Undergraduate Program in Central European Studies

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Environmental Policy in the Central European Context

Time: Tuesday 4pm
Location: at CERGE-EI, Room # 10

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6 Environmental Policy in the Czech Republic – History and current issues

We start with a brief overview of political and economic historical background… and transition period…

Milestones of 20th century

1918 The first Czechoslovak Republic was established.
one of the most developed countries (economically)

1939 The Czech part was occupied by Germany, an independent Slovak State was established.

1945 Liberation by Soviet and US armies, the Czechoslovak Republic was restored.

1946 the Communist party wins elections with about 38% of votes

1948 Communists took over the country.
- purely communist cabinet,
- nationalization
- centrally planned economy
- repressive regime

1968 Prague Spring.
- in January political leaders (led by a newly appointed first secretary of communist party Alexander Dubcek) started to lighten restrictions
- Warsaw Pact armies (Bulgaria, Poland, Hungary, Eastern Germany and Soviet) invaded Czechoslovakia in response (August'68)

1970's formation of a dissident movement represented, among others, by Vaclav Havel

1989 The Velvet Revolution
- turning down the communist regime
- sooner or later it happened also in other countries: Poland, Bulgaria, Eastern Germany, Romania, Hungary, within 3 years totally eradicated from Europe. Mostly peaceful.

1990 The first democratic parliamentary election after 42 years.
- before, elections every 4 years, with only one party to vote for and compulsory participation)
- Václav Havel elected president of the Czech and Slovak Federal Republic.

1993 Czechoslovakia ceases to exist
- establishment of the Czech and Slovak Republics (Jan 1, 1993) and Czech and Slovak Custom Union.
- also other 2 federations disintegrated: Yugoslavia and Soviet Union (1991)
- as regards political orientation the government until 1997 was rightist (Civil Democrats), after its fall, leftists formed a minority government.

1995 The Czech Republic joins OECD

1997 Coalition government (established in 1996) falls

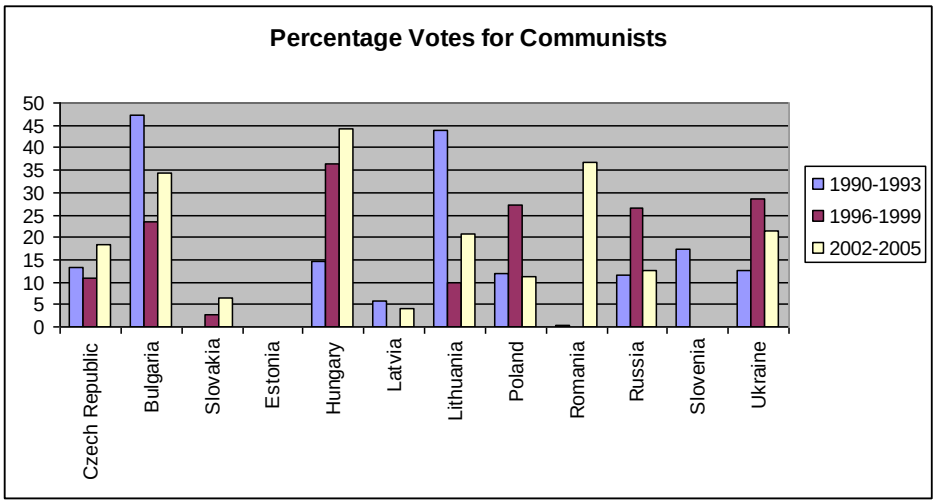
1998 Early parliamentary elections - minority government of Social Democrats

1999 On March 12 the Czech Republic officially joined NATO.

2004 On May 1 the Czech Republic joined the EU.

2007 December, Schengen agreement, border controls with all neighbours abolished

Elections



- the fall of communism did not mean complete disappearance of the communist party from the political life. In many countries, after some time had passed, the support of communists rose. Also now, we communists have their seats in the Czech parliament.

Economic transition of the Czech Republic

Initial Conditions:

- the first Czechoslovak Republic (between WWI and WWII) was one of the most developed economies in the world.
- even after the WWII, the economic position was optimistic, with good predispositions for further growth (the country was not much destroyed by the war, with well-preserved infrastructure, orientated to heavy industry)
- Centrally planned economy since 1948
    - **No private ownership** (all means of production nationalized)
    - **5-year plans**: quantity preferred to quality (re-negotiations possible goods**)**
    - **Fixed prices**: administratively set, no market prices
    - **Overemployment**: wastage of resources; not working was illegal
    - Specialization within the Soviet block: **heavy industry, crystal glass, raw materials**
- Consequences
    - **No incentives** (plans could be re-negotiated, hard work was not rewarded, ordinary workers were valued the most, no incentives for innovation)
    - **Shortage and low quality** of consumer goods and services
        - periods with complete lack of basic goods -> Economy of Shortage (some basic goods becoming luxury, e.g. bananas)
        - production of some goods was supported centrally, without increased domestic demand (e.g. when tractors were decided to be more important resources were invested into production of tractors sometimes at the expense of basic goods like e.g. shoes).
        - the variation of goods was very low, many families had same furniture, carpets in their homes.
- Still, thanks to very good starting position and clear market orientation (heavy industry), the economy was doing well initially
- A rapid economic growth continued over 1950ties and 60ties, started to slow down in 70ties
    - because of fixed prices, lack of incentives and emerging need to re-direct the production (raw materials were becoming scarce) also the central planning was becoming more complex.
- In 80ties the economy was experiencing increasing problems: slow economic growth, low productivity, slow implementation of technical progress and also western influence eventually led to collapse of the system.

"Good" starting position of the CR (after 1989)

- Relative – to other transition countries:
    - no significant external debt
    - low inflation
    - positive trade balance

- balanced government budget
- great political will to liberalize the economy

- Non-competitive structure of the economy
- Investments into technologies and infrastructure necessary

1990's: What to do?

- start private ownership (state ownership is connected with low effectiveness)
  - restitutions
  - privatization
  - support for small and medium enterprises
- restore price relations (economic scarcity)
  - exchange rate liberalization
  - price liberalization
- restore economic incentives
  - trade liberalization
- create proper institutional and legal framework to support entrepreneurial activities
- development of banking sector
- no one really knew what to do exactly, how to transform a centrally planned economy to a market economy. There was no prior experience, the only method was trial and error.

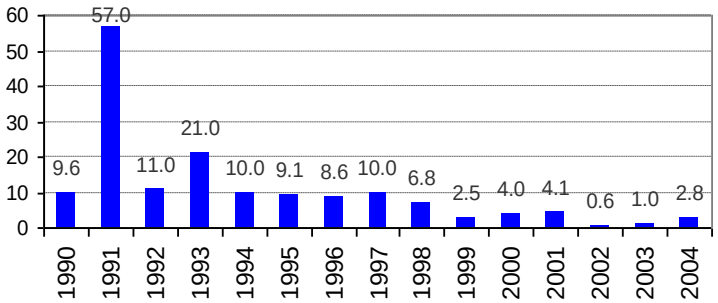
SURPIRSES/PROBLEMS

A. Privatization
- started in 1990 under three schemes:
  - restitutions (property was returned to its pre-nationalization owners or their descendants)
  - small-scale privatization
  - large scale privatization -> voucher privatization ->
- a mass voucher privatization (something like stocks emission – everyone purchased a book of investment vouchers).
  - Two waves of voucher privatization took place in 1992-93 and 1993-94
  - 1664 firms (first wave: 988 firms, second wave 676 firms plus 185 firms carried over from the first wave).
- the 1995-96 ownership changes were massive, spontaneous and quite unregulated.
- ordinary people did not understand the process clearly
- key companies ended up in hands of insiders many of who were seeking private profits.
- number of companies folded as a result of asset stripping.

B. positive: relative efficiency of firms that remained state owned.

C. returning (partial) support for communist party.

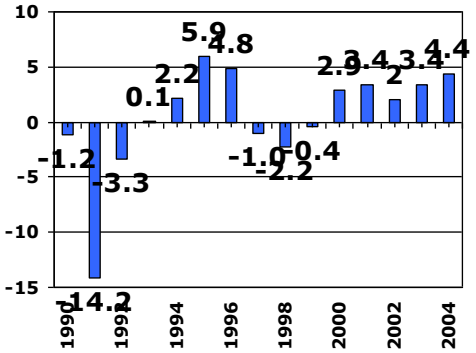
D. high initial **inflation**
- after 1989 there was a will and need to abandon fixed prices.
- naturally, price liberalization after long period of time (40 years) led to large initial inflation (the 1993 jump reflects the introduction of VAT (5-25%)).

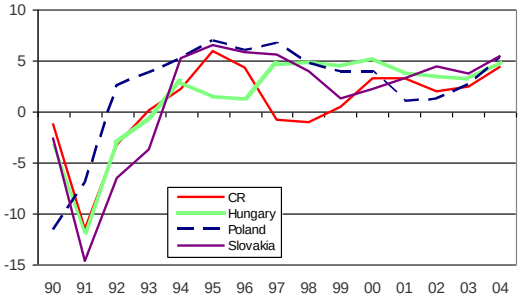


- The main reasons for large initial inflation were:
  1) uncertainty (no one was sure how economy will react to massive changes)
  2) increase in energy costs (energy dependent on Soviet Union)
  3) before large food subsidies were being provided
  4) prices were pushed up in order to maintain over-employment (initially) – companies were reluctant to fire, they preferred to increase prices even though it was not very efficient (only initially)
- later, inflation keeps on lower levels, though before 1998 it remains relatively high (10%)
  - connected to gradual quality improvements (recall that during communism quality was not very important for central planners)
  - after 1989, the economy was opening to western markets, which also led to quality improvements

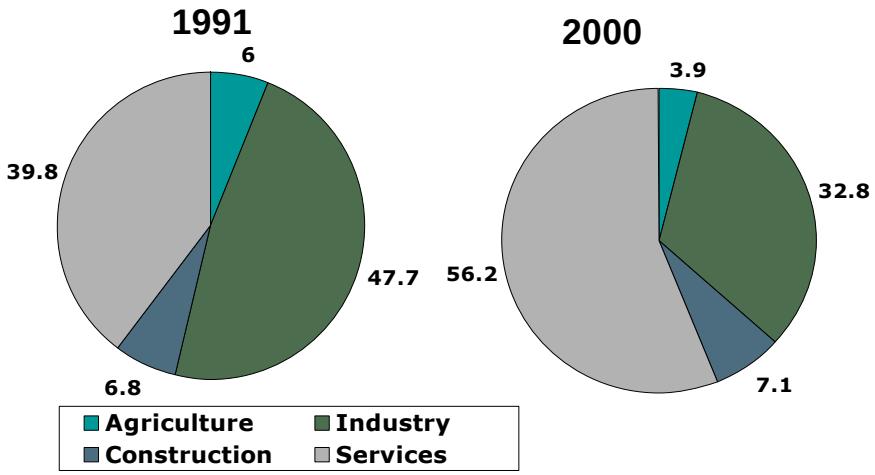
E. initial drop in **GDP growth**

- different opinions on why it happened
  - a natural thing to happen
  - loss of export markets after break down of trade agreements (with Soviet Union e.g.)
  - external shocks (Persian Gulf war, oil price increase, collapse of COMECON – Council for Mutual Economic Assistance – CR had to re-orient its international trade)
  - before large quantities of some goods were produced without demand, just to fulfill the plan
- later, 1998 drop reflects global recession which naturally affected small opened economy of the CR. But also as a result of some internal problems with privatization of banks and asset stripping as a response to which number of foreign investors left. (see on the second figure that drop of the CR was more visible than for other comparable V4 countries).



