

6. Sustainable development

In 2004, the Government of the CR approved a document concerning the strategy of sustainable development. Among its points of departure is a new extended conception of sustainable development. The need to ensure the balance in economic, social and environmental developments becomes a starting point of strategy in the modified approach. An important task in this connection is to prepare an adequate set of indicators tracking the character of contexts and risks of sustainability of development between its main pillars.

Two sets of indicators have been prepared on the basis of this challenge. The first set of indicators tracks links between the development of economic and social pillars. They are proportional indicators where the economic pillar represents the movement of GDP or of labour productivity. Indicators describing social development are assigned to this pillar. The purpose is to find out the level of discrepancy or risk of sustainability in prevailing tendencies. Data relevance and availability was the criterion for selection of indicators. The set of indicators is predominantly represented by characteristics of living standard such as household consumption, real wages and salaries, social expenditures, or unemployment rate which are compared to the sufficiency of economic performance. Attention is also focused on long-term trends in the development of relations between incomes and expenditures of the pension scheme and of the public health system. The position of the CR according to international comparisons is mentioned in some cases.

The second set of indicators is intended to monitor the impact of economic growth on the environment. The purpose is finding out the nature of decoupling the growth of economic performance from the trend of air and water pollution. The set also includes indicators measuring environmental burden, using characteristics of energy, material and transport intensiveness. To complete the findings on development trends in the CR, information is added on international comparisons allowing the indication of the CR's position and of the level of deviations from the standard achieved in the EU.

6.1. Contexts of economic and social developments

- **Imbalance of growth of household consumption and GDP**

Whereas equilibrium of growth of household consumption, GDP and domestic demand is gaining ground in developed economies as a long-term development trend of the macro sphere, the CR shows differences. Between 1996 and 2004, household consumption grew by 3.6% and GDP by 2.5% a year on average. Among the underlying causes of this development was an exceptionally favourable combination of factors supporting household consumption such as low inflation, excessive growth of real wages and salaries compared to growth of productivity, and in last years also favourable conditions for receiving consumer loans. This resulted in a decrease in household saving rate which will make the preparedness of households for the reform of the pension scheme more difficult.

- **Discrepancy between developments of GDP and domestic demand**

A similar discrepancy was recorded for development of GDP (+2.5% a year) and growth of domestic demand (+3.6% a year). The cause of this development was insufficiently flexible adaptability of domestic supply to domestic demand which resulted in excessive growth of external imbalance on the current account of the balance of payments. The difficulties of financing external imbalance may increase in the period after privatisation processes have been completed.

Table 16 GDP, domestic demand, household consumption

Y-o-y change in %, constant prices

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Avg. of 96-04
Household consumption	5.5	5.8	8.8	1.4	-1.5	2.2	2.9	2.8	2.7	4.9	2.4	3.6
Domestic demand	6.7	8.3	7.0	-0.9	-1.1	0.9	3.8	3.6	2.8	4.2	4.5	3.6
GDP	2.2	5.9	4.2	-0.7	-1.1	1.2	3.9	2.6	1.5	3.7	4.0	2.5

Source: CZSO, OECD

- **Discrepancy between trends of insurance premiums and social benefits**

The process of population ageing strongly affected the trend of social benefits. In 1997-2004, deficit between social incomes and expenditures ranged between CZK 14 and 35 billion a year. In comparison to 1997, social expenditures grew by CZK 108 billion in 2004. Higher increases in social expenditures than GDP growth and prolongation of the high deficit of the pension account are not sustainable in the long

term because they would lead to an excessive growth of state debt and to a reduction of room to manoeuvre the expenditure side of the state budget.

Table 17 Development of social security incomes and expenditures

CZK mil.

Year	Insurance premiums, total ^{x)}	Social benefits, total	Difference
1997	191 004.2	205 446.4	-14 442.2
1998	203 909.7	221 856.5	-17 946.8
1999	210 886.6	238 009.0	-27 121.4
2000	222 176.1	256 055.8	-33 879.7
2001	242 320.2	274 361.2	-32 041.0
2002	258 512.7	293 413.9	-34 901.2
2003	272 365.8	305 067.6	-32 701.8
2004	293 304.0	313 291.5	-19 987.5

Source: MF CR

^{x)} Social security insurance premiums and employment policy contributions.

