	24,250	9,327	5,040	14,367	0.5	3.6	1.9	0.4	0	1,706
8.A	3	4,912	1,902	776	2,678	-0.5	0.3	0.2	0	0	214
10.A	26	17,173	15,446	0	15,446	0.3	0.2	0.3	1.3	0.0	11
Total	84	199,321	138,888	12,871	147,699	-35.8	15.6	2.4	28.8	3.4	6,423

Source: SEF

Environmental benefits of projects where FPA was approved in 2005

All the 930 projects that were approved with final effect in 2005 fulfilled the stipulated environmental effects. In programmes 1.B, 2.B (non-investment programmes focused on education and publication) and programme 10.A (demonstrational projects of low importance), environmental effects were not monitored. The total benefits in the field of renewable energy sources of the submitted FPAs represent the following reduction in pollution:

Table VI.3.10

Environmental benefit of RES programmes – finally approved support

	No.	**Costs**	**Subsidy**	**Loan**	**Support**	**SPM**	**SO_2**	**NO_X**	**VOC**	**CO**	**CO_2**
		thous. CZK	thous. CZK	thous. CZK	thous. CZK	t/year	t/ year	t/ year	t/ year	t/ year	t/ year
1.A	110	23,739	11,867	0	11,867	35.6	11,6	2.7	7.9	57.4	1,015
1.A.b	43	8,598	4,296	0	4,296	1.4	2,4	0.4	1.4	6.2	196
1.B	7	5,427	4,301	0	4,301	0.0	0,0	0.0	0.0	0.0	0
2.A	8	245,198	146,885	43,601	190,486	197.6	211,5	21.7	54.1	265.3	19,105
2.B	2	646	323	0	323	0,0	0.0	0.0	0.0	0.0	0
3.A	43	74,202	51,992	8,118	60,110	9,9	14.3	3.3	6.8	32.7	1,573
4.A	139	57,390	17,246	17,557	34,804	32,2	21.8	4.1	13.5	56.0	1,892
4.A.a	2	2,211	1,468	300	1,768	0,9	0.3	0.2	0.2	0.7	22
4.A.b	66	28,641	8,573	8,573	17,146	20,7	12.6	103.3	342.9	32.3	1,094
6.A	3	11,347	0	5,291	5,291	6,9	19.4	5.8	0.2	0.5	1,140
7.A	4	54,589	16,377	9,962	26,339	16,1	1.8	36.0	0.4	0.3	9,865
8.A	11	47,859	18,104	13,451	31,555	159,8	93.0	19.1	21.2	101.4	5,919
10.A	492	52,773	52,002	0	52,002	0,0	0.0	0.0	0.0	0.0	0
Total	**930**	**612,620**	**333,434**	**106, 853**	**440,288**	**481,1**	**388.7**	**196.6**	**448.6**	**552.8**	**41,821**

Source: SEF

OPI 3.3.C – Utilisation of renewable energy sources

In the 2nd call, 12 applications were assessed within this category, 9 of which were approved. Those included 3 central heating plants with biomass boilers, 5 thermal pump installations and 1 cogeneration unit at a waste dump. The support from the Fund totals CZK 22.047 million (investments) and CZK 4.420 million (support for preparation of project documentation). The implementation of these projects will make it possible to eliminate the following emissions of pollutants and CO_2:

Table VI.3.11

Man pollutants and CO_2	t/year
Particulate matters	24.0
SO_2	60.7
No_x	- 7.2
C_xH_y	1.5
CO	11.8
Total	**90.8**
CO_2	10,550

Source: SEF

Operational Programme Infrastructure – OPI

Global aim of the OPI programme is the protection and improvement of environment and improvement of transport infrastructure. In the framework of the OPI, the Fund acts as a mediator and a paying unit.

The 2nd call, which took place between 3 January 2005 and 15 March 2005, was only focused on 3 measures in contrast to the 1st call, which also included the measure 3.2 – Improvement of infrastructure in water management.

Within the 2nd call, Priority 3, 104 projects were approved by the Minister. The total costs of these projects are approximately CZK 1,836.742 million, the ERDF grant is CZK 1,332.894 million and the SEF CR support amounts to CZK 232.379 million.

Measure 3.1 – Rehabilitation of environmental functions of the territory

Within the measure 3.1, 36 projects were approved by the Minister in 2005. The total eligible costs of projects within this measure amount to CZK 331.873 million, the ERDF grant totals CZK 265.499 million, and the SEF CR support amounts to CZK 37.255 million.

Measure 3.2 – Improvement of infrastructure in water management

Due to a significant excess of projects submitted within the 1st Call, this category has not been announced at the 2nd Call.

Measure 3.3 – Improvement of infrastructure and air protection

Within measure the 3.3, 22 projects were approved by the Minister in 2005. The total eligible costs of the projects within this measure amount to CZK 419.564 million, the ERDF grant totals CZK 272.955 million and the SEF CR support including the contribution to the preparation of project documentation is CZK 56.216 million.

Measure 3.4 – Waste management and elimination of old environmental burdens

Within measure the 3.4, 47 projects were approved by the Minister in 2005. The total eligible costs of projects within this measure total CZK 1,085.305 million, while the ERDF grant totals CZK 794.440 million, and the SEF CR support amounts to CZK 138.908 million.

VI.4. Foreign Support

VI.4.1 Transition Facility

The programme is intended for strengthening the capacities of institutions pursuing the fulfilment of *acquis communitaire* in the Czech Republic. Priorities are given to projects focusing on the fulfilment of tasks arising from the Accession Treaty of the CR to the EU and the recommendations identified for individual sectors in the Comprehensive Monitoring Report on the Czech Republic's preparedness for the EU membership.

As regards the environment, the Twinning Light project "Enforcement of EC Legislation in the Czech Republic Regarding Protection of Ozone Layer" should have been implemented within the programme TF 2004, for which an amount of EUR 0.25 million was allocated, Czech co-financing, the project became unnecessary and was cancelled in 2005.

Within the TF 2005 programme, the only environmental project approved was project no. 2005/017/518/03.01 called "Improving Soil Protection through Strengthening Laboratory Control of Sludge Application from WWTP on Soil", which is being implemented by the Ministry of Agriculture. Its total projected budget is EUR 0.220 million and it consists of a twinning part (EUR 0.1 million) and investment part (EUR 0.12 million).

Another Twinning Light project, which was being prepared in 2005 and approved in early 2006, was the project "Improving AQIPs" focusing on dust particles (PM 10 and PM 2.5) with a proposed budget of EUR 0.19 million. This project was not implemented because of a lack of interest on the part of foreign investors and insufficient time for contract conclusion.

VI.4.2 Phare

Within the framework of the Phare programme (pre-accession assistance programme), funds were paid in the Phare 2001 and 2003 programmes in 2005. The financial resources drawn from the Ministry of the Environment as part of national co-financing totalled nearly CZK 20.989 million. The total amount paid from the programmes Phare 2002 and 2003 by the end of 2005 amounted to EUR 8.846 million and the amount provided from the national budget totalled CZK 115.646 million (co-financing).

VI.4.3 CBC Phare

This programme was terminated for the Czech Republic in 2003. Since 1 May2004, similar projects of cross-border cooperation have been implemented within the Interreg IIIA Initiative.

In 2005, programmes from previous years were implemented. The following major projects were implemented: Aš – extension of a WWTP and sewerage, Litoměřice – sewerage in the micro-region.

VI.4.4 Interreg IIIA

In 2005, additional Czech projects were approved in all programmes. As regards the environment, these were for example:

In the programme CR–Austria:

- Biowaste collection and sorting system – applicant ZERA, Náměšť nad Oslavou
- Energy for the Highlands – applicant Energy agency of the Highlands, Jihlava
- Development of environmentally friendly tourism in the area Confluence – applicant Biosphere reserve Dolní Morava, Břeclav

In the programme CR–Saxony:

- Modernisation of the WWTP Vejprty – applicant the city of Vejprty
- Waste management in cross-border areas – applicant the city of Chomutov

In the programme CR–Bavaria:

- Flower parade as part of the Landscape exhibition without limits – applicant the city of Cheb
- Europe's perspectives – environmental protection in the context of Czech-Bavarian cooperation – applicant Úhlava o.p.s., Klatovy

In the programme CR–Slovakia:

- Utilization of renewable resources and effective energy management at the Primary school and Primary school of arts in Dolní Němčí – applicant the municipality of Dolní Němčí
- Green for Beskydy – utilization of renewable energy sources – applicant the city of Valašské Meziříčí
- Utilization of biomass and solar energy in the submontane municipality of Salaš – applicant the municipality of Salaš

In the programme CR–Poland:

- Wastewater sewerage Krnov-Kostelec
- Improvement of anti-flood protection of the city of Turnov

VI.4.5 Structural Funds – Operational Programme Infrastructure, Priority 3

The Czech Republic obtained funding for Priority 3 "Improvement of Environmental Infrastructure" in 2004–2006 from ERDF in the total amount of EUR 142.092 million, for which it is obliged to secure national co-financing.

In 2004, the Steering Committee of OPI decided to provide financial support to 64 applications in a total amount of CZK 2,028.649 million from ERDF, i.e. 45% from the total amount allocated for the period of 2004–2006, and CZK 271.622 million from SEF CR (as of 31 December 2004). By the end of 2004, end beneficiaries announced the first tender

proceedings according to the valid Public Procurement Act, after the applications were registered with the Intermediary Entity SEF CR.

VI.4.6 LIFE

Within the LIFE communitarian programme, the project entitled "Restoration of Thermophilous Habitats in the Moravian Karst" was approved in 2004 for the Czech Republic, which underwent 2 successful controls in 2005. The project was launched on October 1, 2004, and it is expected to be completed by the end of 2007. One of the important parts of the project is the purchase of land holding priority specie habitat from private owners. In 2005, a project was approved concerning creation of natural habitats for great bustard; however, it was listed among substitute programmes and was not implemented due to lack of funding.

VI.4.7 Operational Programme Human Resources Development

European money is used to finance the grant scheme called "Network of Environmental Information and Consultancy Centres", which are intended for environmental education as well as other activities.

In 2005, assessment and selection of projects took place in 2 rounds of ME Call. The 1st round was completed on 12 April 2005, 4 of the 43 assessed projects were selected and an amount of CZK 54 million was divided. On 10 November 2005, the second round was completed and the commission selected 11 of the 38 submitted projects, for which the amount of CZK 146 million was allocated.

The main activities of the newly established centres include setting up environmental consultancies, creation of new jobs and cooperation with public administration.

VI.4.8 Operational Programme Infrastructure

The global goal of the OPI programme is protection and improvement of the environment and development and enhancement of transport infrastructure, while respecting the principles of sustainable development as well as EU standards.

OPI is designed as a mono-fund with financial resources being provided from ERDF. Of the total allocation for the Czech Republic for Goal 1 (i.e. EUR 246,360,355), 16.94% is allocated to OPI. The allocated resources are divided into individual OPI Priorities according to the originally set allocations for separate operational programmes (OP Transport and OP Environment) on the basis of a National Development Plan proposal approved by the government.

In 2005, further project selection and assessment was under way based on announced calls Selection of contractors was launched and implementation of projects was gradually initiated. During the second half of the year, the end beneficiaries submitted first payment applications and the first certifications of expenditures were completed. At the same time, the first payment application was submitted to the EC in compliance with the precondition, according to which the advance payment has to be returned unless an operational programme submits a payment application to the EC within 18 months of its approval.

Between 1 January 2005 – 31 December 2005, a total of 15 project applications (Priorities 1 and 2) were registered with the Intermediary Entity Ministry of Transport, the Intermediary Entity SEF received a total of 556 project applications, of which 468 were registered (Priority 3).

In 2005, a total of 138 project applications were approved in Priorities 1, 2 and 3. As of 31 December 2005, two certifications of expenditures were performed for measures in Priorities 3 and 4 totalling EUR 3.570 million. In addition, the implementation of the first OPI projects was completed in 2005.

VI.4.9 Cohesion Fund

The Cohesion Fund is a monetary fund, which provides resources for large investment projects in the area of transport and the environment (Trans-European Transport Network) in EU member states, whose GDP (GNP) per capita is lower than 90% of the EU average and which are implementing the programme of "economic convergence".

In 2005, 11 projects were approved and funded within CF. All of these projects dealt with wastewater treatment and some of them also with the assurance of the necessary quantities and quality of drinking water. There were no other CF Priority areas represented in the collection of projects approved for 2004.

- The gross allocation of CF financial resources available for the environment sector in 2005:

  EUR 106.044 million
- The support as determined by an EC decision for the 11 approved projects:

  EUR 147.272 million
- The difference:

  EUR -41.228 million

This means that in 2005 nearly 140% of the projected allocation was drawn from CF – environment sector, which can be characterized as a significant success.

More information is available at the ME web site in section "Cohesion Fund":

http://www.env.cz/AIS/web.nsf/pages/fond_soudrznosti.

VI.4.10 Financial Mechanism of the European Economic Area and Norway

Upon accession to the EU on 1 May 2004, the Czech Republic gained the opportunity to draw financial resources from the Financial Mechanisms of EEC and Norway. The total amount allocated for the Czech Republic is 110.91 EUR million for the five-year period between 2004-2009, of which EUR 48.54 million is provided from FM EHP and EUR 62.37 million from FM Norway.

The call no.1 for allocation 2004/2005 was announced on 18 May 2005 with an application deadline of 15 August 2005. The ME accepted individual projects in Priority area 2

“Environmental Protection”. A total of 33 applications were submitted. The evaluation commission drew up a list of the projects arranged according to the amount of points awarded au to the limit of the indicative allocation of EUR 3 million intended for the environment sector. 5 projects totalling EUR 2.59 million were advanced to the Financial Mechanisms Office currently pending approval.

VII Environment and Society

VII.1 Environmental Risks

VII.1.1 Chemicals

After joining the EU, the Czech Republic joined the EU's cooperative way of assessing chemical hazards. The Czech Republic joined the EU when this cooperative programme had already been in progress and therefore it did not become a country reporting on a particular chemical. However, the country can participate in creating documents by taking part in meetings where final reports are reviewed. Subjects of assessments are as follows: chemicals included on the priority lists of the EC (consisting of 141 chemicals so far), including chemicals produced in or imported to the Czech Republic and chemicals included on the national lists of priority chemicals. Results of assessments are to be found in monographs dedicated to individual chemicals. They are also available at http://ecb.jrc.it/existing-chemicals.

After the EU adopts its new chemical policy, the importance of chemical hazard assessments will grow. According to the new legislation on chemicals (REACH), assessment of chemical hazards will become obligatory when the total production of a chemical amounts to 10 tonnes or more. This regulation will replace the present one and will have great influence on all the member states, including the Czech Republic. REACH will introduce a regulation leading to greater protection of health and the environment. It will also simplify the present regulation as it introduces a single process for the safe use of all chemicals. The obligation to gather data and to ensure their reliability is imposed on the industrial sector, which produces and markets chemicals. After the data are analysed, chemicals found to be the most dangerous for human health and for the environment (especially carcinogens, mutagenes and substances toxic for reproduction, persistent and bio-accumulative substances) will be used in such ways as to minimise all existing hazards. Their use will be gradually limited and the search for new alternatives will be supported. At the same time competitiveness of the member states should be ensured. Mastering processes of hazard assessment and hazard lowering will become an important part of industrial activities.

Within the EU Environmental Council, the Czech Republic supports the basic principles of the new legislation (see below). It also attempts to simplify requests imposed on importers and exporters of chemicals, e.g. to simplify the registration of substances produced in small amounts or substances present in other products. The Czech Republic also supports the request to adopt the rule 'one substance – one registration' and to arrange the substances according to their dangerous characteristics (particularly carcinogens, mutagenes and substances toxic for reproduction, persistent and bio-accumulative substances). With other suggested dangerous characteristics (PBT and vPvB), the Czech Republic prefers a differentiated attitude based on hazard assessment – at least in connection with tonnage. It is also important for the Czech Republic to pay attention to small and medium-sized businesses and to specify assets data.