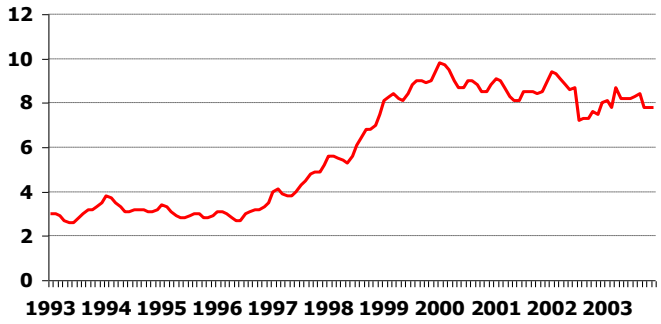


- after a decade the CR re-oriented from Industry towards Services.
- large share of services in GDP is characteristic for western developed economies.

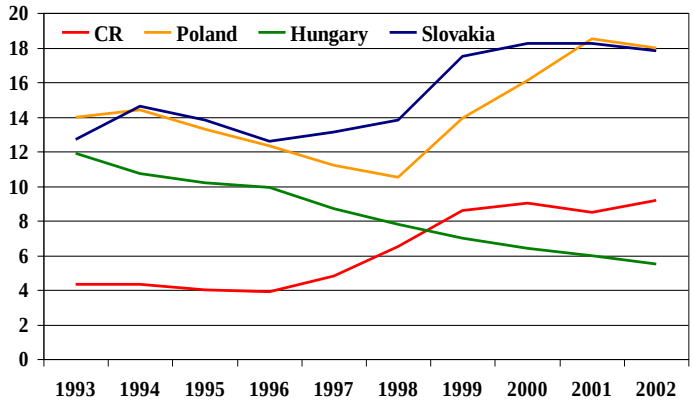


F. delayed increase in **unemployment rate**

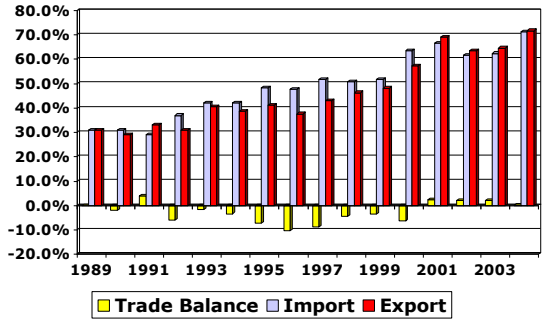
- some talk about great success and great failure of the Czech Republic, as regards unemployment.

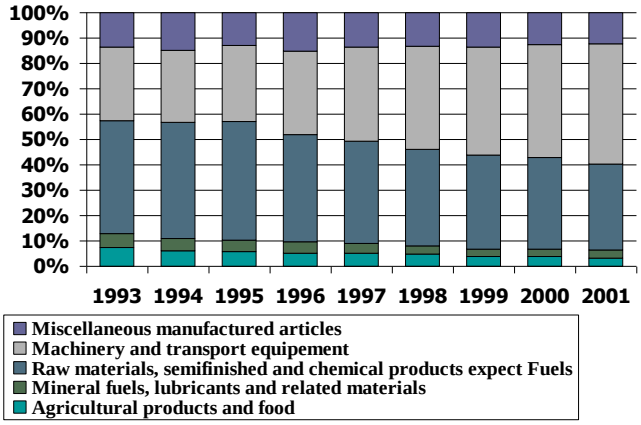


- during first years (before 1997) unemployment was low
  - the CR was the only post-communist country maintaining such low levels of unemployment (corresponding to levels of developed countries)
  - two main reasons
    1. Reluctance to fire (compensated by increased prices)
    2. incentives to establish own small businesses (favorable environment)
- in 1997 oil price shock naturally led to increased unemployment.
- in 1998, however, begun what one could call great failure
  - new central-left government brought about a social system
    - very convenient to stay unemployed, living on social benefits
  - low mobility of workers
    - reluctance to move for work
    - e.g. in Prague almost is zero unemployment , but despite large regional differences in employment, Czechs don't like to move.
- see that the CR was doing really well initially compared to other V4 countries



G. unavoidable reorientation of **foreign trade**





- CR is a small open economy with large share of export and import (larger imports during transition likely connected to investments and imports of technologies)
- quick re-orientation of the CR to EU markets (about 70% goes to EU, over 40% to Germany alone) – successful re-orientation from Soviet markets
- as regards sector structure, we observe re-orientation from raw materials and semi-products towards machinery and transport equipment (Skoda accounts for about 7% of total exports)

H. inflow of **FOREIGN DIRECT INVESTMENT** (FDI)

- an important factor during transition
- a source of necessary capital for restructuring and recapitalizing banks in transition countries.
- positive spillovers were expected, for firms in the same industry branch FDI was expected to bring about increase in quality by competition…the thing is that it came with a high cost
- the CR was the most successful among post-communist countries in attracting foreign direct investment.
    - corporate tax relief for 10 years

- duty free imports of machinery and equipment
- job-creation grants
- training and re-training grants
- provision of low-cost building land and infrastructure
- best math and science skills in Europe
- "Czechs are among the most industrious people in the world" The Economist, Sept. 1999
- high spending on information and communication technologies

The transition went very well compared to other post-communist countries, the CR is now performing similarly to developed countries

BACK TO ENVIRONMENTAL POLICIES

State of the environment in CR: History and current issues

The Environment in the Czech Republic 1989-2004/2007
CENIA – Czech Environmental Information agency www.cenia.cz

The first 15 years after the velvet revolution

"From the environmental point of view the last fifteen years have been long enough for us to become a standard European country, whose inhabitants can breathe relatively fresh air and drink quality water. On the other hand this time period has not been long enough for forests to become healthy and for soil to be cleared of an abundance of pesticides and pollutants. The youngest generation of people, who still remember yellow fog in the surroundings of the North Bohemian power plants and who used to go to "curative stays" away from their homes, is not even in their thirties yet."

"In the past fifteen years we have had the chance to witness or take part in the process concerning environmental protection, the creation of the basic conceptual and legal framework for this environmental protection and its enforcing at home as well as in terms of international cooperation."

Libor Ambrozek, Minister of Environment

- situation influenced by geopolitical situation after 1945
- Czechoslovakia, one of the most developed countries in the world with strong manufacturing industry before WWII **forced by the Soviet bloc to shift its production to heavy industry, especially metallurgy, steel industry, coal carbonization, heavy chemical industry and mechanical engineering**
- enormous energy demands of heavy industry satisfied by mainly **brown-coal fired plants** -> pollution + strip mining; none of the coal plants had a desulphurization equipment
- **socialistic farming** -> adverse impacts on agricultural landscape, excessive use of fertilizers, chemical pest control

- protection on some level existed (water law, forest law, laws on state protection of nature and agricultural land, measures against air pollution) -> production was, however, priority
- adverse effects became very visible in 1970s and 80s ->
    - dead trees in “Krusne hory”,
    - unnatural color of rivers in Northern Bohemia (Usti nad Labem),
    - “moonscape” = areas of strip mining,
    - life expectancy of people living in polluted areas of North-Western Bohemia and Northern Moravia significantly below national average, which itself lower than the average in Western Europe
- emergence of professional and civic environmental activists – some of them banned and punished by the regime
- in 1980s the problem became evident -> environmental committees of the communist party were established, some tangible measures were implemented (e.g. fly-ash separators installed in power plants)
- 2nd half of 90s citizens becoming conscious of the problem, the environmental protection became a recognized priority after 1989

4 periods of the development of environmental protection in CR after 1989

Founding Period (1989–1992)

- started with the so-called Rainbow Program, a political document focused on preparation and approval of new environmental laws (especially new laws on waste, air, nature and landscape protection and environmental impact assessment) and amendment of some laws from the previous period.
- new regulations struggled to achieve the **best possible improvement of the environment in the shortest time** and contained a number of transformation features (e.g. very strict rules of trans-border waste shipments, temporary emission limit values or temporary unsecured landfills).
- the **assessment of resulting economic impact was not a priority**
- a period of **economic transformation** which made the economic impact assessment almost impossible.
- old public administration institutions transformed and **new institutions** were established (especially the Ministry of the Environment and the Czech Environmental Inspectorate) as well as supportive organizations (such as the State Environmental Fund of the Czech Republic or the Czech Environmental Institute).
- the public interest in the environment was high, the condition was improving mainly thanks to the **economic transformation** (restrictions or shut-downs of many energy-intensive and polluting industries).

Implementation Period (1993–1998)

- the environmental laws had been drafted and their implementation started

- unsafe **landfills closed**,
- **purification devices installed** in power plants and other pollution-producing facilities,
- **gas pipelines installed in cities** and in the country within a global program,
- **waste water treatment plants and sewer** systems built in some places.
- the **environmental impact assessment (EIA)** became a common practice.
- annual investment costs made up between 2 and 2.4 % of the GDP
- the condition of basic environmental elements, namely air and water, started to improve fast (values of some pollution indicators were decreasing by more than 10 % a year).
- on the other hand, the **public interest** in the environment **was receding**.
- In 1995, after long political debates, a **new national environmental policy** was approved with **the aim to achieve the same level of the environmental quality as the EU15 average by 2005**.
- 1994 **negotiations with the OECD => certain liberalization of existing laws** (especially on waste management) and preparation of new laws (especially on chemical substances and preparations)

Pre-Accession Period (1999–2003)

- the main objective was to prepare CR for **accession to the European Union.**
- a second generation of environmental legislation was prepared and passed; **virtually all existing legal regulations** were replaced by new ones and issues which had not been dealt with (e.g. GMO, industrial accident prevention, integrated pollution prevention and control – IPPC, packaging and package waste, and access to environmental information) were newly regulated.
- the whole process finished in June 2003; the European Commission provided the Czech Republic with three transition periods (concerning directive on packaging and packaging waste, directive on urban waste water treatment and the deadline of emission limits for sulphur dioxide from two large combustion plants).
- the **condition of environmental elements was stabilized at the level of "worse EU average**",
- the **investment in environmental protection dropped** to 0,7 % of GDP and the public interest remained quite low
- the new 1999 national environmental policy, fully compatible with the environmental policy of the European Communities was updated in 2001
- further development was substantially influenced by the public administration reform where many powers were transferred to the new regions (13 regions and the capital).

European Period (from 2004)

- meant basically a **continuation of trends** which had started in the previous period, i.e. stabilization of the environment, investment of 1 % of GDP, low public interest.

- the **legislation was amended continuously with respect to the development of European regulations** and on the basis of existing experience with the implementation.
- In 2004 a new national environmental policy of the Czech Republic was approved with effect until 2010.