• **Imbalance between incomes and expenditures on old-age pensions**

There was a very dynamic growth of expenditures of the pension account in 1997-2004 – by 6.2% a year on average. In terms of volume, expenditures rose by CZK 79 billion. The growth of incomes of the pension scheme was not high enough to cover the rate of growth of expenditures, so that the deficit of the pension account was between CZK 15 and 16 billion in 1999-2003. The premium rate was therefore raised from 26% to 28% in 2004, which allowed the coverage of the expenditure side of the balance by incomes of the pension account. Prolongation of the hitherto development trend is not sustainable in the long term because it generates strong pressures on the income side of the state budget and thus on increasing burden of taxation.

Table 18 Development of incomes and expenditures on the pension account

CZK bn

Year	Pension insurance premiums	Pensions	Difference
1997	146 332.5	151 115.0	-4 782.5
1998	156 337.8	166 121.3	-9 783.5
1999	161 827.0	177 854.2	-16 027.2
2000	170 456.6	186 851.7	-16 395.1
2001	185 952.6	201 110.0	-15 157.4
2002	198 423.8	213 647.8	-15 224.0
2003	209 584.9	225 832.8	-16 247.9
2004	243 232.9	230 896.8	12 336.1

Source: MF CR

• **Discrepancy between trends of wages and salaries and labour productivity**

In 1996-2004, real wages and salaries grew at an average annual rate of 4.2%, whereas labour productivity by a mere 2.7% a year. Increase in labour productivity was higher only in 1998 and 2000. An interesting finding is that wages and salaries grew faster than productivity both in the expanding stages of business cycle, i.e. in 1994-1996 and 2000-2004, and in the period of recession, i.e. in 1997-1999. The continuation of the trend of higher increases in wages and salaries than in labour productivity in the future would arise the risk of weakening competitiveness of Czech products and, as the case may be, increasing inflationary pressures.

Table 19 Wages and labour productivity

Y-o-y change in %, constant prices

	1996	1997	1998	1999	2000	2001	2002	2003	2004	Avg. of 96-04
Labour productivity	3.1	0.1	0.8	4.0	4.6	2.1	0.8	4.6	4.2	2.7
Real wages	8.7	1.3	-1.4	6.2	2.4	3.8	5.4	6.5	3.7	4.2

Source: CZSO

6.2. Contexts of economic and environmental development

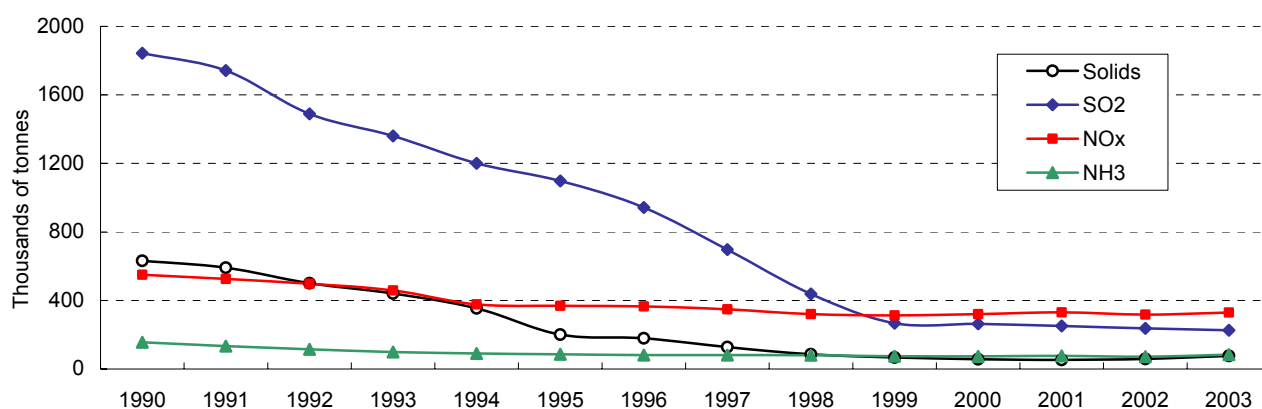
- **Considerable reduction of sulphur dioxide and solids**

In the reference period (1990-2003), emissions of all the main air pollutants in the CR fell. Among them are particularly solids and so-called “acidifying substances”, sulphur oxides, ammonium and nitrogen oxides.