As for the legislative changes, an amendment to Act No. 356/2003 Coll., on Chemical Substances and Chemical Preparations, was prepared in 2005. The reason for this amendment was the adoption of the above-mentioned EC legislation. These became part of Czech law – namely Regulation (EC) No. 648/2004 of the European Parliament and of the Council, on detergents, and Regulation (EC) No. 850/2004 of the European Parliament and of the Council, on persistent organic pollutants.

VII.1.2 Genetically Modified Organisms

Genetically modified organisms (GMOs) are used mainly in research, especially medical research, in the Czech Republic. There has been a certain influence of the world-wide increase in the rate of genetically modified agricultural products. At the end of 2005 there were 68 workplaces entitled to work with GMOs, mainly in the mode of isolated manipulation with genetically modified micro-organisms, plants and laboratory animals. Only one field experiment was allowed, namely an experiment with genetically modified potatoes designated for technical use. Based on the permit issued on the EU level, genetically modified maize was grown for the first time. It was maize MON 810, resistant to the pest *ostrinia nubilalis*, which was grown on a small area of 270 ha. After joining the EU, permits to market GMOs issued in the previous years came into effect. Since then the Czech Republic has been taking an active part in European processes concerning GMOs marketing, preparation of new regulations and implementing regulations and information exchange between the member states and the EU bodies. Every year the Ministry of the Environment commissions several projects aimed at revealing possible hazards of GMOs and at ensuring methodical and laboratory control over GMOs manipulation.

Every use of GMOs is assessed by the Ministry of Health, the Ministry of Agriculture and the Czech Commission for GMOs Manipulation, an advisory body of experts to the Ministry of the Environment. This commission expresses its opinions particularly with regard to possible environmental hazards. There is an opportunity for the public to express its opinions during the ratifying process. The Ministry of the Environment also lays stress on publicising the largest possible amount of information on GMOs. There are various ways of publicising this information – the Internet, seminars, publications, etc. Considering the wide range of GMOs, inspections, co-operation improvements, information exchange between the ministries and specialised institutions in the Czech Republic as well as on the EU level is of great importance.

Detailed information concerning the issued permits on GMOs utilisation and many other documents are regularly published on the web site of the Ministry of the Environment.

VII.1.3 Prevention of Serious Accidents

In 2005 inspections were carried out in all objects from group B (objects storing a large amount of a dangerous substance) and in selected objects from group A (objects storing lower amounts of dangerous substances but exceeding the limits set for the substances). These inspections were carried in compliance with Act No. 353/1999 Coll., on the Prevention of Serious Industrial Accidents, as amended, and according to the approved yearly plan of inspections.

In 2005 the Act applied to 158 objects and a total of 112 inspections were carried out. 77 of them were carried out in objects belonging to group B and 35 in objects belonging to group A. In addition to these announced inspections there were also some unannounced inspections aimed at revealing the real amount of the dangerous substances stored in the objects and at comparing the data in the reports and in the safety documents. These inspections were carried out in co-operation with regional councils.

No serious defects, mistakes or breaches of serious accidents prevention rules were found. The safety documents of 35 objects (out of the total number of 158 classified objects) have not been approved yet.

There were no accidents classified pursuant to Act No. 353/1999 Coll. in 2005.

VII.2 Health and the Environment

The quality of the environment is one of the most important factors influencing human health. A set of indicators is used to assess the influence of the environment on human health. These indicators are monitored by the System of Human Health Condition Monitoring and implemented according to Government Resolution No. 369/1991. This monitoring system represents an integrated system which collects data and processes and assesses information on the conditions of the individual environmental factors and their influence on the health conditions of the Czech population. The main aim of this system is to monitor and assess the timelines of some selected environmental factors quality indicators and the population's health conditions. It also assesses to what extent the population is exposed to the effects of harmful substances and the impact of such substances on human health.

The system consists of eight subsystems, which monitor the quality of air, drinking water, noise levels in urban areas and dietary exposure to extraneous substances. They are also used for biological monitoring, they assess the population's health conditions and health risks in the working environment and monitor the quality of soil in urban settlements. This monitoring system is in place thirty areas – in Prague, in the regional capitals and in several selected former district towns. Some of the areas may change. The monitoring results are regularly published in the General Report and in the Special Annual Reports. These reports can be found on the web site of the National Institute of Public Health, Prague (www.szu.cz/chzp/monitor).

VII.2.1 Drinking Water Quality

In 2005 drinking water quality was monitored as a part of the monitoring system in most of the public water lines in the Czech Republic. The Ministry of Health runs an information system (IS PiVo), which is used to process the data on drinking water. Two systems were used to assess the compliance with drinking water quality indicators – one for areas supplying locations with less than 5,000 inhabitants (smaller locations) and a different one for areas supplying localities with more than 5,000 inhabitants (larger locations).

The maximum limit values (MLV) and limit values (LV) were exceeded in 1% of the total number of measurement in smaller localities and in 3% of measurement in larger localities. According to a detailed division of the areas (made according to the number of supplied inhabitants) the frequency of exceeded limit values decreases with the increasing number of supplied inhabitants. In 2005 nearly 6.4 million inhabitants (67%) were supplied with drinking water from the distribution network in which no maximum limit values were exceeded. The maximum limit values of at least one indicator in all the measurements was exceeded in water lines supplying 80,000 inhabitants.

The maximum limit values were most often exceeded by the pesticide Atrazin (3.9%). Considering the health risks, nitrates and trichlorinmethane are the most problematic

substances. In 2005, nitrates in drinking water were found in almost all areas (99.9%). No damage to human health caused by the monitored contaminants was registered.

Calculations of theoretical cancer development probability decrease caused by chronic exposure to 12 organic substances contained in drinking water (1,2-dichlorethane, benzene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bromdichlormethane, bromoform, chlorethene (vinyl chloride), dibromchlormethane, indeno(1,2,3-cd)pyren, tetrachlorethene, trichlorethene) showed that drinking water consumption may contribute to a yearly decrease of theoretical cancer development probability. This contribution accounts for approximately $2x10^{-7}$, which means 2 cases of oncogenous diseases per 10 million inhabitants.

Nowadays we have more and more knowledge about the importance of optimal concentration of calcium and magnesium for human health. The monitoring shows that only 6% of inhabitants is supplied with drinking water containing the optimal recommended concentration of magnesium, which is 20 – 30 mg/l.

VII.2.2 GMO-Foodstuffs in the Czech Market

2005 was the fourth year of GENOMON, one of monitoring projects aimed at finding any foodstuffs containing genetically modified organisms. Inspections carried out in the Czech food-store network were aimed at tomatoes, soybeans, soy products and corn flour.

Using the RT-PCR method, nine samples of soy products and 2 samples of soybeans were found positive. A qualitative method of reactions specific for a species (the nested PRC method) showed the presence of corn line type MON810 in one sample of corn flour. According Regulations (EC) Nos. 1829/2003 and 1830/2003, all foodstuffs containing more than 0.9% of GMOs shall be labelled. The amount of GMOs up to 0.9 is considered to be incidental or a technically unavoidable admixture of GMOs. In the EU, the MON810 corn line was approved as a foodstuff with can be marketed. Therefore its occurrence was not against the law. During the year 2005 no new scientific information showing any possible risks of using GMO-foodstuffs was published.

VII.2.3 Soil in Urban Settlements

The soil contamination in industrial areas, residential areas and along roads stems, among others, is from some of the above-mentioned activities concerning waste management and industrial and mining activities (old environmental burdens, inadequate solid waste and waste water management, raw material storage). Transport is considered to be a significant source of soil contamination along roads and inside residential areas. Toxic metals and various organic compounds affect mainly children. Increased microbe contamination of the surface layer of soil at children's playgrounds and in recreational areas may lead to a certain increase in the number of some types of diseases.

As a part of soil monitoring in urban settlements, the surface layer of soil is monitored in order to assess the level of health risks resulting from toxic substances exposure caused by unintentional soil and soil dust consummation. As pre-school children are at the highest risk of an increased exposure to harmful substances from contaminated soil, the project is aimed at kindergarten playgrounds.

During the 2002 – 2004 monitoring period, measuring was performed in a total of 251 kindergartens of 15 towns. In 2005 samples were taken in order to assess soil contamination in 78 kindergartens in 5 towns.

The results of soil surface layer monitoring in urban settlements are as follows: The most significant inorganic substances of unintentionally consumed soil are arsenic and lead. The concentrations of these substances exceeded the proposed limits for non-contaminated soil in most kindergartens in all the towns.

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VII.2.4 Environmental Noise

Noise development monitoring on the base of regular twenty-four-hour noise measuring is carried out in selected noisy and quiet areas in 19 towns. The measuring is carried out monthly, in noisy and quiet bases respectively. The registered equivalent levels of acoustic pressure A – LAeq mean energetic representation of noise levels in the individual areas. Ninety percent noise level probability (L90) is used to describe the permanent noisiness (or so called background noise) in the individual areas. This value represents the level occurring in the locality for ninety percent of the measured time. Since 2004, there has also been a new noise level descriptor Ldvn, which corresponds to the requirements of the European Parliament and European Council directive No. 2002/49/ES. In 2005, the registered average annual values A, L90 and Ldvn formed a coherent line.

The measuring results show that the noisiness in the individual noisy and quiet areas is equally distributed in the whole range of all possible noise levels. The registered values of noisiness described using the A scale reach up to 75 dB in the day-time and 69 dB at night (in noisy areas), 50 dB in the day-time and 40 dB at night (in quiet areas). The highest values of noisiness were, as usually, registered in noisy areas of Pilsen, Brno, Prague 10 and Olomouc. The lowest levels of noisiness were repeatedly registered in Kolín, Příbram and České Budějovice.

Globally, neither decrease nor increase in noisiness in towns can be reported as there were few areas where changes were registered and increases in some areas were balanced by decreases in other areas.

The influence of long-term exposure to various levels of noisiness on public health is regularly surveyed using questionnaires on demographic, sociologic and health information of inhabitants of primarily monitored areas. The last survey was carried out in 2002. Considering the so-called civilisation diseases and hypertension, an important relationship between their occurrence and the registered level of night noisiness was repeatedly found. As well as this, there exists a significant correlation between the number of people feeling annoyed by the outside noise and the measured noisiness in a given area. There is also a statistically important relationship between the noisiness of a locality and the number of people stating that they have problems with falling asleep and sleep quality.

VII.2.5 Working Conditions and Occupational Diseases Factors

During 2005 new professional and workplace classification proposals continued. The public health bodies continued issuing their decisions and legalising the proposals. Analyses obtained from the Job Classification Information System show that as of 17 May 2006 1,769,065 people, i.e. 37.6% of all employees[1] (19,019 people per 100,000 insured), belonged to categories 2, 2R, 3 and 4. 424,596 people, i.e. 9% of all employees (4,565 people per 100,000 insured) belonged to categories 2R, 3 and 4 (dangerous jobs). 18,571 people, i.e. 200 people per 100,000 insured, belonged to category 4 (highly dangerous jobs). 1,756 out of

[1] The total number of employees – 4,706,600 (Statistical Yearbook of the Czech Republic, 2005)

them were women. Most of the employees registered in categories 2, 2R, 3 and 4 are exposed to the following factors: physical load (823,625), working posture (677,763 people), psycological load (676,685 people) and noisiness (668,487 people). The highest absolute number of employees exposed to the factors was registered in Moravskoslezský region. As for the relative number (per 100,000 employees), all the regions except Prague, Karlovarský and Jihomoravský exceed the national average.

Job classification is a dynamic process and the above-mentioned numbers may change in relation to the changes in data on the rate of employees' exposure to crucial factors. These data changes are caused by the development of new technologies and the specification of data characterising the exposure.

In 2005 a total number of 1,400 professional diseases in 1,317 employees (out of which 817 were men and 583 women) were reported in the Czech Republic. 1,340 of them represented occupational disease and 60 of them represented occupational disease risk. From 1996 to 2004 a falling trend in the number of reported professional diseases was registered. In 2005 the number of absolute cases as well as incidences of professional diseases (31,5 cases per 100,000 insured) was comparable with 2004. Most of the professional diseases were reported from Moravskoslezský and Středočeský region (272 and 181, i.e. 19.4% and 12.9% of all cases). In Moravskoslezský region diseases caused by physical factors represented the most numerous category (169 cases). The particular diseases were as follows: diseases of the peripheral nerve system caused by one-sided excessive physical overloading of extremities and diseases of the peripheral nerve system caused by vibrations. In Středočeský region professional diseases affecting air passages, lungs, pleura and peritoneum (86 cases) predominated. These diseases were caused by work exposure to dust containing glacial silicon dioxide and asbestos and exposure to radioactive substances in uranium mines in last century being a cause of lung cancer.

VII.3 The Environment of Urbanised Areas

As the majority of population lives in towns and cities, the quality of life there affects more and more people. Urbanised areas and care of these areas were included in the previous parts of the State Environmental policy in the period between 2004 and 2010 and in the Czech Republic's Sustainable Development Strategy issued in 2004. The life in towns and cities of the Czech Republic is loaded with many unfavourable agents and environmental issues. One of the biggest problems in cities is growing car traffic, which causes air pollution, excessive noisiness and further building in suburban areas. The spreading of towns into the environs causes that green areas in towns and cities are reduced or lose its function for lack of adequate care.

The Ministry of the Environment continues to implement the Programme of Urbanised Areas Care as an instrument to support of the care for green areas in towns and cities. This program was founded in 2002 with the aim to support municipalities and other subject to improve the condition of public green which has positive effects on environmental, climatic and aesthetic conditions of the built-up areas.

Every year the Programme of Urbanised Areas Care provides financial help in order to obtain out-planting and green regeneration projects. In the period between 2002 and 2005, 85 projects were supported amounting to a total of CZK 11.08 million.

Subsidies up to 80% of the total costs are provided in order to obtain the so-called feasibility studies. Applicants for the subsidies can include municipalities, legal entities and individuals

owning the relevant land or tenants having the owner's approval. The most common types of subsidised projects are as follows:

- Green out-planting as a way of regeneration of unused land and empty premises,
- Foundation of green areas or green zones as a part of the town planning scheme of environmental stability in built-up areas
- Important green areas regeneration (public parks and forest parks, hospital and school premises, cemeteries, village greens and town squares)
- Out-planting of barrier greens separating residential areas from industrial and commercial areas and noisy roads

The Programme of Urbanised Areas Care is followed by the Environmental Protection Programme organised by the State Environmental Fund. Some towns and cities also use the existing feasibility study as a part of a bigger project to obtain subsidies from the EU funds.

Geoparks

Areas interesting mainly from the geological point of view have been forming networks, respecting the basic ideas and functions of geoparks and trying to preserve unique geological areas. At present there are two closely related geo-park networks. One of them is the European Geopark Network founded in 2000, which now includes twenty-five geoparks of different European countries.

The Beijing Declaration on the Protection of the Geological Heritage of the World was adopted at the First International Geopark Conference held in Beijing (2004), which gave rise to the Global Geopark Network under the auspices of UNESCO.