CLIMATE

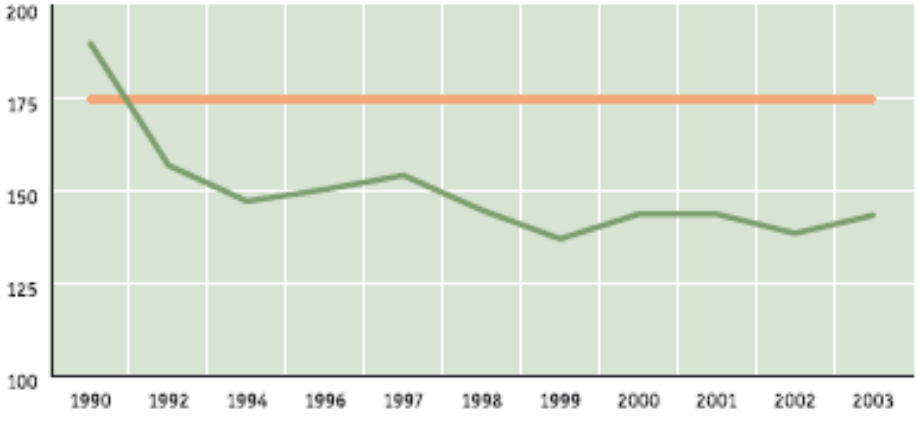
- after more pressing problems (air and water pollution, waste management) have been solved, at the beginning of the pre-accession period, climate protection became more important, now no.1 issue in common with the EU

Total GHG emissions from 1990 to 2003 [mil. t $CO_{2eqv.}$]

	1990	1992	1994	1996	1997	1998	1999	2000	2001	2002	2003
CO_2	161,9	133,3	125,9	128,3	132,7	124,5	117,7	123,9	123,6	118,6	123,3
of which CO_2 emissions	164	139,8	130,6	132,8	137,3	128,3	121,1	127,9	128	123,1	127,1
of which CO_2 sink LUCF	-2,1	-6,5	-4,7	-4,5	-4,6	-3,8	-3,4	-4	-4,4	-4,5	-3,8
of which CO_2 from road transport	6,7	6,5	7,5	9,6	10,3	9,9	10,7	11,2	11,8	11,0	13,095
CH_4	16,8	14,4	13	12,6	12,1	11,4	10,7	10,7	10,5	10,4	10,2
N_2O	11,3	9,2	8,3	9,2	8,8	8,4	8,1	8,2	8,3	8,2	8,2
F – gases	–	–	0,2	0,3	0,6	0,5	0,5	0,9	1,3	1,3	1,7
Total	190	156,9	147,2	150,4	154,2	144,8	137	143,7	143,7	138,5	143,4
in % of 1990	100	82,6	77,5	79,2	81,2	76,3	72,2	75,7	75,7	72,9	75,5

Source: Czech Hydrometeorological Institute, CO_2 from road transport Transport Research Centre in Brno

GHG emissions in the Czech Republic compared to the Kyoto Protocol target



Source: http://indikatory.env.cz

- absolute majority of the main greenhouse gas, i.e. carbon dioxide, comes from **fossil fuel combustion in power industry** (fossil fuels make up almost 90 % of primary domestic energy sources), and also from **transportation**

- the decrease in emissions between 1990 and 1992 without any doubt caused by a drop in industrial production and the economic transformation (reduction or complete shutdown of some energy-intensive productions)
- in 90s more than 2000 MW of installed output in coal-fired power plants was closed, smaller sources changed fuel (to natural gas) and increasing industrial production came along with modern and energy efficient installations.
- since 1998 the emissions have stabilized at about 76 % of the base year 1990
- **current problem:** levels of specific carbon dioxide emissions per capita and year (approx. 11.6 tons) for CR exceeds both the OECD average (10.9 t) and the EU15 average (approx. 8.2 t).
- **positive fact:** CR by far complies with the Kyoto Protocol target to keep the GHG emissions 8 % below the 1990 level.

Ozone Layer

- the risk of the depletion of the Earth ozone layer is viewed as a serious global problem, which has been successfully handled at the international level
- first addressed in CR in the early 1990s, when appropriate legal regulations based on international treaties (Vienna Convention, Montreal Protocol) were passed and implemented.
- In the early 1990s the annual use of ozone depleting substances in CR was over **5,000** tons
- Since 1 January 1996, the production and import of "CFCs" (Chlorofluorocarbon = a class of chemical compounds that deplete ozone) were outlawed and more restrictions on other categories of regulated substances were placed.
- The basic use of ozone depleting substances is now covered by imports and does not exceed **200** tons per year.
- CR meets its obligations resulting from the Montreal Protocol and its amendments

Air

- air pollution was the most pressing issue at the beginning of the Founding Period
- national emissions of most major pollutants (especially **suspended particular matter**, **sulphur dioxide** and **nitrogen oxides**) were one of the highest in the world and the air pollution of some regions (especially in North-Western Bohemia and Northern Moravia) was causing serious **health problems** and **large forest damage**.
- **1st generation of new legal regulations of air protection, passed in 1991, was focused on the biggest air pollution decrease possible in the shortest time**.
- In late 90s the emission and pollution levels stabilized and more attention was paid to the transposition of EC regulations -> in 2002 new law on air protection and implementing regulations was passed.
- air protection can be divided in two areas: emissions and air pollution levels

- emissions of all monitored pollutants dropped between 1990 and 1998; like with GHG emissions, the main reason during the Founding Period was **economic transformation** and resulting cuts or shutdowns in some energy-intensive and polluting productions.
- between 1993-1998 the decrease in air pollution was caused by the implementation of **emission reduction measures** like the introduction of dust filters, desulphurisation units, installation of gas pipelines, implementation of protective measures in industrial pollution sources, installation of smog warning and regulation systems

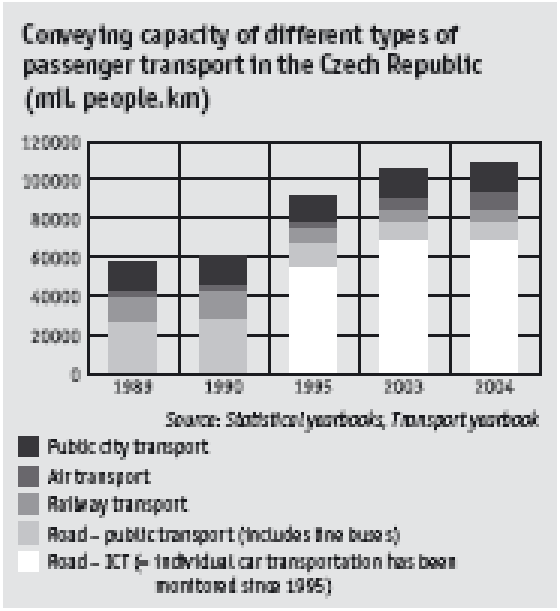
Emissions of main pollutants 1990–2004

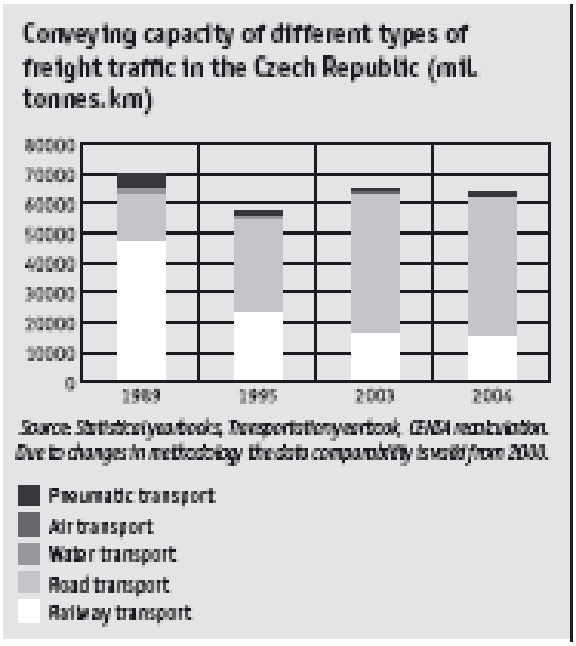
Year	Dust (kt)	SO_2 (kt)	NO_x (kt)	CO (kt)	VOC (kt)	NH_3 (kt)	Cd (t)	Hg (t)	Pb (t)	PAH (t)	PCB (kg)	PCDD (kg)
1990	565	1850	551	1275	441	156	4.3	7.5	241			
1991	524	1749	527	1197	394	134	3.9	7.4	215			
1992	425	1495	499	1141	366	115	3.6	7.3	249			
1993	367	1366	459	1055	346	99	3.5	7.5	228			
1994	258	1205	378	1036	310	91	3.5	7.2	222			
1995	211	1103	370	1043	292	86	3.6	7.4	204			
1996	178	944	366	1012	293	81	2.9	5.9	181			
1997	127	697	349	944	277	81	3.0	5.5	171			
1998	84	438	321	765	242	80	2.7	5.2	151			
1999	66	268	313	716	234	75	2.7	3.7	146			
2000	57	264	326	648	227	74	2.9	3.8	106			
2001	54	251	332	649	220	77	2.6	3.3	47	36.7	96.1	0.19
2002	59	237	318	546	203	84	2.7	2.8	47	24.4	82.5	0.18
2003	79	231	333	576	204	82	2.3	1.8	39	26.7	84.6	0.19
2004	76	229	339	581	199	81	2.5	2.0	40	27.0	85.0	0.19

Source: Czech Hydrometeorological Institute (CHMI), Czech Environmental Inspectorate (CEI), Transport Research Centre, Research Institute of Agricultural Machinery, Czech Statistical Office (CSO)

PCDD – polychlorinated dibenzodioxines/ dibenzofuranes
VOC – volatile organic compounds
PAH – polycyclic aromatic hydrocarbons
PCB – polychlorinated biphenyls

- **for nitrogen oxides the change is less distinct: the positive influence of reduction measures was partially offset by transport increase**
- the **share of road transport is increasing**, although it is partly moderated by fast car enhancement (increase in the number of cars with catalysers from zero in 1990 to approximately 47.5 % in 2004).





- after 1998 the emission reduction slowed -> stabilization (only exception is 50 % y/y drop in lead emissions caused by the prohibition of leaded petrol distribution effective from 1 January 2001)
- the growth in emission of solid particular matter in 2002 and 2003 and the growth of ammonia emissions in 2003 were caused by changes in methodology (the emission inventory was extended by other air pollution sources).
- **the most pressing emission problem** of the Czech Republic is a high emission **of dust** and **nitrogen oxides**.
    - emission of dust is reflected in exceeding limit values for human health protection for suspended particulate matter PM10,
    - the values of nitrogen oxides are so high that the national emission ceiling might not be complied with in 2010.
    - most exceeded areas concern PM10, other limit values are exceeded only in very limited but densely populated areas, especially in Prague and Ostrava
    - despite that the zones with worse air quality represent only 3.5 % of the CR area more than 34 % of population live there
    - major problem of air quality is the pollution with tropospheric ozone (2nd figure)

Areas of exceeded limit values of regulated pollutants excluding ozone in 2004

Fig. 2.1

Area with the excedance of LV

Area with the excedance of LV+MT

LV – limit value

MT – margin of tolerance

Compliance with the limit values following the legal regulations means a duty to prepare plans for improvement of the air quality.