During the 1990s, the largest fall was recorded for sulphur dioxide (-90%) which was a unique result worldwide within such a short period of time. Its trend still moderately decreases (by roughly 4% a year on average in 2000-2003) and emissions are kept below international limits⁷. Emissions of nitrogen oxides dropped by 42% in the reference period. The decrease was particularly due to stationary sources and new incineration technologies. On the other hand, transport contributes to increasing emissions, so that environmental burden is actually stagnating. The reduction of these emissions is still a worldwide problem, mainly in big cities. Emissions of ammonium were decreasing up to 2002 and were already below the EU limit⁸ for 2010. After emissions from agriculture and from mobile sources were added in 2003 according to a new methodology, emissions of ammonium will have to be further reduced.

Emissions of solid pollutants (from incineration of solid fuels, construction activity, tyre and brake abrasion, etc.) showed a decreasing trend during the reference period from 631.1 thousand tonnes in 1990 to 76.4 thousand tonnes in 2003. A slight increase in 2003 was likewise affected by a more rigorous methodology of observation.

Graph 26 Emissions of main pollutants



Source: Ministry of the Environment of the CR

- **Emissions of greenhouse gases stagnating since 1995**

Carbon oxides have the biggest share in greenhouse gases which raise the temperature of the earth's surface and influence the climate, the sea level and world agriculture. Global emissions of carbon oxides have risen by 70% since 1970, particularly due to developing countries. While especially electricity generation participated in production of these emissions in previous decades, transport is the main source of growing emissions in the last two decades.

Total emissions of greenhouse gases⁹ in the CR showed a falling trend from 1990, with economic reduction and transformation and with the switch from solid fuels to natural gas and liquid fuels. These emissions have fluctuated since the second half of the 1990s without any distinctive trend. During that period, the volume of CO₂ emissions was reduced and is kept below the Kyoto Commitment. The shares of the economic sectors in emissions of greenhouse gases from incineration processes in 2003 were as follows: energy producing processes 48.3%, production processes

⁷ The target limit for emission of sulphur dioxide in 2010 is 283 thousand tonnes according to Göteborg protocol and 265 thousand tonnes according to Directive No 2001/81/EC. Emissions of this pollutant in the CR reached 226 thousand tonnes in 2003.

⁸ Directive No 2001/81/EC.

⁹ Greenhouse gases — halogenated hydrocarbon (freon) gases, nitrogen oxides, methane and CO₂ are converted to CO₂ equivalent. Leaving aside water vapour, carbon dioxide (CO₂) which makes up roughly 70% is the most important greenhouse gas.

¹⁰ Fugitive emissions are emissions from mining and quarrying, treatment and all kinds of manipulation of fossil fuels (leakage from gas pipes, methane liberation from extracted coal, etc.).

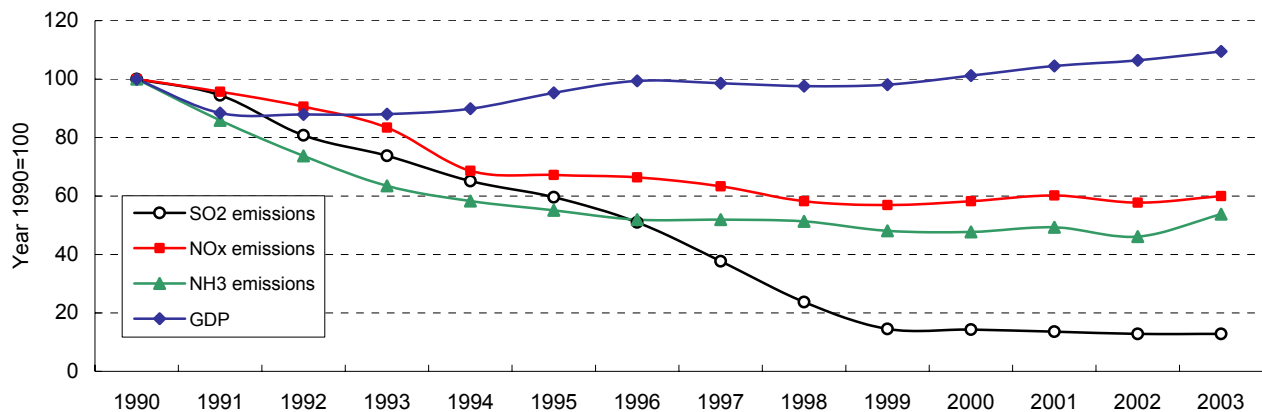
22.5%, transport 11.4%, other 13% and fugitive emissions¹⁰ 4.7%.