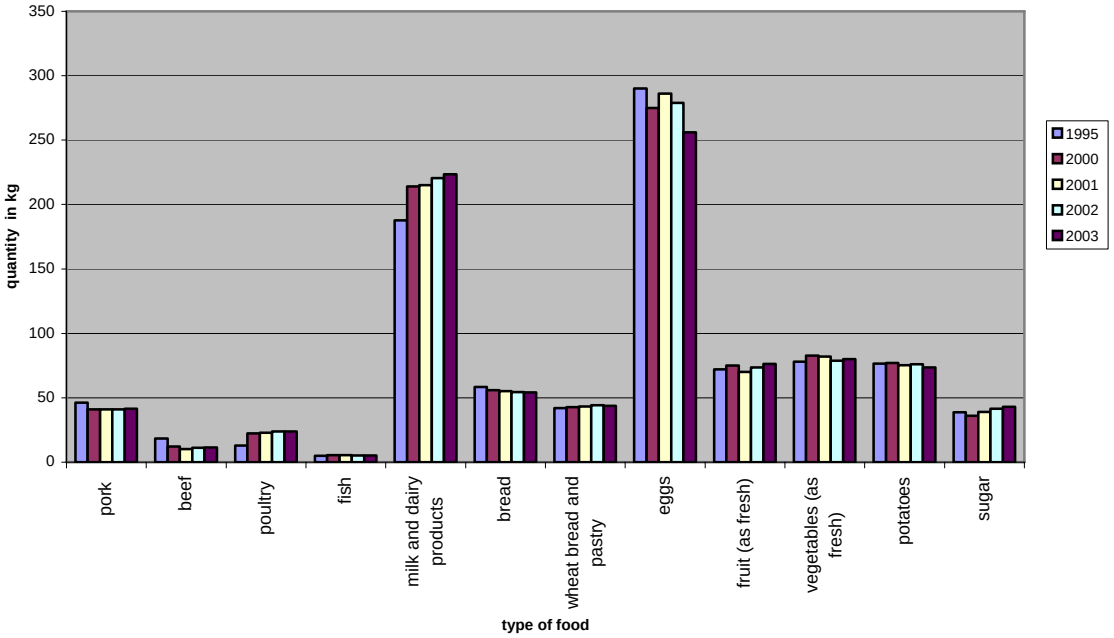
The Czech Republic is proud to heave the first geopark which became a member of the European Geopark Network and a UNESCO geopark at the same time. In October 2005 the Český ráj geopark was included in the European Geopark Network list. It forms an area of 700 km^2 and contains a wide range of geological phenomena, paleontologic, mineralogical and archaeological areas as well as historic monuments.

VII.4 Households and the Environment

Sustainable consumption is defined as the use of services and products satisfying the needs of the society and improving the living standards, minimising the use of natural resources, toxic substances and waste and harmful substances production during the whole life cycle of a service or a product so as not to threaten the needs of future generations (the Sustainable Consumption and Production Framework of the Czech Republic).

The below graphs show the trends in basic food products consumption and long lasting household products. The first graph shows some remarkable changes mainly in the composition of meat consumption. The consumption of beef and pork has been decreasing, whereas the consumption of chicken has been increasing. Compared to other food products, there was also a significant increase in sugar consumption.

Graph VII.4.1
Consumption of selected foodstuffs in the Czech Republic



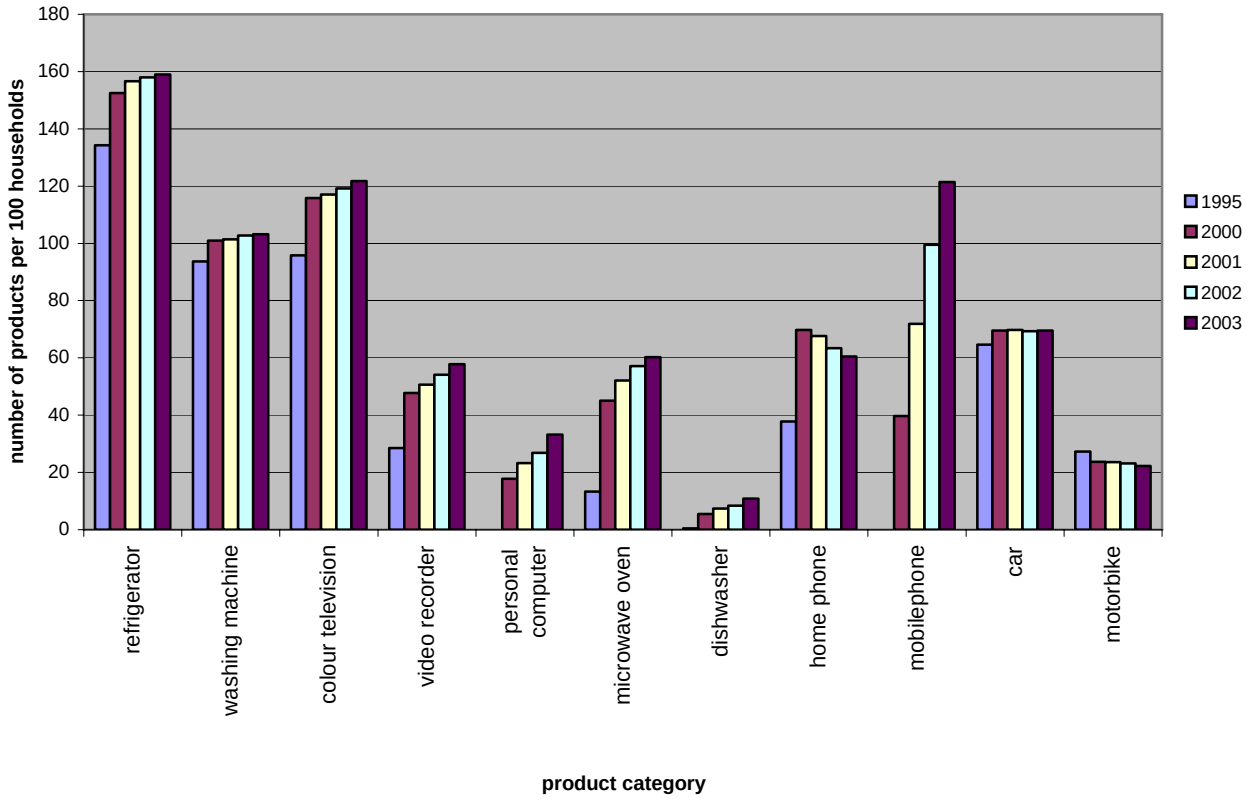
Note: The amount of eggs is stated in pieces, milk and dairy products do not include butter.

Source: The Statistical Yearbook of the Czech Republic, 2005

The purchase and consumption of food products has a significant influence on environmental conditions. According to Danish EPA 2002 data, the negative effects that households have on the environment conditions are caused one third by food products and beverage consumption. This is mainly because of the way goods are produced and processed, whether we are talking about agricultural products, way of transport or type of packaging. According to INCPEN (2001), more than two thirds of household waste is connected with food consumption. Labelling of environmental agriculture products might be a good way to reduce these negative effects.

As you can see in Graph VII.4.2, the Czech households are increasingly better equipped with electronic appliances. The most massive increase was registered in mobile phones (+ 81 pieces per 100 inhabitants) and microwave ovens (+ 47 pieces per 100 inhabitants). The only decrease was registered in motorbikes (- 5 pieces per 100 inhabitants).

Graph VII.4.2
Long lasting household products in the Czech Republic



Note: Home refrigerators with freezers, cars and motorbikes according to Decree No. 102/95 Coll.

Source: Statistical Yearbook of the Czech Republic, 2005

Household equipment (electrical appliances in particular) is closely connected with the electricity or water consumption, which is constantly increasing. However, consumers now have several possibilities (e.g. energy consumption labelling or eco-labelling) to choose an appliance which uses the lowest possible amount of electricity and which is more environmentally friendly. By using energy-saving appliances, the consumer may save a significant amount of money.

VII.5 Non-governmental Non-profit Organisations

The Green Circle (Zelený kruh) Association

The Green Circle Association, founded in 1989, is an association comprised of 26 environmental organisations operating in the Czech Republic. The members of the Green Circle can use the services of its information and legislative centre, taking part in the Green Circle development strategy forming. They can also use various supporting services free of charge, such as the pressroom in the Green Circle centre. The members of the Green Circle are obliged to sign the Code of Conduct, which obligates them to follow ethical rules beyond the legal framework.

Green Circle - Specialised Platform of Environmental NGOs

The Green Circle Platform of environmental NGOs was founded in 2003 as an open and informal information and communication network. One of its aims is to ensure and improve the communication among non-governmental organisations and to support the formation of common viewpoints concerning the environment.

The Green Circle issues an electronic monthly called the *Specialised Platform Newsletter*, distributed among more than 70 subscribers coming not only from the non-governmental sector. The newsletter summarises the main activities of the association and the specialised platform, it provides information about the changes of national and European environmental legislation, new publications, planned events, etc. In 2005 the Green Circle organised a meeting of environmental organisations with the Ministry of the Environment and two meetings of non-governmental organisations and prepared a report on the Aarhus Convention implementation and the Code of Conduct of non-governmental environmental organisations.

In 2005 the Green Circle participated in, among other things, the preparation of a law on renewable energy sources and in the discussions regarding a law on highways, a building law and environment protection or nuclear laws. It also coordinated the formation of statements of environmental NNOs with respect to various important documents. The Green Circle also publishes a summary of the most important voting of MPs and senators with impact on the environment called "Tell Me Who is the Most Beautiful". The Internet web site "Playing with the Earth" extended and updated the ecological footprint calculation model.

A new edition of technical studies was established within the Green Circle "Think-tank Project" (APEL) in 2005. The first publication called "Perverse Subsidies" came out in 2005. It provided an analysis of public subsidies with a negative impact on the environment. The project was conducted together with the DUHA Movement and was supported by the OSF Praha.

In 2005 the activities of the specialised platform were also supported by the VIA Foundation, the Ministry of the Environment and the Mott Foundation. The activities of the legislative centre were supported by the Partnership Foundation and by the Ministry of the Environment.

Pavučina – an Association of Environmental Education Centres

In 2005 the Association had 31 members and 8 observers. Activities of 71 environmental education centres were supported under a public tender by the Ministry of the Environment to meet selected tasks of the Action Plan "National Environmental Education and Training Programme" (EVVO). The total amount accounted for CZK 5 million.

In spring 2005 the European Social Fund financially supported the Education of EVVO School Coordinators project. The project started in November and it is linked to the current school reform. The project offers a course for EVVO school coordinators to approximately 140 teachers.

In 2005 a project called Education, Training and Awareness of Animal Protection was successfully finished. 1,200 copies of a guide for primary school and secondary school teachers called "Living Together or How to Teach Animal Protection" were printed.

The Czech Union of Nature Conservation

The Czech Union of Nature Conservation (CSOP) is the biggest nature, countryside and environment protection union. It carries out a wide range of activities, such as valuable

natural areas protection or biological mapping. It prepares various programmes aimed at bio-diversity protection, programmes for children, teenagers or the general public. It takes part in decision-making in administrative proceedings, looks after handicapped animals and preserves cultural monuments. Unlike other similar organisations, CSOP is mainly a volunteer organisation.

These are some of the main activities of CSOP in 2005

- 22 sub-programmes of the bio-diversity protection programme;
- Accreditation of 4 new land societies under the programme Place for Nature and renewal of the existing 36 accreditations;
- Coordination of 24 rescue stations under the National Network of Handicapped Animals Rescue Stations;
- Coordination of 121 clubs of Young Nature Conservationists (3,357 members);
- Organisation of the traditional Green Path – Golden Leaf environmental competition for children teams;
- Organisation of environmental Olympiad for talented secondary school students;
- Many other events for teenagers, such as Search for the Spring, Save the Wells and Views of the Nature
- Operation of fifty environmental centres accredited as training, education or consulting centres;
- Organisation of the first year of the Living Garden competition for garden owners pursuing revitalisation of their garden.

Environmental Counselling

The aim of eco-consulting is to provide the public with access to a wide range of objective environmental information on the environment, environmental problems and their solution and on products and their effect on the environment. Eco-consulting participates in creating public, administration and business ecological awareness, ensuring preventive environmental protection and supporting inter-sectional cooperation and communication. The basic principals are independence, professionalism and connection with the region. At present an increasing number of non-governmental non-profit organisations (NNOs) profile and systematise their eco-counselling activities.

The activities of the **Eco-counselling Network** (**STEP** – a counselling organisations association) in 2005 were aimed mainly at the development of eco-counselling in the Czech Republic (the 2005 Eco-counselling Programme), cooperation within the EU (member of Eco-Counselling Europe – European Association of Eco-counsellors, European projects ECO-ECHO and Eco Stands For aimed at experience exchange, education and eco-counselling standards) and at sustainable public administration (introducing environmentally friendly operation of some institutions, participation in the Sustainable Consumption and Production Task Force, which formed the Czech Sustainable Consumption and Production Framework).

Several regional projects were supported under the grant scheme of the Ministry of the Environment named "Environmental Information and Counselling Centres Network," which can be considered as an important achievement in the field of eco-counselling. The support was provided within the measure 4.2 of the operating programme "Human Resources Development – Specific Education". NNOs providing eco-counselling can either propose a project or can function as methodical centres for eco-counselling development in the region or in a specific area.

Projects aimed at consumption and sustainable development are considered more important than projects aimed solely at the environment.

The following is a summary of the functions and projects of the eco-counselling non-profit organisations:

- Counselling as a reactive and pro-active service (it reacts to the specific demands of clients but also to problems identified in public discussion). Examples: as a part of everyday counselling, the NNOs provided more than 11,000 official consultations, prepared 150 short-term courses and issued 70 publications or information leaflets.
- Counselling as an important factor of regional development (i.e. it promotes and supports the possibilities of sustainable development of a region). On the local level, the NNOs are very often the only subject able to provide basic environmental counselling. Their projects include, for example, introduction of renewable energy sources associated with creation of new job opportunities, support of local production in relation to eco-agriculture, support of environmentally friendly innovations in the building industry, etc. An important part of counselling services on the local level is implementation of pilot-projects or demo projects.
- Counselling as an important part of watchdog activities. There is a purpose not to make decisions on behalf of the public (except for technically complicated cases) but to provide them and their associations with adequate support, which will enable them to solve the problems on their own.
- Counselling as a technical service for public administration and for businesses. Compared to commercial counselling, NNOs commonly provide more innovative, accessible and effective services. The projects in this area introduce environmentally friendly running of municipal offices and other public institutions including technical and organisational aspects and presentation and interpretation of legal solutions.

The Partnership Foundation

The Partnership Foundation is the most important Czech foundation supporting environmental projects in all the regions of the Czech Republic. Together with its five sister foundations in Bulgaria, Hungary, Poland, Romania and Slovakia, it is a part of the Environmental Partnership Consortium.

The mission of the Partnership Foundation is to help non-governmental organisations, local governments and other partners care for the environment, promote sustainable development, inter-sectional cooperation and public participation in solving public issues. It allocates subsidies, organises internships, courses and seminars and publishes various publications. It tries to interface with similar projects both in the Czech Republic and abroad and provides information concerning the environment, sustainable development and its own programmes.

In 2005 the Partnership Foundation supported NNO 155 projects (a total amount of CZK 30,157,952). From its foundation in 1991 to the end of 2005 it supported about 1,700 projects of non-governmental non-profit organisations and local governments (a total amount of more than CZK 150 million). The foundation receives contributions from the Foundation Investment Fund. In 2004 the foundation merged with the Josef and Petra Vavroušek Foundation.

The VIA Foundation

The VIA Foundation was founded in 1997 in order to continue the activities of the Czech branch of the Foundation for a Civil Society (a US foundation), which operated in the Czech Republic from 1990. In 2005 the foundation supported 20 projects (CZK 1,200,038).

The VIA Foundation supports active public participation in the development of democratic society, good relationships and cooperation among non-profit organisations, local governments and businesses that promote the development of non-profit organisations and donations. In order to achieve its goals, the foundation combines financial support with know-how creation. It allocates subsidies, provides consultations and information, organises seminars and other forms of education.

The Civil Society Development Foundation (NROS)

NROS was founded in the spring of 1993 as a Czech legal entity. From its beginning it administered the Civil Society Development Fund – one of the Phare programmes financed from EU funds. The mission of this foundation is to support the development of the non-profit sector, donations and voluntary services as a way of civil society development. NROS supports non-profit organisations, which help the endangered and the disadvantaged and defends human rights and democratic values. It supports peaceful coexistence with minorities and promotes people's interest in local development and public issues. The foundation continuously endeavours to provide people better information on the non-profit sector.

In 2005 NROS supported 387 NNO projects (CZK 137,931,543).

VII.6 Public Attitudes Towards Environmental Issues

Eurobarometer 2005

The Eurobarometer Survey continuously gathers the attitudes of public in the EU member states and candidate states and publishes them twice a year in national reports. In 2005 the reports were issued in spring and autumn.

Compared with the EU-25 average, the Czech public rates the environment situation more positively (CR-59/40 %, EU-25-51/44 %), see Graph VII.6.1. On the other hand the Czech public rates the environment situation in the Czech Republic worse than the rest of the EU countries (see Figure VII.6.2).