Source: CHMI

Areas of exceeded limit values of regulated pollutants including ozone in 2004

Fig. 2.2

Area with the excedance of limit values

Source: CHMI

⇨ at least one pollution limit value (usually for ozone) is exceeded in majority of area

- pollution caused by tropospheric ("ground") ozone has been a long-term problem of the whole Europe; it comes from photochemical reactions between gas precursors (nitrogen oxides and VOC), as the main sources of the precursors are combustion engines, it is very difficult to reduce the emissions
- a **topical problem** in CR (and in number of other states) concerning air pollution is the non-compliance with ambient air quality standards for suspended particulate matter PM10

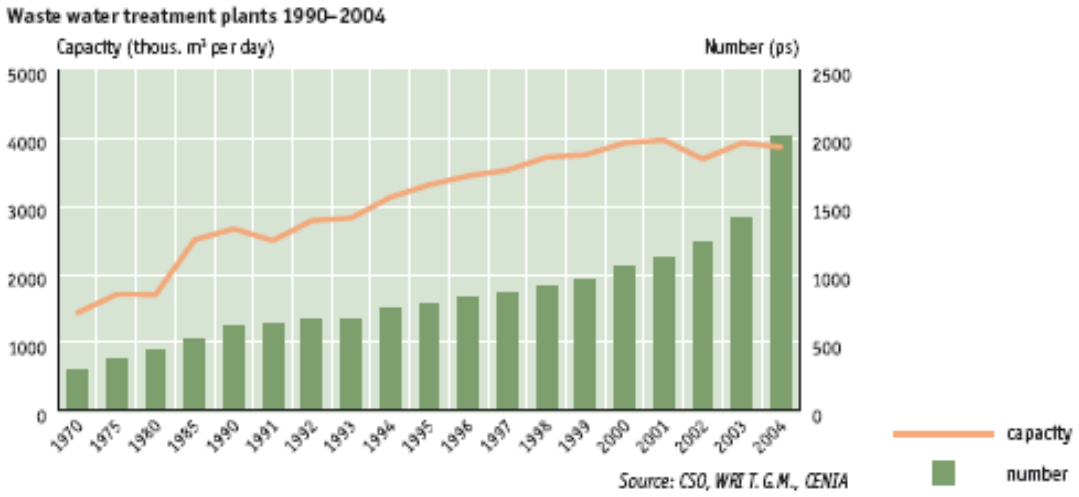
  (particulate matter or fine particles, are tiny particles of solid or liquid suspended in a gas or liquid. PM10 is used to describe particles of 10 micrometers or less (thoracic fraction) and PM2.5 represents particles less than 2.5 micrometers in aerodynamic diameter)

- most problematic regions are the Moravian-Silesian region, Prague, parts of the Central Bohemia, and Usti nad Labem regions

- The biggest proportion of air pollution comes from **local furnaces burning solid fuels** and from **traffic** (not only exhaust fumes, but also abrasion of tyres and brakes and road surface)
- another group of major air pollutants are **"secondary particles" from gas precursors** (sulphur dioxide, nitrogen oxides, VOC (= *volatile organic compounds are organic chemical compounds that have high enough vapor pressures under normal conditions to significantly vaporize and enter the atmosphere*) and ammonia)
- health-wise, fine PM2.5 suspended particulate matter (or smaller ones) present the biggest hazard
- one **positive fact** is that the limit values for sulphur dioxide in the whole country are complied with and the limit values for nitrogen dioxide are exceeded only in Prague
- CR complies with its international commitments for air protection (the UN ECE Convention on Long-Range Trans-Boundary Air Pollution and 8 related protocols).

Water

- at the beginning of the 1990s water pollution was considered **the second most pressing issue**, with most important watercourses belonging to the category of polluted or heavily polluted and the contamination of groundwater being also high
- unlike with air pollution no new legal regulations were prepared and the situation was addressed by amendments to the law passed in the 1970s.
- Water protection focuses on two areas: emissions (water contamination, especially surface water) and water quality (both surface and underground water sources)
- attention was focused mainly on pollution discharged into surface water, i.e. construction, **rebuilding and intensification of waste water treatment plants and construction of sewer systems** (the number of households connected to sewer systems was increasing from 72.6 % (of which 71.2 % was treated) in 1990 to 78.8 % (of which 93.8 % was treated) in 2004



- **cuts or shutdowns of some big industrial production entities brought also an important decrease in pollution from point sources**; some of the productions were phased out and all the exemptions from the water law were cancelled in 1990
- at the beginning of the Pre-Accession Period the quality of surface water was significantly improved and the quality of groundwater was stabilized => more attention was paid to the transposition of EC legal regulations which culminated when new comprehensive regulations concerning water were approved
- while treatment of waste water from **point sources** is technically feasible, though expensive, **surface sources** are a pressing problem, which is caused by the impossibility to reduce soil fertilization and plant treatment under a certain level and the fact that the fertilizers are washed out from the soil very slowly.

SURFACE WATER QUALITY

Quality of surface water in the Czech Republic 1991–1992

Source: WRI T.G.M. on the base of CHMI data

Fig. 2.3

Class	Classification
I and II	Non-polluted and slightly polluted water
III	Polluted water
IV	Strongly polluted water
V.	Heavily polluted water

Quality of surface water in the Czech Republic 2003–2004

Fig. 2.4

Class	Classification
I and II	Non-polluted and slightly polluted water
III	Polluted water
IV	Strongly polluted water
V.	Heavily polluted water

- "current" problem is the contamination of some parts of watercourses with specific pollutants (hazardous chemicals, radioactive substances) and the risk of eutrophication of water reservoirs (= *an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases the primary productivity of the ecosystem. Depending on the degree of eutrophication, subsequent negative environmental effects such as anoxia and severe reductions in water quality, fish, and other animal populations may occur.*), caused mainly by nitrates and phosphates from sewage water (from point sources without a third step of water treatment for phosphorus and nitrate elimination) and by denudation of cultivated land (from diffusive sources).
- As all watercourses flow out of the Czech Republic and there is no water fed into the country, the whole Czech Republic was defined as a "sensitive area" in the EU terminology, meaning that it is subject to stricter parameters for treated sewage water.

GROUNDWATER

- the present quality of groundwater can be considered **stabilized and more or less satisfactory**
- there is a certain risk of "old environmental load" (old waste landfills, contaminated industrial zones)
- groundwater pollution, e.g. ammoniated ions from agriculture, which existed in the early 1990s, has been removed

DRINKING WATER

- the number of inhabitants connected to the public water supply lines increased from 83.2 % in 1990 to 89.8 % in 2004
- the quality of supplied drinking water is mostly sufficient
- the problem is that more than 10 % people, connected to the public water piping, are not connected to a sewerage system

Soil

- the decreasing of the farm land cultivation area is very slow, cultivation of almost 72 % remains relatively high compared to the EU15 average (60.1 %)
- the quality of soil in the Czech Republic at the beginning of the Founding Period was affected by "socialist" agriculture (plant and animal large-scale production with a high use of fertilizers and pesticides) and by the atmospheric deposition due to high pollutant emissions into the air
- after 1990 there was a radical decrease in the use of mineral fertilizers and pesticides
- the Implementation Period brought environmentally positive changes in agriculture, cuts in some agriculture productions and a decrease in the atmospheric contamination fall-out.
- fast reduction of the negative impact on soil has, however, a **very slow response**
- in the early 1990s the content of cadmium and lead in the Central Bohemian region, the content of cadmium and mercury in Northern Moravia were above the threshold levels, and the content of chromium in Southern Moravia was occasionally high -> since then the situation has come under control, which can be explained by drop in use of mineral fertilizers and their quality and by lower atmospheric deposition

- organic pollutants (polychlorinated biphenyls, polycyclic aromatic hydrocarbons and organic chlorinated pesticides) exceed the threshold levels occasionally, they were used in large uncontrolled amounts in past and due to their persistence they are only slowly eliminated
- **erosion**, especially water erosion, remains a pressing problem. It is the result of long time intensive exploitation of soil.
- other soil-related issues include compacting caused by heavy machinery and subsequent water retention and worse plant growth.

Geological environment

- affected by strip and underground mining of coal and other mineral materials (large-scale uranium leaching in Northern Bohemia)
  - ⇨ **vast landscape devastation**
  - ⇨ **imminent risk of land slip and large surface water contamination.**
- **black and brown coal mining** substantially decreased in the 1990s, **ore extraction discontinued completely** (reorientation of industry, reducing share of coal-fired power plants, employment of other fuels, like natural gas)
- **uranium extraction should be abandoned soon**, too

Forests

- CR is a country with an average forest area (the forest percentage is 34.1%, the OECD average was 34.4% in 2000), although it is the 8th most wooded OECD country in Europe
- **catastrophic condition of forests in 1989** was the best-known symptom of the bad environment (e.g. air pollution affecting particularly spruce mono- cultures).
- despite that pollutant emissions on forests were decreasing ("passive measures" like liming, fertilization and artificial forest reproduction and gradual changes in forest composition), **the condition of the forests was not improved.**
- the age, species and spatial structure is not good
- **forest health is a chronic problem and solving it will take a long time**

Nature and Landscape

- involves **landscape and species protections**
- at the beginning of the Founding period the condition of nature and landscape was equivalent to the condition of fundamental environmental elements – air and water
  - the landscape infrastructure was disturbed and the biological diversity was decreasing
  - the only national park established before 1989 was in the Giant Mountains (1963)
  - only 20 protected nature areas covering only 12% of the territory.
  - Act on Nature Protection, was passed in 1992 to serve as a comprehensive regulation for nature and landscape protection

- CR is a relatively densely populated country with extensive linear infrastructure which divides the landscape into fragments and limits the natural species migration, large parts of the territory are endangered by water erosion and are easily affected by floods a
- hot issue is the conflict of interests between the land required for the building of transport infrastructure and utility buildings and the effort to improve the landscape condition.
- the percentage of specially protected areas in the Czech Republic (15.9%) is slightly above the EU 15 average (12.1%) and the OECD average (12.4%)
- three quarters of the existing national parks and 5 out of the 25 existing protected landscape areas were proclaimed after 1989
- at the moment the Czech Republic is building a part of the European network of protected areas known as NATURA 2000
- a recent issue of species protection is the genetically modified organisms (GMO) which might threaten the natural biological safety if they spread without control… Regulations concerning GMO were passed in the late 1990s

Waste

- main problems were **illegal landfills**, a **lack of legislative interest** and very little information about waste, its disposal and landfills before 1989
- waste disposal has changed significantly over the last 15 years
- the first generation of legal regulations from 1991 contained a number of time-limited transformation elements (e.g. stricter rules of trans-border waste shipment, temporary unsecured landfills)
- In early 90s unsecure landfills were closed down (approximately 8,000 landfills) and new landfills were built, complying with the relevant environmental safety parameters and European regulations.
- at present the capacity of secured landfills is sufficient for decades
- in 1997 a second generation of legal regulations was approved influenced especially by the OECD requirements and in compliance with the Basel Convention on trans-boundary shipment of hazardous waste, bringing about certain liberalization of the waste movements (colored lists of wastes according to their risk level) and termination of waste management programs
- during the Pre-Accession period a third generation of legal regulations was approved, in compliance with the EC requirements**: the disposal of selected waste commodities was changed comprehensively** (electrical scrap, wrecked cars, batteries and accumulators, sludge, etc.), packaging disposal and return of some products.
- **"On one hand, waste disposal is closely related to environmental protection; on the other hand it is an industry with important turnover."** Three generations of regulations show that to set parameters in this industry is very difficult
- during the 90s the production of hazardous waste decreased and the volumes of municipal waste are comparable to other developed European countries.
- waste monitoring was in the 1990s rather difficult **(paper)**.