- **Weakening pressures of economic growth on the environment**

Data on economic and environmental development indicate decoupling of GDP development from air pollution, mainly in terms of emissions of sulphur oxides and emissions of solids. Emissions of nitrogen oxides (NO_x), which develop not that fast but in the same direction as GDP, remain the most important challenge.

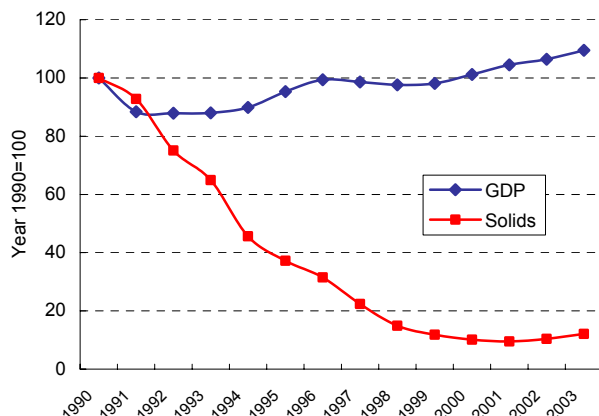
We can also observe decoupling of the trend of emissions of greenhouse gases from GDP development. Comparison of these two indicators serves as an indicator of energy intensiveness of the economy.

Graph 27 Emissions of acidifying substances and GDP

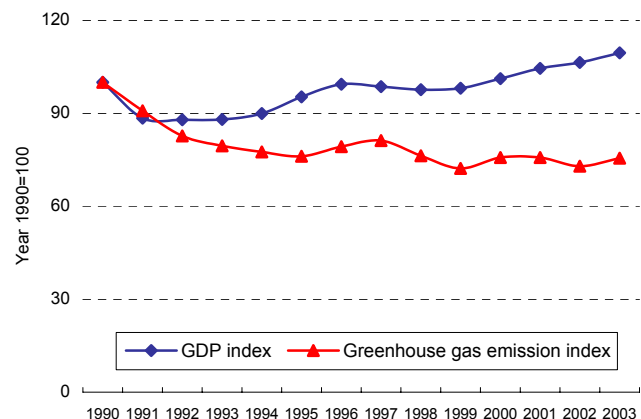


Source: Ministry of the Environment of the CR

Graph 28 Emissions of solids and GDP



Graph 29 Emissions of greenhouse gases and GDP



Source: Ministry of the Environment of the CR

Notes on Graphs 27-29: Data on GDP prior to revision due to the retaining of data comparability.

- **Position of the CR according to international comparison indicates better as well as worse results**