When assessing the relevance of various issues, the Czech public placed the environment almost at the end of an imaginary scale of issues to be solved. It gained only 2% relevance (compared to other issues such as unemployment – 44%, health sector – 38% and crime – 33%). In other EU member states (EU-25), 4% of people consider the environment to be a key issue.

As for solving environmental issues (as well as the issues of defence, foreign affairs and the fight against terrorism), two thirds of the Czech public find the role of the EU positive. Almost seventy percent (69%) of the Czech public would entrust the EU, not the individual governments (30%), with making decisions about environmental issues, which is a very interesting finding. The situation in the other EU member states is similar. According to one

fourth of the Czech public (19% of the EU public), environmental policy should become the key EU policy.

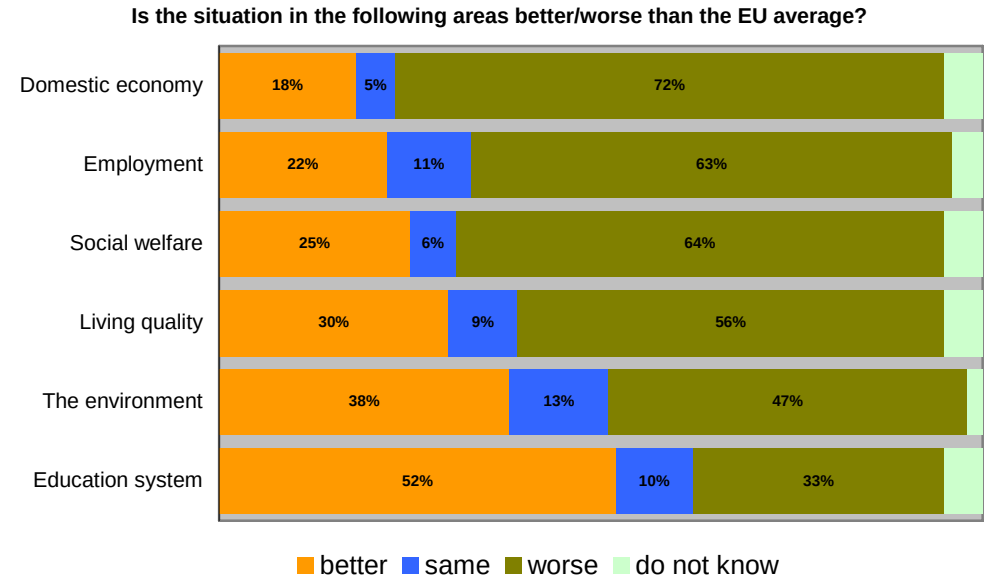
Graph VII.6.1
Satisfaction with various aspects of everyday life in the Czech Republic and in the EU (spring 2005)

	CR good	CR bad	EU25 good	EU25 Bad
Quality of your life	80%	18%	77%	21%
European economy condition	62%	27%	50%	36%
Your financial situation	62%	37%	64%	33%
The environment in your country	**59%**	**40%**	**51%**	**44%**
Domestic economy condition	36%	62%	36%	62%
Social welfare in your country	35%	63%	47%	49%
Employment in your country	14%	85%	21%	78%

Question: How do you evaluate the situation in the following areas?

Source: Eurobarometer

Figure VII.6.2
Situation in the Czech Republic and in the EU



Source: Eurobarometer

Public Opinion Poll (according to the Public Opinion Research Centre)

Most of the respondents polled by the CVVM (Public Opinion Research Centre) were satisfied with the condition of the environment in their surroundings and in the Czech Republic. Three fourths of the polled were satisfied with the condition of the environment in their surroundings. More than a half of the polled were satisfied with the environment in the Czech Republic (44 per cent were dissatisfied).

Graph VII.6.2

Satisfaction with the environment (%)

	very satisfied	rather satisfied	rather dissatisfied	very dissatisfied	+/-
In the Czech Rep.	2	49	39	5	51/44
In my surroundings	11	62	22	5	73/27

Note: The missing percentage stands for the answer 'do not know'.
Question: How are you satisfied with the environment in our country and in your surroundings?

Source: CVVM

When rating the individual factors or areas of the environment, more people were satisfied rather than dissatisfied. The best rated factors were proximity of nature and its cleanliness, the worst rated were surface water cleanliness and noise levels.

Graph VII.6.3

Satisfaction with selected environmental components (%)

	very satisfied	rather satisfied	rather dissatisfied	very dissatisfied	+/-
Surrounding nature cleanness	11	64	22	2	75/24
Nature accessibility	34	54	10	1	88/11
Air cleanness	15	54	24	6	69/30
Surface water cleanness	8	46	31	5	54/36
Drinking water quality	17	53	22	3	70/25
Noise levels	10	50	29	9	60/38

Note: The missing percentage stands for the answer 'do not know'.
Question: How are you satisfied with ... in your surroundings?

Source: CVVM

The attitudes of the Czech public towards environmental conditions are rather positive. Satisfaction prevails especially with regard to people's surroundings. However, the satisfaction with the environment in the Czech Republic as a whole is about 50:50. The survey shows that the attitudes towards the environmental conditions in the Czech Republic are rather critical, compared with the conditions in other EU states. On the other hand, the Czech public is evidently unwilling to entrust the Czech government with environmental issue solving. Almost 70 % of people would prefer environmental issues to be solved on the EU level. The situation in the rest of the EU is similar. The attitude towards evaluating the seriousness of the environmental problems is rather negative. Only two percent of the Czechs consider the environmental problems in our country serious.

VIII International Aspects of Environmental Protection

VIII.1 EU Legislation, Policies and Strategy

The Sixth Environment Action Programme (6EAP) of the European Community for the Environment and Thematic Strategies

At the EU level, the 6EAP adopted in 2001 is the basic conceptual document with respect to the environment. The 6EAP sets the main areas of priorities and environmental policy objectives for a 10-year period and details the measures necessary to promote these objectives. The prioritized areas of the EU environmental policy are: climate change, nature and biodiversity, environment and health, sustainable use of natural resources and waste management.

In order to fulfil and detail the relevant objectives, 6EAP also commissioned the European Commission (EC) to elaborate seven Thematic Strategies (hereinafter Strategies) concerning air pollution, prevention and recycling of waste, protection and conservation of marine environment, soil protection, sustainable use of pesticides, sustainable use of resources and urban environment.

In 2005, a significant shift occurred as regards the Thematic Strategies. The Strategies are based on the so-called "*Better Regulation"* initiative, which was sponsored by the EU Environment Council and the EU Competitiveness Council.

In the second half of 2005, the EC adopted and published four of the seven Thematic Strategies, i.e. strategies related to air, waste, natural resources and marine environment.

The Thematic Strategy on Air Pollution is a long-term strategy aimed at reducing air pollution, which sets air quality goals and targets and designs appropriate measures to achieve those goals. It also recommends updating the current legislation so that it focuses more on the serious pollutants – in particular dust particles ($PM_{2.5}$ and PM_{10}), tropospheric ozone and nitrogen oxides; it recommends reviewing the directives on national emission ceilings and suggests a broader and deeper inclusion of air protection into other policies. From the viewpoint of the Czech Republic, these are crucial issues.

The Thematic Strategy on Prevention and Recycling of Waste embodies another priority area of the Czech Republic. This strategy promotes updating and simplifying the current waste management related legislation. The strategy also supports the incorporation of the life cycle into the waste policy. The long-term goal is to increase the level and quality of recycling, reduce the amount of waste deposited at waste dumps and increase composting and utilisation of waste for energy purposes.

The Thematic Strategy on Sustainable Use of Resources The objective of the strategy is to reduce the environmental impacts associated with increased resource use in a growing economy, and thereby contribute to sustainable economic growth. The emphasis is on creating a set of indicators based on the currently used methods (e.g. environmental accounting, material flow accounting etc.) By 2008, the EC should create indicators measuring the effectiveness and efficiency of the utilisation of natural resources.

The Thematic Strategy on the Protection and Conservation of the Marine Environment (and the proposed directive on marine strategy) focuses on the sustainable use of the seas and on the protection of marine ecosystems. The directive should define the common priorities at

the EU level; the member states should create the European "marine regions" and cooperate on the creation of the "marine strategy", devise and implement programmes and measures to improve the state of the seas.

EU Activities in Priority Areas

Sustainable Development

Sustainable development is one of the fundamental goals of the EU as defined in the Agreement; its fulfilment is ensured by the EU's Sustainable Development Strategy (SDS) adopted at the Gothenburg summit in June 2001. In June 2005 the Declaration on Guiding Principles for Sustainable Development was adopted by the European Council, which defines 4 key objectives (environmental protection, social justice and cohesion, economic prosperity, fulfilment of international obligations) and 10 political principles related to sustainable development in the EU. Based on this declaration, a review and update of the SDS was initiated in December 2005 as a reaction to the existing as well as new challenges in this area.

Climate Change

In the **Kyoto Protocol**, which entered into force in 2005, the EU committed itself to reduce the total emissions of greenhouse gasses covered by the protocol by 8% relative to the 1990 levels by 2012. Based on the Burden Sharing Agreement, a goal was set for each member state of the EU-15. For each of the remaining 10 member states, a goal was set amounting to a 6% or 8% decrease, with the exception of Cyprus and Malta. The **EU's Emissions Trading Scheme (ETS)**, which entered into force on 1 January 2005, defines the overall ceiling, within which the participating economic entities can buy and sell emission quota according to their needs. The system covers 11,500 industrial complexes producing nearly a half of EU's CO_2 emissions.

The Commission stated that increasing air traffic contributes to climate change as the airplanes are becoming an increasingly significant source of greenhouse gas emissions. Therefore, the Commission suggested airplane operators are included in the ETS in order to motivate airlines to reduce emissions.

Air Quality

In August, the **Council Directive 2004/26/EC adopted as part of the strategy for the reduction of emissions from ships** entered into force**.** Its goal is to extend the current sulphur content limitations onto all liquid fuels produced from crude oil and used on ships operated in the waters of the member states.

Information Access

At the beginning of the year, the Community ratified the **Aarhus Convention** (Council Decision 2005/370/EC), which contributed significantly to participation of citizens in environmental matters. The convention specifies the basic rules governing access to information, public participation in decision making in environmental matters and application of environmental law.

Power Engineering

In July, the Commission presented the Green Book on Energy Efficiency.

VIII.2 International Cooperation

VIII.2.1 Bilateral International Cooperation – Important Activities

Within the framework of European **bilateral cooperation**, a number of meetings and activities took place in 2005:

Bulgaria – In September 2005 a **Phare twinning project** was initiated under UK leadership and in cooperation with the Czech Republic focusing on the transposition and implementation of directives related to drinking and bathing water. The Ministry of the Environment takes part in this project.

Austria – In January 2005 the **Climate Alliance** project was initiated focusing on cross-border cooperation in climate protection. In 2005 negotiations with Austria were underway concerning the draft **bilateral agreement on cross-border evaluation of environmental impacts**.

Romania – In autumn 2005 several **twinning projects** with Czech participation were initiated (e.g. IPPC implementation, preparation of the Romanian Ministry of the Environment for the function of the Managing Authority and Intermediate Body, projects in the area of water management).

Germany – In 2005 the German-led twinning project for the establishment of the Czech Environmental Information Agency (CENIA) was completed and the **Amendment to the Memorandum of Cooperation between the National Parks of Šumava and the Bavarian Forest** was signed**.**

Sweden – the Swedish Minister of the environment Mrs. **Lena Sommestad** officially visited the **Czech Republic**. During the visit, issues of bilateral cooperation were discussed, e.g. environmental technology, sustainable consumption and production, cooperation during discussions on new legislation in the EU Environment Council, also taking into account the possible future common EU presidency (France, Czech Republic, and Sweden 2008 – 2009).

Netherlands – The Phare twinning project "Integrated and Planned Enforcement of Environmental Law" was terminated and the project "Management of Bio waste from Municipal Solid Waste" is in progress.

Belgium – In 2005 an exchange of experts took place, in particular in the area of prevention and minimisation of waste in the Czech Republic, but also to support the drafting and implementation of action programmes for rational energy use in the Czech Republic.

France – In June 2005 the third Sustainable Development Week took place, which was organized be the French embassy in cooperation with The Ministry of the Environment and the British embassy. The event focused on the implementation of the Lisbon Strategy.

Great Britain – In 2005 cooperation in the support of public "green" orders and climate change was under way within the framework of the British EU presidency.

Agreement between the Czech Republic and Germany on Cooperation on Cross-Border Waters in the Area of Water Management

8th meeting of the Czech-German Commission for Border Waters was held in November 2005. The results of the 7th meeting of the Standing Committee Bavaria and the 7th meeting of

the Standing Committee Saxony were discussed and approved here. These were related to the control of the implementation of tasks within the cooperation on boundary waters in the Bavarian and Saxon boundary sections in the areas of water management and balancing, maintenance and modification of boundary watercourses, protection and improvement of the quality of boundary watercourses, water power utilisation, hydrology and flood protection.

Agreement between the Czechoslovak Socialist Republic and the Republic of Austria on Water Management Issues concerning Border Waters

A Czech–Austrian Commission assessed the activities in the area of management and maintenance of border watercourses, protection of the quality of border watercourses, hydrology, navigation issues, border issues and water management studies and planning.

Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Cooperation in Border Waters

The Czech–Slovak Commission for Border Waters discussed the issues related to the management and maintenance of border watercourses, protection of the quality of border watercourses, hydrology, navigation and border issues and water management studies and planning. The "Directive for the forecasting, reporting and warning service on the Czech-Slovak border watercourses" was approved.

Agreement between the Government of the Czechoslovak Republic and the Government of the People's Republic of Poland on Water Management on Border Waters

The representatives of the Governments of the Czech Republic and the Polish Republic for the cooperation in the area of water management of border waters approved the principles for the preparation of a new monitoring system for border waters, which will be based on national monitoring networks governed in accordance with the requirements of the EU Water Framework Directive. The annual "Report on the Quality of Border Waters in 2004" was discussed as well as the impact of the activities of the Polish lignite mine Turów on the groundwater regime in the Czech Republic. Increased attention was paid by the representatives to issues of transboundary meanders of the Odra River, whose natural uniqueness is appreciated by both parties.

VIII.2.2 Multilateral International Cooperation – Important Activities

VIII.2.2.1 Activities within the Framework of International Treaties

Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer

The hydrometeorologic institutes of the Czech Republic and of Germany participated actively in the implementation of the projects of the Fund for the assistance to developing countries and countries with economies in transition (established in accordance with the Vienna Convention).

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and Amendments to the Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

The Czech Republic participated actively in the activities of the Working group for persistent organic pollutants and prepared comments on the proposed technical instructions on environmentally sound management of wastes containing or contaminated with eight pesticides (aldrine, chlordane, dieldrine, endrine, HCB, heptachlor, mirex, toxaphene), HCB and DDT.

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

In 2005 the inclusion of an additional substance was suggested, namely the chrysotil-asbestos fibre. The decision on this matter will be discussed at the 3rd conference of the parties of the treaty in Geneva in October 2006.

Stockholm Convention on Persistent Organic Pollutants

At the national level, the Czech Republic focused mainly on the preparation of the National Implementation Plan of the Convention, which was acknowledged by the Government Decree No. 1572 of 7 December 2005.

Convention on Biological Diversity – www.biodiv.org

On 25 May 2005 the Government of the Czech Republic approved the Biological Diversity Protection Strategy in the Czech Republic by its Decree No. 620/2005. The Strategy is a fundamental inter-departmental material on biodiversity protection in the Czech Republic, which obliges the other ministers to take into consideration the goals of the Strategy in their programme and departmental documents, policies, strategies, conceptions and legal regulations in order to contribute to the implementation of the goal 2010. The Czech Republic met the CBD reporting obligations and provided the secretariat with responses to a number of notifications and with the third National Report on the Implementation of the Convention. (http://www.biodiv.org/reports/list.aspx?type=nr-03&alpha=C).