- **increased waste recycling and the use of waste as secondary raw material are very positive.**
- at the moment there are 298 landfills, 33 of them with the possibility of depositing hazardous waste, there are three incineration plants (Prague, Brno and Liberec); the number of incineration plants for hazardous waste has been decreasing (67 in 2001,24 in 2004).
- the total amount of waste incinerated and used in the energy sector in 2004 was ca 9.1 % of municipal waste and 10.2 % of hazardous waste
- compared to most European countries, the % of waste deposited in landfills is still quite high in CR ☹

Waste production in the Czech Republic between 1998 and 2004 (t)

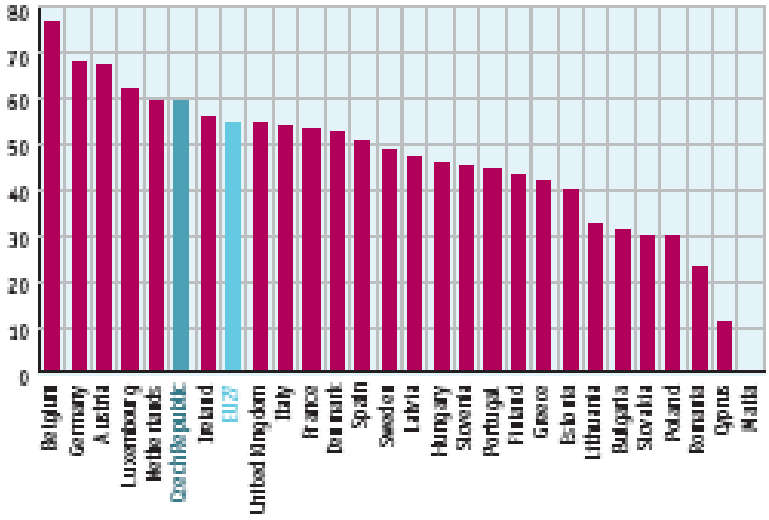
Category	1998	1999	2000	2001	2002	2003	2004
Hazardous	3399468	2380171	2603337	2785128	1289912	1194619	1424022
Total	44121739	38088463	40162871	42655501	24959160	25172816	26583877

Source: CSO

The rate of packaging waste recycling in the EU and recycling in 2005 [%]

Chart 23

Source: DG Environment



Noise pollution

- significant problem from the long-term point of view, especially in cities
- **about 85% is caused by transportation** (all kinds… road, air, railway…)
- **transport is one of the most rapidly developing fields** of human activity
- environmental impacts of transport are increasing in CR
- negative impacts of transport on
    - Health
        - Directly: emissions, noise, accidents
        - Indirectly: contribution to obesity and "civilizing diseases"

  - Buildings

- although discussed in the EU for a long time, in CR it was not a priority between 1990 and 1998 as the country had to deal with air and water pollution and waste disposal
- legal regulations for the noise pollution levels were passed in the Pre-Accession period, and regulations concerning noise pollution have been prepared since 2004.

- the noise pollution concerns a significant part of the population in Hradec Kralove district.
- people in many other cities and locations close to busy communications and traffic junctions (roads, airports) are affected in the same way

Conclusions from 2007 report on Czech environment

- the previous stagnation of 2005–2006, the state of the environment has been improving.
- some of the principal problems, threats to the future development, identified in previous years are of increasing significance and urgency
  - growing greenhouse gas emissions,
  - large proportion of air emissions from pollution sources that are difficult to regulate (transport and household heating)
  - dynamic development of road transportation with its associated adverse environmental effects.

NEGATIVE CON CLUSIONS

- Following the steep decline of the early 1990s that ensured compliance with the commitments under the Kyoto Protocol, greenhouse gas emissions have not decreased any further, and even have displayed a moderate increase in recent years.
- Specific greenhouse gas emissions in the Czech Republic are amongst the highest in Europe.
- Transportation is one of the main air polluters and its effect on air quality keeps growing.

  - road transportation (that is responsible for almost all pollution from transportation) accounted for 32 % of NOx, 23 % of VOC, 33 % of PM10 and 46 % of PM2.5 emissions in 2006. A significant proportion of suspended particles is produced by household heating (30 % of PM10 and 23 % of PM2.5).
  - performance in private automobile transportation keeps increasing.
  - high age of the vehicle fleet poses complications for reducing emissions from transportation.
  - Freight road transportation is a major component of transportation performance within freight transportation (72 %), while its environmental impact is the highest of all modes of freight transportation.
- In most of the area, limit values for ground-level ozone have been exceeded, which poses a risk to both human health and ecosystems.
- the economy's energy intensity continues to sharply increase as it has since 2005, i.e. at an annual rate of approximately 6 %.
- the proportion of renewable energy sources (RES) in the consumption of primary energy sources (PES) does not make it likely for the State Environment Policy's objectives to be met within the given time horizon (a 6 % proportion of RES in PES consumption by 2010)
- The proportion of RES in gross domestic electricity consumption decreased from 4.9 % in 2006 to 4.7 % in 2007.
- The health condition of forests as determined by the level of defoliation of coniferous trees older than 60 years is amongst the highest in Europe.
- waste production has shown an annual increase, with an ever increasing proportion of waste being landfilled (high proportion of municipal waste is being landfilled)

POSITIVE CONCLUSIONS

- the area with poor air quality with respect to human health has decreased from 29 % in 2006 to 6.3 % in 2007 (still, more than 32 % of population lives there, positive effect of good meteorological conditions; Moravian-Silesian Region remains problematic)
- Water pollution from point sources has been decreasing; running water quality has improved.
- 92 % of the Czech Republic's population is connected to water supply systems and water losses within the piping systems have decreased.
- freight rail transportation has shown an annual increase of 3.3 % and the most environmentally harmful freight road transportation is no longer increasing
- the proportion of permanent grasslands and forests has increased at the expense of arable land.
- Since 2003, we have witnessed a growing trend in the amount of the total expenditure on environmental protection, both in absolute terms and as a proportion of GDP; in 2006, it reached CZK 63.5 billion, i.e. 2 % of GDP.

Instruments of environmental protection in CR

Organization and Institutional Arrangement to Environmental Protection in CR

- **Ministry of the Environment**
  - The foundation of the Ministry of the Environment on 1 January 1990 was a fundamental change in the institutional and organization arrangement of the environmental protection in the Czech Republic.
  - On 1 August 1990 the Ministry of the Environment became responsible also for the protection of Agricultural and Forest land Fund, geological survey, protection of mineral resources and environmental supervision over mining. At the same time the Ministry ceased to be responsible for water and sewage piping systems.
- professional organizations supporting public administration of the environmental protection: Czech Environmental Information Agency (CENIA); Czech Hydrometeorological Institute, Water Research Institute of T.G. Masaryk, Agency for Nature conservation and landscape protection of the CR, Czech Geological Survey,…

Financing of environmental protection

- after 1989 the state of the environment could not have been improved without a significant increase in the funds spent
- after 1998 the amount of funds was reduced, as the most important environmental problems have been solved (or at least improved substantially)

Graph 5.1

The unusual height of investments in the 1990s was especially influenced by the legal deadline of the end of 1998, by which the operators of all the large and medium-size sources of air pollution had to achieve tighter emission limits. Within the scope of this all power plants and large heating plants were dusted off and desulphurised. Such high investments, concentrated in a couple of years, will never be repeated again. At the beginning of the current decade the Czech Republic got into a stage when all relatively „cheap" measures had been realised and every other improvement was markedly more expensive (the cost curves moved into a non-linear area).

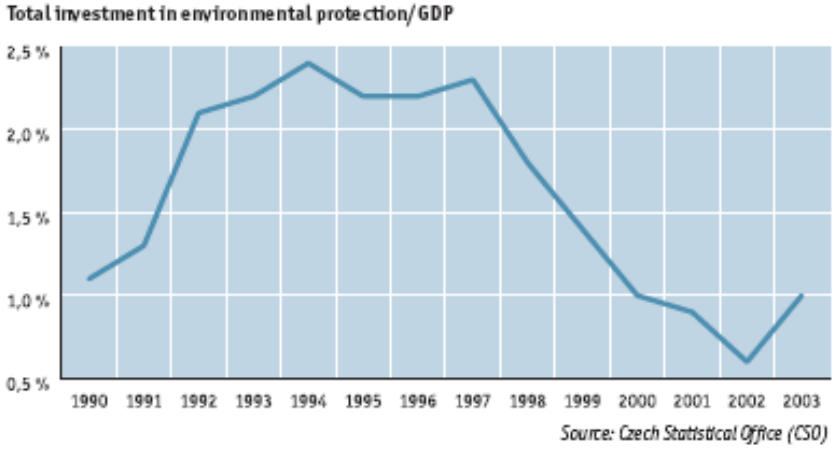


Table 5.1 Total investments in environmental protection in the Czech Republic (mil. CZK)

Projects	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CR Total	3602	6048	9376	16954	19890	28272	32252	37036	40503	35160	28956	21399	19892	14919	19383
Waste water management	2271	3268	4626	7224	8715	10843	10246	10011	11275	8291	8839	8567	8815	7034	9523
Air and climate protection	692	1688	3187	5755	7876	13489	17886	21475	22323	20141	15762	8407	7057	4149	4179
Waste management	639	1092	1427	3115	2893	3127	2772	3449	4765	4698	2597	2270	1463	1236	2125
Reclamation of land			136	72	109	162	374								
Biodiversity and landscape protection								659	1081	1162	1091	1549	1437	511	405
Reduction of noise and vibrations (apart from workplace protection)				788	297	651	974	567	455	313	241	277	632	365	374
Protection and revitalisation of soil, ground and surface water								875	604	555	426	329	488	1027	2153
Protection against radiation														15	33
Environmental research and development														132	137
Other activities of environmental protection														450	454

Source: CSO

Sources of financing

- **State budget**: subsidies, refundable aids (free loans) and guarantees for commercial credits
- **State Environmental Fund of CR**: its incomes consist of charges for pollution, use of natural resources and from penalties for breaching environmental law; in 1994–1997 SEF was funded by the National Property Fund in the amount of CZK 6.1 billion, which was a share of “small” privatization revenue addressed to the National Clean Air Program.
- The SEF has contributed to the implementation of many environmental protection measures in the form of subsidies, loans and contributions to cover partially the interest accrued.
- **National Property fund of CR**: focuses on reclamation related to old ecological burdens in privatized companies (dissolved as of December 31 2005)
- **Local budgets** subsidies of municipalities or regions granted continuously (unlike the state program)
- **private investors**