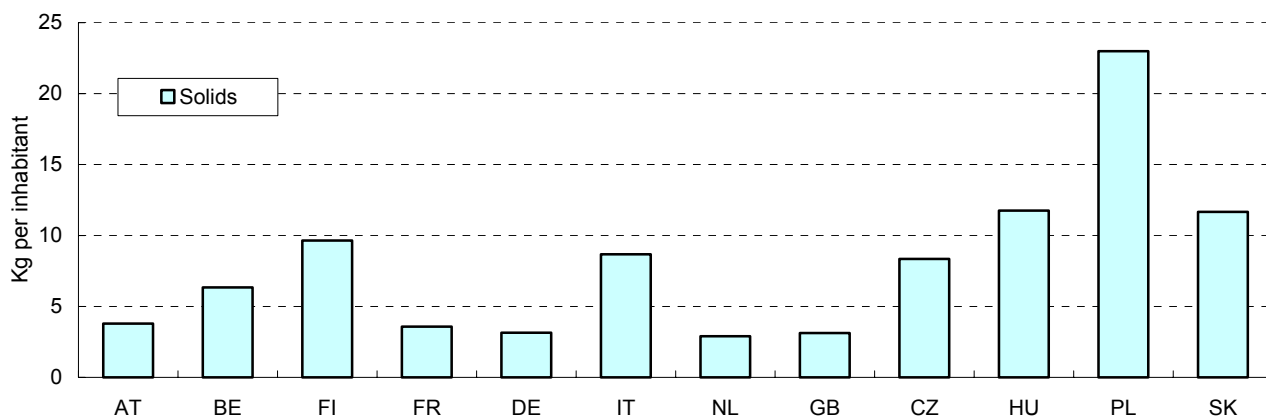
In spite of considerable improvements at the national level, the CR's situation in international context is not that good. If calculated per capita, the CR is still among the marked air polluters by acidifying substances. Emissions of SO₂ are 25.3% above the EU15 average and the production of nitrogen oxides of 30.9 kg per capita exceeds by 14.4% the EU15 average of 27.0 kg per capita. Comparison of emissions of solids is relatively favourable for the CR, mainly comparison with the Visegrad Four countries. Emissions per capita of nitrogen oxides as of the main greenhouse gas are in the CR by a third higher than the EU15 average.

Table 20 International comparison of emissions of acidifying substances, 2002

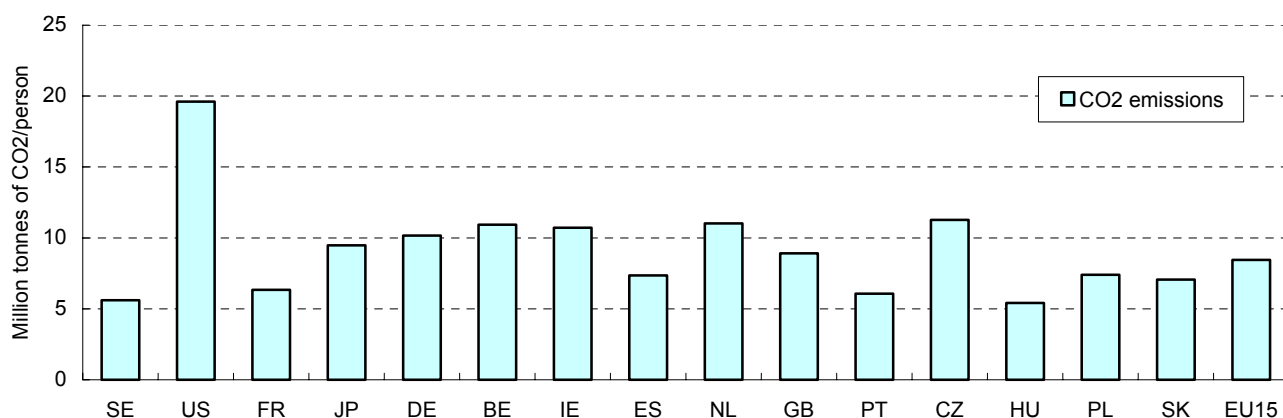
Kg/inhabitant	AT	NL	DK	LV	SE	DE	FR	BE	GB	PT	CZ	IE	HU	SI	EU15*
SO ₂	4.46	4.74	4.77	4.98	6.75	7.41	9.18	15.32	17.05	20.83	23.30	26.54	35.25	36.45	18.6
NO _x	25.35	27.06	37.84	17.46	28.22	18.21	23.11	28.43	26.90	26.90	31.20	34.54	17.63	30.61	27.0

Source: Ministry of the Environment of the CR

* Data for the EU15 mostly refer to 1997-2000, exceptionally to 2001.