Cartagena Protocol on Biosafety

In 2005, the second conference meeting of the parties to the Cartagena Protocol failed to adopt the most important decision, which would make it obligatory for the parties to implement measures requiring accompanying documentation to live GMO, which are subject to intentional transboundary movement and are intended for direct use as food or fodder, or for processing. At the national level a Memorandum of Understanding was prepared for the UNEP/GEF project "Capacity Building for an Effective Participation in the Information System Biosafety Clearing House".

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – www.cites.org

In 2005 the Czech Republic continued to be a member of the Standing Committee of CITES. The Ministry of the Environment provided for the agenda of the national executive body of CITES, ANCLP CR the agenda of the scientific body of CITES and CEIA and the General Directorate of Customs as well as customs officers the agenda of the control and enforcement bodies.

The Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) www.carpathianconvention.org

The Czech Republic completed the process of ratification of the Convention by depositing the ratification documents with the depository on 28 July 2005. For the Czech Republic, the

Convention will enter into force on 4 January 2006. Representatives of the Czech Republic took part in the 3rd and 4th expert meeting to the Convention focused on the preparation of the 1st conference meeting of the parties to the Convention. Czech experts participated in the project Carpathian Environmental Outlook with the goal to map the geological as well as environmental, social and cultural, natural and developmental image of the Carpathians. The Czech Republic started participating in the project for the creation of the Carpathian Network of Protected Areas, and in the project ANPED on inclusion of the public in the implementation of the Convention. Czech environmental NGOs participate in both these projects.

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention – CMS) – www.cms.int

The Czech Republic began preparations for the accession of the Czech Republic to the African-Eurasian Waterbird Agreement (AEWA). The ratification document was signed by the president on 14 April 2006 and has not yet been deposited with the depository. Czech experts participated in the International Waterfowl Census project.

Agreement on the Conservation of Bats in Europe (EUROBATS) – www.eurobats.org

In 2005, the research project on forest bat species continued (implementation of one of the EUROBATS resolutions).

Agreement on the International Commission for the Protection of the Elbe River (ICPE)

In March 2005 an international meeting of the ministers of the environment of the states of the Elbe basin was held, where the "2005 Report for the International Area of the Elbe Basin" was presented and approved. This report is part of the obligatory reporting of the EU member states to the EC pursuant to the EU Water Framework Directive.

In October 2005 the 18th ICPE meeting was held in Prague. ICPE is the most important Czech-German panel addressing the issue of water protection in the Elbe basin. Its priorities include reducing the pollution of the Elbe river and its tributaries, programmes for water quality measuring and monitoring, improving water-related ecosystems, prevention of pollution from accidents and lately in particular a coordinated implementation of the Water Framework Directive and improvement in flood protection.

Convention on Cooperation for the Protection and Sustainable Use of the Danube River

In March 2005 the International Commission for the Protection of the Danube River (ICPDR) completed and submitted to the EC the "Summary Report for the Danube River Basin" as part of the reports from individual Danube countries submitted to EC.

The Danube Day was celebrated in all Danube Countries including the Czech Republic for the second time in 2005. This event is scheduled on the day of signature of the Convention, i.e. 29 June. Besides celebrations at the national level, a conference on the outcomes of the Summary Report was organized by ICPDR intended for all groups of public stakeholders.

The 8th ICPDR meeting presided by Hungary was held in November 2005. Delegations of all 14 parties to the Convention participated. ICPDR discussed recent activities of the individual expert groups focusing on the coordinated implementation of the EU Water Framework Directive in the Danube basin and inclusion of the public in this process.

International Commission for the Protection of the Odra River against Pollution (ICOP)

The 1st ICOP special session discussed and approved the "2005 Report for International Area of the Odra River Basin" in March 2005. The Report is a part of the reporting obligations of the individual EU Member States which are also parties to ICOP.

The 8th ICOP plenary session was held in Wroclaw in December 2005. It was agreed at the session, that the following means will be used to inform the public pursuant to Article 14 of the EU Water Framework Directive: information on the website, NGOs' participation in the meetings of the working groups, publishing booklets and leaflets, organizing workshops and conferences. The reorganisation of the working groups and their working plans was approved. Various forms of cooperation with HELCOM and bilateral commissions for cooperation on boundary waters were discussed.

Environmental Agreements with Special Status

United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto protocol

On 2 December 2005 a Memorandum of Understanding between the governments of the Czech Republic and of the Kingdom of Denmark was signed in Brussels pertaining to cooperation in the implementation of UNFCCC and its Kyoto Protocol, in particular in reducing greenhouse gas emissions in accordance with Article 6 of the Kyoto Protocol. A similar Memorandum is being prepared with the Netherlands and Canada.

UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD)

Another stage of one of many the Ministry of the Environment development projects based directly on the needs of the Convention "Sustainable development and management of water resources and combating desertification in the Dornogobi area in the south-eastern part of Mongolia" was under way. The project, which is being implemented by the company GEOMIN, promotes the creation of a sustainable water management and water source system.

International Convention for the Regulation of Whaling (ICRW)

On 26 January 2005 was completed the process of accession of the Czech Republic to the Convention by depositing the document with the depositary – the Government of the USA. The Czech Republic opposes any efforts to lift the ban on commercial whaling. An *Ministry of the Environment* delegation participated in the 57th ICRW session, which was held from 20 to 24 June.

Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol)

In 2005 the Madrid Protocol was published in the Collection of International Treaties, and the Act No. 276/2003 Coll., on Antarctic and on amendment of certain laws. The construction of a scientific station in Antarctica led by the Masaryk University continued.

UN ECE Conventions

Convention on Long-Range Transboundary Air Pollution (CLRTAP)

Work continued on revisions of the *Protocol on Persistent Organic Pollutants, Protocol on Heavy Metals and the Göteborg Protocol.* The revisions are intended to boost the effectiveness including a possible broadening of the spectrum of pollutants. The Czech

Republic organized the international conference "Acid Rain 2005" (Prague, 12 – 17 June 2005) which was closely linked to CLRTEP activities and bodies.

Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)

Based on the Espoo Convention (Article 8) the Czech Republic is preparing bilateral agreements with all neighbouring countries, specifying the procedures which will govern the process of transboundary environmental impact assessment. A favourable EIA statement issued in 2005 represented the completion of the assessment of the plan "Storage facility for used nuclear fuel in the Temelín plant region".

Protocol on Strategic Environmental Assessment (SEA Protocol)

The Czech delegation informed on the progress in the ratification of the Protocol in the Czech Republic. The ratification documents were deposited with the depositary on 19 July 2005. The Czech Republic participated actively in the preparation of the Guidebook for Health Impact Assessment within SEA.

Convention on the Protection and Use of Transboundary Watercourses and International Lakes

The session of the working group for monitoring and assessment focused on issues related to the strategy of the monitoring and assessment of transboundary watercourses and to assessment of the results of the pilot projects in this area. The first draft of the Strategic Guideline for the monitoring and assessment of transboundary rivers, lakes and groundwater was discussed as well as the progress of the preparation of the evaluation report on the state of transboundary waters within ECE/UN. On the basis of a Memorandum of Understanding between the Czech and Slovak MEs, the Brno-based TGM Water Research Institute has participated in the Pilot Project Moravia since 1998. In 2005 the activities were oriented on the practical verification "Recommendation for Transboundary Monitoring and Assessment Activities in the Moravain River Basin".

Convention on the Transboundary Effects of Industrial Accidents

Among other things, the conditions for the implementation of the international Programme of Help for the Countries of South-Eastern and Eastern Europe, Caucasus and Central Asia adopted at the 3rd conference of the parties were prepared in 2005. The Czech Republic contributed USD 4,000 to the implementation of this programme in 2005.

The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the Aarhus Convention)

At the beginning of 2005, the Report on Performance of the Convention in the Czech Republic was submitted to the secretariat. A significant compromise was reached in the area of public participation in the release of genetically modified organisms into the environment.

Conventions of the United Nations Educational, Scientific and Cultural Organisation (UNESCO)

Convention Concerning the Protection of the World Cultural and Natural Heritage

Active cooperation with the Ministry of Culture and the National Heritage Institute on the preparation of the nomination of the Třeboň area; the Ministry of the Environment also takes

steps to primarily ensure the possibilities and preparation of an impact study of the nomination of the transboundary region Czech–Saxon Switzerland for the UNESCO World Heritage. The admission of the Geopark Bohemian Paradise into the European Geoparks Network, i.e. also to the World Geoparks Network under UNESCO, was a significant success.

Convention on Wetlands of International Importance especially as Waterfowl Habitats (Ramsar Convention) – www.ramsar.org

The Czech Republic became a member of the Standing Committee of the Ramsar Convention for the European region for the period 2005-2008, together with Austria, Slovenia and Georgia. The Ministry of the Environment declared the 11th wetland of international importance "Podzemní Punkva". In 2005, a 12th wetland named "Krušnohorská rašeliniště" was added to the list. Within the implementation of the Convention at the national level, a second run of a seminar on wetlands was organized. The Czech Republic fulfilled its reporting obligations – it submitted the National Report on the implementation of the Convention for the period 2003-2005.

Conventions of the Council of Europe

European Landscape Convention (ELC)

The following research projects were completed: *"Assurance of the implementation of the ELC within further activities of the* Ministry of the Environment*"* (2002 – 2004) and *"Assessment of the economic effectiveness of the care of the Czech landscape and suggestions for changes to transform the current landscape care programmes in connection with the ELC and other international obligations"* and *"Typology of Czech landscape"* (2003-2005).

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Nature_protection/

The Czech Republic submitted a report on exceptions to the secretariat pursuant to Article 9 of the Convention. At the national level, negotiations were initiated between the Ministry of the Environment and the Ministry of Agriculture on possible withdrawal of reservations made by the Czech Republic upon signature of the Bern Convention.

VIII.2.2.2 Activities of the Czech Republic within International Organisations

World Bank (WB)

The Czech Republic continued to cooperate with WB on the basis of a General Agreement on Cooperation in the Implementation of Projects to Reduce Greenhouse Gas Emissions signed between the Czech Republic and the International Bank for Reconstruction and Development (IBRD). The General Agreement should make it possible to implement some projects and to gain PCF financial resources to buy emission reductions resulting from project activities. Projects focusing on energy savings achieved through increasing the energy efficiency in the public sector, in the systems of central heat distribution, in the area of renewable resources utilisation and in appropriate industrial facilities were prioritized. Standardized methodical procedures were designed for the area of heat production and for the electricity supply industry, for the determination of energy savings and calculation of emission reductions.

Another area of cooperation was increasing the share of renewable resources in the overall energy consumption by promoting the use of the geothermal energy for the production of heat, electric energy and other energy related purposes.

Global Environmental Facility (GEF)

The UNEP/GEF project "Access to Genetic Resources and Benefit Sharing, Protection and Sustainable Use of Biodiversity Important for Agriculture, Forestry and Research" was terminated in 2005. The goal of the project was to support the implementation of international treaties related to biodiversity, in particular in the area of access to genetic resources and distribution of their benefits and the protection of collections *ex situ*.

In 2005 a proposal of the implementation phase of the UNEP/GEF project "Measures to Ensure Bio-Safety in the Czech Republic" was drafted and approved in December 2005. The project's objective is to support the fulfilment of obligations arising from the Cartagena Protocol on Bio-Safety, including incorporation of bio-safety principles in strategic documents of the state and informing the public.

In 2005 the UNDP/GEF project "Estimate of Capacities for Implementation of Global Environmental Conventions", focusing on the improvement of the implementation of fundamental international environmental conventions in the Czech Republic (CBD, UNFCCC and UNCCD).

In the second half of 2005, the implementation of the following UNDP/GEF projects was initiated: "Integrated Ecosystem Management in Northern Bohemia", "Conservation of Biological Diversity in the Czech Republic's Carpathian Alpine Meadows Using the New Financing Mechanisms of the European Community" and "Development of Environmentally Sound Tourism in the Biospheric Reservations of Central and Eastern Europe – Šumava".

Also, the implementation of the UNEP/GEF project focused on measures leading to a reducing in the energy needs of the central and eastern European countries (EMPRESS) was under way.

United Nations Environment Programme (UNEP)

The meeting of the UNEP Steering Committee and the 6th Global Ministerial Environment Forum (GMEF) were held in Nairobi. In connection with the natural disaster which took place in the Indian Ocean in 2004, the development of the Tsunami Early Warning System was sanctioned, which was prepared by UNESCO's Intergovernmental Oceanographic Commission. The UNEP water strategy and policy was approved and updated as the basic framework for all UNEP activities related to waters and sanitary services between 2005 and 2007 as well as the Bali Strategic Plan for Technology Support and Capacity Building. Besides these UNEP documents, it also appealed to all states as well as to the private sector and international organisations to adopt measures to protect the environment and human health from negative impacts of mercury in products and production processes.

UN Commission on Sustainable Development (CSD)

The 13th CSD meeting was held in New York. The final political decisions adopted at the meeting included measures designed to speed up progress in the sectional areas sustainable consumption and production, international institutional arrangement and monitoring and assessment of the implementation of these measures. Special attention was given mainly to the needs of Africa, the least developed countries and small island developing countries. It

was stressed that it is necessary to increase all financial resources in order to fulfil the internationally adopted goals and targets from the part of the developing countries.

UN Economic Commission for Europe (UN ECE):

The main issue of 2005 within UN ECE was the completion of the debate on the reorganisation in the context of a general UN reform. The main thematic areas of activities will include for example the continuation of the Programme for Evaluation of the State and Policy of the Environment and the Programme for Harmonisation of Environmental Monitoring emphasising the countries of eastern Europe, Caucasus and central Asia, support for the process "Environment for Europe", support for the implementation of regional treaties and protocols related to the environment, support for sub-regional partnership initiatives (Environmental Strategy for Eastern Europe, Caucasus and Central Asia and the Initiative for the Environment, Water and Security in Central Asia).

Between 17 and 18 March 2005 a high level meeting took place in Vilnius dealing with the issue of education for sustainable development, where the ECE Strategy for Education for Sustainable Development was adopted.

UN Development Programme (UNDP)

In 2005 the pilot project "Support for Preparation of Sustainable Development Strategies in Selected Regions of the Czech Republic" continued to be implemented by UNDP in cooperation with the Ministry of the Environment, the Ministry for Regional Development and the relevant regions.

Organisation for Economic Cooperation and Development (OECD)

The assessment of the environmental policy of the Czech Republic was performed in 2005. The report evaluates the development in the area of the environment for the period 1998-2005. It emphasises the achievements but also draws attention to some negative trends in environmental protection, including the insufficient separation of economic development from the negative impacts on the environment (decoupling), which shows mainly in the high pollution level and high energy and material intensity per a GDP unit. The OECD report presents 53 recommendations for improvements within the context of sustainable development.

The Regional Environmental Centre for Central and Eastern Europe (REC)

The REC strategy for the period 2006–2010 defines the following priorities: strengthening institutions for sustainable development, sustainable use of natural resources, rural development, environment and health in urban areas and sustainable energy use.

The national project within the UNEP initiative "Capacity Building for Integrated Assessment and Planning for Sustainable Development" was implemented by REC in cooperation with the Ministry of the Environment and the Ministry for Regional Development in 2005.

VIII.2.3 Foreign Development Cooperation of the Czech Republic (FDC)

The main objective of the Czech development cooperation is to alleviate poverty in the developing countries. In order to increase the FDC efficiency and transparency, the following eight countries were prioritised in 2005: **Angola, Bosnia a Herzegovina, Yemen, Moldova, Mongolia, Serbia and Montenegro, Vietnam and Zambia**. The government approved programmes of development cooperation for these countries defining the development priorities for the period 2006-2010. The Ministry of the Environment will primarily focus on **Serbia and Montenegro, Moldova, Mongolia and Vietnam.**

The plan of FDC projects for 2005 was approved by the Government Decree No. 652 of 23 June 2004 with a total budget of CZK 600 million. A total of 114 bilateral development projects were implemented in 2005, most of them in the sector of the environment (34 + 1 multilateral project) and development education (19). A total of CZK 468.838 million was made available for the implementation of bilateral development projects in 2005, the amount actually used was CZK 395.819 million. The ratio of the Official Development Assistance to the GNI was 0.11% in 2005.