Public expenditure on environmental protection in 1997–2007 [% of GDP, current prices]

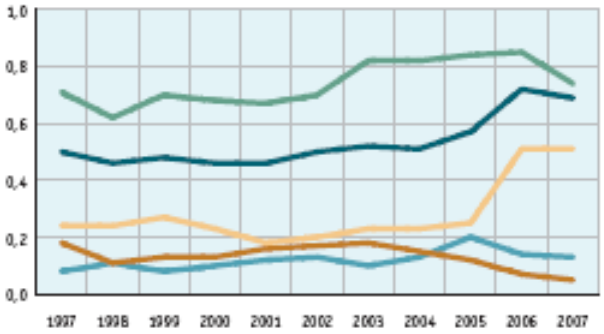


Chart 29

- Regional-budgeted environmental protection expenditures to GDP ratio
- Environmental protection expenditures from central sources to GDP ratio
- State-budgeted environmental protection expenditures to GDP ratio
- Environmental protection expenditures from the National Property Fund to GDP ratio
- State-fund environmental protection expenditures to GDP ratio

Source: Ministry of finance, Czech Statistical Office

The orientation of state-budgeted environmental protection expenditures from 2000–2007 [billions CZK current prices %]

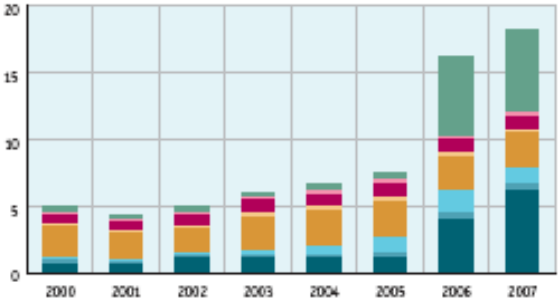


Chart 30

- Water protection
- Air protection
- Waste management
- Biodiversity and landscape protection
- Soil and groundwater protection
- Administration in environmental protection
- Environmental research
- Other environmental activities

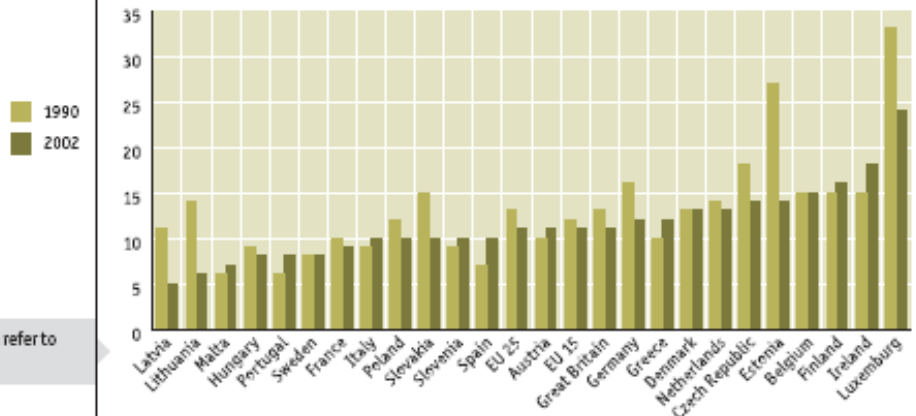
Source: Ministry of finance

International context

- At the end of the 20th century environmental protection became an inseparable component of international relations in the political and economical sphere influencing social and cultural issues.
- The development of the state of the environment in the monitored time period has been positively influenced by the EU-approximation process of the Czech Republic and by the development of multilateral cooperation within international organizations, especially the UN Economic Commission for Europe (UN ECE), the UN Environmental Programme (UNEP), the UN Educational, Scientific and Cultural Organisation (UNESCO), and the Organisation for Economic Cooperation and Development (OECD).
- The Czech Republic became a contracting party of most of important global and regional multilateral agreements and established an effective system of bilateral cooperation with European as well as developing countries.

Graph 4.1

Greenhouse gas emissions in equivalents of CO_2 per capita of the EU15 Member States for 1990 and 2002 (t/capita)

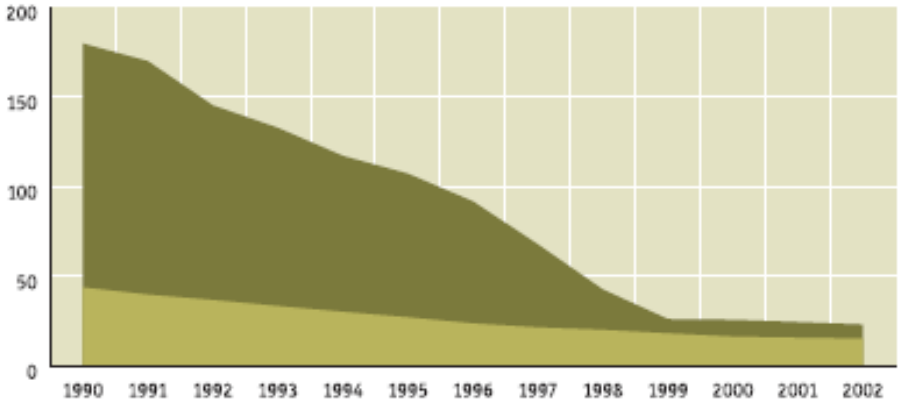


shown refer to

Source: GHG inventory for the UNFCCC, EEA

The EU15 and the Czech Republic's emission trends for SO_2 between 1990 and 2002 (kg/capita.year)

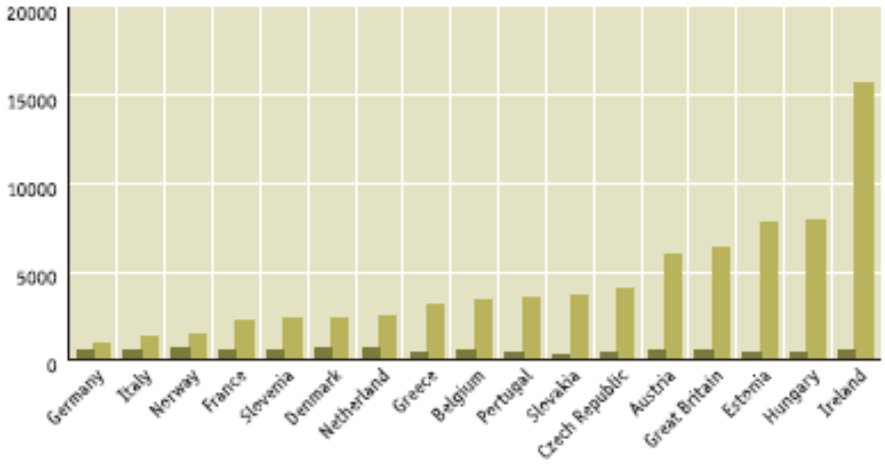
Graph 4.3



Source: EMEP, EEA

Total waste generation and municipal waste generation in EU member states (kg per capita, 2002 or latest year available)

Graph 4.10



Source: EEA, Eurostat

Economic instruments of environmental protection in CR

The protection of nature and the landscape in the Czech Republic uses, above all, the following economic instruments:

- **non-market ("financial") instruments**
  - **positively stimulating**
    - financial subsidies => national subsidy programs + European subsidy programs
    - grants
    - loans
    - tax reliefs
  - **compensatory instruments**
    - financial compensation for losses resulting from the declaration of a provisionally protected area,
    - compensation for aggravating conditions for farming and forestry
    - compensation for some damages caused by selected specially protected animals.
  - **negatively stimulating**
    - fees (e.g. entry fees for cars in national parks)
    - taxes and charges for environmental impacts (e.g. cutting down trees) – "**polluter pays principle**" **=** inclusion of negative externalities in the costs of the polluter
    - penalties for non-compliance with environmental regulations
- **market ("financial") instruments**
  - trade in greenhouse gas emission allowances (Kyoto protocol)
- **voluntary instruments**
  - eco-labeling
  - responsible care
  - voluntary agreements…
- **access to environmental information**
  - integrated pollution register

Tax relief due environmental protection

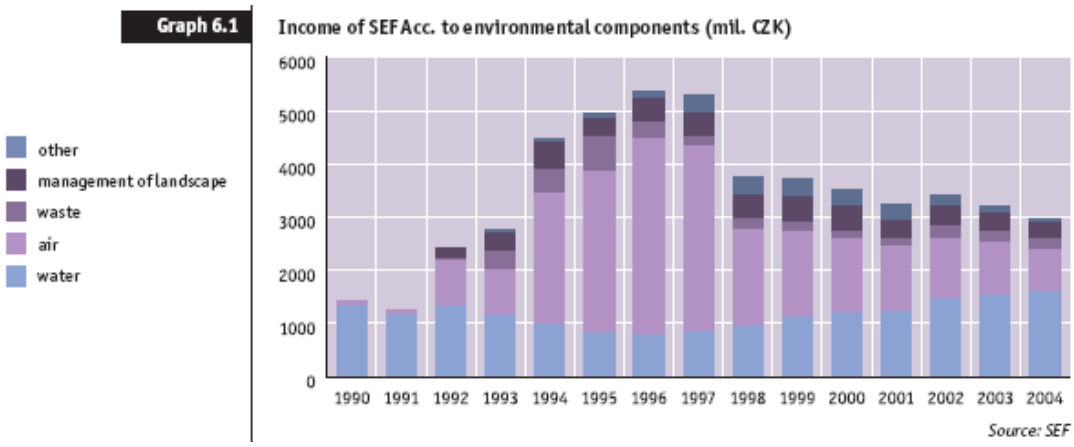
- In the early 1990s environmental tax reliefs were only exceptional. The whole system of taxation was rather **unclear,** especially because of the sales tax. This tax consisted of hundreds of rates and was used instead of the VAT and concise taxes (high sales tax imposed on the sale of passenger vehicles and fuels)
- since 1993 exemptions from the road tax for some modes of transport;

- concise tax on fuels
    - rates of the sales tax and concise tax on fuels grew only a little between 1989 and 2004 in comparison with consumer price inflation
    - international water transportation and environmentally demanding international air transportation exempted from any concise taxes on fuels based on international agreements; domestic air transportation exempted from the concise tax on fuels since 2001 and domestic water transportation since 2004
    - lower sales tax rate was applied between 1991 and 1992 and a lower concise tax rate on unleaded petrol between 1993 and 1995; the tax advantage of unleaded petrol was cancelled from 1996 and since 2001 it has not been possible to sell leaded petrol.
    - a zero concise tax on biodiesel was applied until 2000.
    - a lower concise tax rate has been applied to LPG (liquefied gasses) used as a fuel for vehicles
    - until 2003 there was a zero concise tax on CNG (compressed gasses) used as a vehicle fuel; a relatively high concise tax on CNG and substantially increased concise tax on LPG and diesel oil were applied in 2004, and the concise tax on petrol has been increased too.
    - economic advantages of more environmentally-friendly fuels in the form of lower concise taxes dropped in 2004 to ca ½.
- exemption from the property tax in case of real estates that were found important for environmental protection;
- reduced VAT (5 %) rate on some environmentally-friendly products (renewable fuels and energy sources and biodiesel), since 2004, all products under lower VAT rate transferred to the basic VAT rate of 22%

.