Graph 30 International comparison of emissions of solids, 2002

Source: Ministry of the Environment of the CR

Graph 31 International comparison of emissions of CO₂ per person, 2002

Source: Ministry of the Environment of the CR, OECD

- Reduction of energy intensiveness halted**

Whereas primary energy sources were decreasing in the 1990s, growth resumed from 2000 (+2.7% a year). Their volume in 2003 was close to that in the first half of the 1990s. This development strongly affected the trend of energy intensiveness, which decreased during the 1990s from 0.36 (coefficient of energy sources related to GDP) in 1990 to 0.30 in 1999. Between 2000 and 2003, energy intensiveness actually stagnated. The rate of GDP growth was nearly the same as the growth of primary energy inputs.

In comparison to the EU average, energy intensiveness of the Czech economy was 1.8 times higher in 2003, and this proportion was actually stable in 2000-2003. Low energy intensiveness is reported by Ireland (0.12), Austria and Denmark (0.15).

Table 21 Energy intensiveness
(primary energy sources in oil equivalent tonnes per GDP unit (USD 1 000))

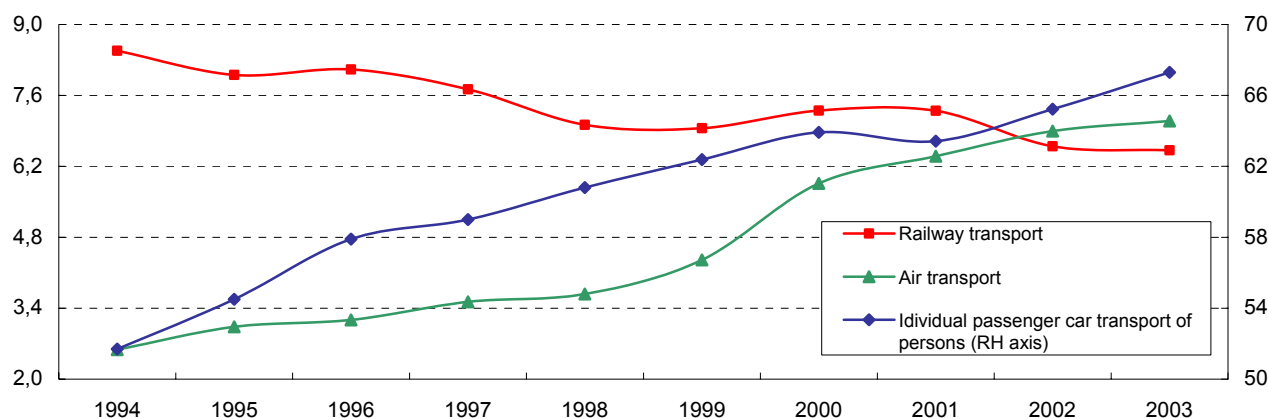
	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CR	0.36	0.35	0.33	0.33	0.32	0.32	0.30	0.31	0.30	0.30	0.31
Avrg. of EU15	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17

Source: Statistical Factbook, OECD, 2005

• **Individual transport on the increase**

After energy, both goods and passenger transport causes a heavy environmental burden. Outputs of passenger railway transport fell by 23.1% in 1994-2003. The opposite trend was recorded for passenger transport by air and by road (cars). The former grew 2.75 times; the latter increased by 3% a year on average. As to environmental burden by transport by road, increasing intensity outweighs the benefits of technological progress.

Graph 32 Passenger transport outputs (passenger-km in billions)