The largest part of the total financial resources drawn, which were intended for Czech FDC projects, went to the sector of the environment - 30%, approximately CZK 119 million. The regional targeting of the implemented bilateral development programmes was as follows: Asia 27% (CZK 106.678 million), south-eastern Europe 24% (CZK 93.456 million), eastern Europe and CIS states: 18% (CZK 69.787 million), Africa 14% (CZK 53.663 million), Czech Republic (the part of development cooperation done in the Czech Republic) 6% (CZK 25.276 million), Middle East 4% (CZK 14.449 million), Latin America 4% (CZK 14.313 million), projects in multiple regions (training of experts, monitoring and control of projects) 5% (CZK 18.197 million).

Table VIII.2.1

Share of the ODA in the GNI in the Czech Republic

ODA / GNI (%)	1999	2000	2001	2002	2003	2004	2005
Czech Republic	0.027	0.032	0.047	0.065	0.101	0.108	0.11

Source: ME

FDC of the ME has been and will continue to be based on the international obligations of the Czech Republic, namely the Millennium Development Goals (MDGs). Development projects related to the environment focus mainly on:

- fulfilment of international environmental agreements (e.g. Earth's ozone layer protection, combating desertification);
- sustainable methods of utilisation of natural resources, increasing energy efficiency;
- environmental aspects of industry (transfer of experience with environmental technologies, cleaner production , environmental management systems);
- environmental geology (removing old ecological burdens, risk research and assessment, hydrogeology);
- waste management.

The projects were implemented mainly by private subjects, state organisations and NGOs. Bilateral projects were for the most part implemented in Serbia and Montenegro in 2005, i.e. in a main priority FDC country for the next period. Development cooperation with Mongolia

is also important. The efficiency of financial resources employed is controlled in the form of the so-called control and evaluation missions of the Czech part in the recipient countries.

Within the framework of the Ministry of the Environment's cooperation with international organisations (e.g. UNEP, UNDP, UNIDO), the multilateral project "Preparatory Assistance for the Establishment and Operation of a National Cleaner Production Programme in Serbia and Montenegro" is being implemented in cooperation with UNIDO in 2005and 2006.

In the future, the FDC programmes will have to focus more on the protection and sustainable use of biodiversity.

IX Environmental Indicators

IX.1 Evaluation of the Environment Based on Indicators

IX.1.1 Importance of Indicators, Shift to Sustainable Development Indicators (SDI)

The environmental indicators represent a specific type of information used to evaluate the state and development of the environment. The indicators result from primary data processing and interpretation. The evaluation can be also based on indices, i.e. very aggregated and complex indicators.

The indicators enable the evaluation of trends and international comparison. There has been a shift in the construction of indicator sets from purely environmental ones to sets based on the sustainable development principle. The reason is the fact that environmental problems cannot be assessed without considering their social and economic relationships.

IX.1.2 State of Indicators

Indicators have been examined by a number of international institutions (e.g. the UNO, OECD, the World Bank and the EEA or Eurostat in the EU). Eurostat has been monitoring several sets of indicators related to the environment, whether they are separate environmental indicators or sectional indicators – apart from the structural indicators based on the Lisbon Strategy, these also include the sustainable development indicators (SDI). Between 2004 and 2005 a Eurostat task force prepared a final general set of indicators for the methodology of SDI (Task Force on Methodological Issues for Sustainable Development Indicators), available on the Internet, including the report "Measuring progress towards a more sustainable Europe (2005)" http://europa.eu.int/comm/eurostat/sustainabledevelopment.

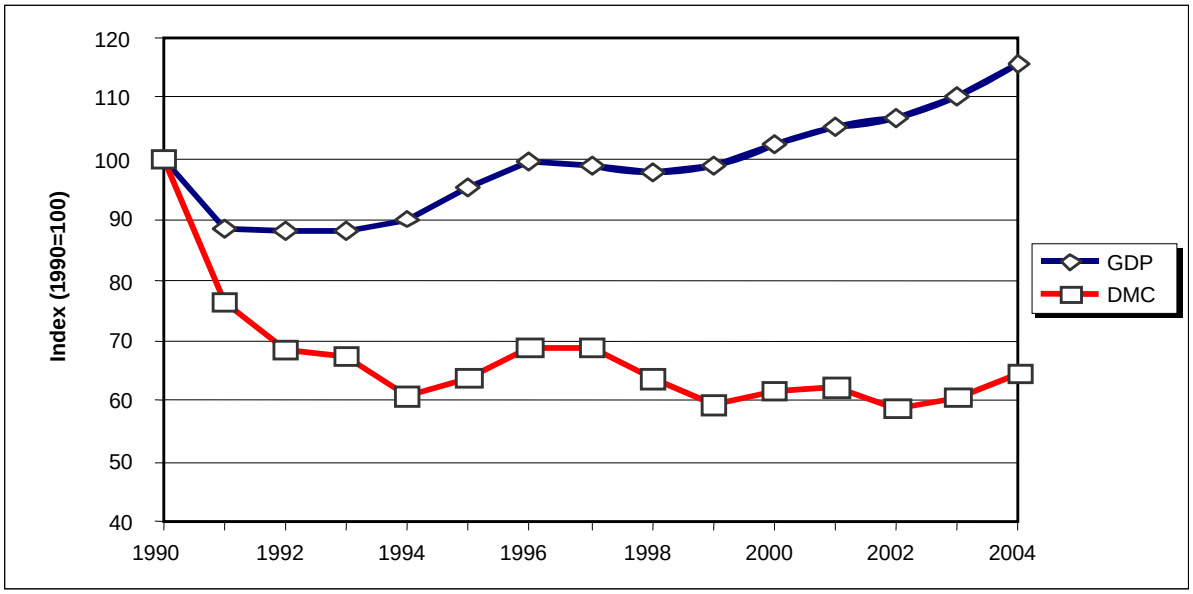
IX.1.3 Material Flow Indicators

The material flow indicators are used to quantify the total material intensity of the economic system. An important indicator of this group is material consumption, an environmental burden indicator, as the consumption of raw materials, their processing and use in form of actual raw materials or products is connected with a number of key environmental issues (e.g. changes in the landscape related to mining or global clime changes caused by fossil fuel burning).

Material consumption is monitored as the indicator of domestic material consumption (DMC) based on the Eurostat methodology for the calculation of material flow indicators. The DMC is the sum of the actual amount of raw materials mined and biomass produced in a country. These materials are increased by import and decreased by export. The DMC is considered to be a suitable indicator to express the difference between the environmental burden and the economic efficiency curves (the so-called decoupling – more information on decoupling provided further in the text). Decoupling, as expressed by this indicator and by the GDP[a)] indicator, is provided in the following graphs.

Graph IX.1.1

Decoupling of environmental burden and economic efficiency curves in the Czech Republic between 1990-2004



[a)] *Data in constant prices of 2000*

Source: EC, Charles University (DMC), OECD (GDP)

Between 1990 and 2004 there was significant decoupling in the Czech Republic between the environmental burden and the economic efficiency curves, caused by a material consumption decrease and a GDP increase. As far as material consumption is concerned, the decrease was more significant, especially at the beginning of the period, although there was a slightly decreasing trend in the following years. This decrease was caused by lower brown and black coal consumption due to a cutback of some energy-intensive industries (e.g. metallurgy), a global increase in energy efficiency or fuel conversion to useful work thanks to the introduction of modern technologies and gas connections (one ton of natural gas provides more energy than one ton of coal and therefore a smaller amount is used). A relatively big increase in the material consumption in 2003, but mainly in 2004, was caused by growing imports (mainly final consumption products) related to the integration of the Czech Republic into the EU market. Decoupling also helped decrease the GDP material intensity, or the material consumption per GDP unit. This means more efficient material conversion into economic outputs which resulted in a decrease in production costs with respect to the purchase of raw materials and other materials required for production.

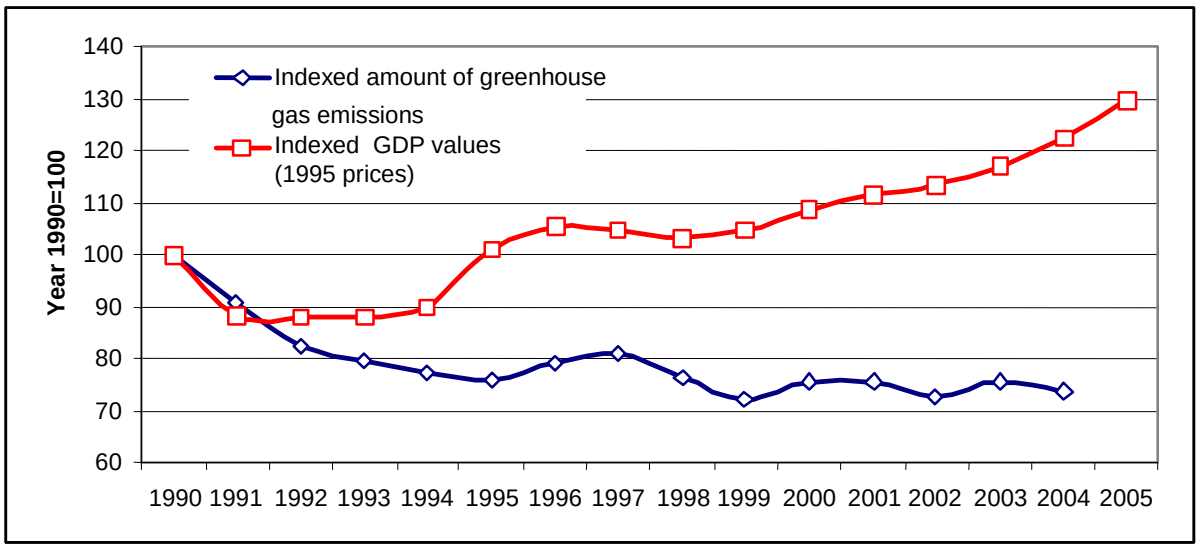
IX.1.4 Decoupling

The term “decoupling” expresses the in/dependence of environmental, social and economic aspects of the sustainable development or life of the society. An important element is the relationship between environmental burdens and economic efficiency.

Taking into consideration absolute values, there has been decoupling between the state economy, expressed as the GDP, and the greenhouse gas emissions, the number of inhabitants connected to public sewer and other values.

Graph IX.1.2

Decoupling – greenhouse gas emissions and GDP, Czech Republic, 1990–2004

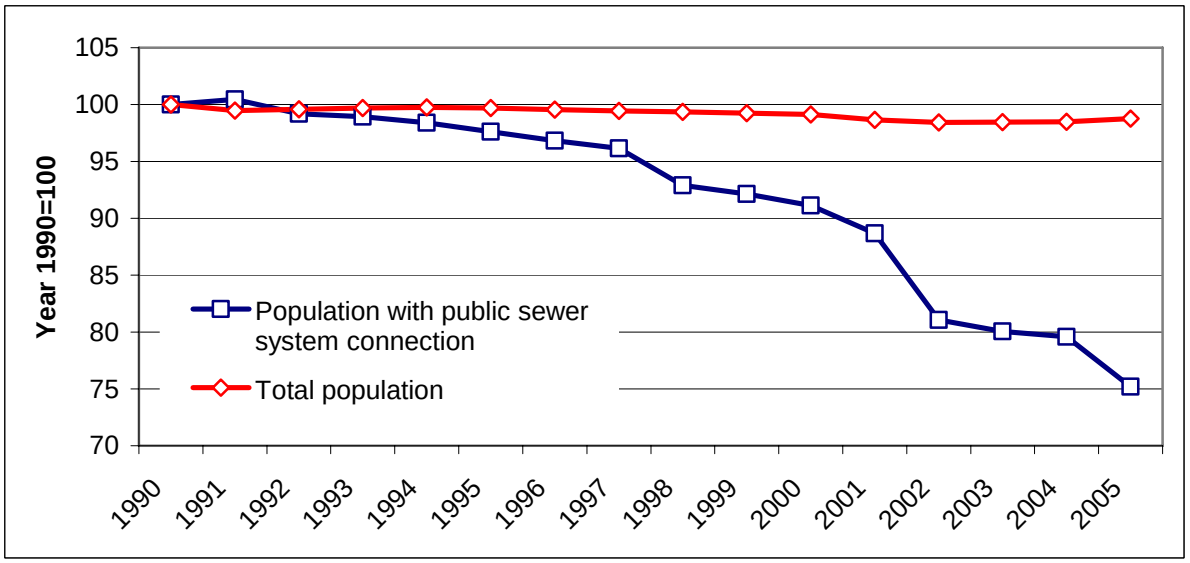


Source: CHI, CSO

Another example of decoupling is the difference between the curves symbolising the number of people with public sewer connections and the total population, which replaces the standard GDP. Since 2003 there has been absolute decoupling which means the population has been growing in absolute figures and the number of people not connected to the public sewer system has been decreasing.

Graph IX.1.3

Decoupling – population with public sewer system connection compared to the total population, Czech Republic, 1990 – 2005



Source: CSO

IX.2 International Comparison

IX.2.1 Comparison with Eurostat Data

This chapter provides an international comparison of the state and development of the environment of the Czech Republic with the EU-15 and EU-25 average, including the new member states, as well as a comparison with Slovakia (SK), Poland (PL), Hungary (HU), Germany (DE), Austria (AT), an Portugal (PT), i.e. with countries that have the same characteristics as the Czech Republic from the geographical or economic points of view. The comparison allows monitoring the trends in countries with transforming economies, as well as with more developed countries. The source of the statistical data is the European statistical office Eurostat. In order to ensure data comparability within the given countries, the data for the Czech Republic come from the same source (it is possible that the Eurostat data may differ in some cases from the basic data reported in the Czech Republic).

Purely environmental indicators are being replaced by a wider set of sustainable development indicators and indices that cover not only the environment, but also the economic and social spheres and their interaction. Therefore some interesting approaches to this issue are provided at the end of the chapter.

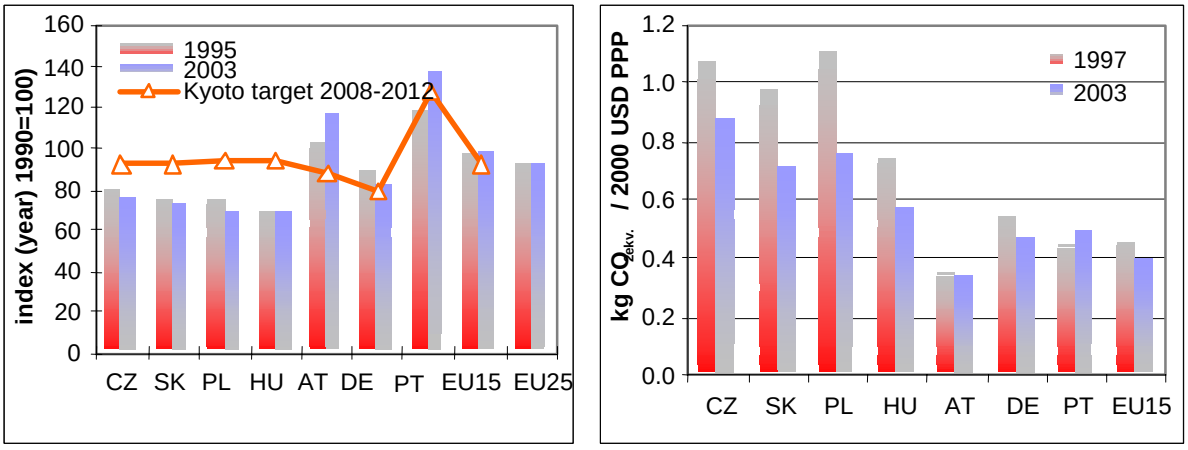
The following trends and problems can be identified in the Czech Republic in the international comparison using the values of the indicators provided in the table attached hereto.