Payments for environmental impacts ("charges")

- various payments for pollution and utilization of the natural resources.
- the payments have been utilized since the mid 1960s, they include charges for **air pollution**, charges **for discharge of waste water** into surface water, charges for **consumption of surface and ground water**, as well as charges for the **use of agriculture land resources**,
- in the 1990s, new charges were introduced – especially **for waste dumping**, **extraction of mineral resources** and **forestland exclusion**
- the payment of the charges is controlled mainly by the Czech Environmental Inspectorate or regional authorities, most of the charges are collected by tax offices and the financial revenue is received by the State Environmental Fund of the Czech Republic or municipalities.
- the majority of the collected charges are used to support activities dedicated to environmental protection



As of 2004, **16 types of charges** (payments) are paid in the CR. They include charges:

- for **air pollution** – operators of extra large to small stationary sources,
- for **production and import of regulated substances** and products containing them (**Freon**) (they in fact, but not de jure, ceased as of 1 May 2004 after the accession of CR in EU),
- for **discharging wastewater into surface water**,
- for permitted **discharging of wastewater into groundwater**,
- for **surface water consumption** in order to pay for the river basin management,
- for **groundwater consumption**,
- for **waste dumping on a landfill**
- to support the collection, processing, usage and removal of selected **car wrecks**, which have been paid since 2004 by the car importer, amounting to 5,000 CZK/car, if the imported used car does not comply with the emission standard for new cars,
- for the operation of a system of collection, transport, separation, usage and removal of municipal waste /for municipal waste – this is a fee for **municipal waste disposal**,
- for registration and annual recording in a list of authorized entities under the Act on **packaging** (reg. packaging and their recycling),
- for a **mined area** and for a volume of **extracted minerals**,
- for the **agricultural land use exclusion** (permanent and temporary),
- for **forestland use exclusion**

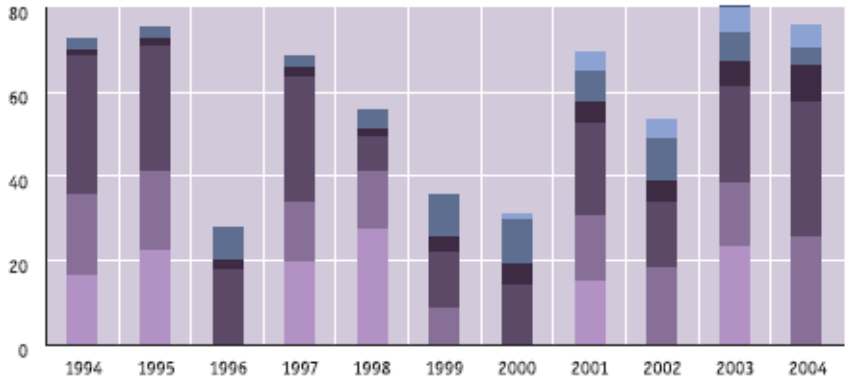
A special category of payments includes fines – sanctions for not observing limits or duties defined by the State.

The Upper limit of fines for breaching the duties resulting from the environmental protection laws

Environment sector	Upper limit of the fine	Pursuant to Act no.
Waste [1]	50,000,000 CZK	185/2001 Coll. [2]
Chemical compounds [1]	5,000,000 CZK	356/2003 Coll [2]
Air protection	10,000,000 CZK	86/2002 Coll [2]
Integrated prevention	7,000,000 CZK	76/2002 Coll. [2]
Water protection [1]	10,000,000 CZK	254/2001 Coll [2]
Packaging	50,000,000 CZK	477/2001 Coll. [2]
Forest protection	1,000,000 CZK	282/1991 Coll. [2], 289/1995 Coll [2]
Nature protection	1,000,000 CZK	114/1992 Coll [2]
CITES	1,500,000 CZK	100/2004 Coll
Cruelty to animals	500,000 CZK	246/1992 Coll. [2]
Agricultural land protection	500 × min. wage	334/1992 Coll [2]
Evaluation of products [4]	300 × min. wage	244/1992 Coll.
Nuclear safety	100,000,000 CZK	18/1997 Coll. [2]
Public health protection	3,000,000 CZK	258/2000 Coll [2]
Prevention of serious accidents caused by chemical compounds [1]	5,000,000 CZK	353/1999 Coll [2]
Genetically modified organisms	5,000,000 CZK	78/2004 Coll
Land planning and building code [1]	1,000,000 CZK	50/1976 Coll [2]
Other	1,000,000 CZK	17/1992 Coll. [2]
Other [5]	100,000 CZK	36/1975 Coll. [2]

Source: CENIA according to the relevant legal provisions

Amount of fines imposed by CEI in sectors of environmental protection (bil. CZK per year)



Source: Czech Environment Inspectorate

Graph 6.8

- Genetically modified organisms
- Chemicals
- Forest
- Nature
- Waste
- Water
- Air

Data for 1992 and 1993 are not available. Between 2000 and 2004, CEI imposed no fines under Act No. 353/1999 Coll. on prevention of serious accidents and under Act No. 153/2000 Coll. on genetically modified organisms.

*"The range of economic instruments available for environmental protection applied in the Czech Republic is **one of the largest in Europe** and probably in the world (Slovakia and Poland have a similar, though less numerous range of charges). However, environmental charges have **not always been introduced and modified systematically and ideally**. Therefore, there are cases when charging is ineffective (e.g. with regard to administration or transaction expenses). For this reason, the existing system of charges, its improvement and gradual coordination with other tools of environmental policy, should be explored."*

Voluntary Programs

- The first voluntary regulatory instruments (i.e. instruments reducing the negative impact on the environment) to be implemented in our country were:
    - ecol-labeling (1993),
    - Responsible Care (1994)
    - Cleaner Production (1994).
- These were followed by
    - voluntary agreements between industry and state administration (1995),
    - implementation of ISO standards of the 14 000 series (1997)
    - EMAS (EC's Eco-Management and Audit Scheme) (1998)
- in mid-2005,
    - more than 300 products of 75 producers have been labeled as environmentally friendly products (179 eco-labeling licenses granted) in 41 product categories.
    - 29 companies of the chemical industry are entitled to use the Responsible Care trade mark,
    - 118 Cleaner Production projects have been implemented,
    - seven voluntary agreements have been made,
    - 1 332 firms have been certified ISO 14 001
    - 18 companies have implemented EMAS.

National Program for Labeling Environmentally Friendly Products (EFP)

- the Czech National Program for Labeling EFPs was started in April 1994.
- criteria were set for evaluation of thermal insulating materials from scrap paper, lubricating oils for chain saws, detergents for textiles and water-based painting and coating materials.
- in 2005, the National Program encompasses 41 evaluated product categories, ca 300 labeled products and 75 companies – eco-label holders.
- The Ministry of the Environment is the guarantor of the program, which is administered by CENIA, the Czech Environmental Information Agency (formerly the Czech Environmental Institute).
- the Czech Republic was the first post-communist country to develop a successful national eco-labeling program.
- In 2000, the Czech Eco-labeling Program became part of the Global Eco-labeling Network (GEN), an organization currently (2005) associating more than 35 most significant world eco-labeling programs.
- In the Czech Republic, the National Program is being implemented in parallel with the EU Eco-label Scheme and the eco-label "Environmentally Friendly Product" is awarded together with the EU eco-label "The Flower".

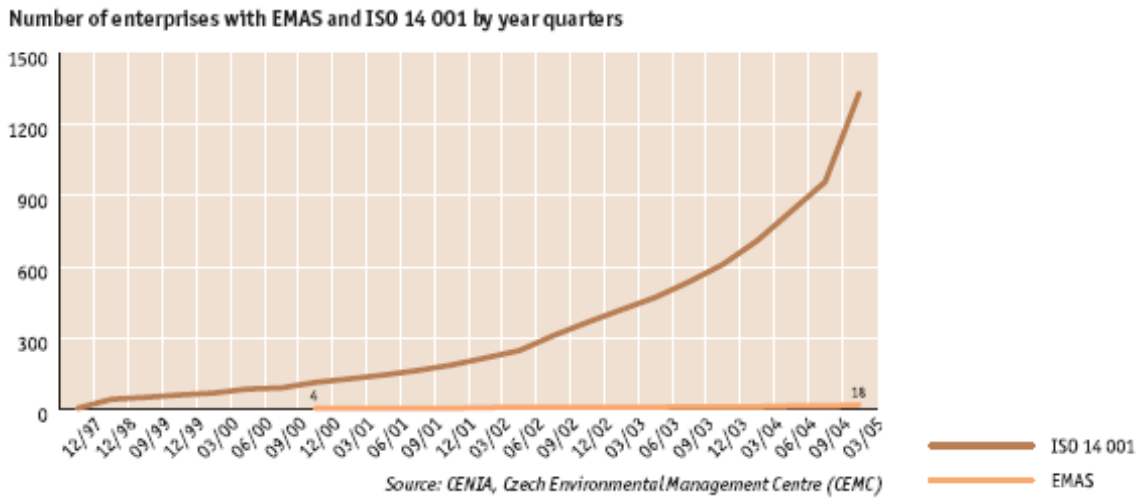
Logo of the Czech ecolabel and the logo of the EU´s "The Flower"

Cleaner Production

- The first (demonstrational) Cleaner Production project in the Czech Republic was carried out in Chemopetrol, Litvínov in 1992–93; initiated by the Czech Environmental Management Centre (CEMC), it was implemented by the World Environmental Centre; It resulted in a reduction in VOC emissions as well as annual savings in the amount of CZK 4 mil.
- In 1999, the Czech Republic joined the International Declaration on Cleaner Production which was proclaimed at the international level in Seoul, South Korea in 1998.
- In 2004 the functions of the NCPP Agency and of the National Cleaner Production Centre were entrusted to the Czech Environmental Institute (today's CENIA).
- During the 12-year history of Cleaner Production in the Czech Republic, 118 projects were implemented in businesses from the fields of light and heavy industry, transportation, chemical and textile industry, health care, food industry, costume jewellery production, agricultural primary production, bakeries, brewing as well as forestry. 32 % of these projects resulted in financial savings. In the year following the Cleaner Production implementation, 37 businesses saved a total of CZK 177 million.
- voluntary program, preemptive measures to increase efficiency of utilization of inputs (raw materials), elimination of toxic and dangerous materials from production, prevention of waste…

National EMAS Program

- EMAS = Eco-Management and Audit Scheme
- The EMAS system entered into force in April 1995 and it was opened mainly to businesses from the production (industrial) sphere.
- The EMAS Program Council and the EMAS Agency were established as bodies responsible for the EMAS implementation in the Czech Republic.
- updated in 2002, the main purpose was to extend the applicability from the field of industry to all economic sectors (incl. public institutions), to strengthen the compatibility between EMAS and ISO 14 001 by using ISO 14 001 as an essential EMAS basis and to encourage the participation of SME (small and medium enterprises) in the program.
- ISO 14 001 surpasses EMAS as regards the number of certified businesses mainly for economic reasons: ISO is the less demanding option, valid worldwide and its implementation is currently seen as a full market factor.
- This trend is apparent all over Europe, despite the pressure from EU authorities to implement EMAS.