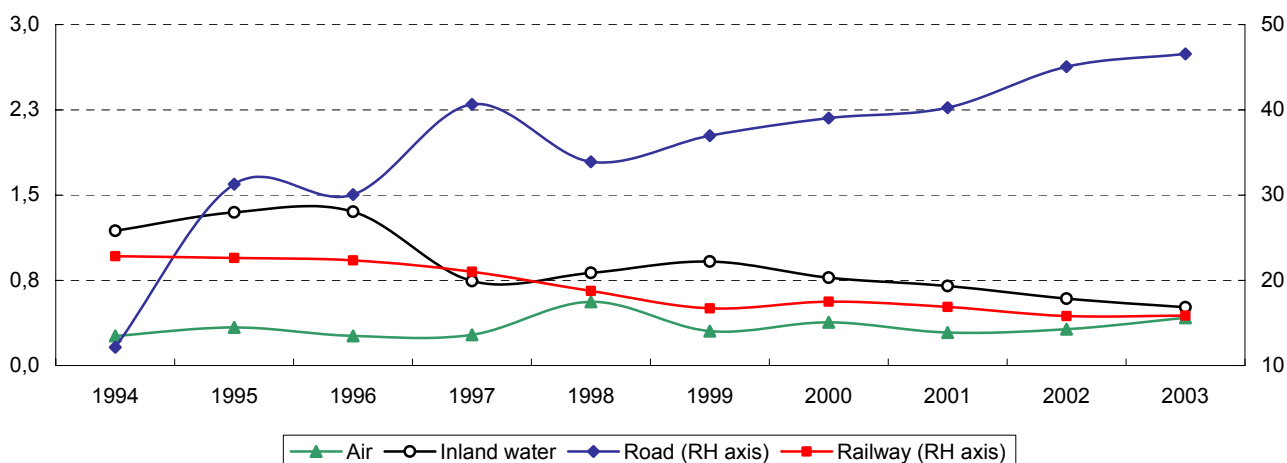


Source: Ministry of Transport of the CR

• **A marked rise in outputs of goods transport by road**

Outputs of goods transport by road, accounting for as much as 71.9% of total goods transport in 2003, recorded a growing trend in 1994-2003. Outputs of goods transport by railway gradually decreased in the same period, the fall being 30.5% in 2003 against 1994. The proportion of these two most important kinds of goods transport reversed in 1995, when goods transport by road got ahead goods transport by railway and strengthened its position. Outputs of goods transport by air were considerably volatile, growing by 12.8% a year on average in the same period. Outputs of inland goods transport by water lowered from 3% of total outputs of goods transport to 0.8% in 2003.

Graph 33 Goods transport outputs (tonne-km in billions)



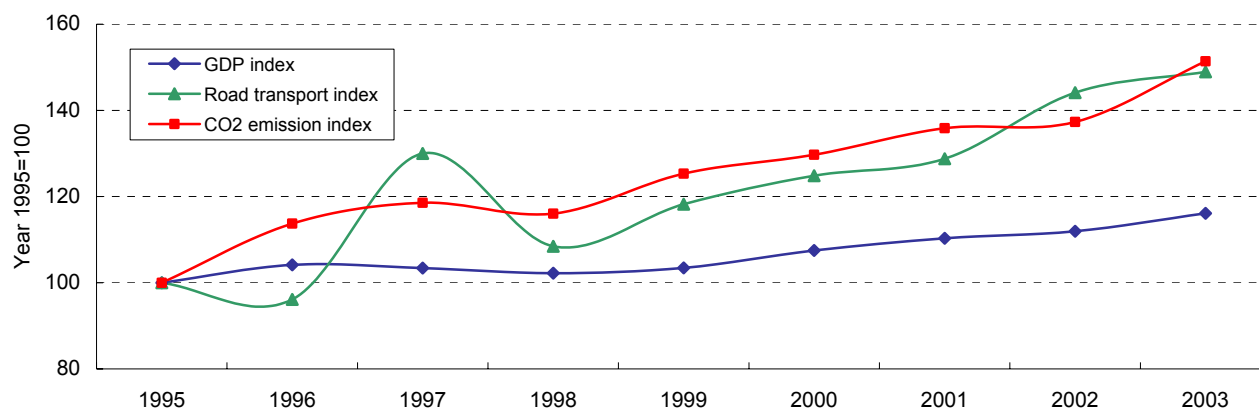
Source: Ministra of Transport of the CR

No indication of decoupling GDP development from emissions produced by transport

Total goods transport and goods transport by road, and hence environmental burden, increased in the reference period together with the growth of economic performance. Total outputs in goods transport grew by 1.8% a year on average in 1996-2003, of which outputs of goods transport by road at a rate of 6% a year, while GDP at constant prices increased by 1.9% a year in the same period. The rates of growth of GDP and goods transport by road correlated significantly (coefficient 0.85).