Graph IX.2.1

Total greenhouse gas emissions index

Graph IX.2.2

Trend of greenhouse gas emission per GDP unit (according to UNFCCC[1])



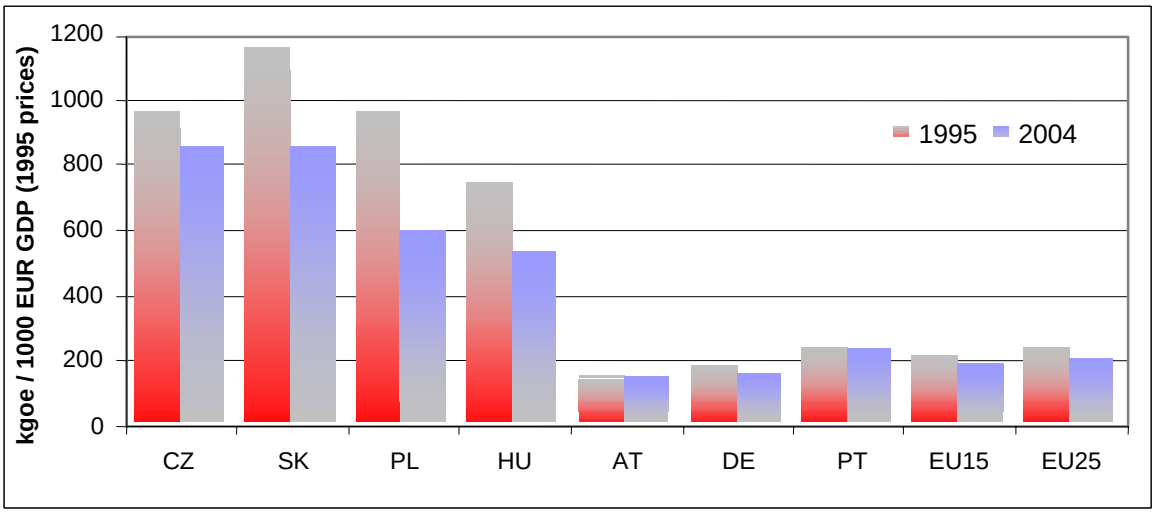
If we compare the greenhouse gas emissions, it is obvious that the new EU member states, including the Czech Republic, do not have problems complying with Kyoto targets (Graph IX.2.1). However, if we monitor specific emissions, e.g. in relation to the GDP (Graph IX.2.2), we will find out that this favourable information means that in spite of a significant emission decrease the new member states do not reach as low energy intensity as the original EU-15 (which means they produce more emissions to create one product unit). Compared to

[1] United Nations Framework Convention on Climate Changes

some countries the Czech Republic has double emissions per GDP unit – the main reason is the composition of primary energy sources with a high percentage of solid fuels and big energy intensity of the Czech economy (see Graph IX.2.3).

Graph IX.2.3

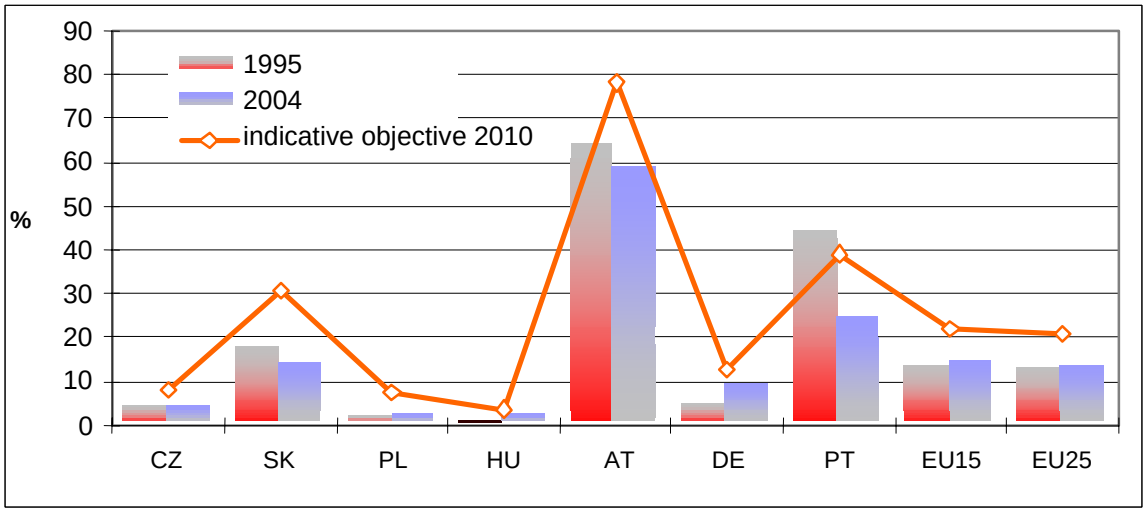
Energy intensity of economy (domestic consumption of primary energy sources in kgoe[2] / GDP)



The reasons for the high energy intensity of the Czech economy compared to the EU-15 and EU-25 average include a exceptionally high percentage of solid fuels, a high percentage of energy-intense production (metallurgy, production of construction materials), lower efficiency of energy utilisation in regular appliances, insufficient metering and regulation systems or insufficient heat-technology (insulation) of buildings.

Graph IX.2.4

Share of electricity made from RES in gross electricity consumption



The indicator measures the share of electric energy made from RES in the total national electricity consumption. Graph IX.2.4 shows that in the Czech Republic the share is at the

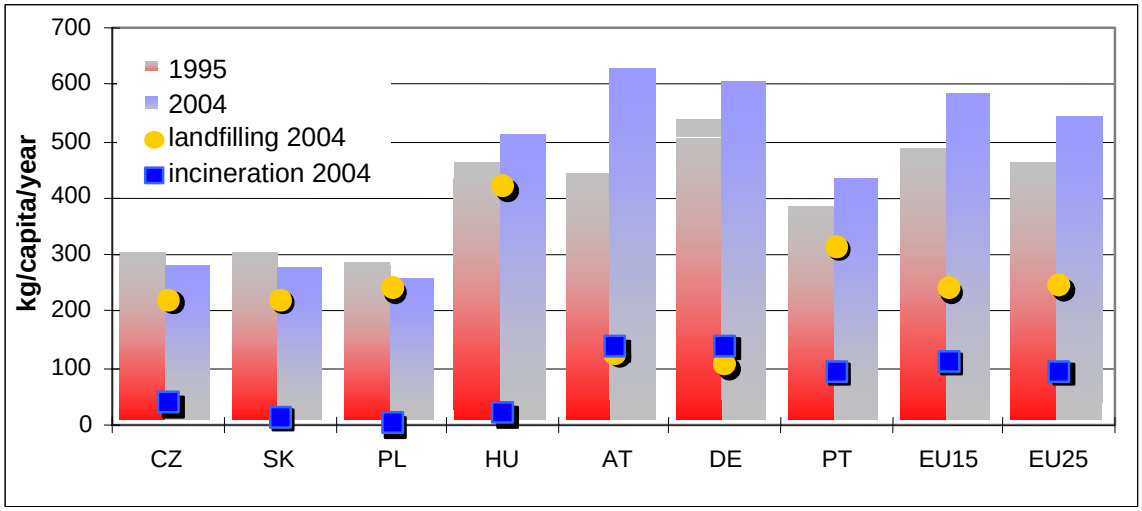
[2] kgoe = kilogram of oil equivalent; 1000 kgoe (1 toe) = 41.868 GJ = 11.63 MWh

level of 1995, i.e. 4% compared to the EU-15, or the EU-25 average, which was at 14.7% and 13.7% in 2004. The indicator reflects different legislation, but mainly different natural conditions for water utilisation. In 2005 Act No. 180/2005 Coll., on the Promotion of Electricity Produced from Renewable Energy Sources, was passed in the Czech Republic. The Act is supposed to bring improvement and get the country closer to the 8% indicative objective by 2010.

The amount of municipal waste in the Czech Republic between 1995 and 2004 slightly dropped compared to the growth of the EU-15 and EU-25 average. Graph IX.2.5 shows that as far as the EU-25 average is concerned, the new member states contributed to lower waste production and its smaller increase – e.g. the Czech Republic produced 50% less municipal waste than the EU average.

Graph IX.2.5

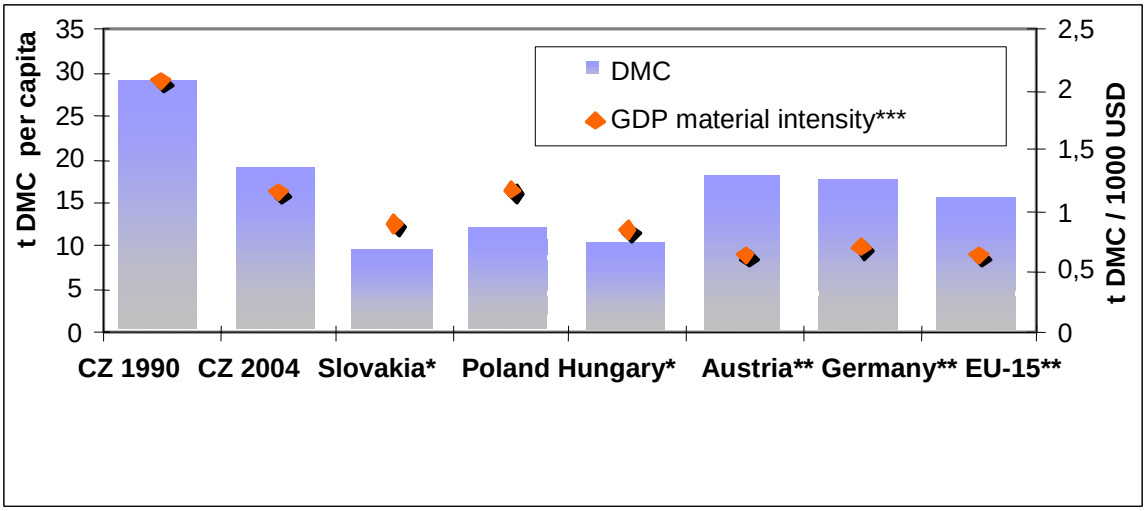
Municipal waste production and its disposal (landfilling and incineration)



On the other hand, the new EU countries have problems with waste disposal – most waste in those countries is deposited in landfills as opposed to expensive incineration methods. The percentage of waste deposited in landfills is too high and in Poland it accounts for 100% compared to the 50% EU average. One of the reasons for this unfavourable condition in the Czech Republic is the fact that low landfill charges make this disposal method cheaper compared to other more environmentally friendly methods (e.g. recycling, composting).

Graph IX.2.6

Domestic material consumption (t DMC / capita) and GDP material intensity (t DMC/1000 USD)



*) *Data for 2000,* **)*data for 2001,* ***) *GDP in fixed prices of 2000 according to the PPP*

Source: EC, Charles University (DMC CR), Eurostat (DMC EU-15, Germany, Austria), Wuppertal Institute (DMC Hungary, Poland, Slovakia), OECD (GDP)

Graph IX.2.6 shows big material intensity of the Czech Republic which is caused by a bigger share of industry in the GDP, a smaller share of sectors with high VAT and a big percentage of solid fuels in the total energy consumption compared to the EU-15. The Czech Republic is, together with Germany and Poland, the only European country where the production of brown coal exceeds the consumption. The economic structure of Hungary, Poland and Slovakia is very similar to the Czech Republic with the exception of Poland, which is much less dependant on coal.

IX.2.2 International Comparison Based on Indices

The environmental sustainability index (ESI), the environmental performance index (EPI), the ecological footprint (EF) or the environmental vulnerability index (EVI) belong to the best-known and most-developed indices of international comparison. These indices are designed to find alternative or additional indicators to supplement the strictly economic indicators – especially the GDP, in order to determine the overall environmental situation of a country or a region.

IX.2.2.1 Ecological Footprint

The **Ecological Footprint** (EF) has been getting a lot of attention among scientists and environmental educators. It was first published in 1996. Since 2000 the WWF has been publishing the Living Planet Report which pub displays the EF results for more than 150 countries.

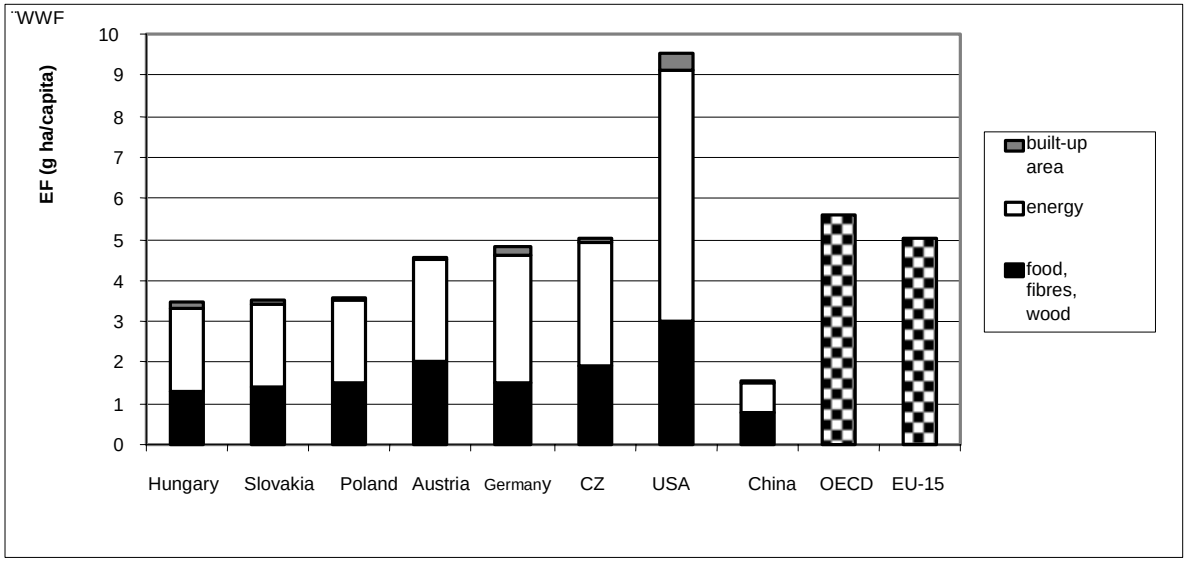
The EF from the national point of view is the total biologically productive area used to provide resources and assimilate waste produced by the population of a given country, using common technologies. The EF converts the total consumption of biological and energetic resources, the production of which burdens the biological capacity of eco-systems, to standardised square units – global hectares. The resulting EF is compared to the available

biological capacity of a given country, i.e. the area that is actually available to the country. Based on the difference between the ecological footprint and the available biological capacity the so-called "ecological deficit" (or ecological surplus) is determined. A number of calculations show that the actual ecological capacity of most industrial countries is not sufficient and therefore they cover a big part of their demand by export at the expense of countries with a surplus of resources, appropriating the ecological capacity of such countries.

The EF of an average Czech person is five global hectares (gha), which is the total area required to provide food, energy, housing, consumer goods and services. A big part of the area (3 gha) is made up by so-called energetic land, i.e. an area required to absorb carbon dioxide released during solid fuel burning. The second largest part of the country is land providing food and fibres (1.9 gha per person). The available ecological capacity of the Czech Republic is 2.8 gha per person which means the country has a 2.2 gha deficit per person. From the global point of view there are 2.2 gha of biologically productive area per one person, while in high income countries[3] the average EF is 6.4 gha per person, in medium income countries it is 1.9 gha per person and in low income countries it is only 0.8 gha per person.

Graph IX.2.1

Ecological footprint, international comparison, 2005



Source: EEA (Europe 2005: The Ecological Footprint)

The concept of the ecological footprint is not clearly accepted. From the factual point of view it is criticised for methodology defects ("imaginary hectares" do not reflect the actual patterns of area utilisation in a smaller scale, the issue of converting the bio-productive areas to equal units, disregard to the total consumption of the society, borders between states and the free-market environment). The results need to be interpreted in relation to other data and indicators. Nevertheless, the ecological footprint is believed to have a strong ethical weight (equal access to resources, focus on territorially determined environmental burdens) and it also represents a relatively illustrative and attractive teaching aid.

[3] High, middle, low income countries – classification according to the World Bank

IX.2.2.2 Environmental Sustainability Index

The environmental sustainability index (ESI) was developed by Yale University and Columbia University (USA) and the EU Joint Research Centre. A pilot version of the index was published in 2000 and has been updated annually ever since.