- The Czech Republic ranks seventh among the European Union Members concerning the number of ISO 14 001 certificates (2004/2005).
- Among enterprises with EMS (ISO 14 001 + EMAS) manufacturing enterprises prevail, by which accepting environmental system is caused by competitive pressure.
- companies can voluntarily participate after fulfilling the following criteria:
    - preliminary environmental audit
    - implementation of management system (problem-goal-solution-result-evaluation)
    - preparation of an environmental statement (public)
    - audit of the system by authorized auditor (once a year evaluation of the environmental statement, every 3 years evaluation of the management system)

Responsible Care

- at present 29 companies are entitled to use the label Responsible Care.
- *"Responsible Care® is the chemical industry's global voluntary initiative under which companies, through their national associations, work together to continuously improve their health, safety and environmental performance, and to communicate with stakeholders about their products and processes."* *http://www.responsiblecare.org/page.asp?p=6341&l=1*

Voluntary Agreements

- contracts between a public law entity on one side and one or more subjects on the other side
- The content of voluntary environmental agreements varies significantly.
- By the end of mid-2005, there were 7 voluntary agreements concluded in the Czech Republic.

- e.g. Agreement on Gradual Reduction in Environmental Impact of Detergents, Agreement on Packaging, Agreement on Cooperation with the Czech Business Council for Sustainable Development and Confederation of Industry of the Czech Republic, Agreement on Portable Batteries Collection, Voluntary Agreement on Reduction in Mercury Load from Dental Medical Institutions…

Environmental Managerial Accounting

- environmental managerial accounting system collects, records, evaluates and transfers to the user the information on material and energy flows, flows of all types of waste and waste management, as well as information on costs, savings and revenues relating to all activities with potential impact on the environment.
- environmental reporting at company level

International context - The concept of sustainable development and Local Agenda 21

"Sustainable development means development which satisfies current needs without compromising the possibilities for future generations to fulfill their own needs."

(UN World Commission on Environment and Development led by G. H. Brundtland, the report "Our Common Future," 1987).

- The concept of sustainable development in the meaning of the first 1987 definition has been implemented in the Czech Republic since the very beginning of the evaluated period.
- The 1990 environmental policy – Rainbow Program – lists "the concept of sustainable development against economic growth leading to high consumption of natural resources" as the primary principle used by the Ministry of the Environment within its activities.
- With different intensities and wordings, the principle of sustainable development has been endorsed by all environmental policies so far.
- In the 1990s this concept was implemented mainly through activities associated with the Agenda 21 adopted at the 1992 conference in Rio de Janeiro.
- The Sustainable Development Strategy of the CR was approved in December 2004.
- The Strategy is also intended as a long-term framework for political decision-making in the context of international obligations assumed or to be assumed by the Czech Republic on the basis of its membership in the UN, OECD and EU, but respecting the specific conditions and needs of the country. The promotion of the Local Agenda 21 is a part of the Sustainable Development Strategy.
- **Local Agenda 21**
    - The Agenda 21 from Rio had a positive worldwide acceptance and the term Agenda 21 became a synonym for sustainable development.
    - in CR, this activity began to develop in 1997, mainly with foreign financial assistance to projects of NGOs. At the same time, the Ministry of the Environment (MoE) started to support LA21, mainly through the Czech Environmental Institute (CEI), today's CENIA.
    - LA21 is one of the objectives of the current State Environmental Policy (SEP) for 2004–2010 and is also supported by the State Program of Environmental Education.

- http://www.cenia.cz/__C12572570032F2DB.nsf/$pid/MZPMSFIV6OXM

  Local Agenda 21 *is a tool for the implementation of the principles of sustainable development at the local and regional levels. It is implemented at a specific time and place, in a municipality or a region. It is a process which through improving the administration of public matters, allowing for strategic planning (management), involving the public and using the achieved level of knowledge of sustainable development in individual areas, enhances the quality of life in all respects and heads towards citizens' taking responsibility for their lives as well as for the lives of other organisms in time and space.*

  21 *refers to what needs to be done in the 21st century, encourages people to think over a longer time-span.*

Right of Access to environmental information

- demand for environmental information during the 1990s was so significant that a law on right to access to environmental information was passed (1998) before adoption of a general law on free access to information (1999)
- Act No. 123/1998 Coll. ensures access to information on the comprehensive state of the environment, environmental pressures and impacts, exploitation of natural resources, impacts of construction, human activities and industrial technologies, and to information on the environment protection measures
- Unified information System on Environmental Issues
  - there was an attempt to centralize the outputs of the individual data sources in one supercomputer in the Centre of Environmental Information, but the technical solution was underestimated.
  - after the failure of the centralized solution the Ministry of the Environment concentrated its attention to setting up the individual information subsystems

ENVIRONMENTAL INFORMATION SYSTEMS

Information System of Nature Conservation *www.nature.cz*

- *Locations, botany, zoology, small-area nature reserves, specially protected trees (memorable trees), geology, remote sensing, aerial photo archive, etc.*

Central Nature Protection Register *www.nature.cz*

- *List of national natural monuments, national natural reserves, natural monuments, natural reserves and natural parks.*

Hydroecological Information System *http://heis.vuv.cz*

- *Models of the water volumes and quality, watercourses, surface water facilities, water utilities, sampling and water discharge sites, time series, map layers.*
- *Groundwater and surface water hydrology, water quality, volume, hydrologic forecast, hydro fund, etc.*

Air Quality Information System *www.chmi.cz*

- *Register of emissions from large pollution sources, emission balance, consumption of principal fuels, emission density, etc.*

- *The current state of atmosphere, ground ozone, air quality monitoring, air pollution models, atmospheric deposition (S, N, H, Pb, Cd, Ni), precipitation, airborne monitoring, etc.*

Meteorological and Climatic Information System *www.chmi.cz*

- *Weather forecast, wind forecast, European forecast map, early warnings, biometeorological forecast, UV index, lightning and tornadoes detection system, etc.*

Waste Management Information System *http://ceho.vuv.cz*

- *Register of waste and packaging management, waste dumps and facilities for waste treatment, use and disposal, information on waste production and disposal, etc.*

Environmental Burdens *http://map.env.cz*

- *Site remediation, old waste landfills, elimination of environmental burdens caused by the former Soviet Army.*

Decisions and Penalties of the Czech Environmental Inspectorate *www.cizp.cz*

- *Charges for pollution sources and discharge of waste water into surface water.*

GeoInformation System *www.geology.cz*

- *Geo-database "GeoČR" 25, 50, 500 – GIS of digital geological maps. A digital atlas of the Czech Republic GEOČR 500, a geological database GEOČR 1:25000, other geo-databases such as important geological locations, a litho-geochemical database, petrographic and mineralogical analyses, a geo-database of radon risk maps 1:50 000, geochemistry of surface water, geochronology of rocks, GEOMON – monitoring of small catchment areas, database of petrographic and mineralogical analyses, etc.*

Mineral Resources Information System *www.geofond.cz*

- *Maps of protected raw material deposit, other deposits, survey areas*

Geofund *www.geofond.cz*

- *Bore-hole register, landslides, deposits, undermined areas.*

Information System of Environmental Impact Assessment *www.cenia.cz*

- *Subjects under EIA, activities, authorised persons, etc.*

IPPC Information System *www.ippc.cz*

Decisions of the Minister of the Environment, proposed by the State Environmental Fund *www.sfzp.cz*

Natura 2000 *www.nature.cz*

Alternative Energy Sources *www.vukoz.cz*

Non-productive Plant Gene Pool *www.vukoz.cz*

Register of approved GMO and Register of GMO Users *www.env.cz*

Information System of Public Library and Information Services *www.env.cz*

Integrated Pollution Register *www.irz.cz*

INTEGRATED POLLUTION AND PREVENTION CONTROL

- Directive 96/61/EC on **integrated pollution prevention and control (IPPC)** is one of the most important but also most difficult **EC regulations** on the environment to interpret
- http://europa.eu/legislation_summaries/environment/waste_management/l28045_en.htm

- *The European Union defines **the obligations** with which industrial and agricultural activities with a high pollution potential must comply. It establishes a procedure for authorizing these activities and sets minimum requirements to be included in all permits, particularly in terms of pollutants released. The aim is to prevent or reduce pollution of the atmosphere, water and soil, as well as the quantities of waste arising from industrial and agricultural installations, to ensure a high level of environmental protection.*

- The directive provides for **individual emission limit values**, e.g. air or water pollution.
- IPPC is also important in **waste prevention**, or the **economical use of raw materials and energies** as binding operating conditions given in the integrated permitting can also specify requirements of this kind.
- in CR about 1500 installations fall within the IPPC process
- The Act No. 76/2002 Coll., Annex 1, states 6 categories of installations, which can operate only with an integrated permit from the end of 2007 onwards.
- As of June 30, 2005 the most integrated permits are issued for category 6 (other installations), especially for slaughterhouses, milk treatment and processing, poultry and pig breeding, and surfacing. On the contrary industrial companies for cellulose production, pre-treatment and dyeing of fabrics or textiles and for leather and pelt tanning have not joined the IPPC process.
- Reports for the 2007 reporting year were filed by 775 organizations in total on behalf of 1232 facilities. In comparison with the reporting year 2006 the number of reporting facilities increased by 135. 1139 (93 %) of the total number of 1232 reports referred to amounts above the threshold values. 109 facilities reported the quantity of waste transferred off –site only, without referring to any substance releases or transfers.
- EU Members (and their relevant institutions) are responsible for auditing the reported data and compliance with the directive

INTEGRATED POLLUTION REGISTER

- The **Czech Integrated Pollution Register (CIPR)** is a database of selected pollutants, their emissions and transfers in compliance with the requirements of the European Pollutant Emission Register (EPER).
- Since the data in the database has a geographic location (company, plant), the CIPR can be used to determine the quality of the environment in a given place.
- used to monitor the success of environmental policies.
- By facilitating access to the pollution sources' emission data CIPR promotes public participation and control, contributing to more responsible environmental behavior of the companies. Industrial and agricultural enterprises may use the data from the register as an environmental management tool (reduction of inputs, implementation of new technologies).
- The register contains information on the release of the registered pollutants into air, water and soil (emission) and the pollutants contained in waste and waste water of production facilities (also known as transfer).
- The obligation to report in terms of the CIPR is effective only if the amount of a released pollutant over a calendar year is equal to or exceeds the threshold level, as specified in Governmental Decree No. 368/2003 Coll.

- The **Central Registration Office (CRO)** unifies and facilitates reporting on the use of a registered substance and its emission in water, air and soil. The objective is to unify all environmental reporting through the CRO so that the environmental portal is used as a single output and the CRO as a single input of the sector.

Environmental Education and the role of NGOs

- Environmental education leading to responsible behavior not only with respect to society, but also towards nature, has been involved in the Rainbow Programme from 1990.
- Non-governmental non-profit organizations dealing with environmental protection were started from “scratch” after 1989. Only some conservationist organizations, e.g. Czech Union for Nature Conservation or the famous Brontosaurus movement, survived the previous regime. At the moment there are more than 420 non-governmental environmental organizations in the Czech Republic.

Public opinions