Emissions of carbon dioxide (CO₂) produced by transport in total were by 5479 thousand tonnes higher in 2003 than in 1995 (an increase of 51.4%). Emissions of nitrogen oxides (NO_x) stagnated in the same period. The trend of other emissions produced by transport is shown in the following table.

Graph 34 Goods transport, CO₂ emissions and GDP



Source: Ministry of Transport of the CR

Table 22 Total emissions produced by transport (thousand tonnes)

	1995	2000	2001	2002	2003
Carbon dioxide (CO ₂)	10 660	13 824	14 483	14 636	16 138
Carbon monoxide (CO)	348.4	286.5	272.5	255.5	240.3
Nitrogen oxides (NO _x)	106.4	117.5	116.4	106.4	112.9
Nitrous oxide (N ₂ O)	2.6	5.7	6.0	6.4	7.3

Source: Ministry of Transport of the CR

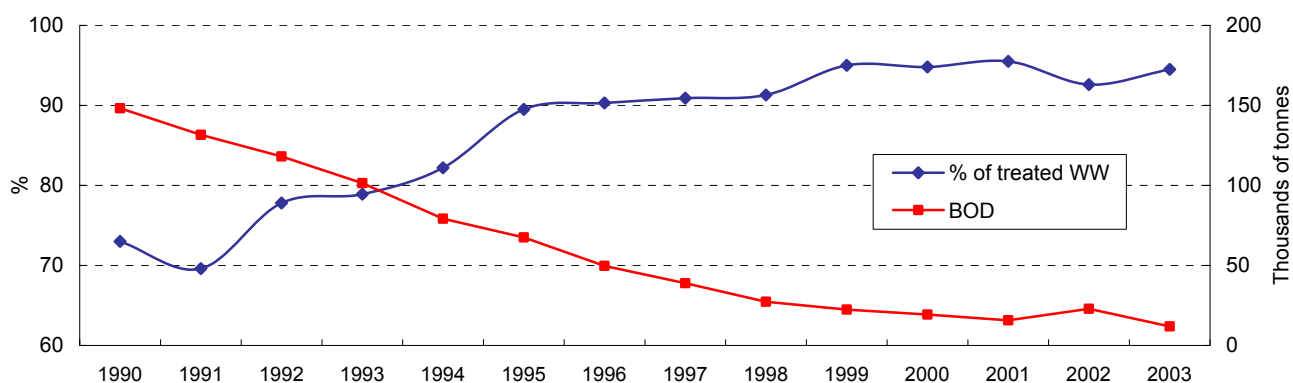
• Water pollutants on the decrease

Water pollutants discharged from point sources fell significantly in 1990-2003, specifically the indicator of biochemical oxygen demand¹² (measuring discharged organic pollutants) – by 92%. The other indicators of water pollution showed the same trend. Only the indicator of pollution by dissolved inorganic salts fluctuated without any distinctive trend.

As much as 94.5% of wastewater was treated in public sewerage systems in 2003 (73% in 1990). Both following graphs show the change of trend caused by the floods.

¹² The indicator of biochemical oxygen demand (BOD) measures discharged organic pollution and hence the pollution of surface waters. High levels indicate water pollution and danger to the aquatic ecosystem as well as more demanding drinking water treatment. Chemical oxygen demand (COD) is another indicator of organic pollution. Water is also polluted by undissolved substances and dissolved inorganic salts.

Graph 35 Wastewater (WW) treatment in public sewerage systems and the discharge of pollutants from point sources – in terms of BOD



Source: CZSO, Ministry of the Environment of the CR

- **Gradual improvement of water quality in watercourses**

At the beginning of the present century, the quality of water in watercourses was characterised by a strong decrease in class V. (highly polluted water) and slight increases in classes I. and II. (non-polluted and slightly polluted water). In 2002-2003, class III. (polluted water) prevailed, in comparison to 1991-1992 when classes IV. and V.¹³ prevailed.

¹³ According to Czech standard ČSN 75 7221.