The ESI contains 76 variables classified into 21 indicators. The indicators are aggregated to 5 components that make the final index. The ESI includes socio-economic, environmental and institutional aspects. Its components are: environmental systems (data on environmental components), the reduction of environmental burdens (data on consumption, emissions and agricultural subsidies), the reduction of human vulnerability (data on health and health conditions), social and institution capacities (e.g. the number of researchers per one million inhabitants or energy efficiency) and the global administration (e.g. participation in international treaties and conventions, CO_2 emissions per capita). The result is a non-measurable index ranging from 0 to 100 which determines the order of the countries. The authors believe that environmental sustainability cannot be measured in absolute values, but its aspects can be expressed in relative values (order).

The ESI concept is based on the assumption that the environmental burden and the state of the environment are of equal importance to the environmental sustainability evaluation as the ability of a given country to cope with the negative phenomena. In other words, a country that has high consumption of natural resources and big pollution on the one hand, and advanced technologies, appropriate legislation and low corruption on the other hand, can show good results.

Scandinavian countries usually rank highest in the ESI evaluation (1st place Finland 75.1); the Czech Republic was 92nd among 146 countries (ESI 46.6). Other selected countries: Austria – 10, Germany – 31, USA – 45, Slovakia – 48, Hungary – 54, CR – 92, Poland – 102. The index has been under development and therefore results from different years are not comparable and the indicator cannot be used to evaluate trends.

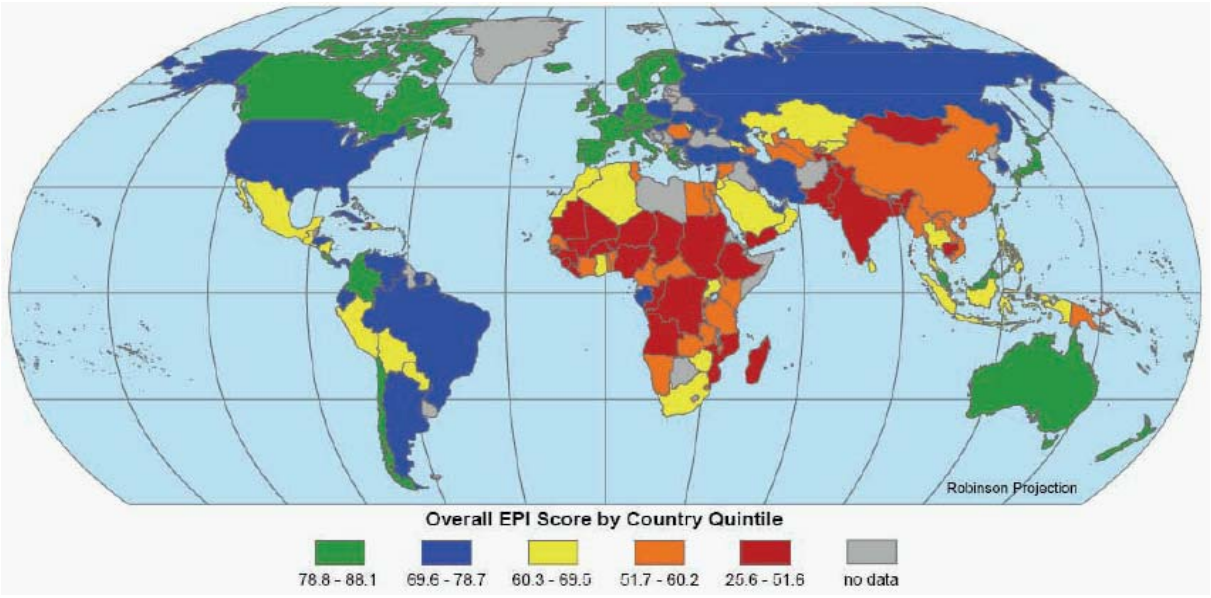
The ESI takes into consideration the long-term development of the environment of a given country as well as capacities and abilities of the countries to solve environmental issues. Due to that Great Britain ranked 65th in spite of advanced environmental protection as the British cut their forests down some centuries ago. Similarly the Czech Republic ranked low because of bad environmental protection during the communist era. Scandinavian countries are always in top positions because of nature conservation and good environmental protection. On average the environmental sustainability of African countries is bigger as they are not so polluted. On the other hand they show low values of environmental protection as their governments are not able to solve the complicated environmental issues they are going to face.

IX.2.2.3 Environmental Performance Index

The environmental performance index (EPI) was introduced this year by the same team that prepared the ESI. The EPI contains 21 indicators aggregated into 6 main groups that make the final index. The EPI includes 5 indicators of human health (child mortality, access to drinking water, etc.) and 14 indicators of eco-system health and management classified into 5 categories (air quality, water quality and consumption, protection of biological diversity, etc.).

Figure IX.2.2

Environmental performance index (EPI) 2005



Source: Pilot 2006 EPI, Yale University, Columbia University, WEF, JRC

The purpose of the EPI is mainly to evaluate the ability of countries to deal with environmental problems. Unlike the ESI, the countries are ranked according to the relative distance from the target value. The target (optimal) values are based on international conventions, national policies or scientific recommendations. The result is a non-measurable index ranking from 0 to 100 which determined the order of the countries.

A total of 133 countries were evaluated. New Zealand ranked first (ESI 88). The Czech Republic was 4th (ESI 86). The Czech Republic achieved the best results in protection of health and biological diversity and use of natural resources. Some indicators (e.g. the access to drinking water and the public sewer system or child mortality) are fully in compliance with the targets. The Czech Republic is also relatively successful in the protection of biological diversity, moderate logging and environmentally friendly agricultural subsidies. On the other hand, the Czech Republic does not meet the targets in air quality and sustainable energy. Selected countries: Austria – 6, Germany – 22, Slovakia – 25, USA – 28, Hungary – 33, Poland – 38. The classification of the countries into groups according to environmental performance is shown in Figure IX.2.2.

X List of Abbreviations

Abbreviation	Czech	English
AOE	Agroenvironmentální opatření	*Agro-environmental provision*
AOPK ČR	Agentura ochrany přírody a krajiny České republiky	*Agency for Nature Conservation and Landscape Protection of the Czech Republic*
AOX	adsorbovatelné organicky vázané halogeny	*Adsorbable organic halogens*
BPEJ	bonitovaná půdně ekologická jednotka	
BSK_5	biologická spotřeba kyslíku	*biological oxygen demand (BOD)*
CDV	Centrum dopravního výzkumu	*Transport Research Centre*
CENIA	česká informační agentura životního prostředí	*Czech Environmental Information Agency*
CITES	Úmluva o mezinárodním obchodu ohroženými druhy volně žijících živočichů a planě rostoucích rostlin	*Convention on International Trade in Endangered Species of Wild Fauna and Flora*
CLRTAP	Úmluva OSN k přeshraničnímu znečišťování ovzduší	*Convention for Long Range Transboundary Air Pollution*
ČAPPO	Česká asociace petrolejářského průmyslu a obchodu	*Czech Association of Oil Industry and Market*
ČEÚ	Český ekologický ústav	*Czech Environmental Institute*
ČGS	Česká geologická služba	*Czech Geological Survey*
ČHMÚ	Český hydrometeorologický ústav	*Czech Hydrometeorological Institute*
ČIŽP	Česká inspekce životního prostředí	*Czech Environmental Inspection Agency*
ČOV	čistírna odpadních vod	*waste water treatment plant*
ČR	Česká republika	*Czech Republic*
ČSN	Česká státní norma	*Czech State Standard*
ČSOP	Český svaz ochránců přírody	*Czech Union of Nature Conservation*
ČSÚ	Český statistický úřad	*Czech Statistical Office*
ČÚZK	Český úřad zeměměřický a katastrální	*Czech Office for Surveying, Mapping and Cadastre*
DDD	dichlordifenyldichloretan	
DDE	dichlordifenyldichloretylen	
DDT	dichlordifenyltrichloretan	
DG	Generální ředitelství Evropské komise	*Directorate General of European Commission*
DMC	Domácí materiálová spotřeba	*Domestic Material Consumption*
DPH	daň z přidané hodnoty	*VAT*
EEA	Evropská agentura ŽP	*European Environmental Agency*
EF	Ekologická stopa	*Ecological Footprint*
EHS	Evropské hospodářské společenství	*The European Economic Communities*
EIA	posuzování vlivů na životní prostředí	*environmental impact assessment*
EMAS	Environmentálně orientované řízení	*Eco-Management and Audit Scheme*
EPI	Index environmentální výkonnosti	*Environmental Performance Index*
ERDF	Evropský fond regionálního rozvoje	*European Research and Development Fund*
ES	Evropské společenství	*European Community*

ESI	Index environmentální udržitelnosti	*Environmental Sustainability Index*
EU	Evropská unie	*European Union*
EVL	evropsky významné lokality	*Special Area of Conservation*
EVVO	Environmentální vzdělávání, výchova a osvěta	*Environmental education and awareness*
FNM	Fond národního majetku	*National Property Fund*
GEF	Globální fond pro životní prostředí	*Global Environment Facility*
GIS	geografický informační systém	*Geographic information system*
GMO	geneticky modifikované organismy	*genetically modified organism*
HCB	Hexachlorbenzen	
HCFC	hydrochlorofluorované uhlovodíky	*hydrochlorofluorocarbons*
HDP	Hrubý domácí produkt	*gross domestic product*
HCH	hexachlorcyklohexan	
HRDP	Horizontální plán rozvoje venkova	
CHKO	chráněná krajinná oblast	*Protected Countryside Area*
CHOPAV	chráněná oblast přirozené akumulace vod	*Protected Area of Natural Water Accumulation*
CHSK	chemická spotřeba kyslíku	*chemical oxygen demand (COD)*
CHÚ	chráněné území	*protected area*
IAD	Individuální automobilová doprava	*Individual Automobile Traffic*
IPCC	Mezinárodní panel pro klimatickou změnu	*International Panel for Climate Change*
IPPC	Integrovaná prevence a omezování znečištění	*Integrated Prevention Pollution Control*
ISKO	Informační systém kvality ovzduší	*Air Quality Information System*
ISOH	Informační systém odpadového hospodářství	*Information System of Waste Management*
ISPA	Nástroj předstupních strukturálních politik	*Instruments for Structural Policies for Pre-Accession*
IUCN	Světový svaz ochrany přírody	*The World Conservation Union*
IUR	Indikátor udržitelného rozvoje	*Sustainability Development Indicator*
JPÚ	Jednoduché pozemkové úpravy	
KPÚ	Komplexní pozemkové úpravy	
KRNAP	Krkonošský národní park	
KÚ	krajský úřad	*Regional Authority*
LULUCF	Využití krajiny, změny ve využití krajiny a lesnictví	*Land Use, Land Use Changes and Forestry*
MD ČR	Ministerstvo dopravy	*Ministry of Transport*
MMR ČR	Ministerstvo pro místní rozvoj	*Ministry for Regional Development*
MZe ČR	Ministerstvo zemědělství	*Ministry of Agriculture*
MZ	Ministerstvo zdravotnictví	*Ministry of Health*
MŽP ČR	Ministerstvo životního prostředí	*Ministry of the Environment*
NNO	nestátní nezisková organizace	*Non-governmental organisations (NGO)*
NP	národní park	*national park*
NPK	kombinované průmyslové hnojivo (dusík, fosfor, draslík)	*combined industrial fertiliser (nitrogen, phosphorus, potassium)*
NPP	národní přírodní památka	*national natural monument*
NPR	národní přírodní rezervace	*national nature preserve*

OCP	perzistentní chlorované pesticidy	
OKEČ	Odvětvová klasifikace ekonomických činností	*Branch Classification of Economic Activities (CZ-NACE)*
OZE	Obnovitelné zdroje energie	*Renewable energy sources*
PAH, PAU	polyaromatické uhlovodíky	*polycyclic aromatic hydrocarbons, polyaromatic hydrocarbons (PAHs)*
PCB	polychlorované bifenyly	*polychlorinated biphenyls (PCBs)*
PEZ	primární energetické zdroje	*primary energy resources*
PHARE	Program hospodářské pomoci	*Poland and Hungary Assistance for restructuring of their Economies*
PM_{10}	respirabilní frakce prašného aerosolu (velikost částic do 10 μm)	*inhalable particulate matter (particle size under 10 μm)*
PO	ptačí oblasti	*special protection areas (SPA)*
POH ČR	Plán odpadového hospodářství České republiky	*Waste management plan of the Czech Republic*
POP	Polyaromatické organické polutanty	*Polyaromatic organic pollutants*
PP	přírodní památka	*natural monument*
PPK	Program péče o krajinu	
PPUP	Program péče o urbanizované prostředí	
PR	přírodní rezervace	*nature preserve*
PRŘS	Program revitalizace říčních systémů	
PVS	Portál veřejné správy	*Public Administration Portal*
REC ČR	Regionální Environmentální Centrum ČR	*Regional Environmental Centre of the Czech Republic*
REZZO	Registr zdrojů znečišťování ovzduší	*Integrated Emission Register*
SEKM	Systém evidence kontaminovaných mist	*Contaminated Sites Monitoring System*
SFŽP	Státní fond životního prostředí	*State Environmental Fund*
SOP	Správa ochrany přírody	
SPM	prašný aerosol	*suspended particulate matter, suspended particulates*
SPŽP	Státní politika životního prostředí	*State Environmental Policy*
SRS	Státní rostlinolékařská správa	*State Phytotosanitary Administration (SPA)*
TTP	trvalé travní porosty	
TZL	tuhé znečišťující látky	*Suspended Particulate Matter*
ÚHÚL	Ústav pro hospodářskou úpravu lesů	*Forest Management Institute*
ÚKZÚZ	Ústřední kontrolní a zkušební ústav zemědělský	*Central Institute for Supervising and Testing in Agriculture*
UNFCCC	Rámcová úmluva OSN pro změnu klimatu	*United Nations Framework Convention for Climate Change*
ÚPD	územně plánovací dokumentace	*Territorial Planning Documentation*
UR	Udržitelný rozvoj	*Sustainable development*
ÚSES	územní systém ekologické stability	*Territorial System of Ecological*

		Stability
ÚSOP	Ústřední seznam ochrany přírody	*Control List of Nature Protection*
VKP	Významný krajinný prvek	
VOC(s)	těkavé organické látky	*volatile organic compounds*
VÚLHM	Výzkumný ústav lesního hospodářství a myslivosti	*Forestry and Game Management Research Institute*
VÚMOP	Výzkumný ústav meliorací a ochrany půdy	*Research Institute for Soil and Water Reclamation*
VÚV	Výzkumný ústav vodohospodářský	*Water Research Institute*
ZCHÚ	zvláště chráněná území	*Special Protected Areas*
ZPF	Zemědělský půdní fond	*agricultural land resources*
ŽP	životní prostředí	*the environment*

English abbreviations used in the document

6EAP	The Sixth Environment Action Programme
AQIP	Air Quality Improvement Programme
CHI	Czech Hydrometeorological Institute
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CNG	Compressed natural gas
EBP	Environmental Burdens from the Past
EC	Charles University, Environmental Centre of Charles University of Prague
EF	Ecological footprint
EGP	Establishing groups of producers
ELC	European Landscape Convention
EPI	Environmental performance indicator
ESI	Environmental sustainability indicator
ETS	Emissions trading scheme
EUROBATS	Agreement on the Conservation of Bats in Europe
EVI	Environmental vulnerability indicator
FDC	Foreign development co-operation of the Czech Republic
FM	Financial mechanism
GMEF	Global Ministerial Environment Forum
HRDP	Horizontal Rural Development Plan
IBRD	International Bank for Reconstruction and Development
LCP	Landscape Care Programme
MDGs	Millennium development goals
REC	Regional Environmental Centre for Central and Eastern Europe
SDI	Sustainable development indicator
SDS	Sustainable development strategy
SEP	State Energy Policy
UECP	Urban Environment Care Programme
WB	World Bank
WRI	T. G. Masaryk Water Research Institute