

7. Environmental issues for sustainable development

There is growing concern that long-run sustainable development may be compromised unless measures are taken to achieve balance between economic, environmental and social outcomes. This chapter looks at two environmental issues relevant for sustainable development: climate change and air pollution. In each case, indicators are presented to measure progress and the evolution of potential problems, and an assessment is made of government policies in that area. An assessment of whether institutional arrangements are in place to integrate policy-making across the different elements of sustainable development is made in Box 7.1. Discussion on the important sustainable-development topic of pensions can be found in Chapter 2.

Climate change

Main issues

Even though its greenhouse gas (GHG) emissions in ten years time look set to be well below the Kyoto target, the Czech Republic might gain from further abatement, provided that projects can be found yielding emission reductions that cost less than the price of allowances on international markets. The country's excess allowances could then be sold abroad for a profit, or, more speculatively, could be saved to count against any future commitments for further emission reductions, when prices might be higher. The economy's low energy efficiency likely implies low-cost emission reduction opportunities. The main issues are to concentrate climate policy on abating emissions where costs are lower than international carbon price and to achieve those reductions in a cost-effective fashion.

Performance

Notwithstanding a comparatively strong decline in the course of the 1990s, the GHG emission intensity of the Czech economy is one of the highest in the OECD area (Table 7.1). High emissions per unit of output are pervasive throughout the economy. In electricity generation, where emissions per kWh even

Box 7.1. **The integration of policies across sustainable development areas**

Until the national sustainable development strategy (due to be approved by the government at the end of this year) the principal framework for the integration of environmental policies with other policies and promotion of sustainable development was contained in the *State Environmental Policy*. First issued in 1995, this government resolution has been regularly updated (in 1999, 2001 and 2004). One of the main goals of the 2004 revision is to make environmental management better articulated with the country's economic policies and to strengthen co-ordination between the Ministry of the Environment and other government departments.

A governmental council on sustainable development was established in August 2003. It has led the preparation of the national sustainable development strategy and reinforced policy coherence and integration. The council is currently chaired by the Deputy Prime Minister for Economy. Other government departments and the Parliament are also represented in the council and the council is served by working groups which provide additional platforms for co-ordination. One of the main challenges faced by the council has been to improve co-ordination amongst the large number of institutions dealing with issues in sustainable development, especially as the new three-tier administrative structure in the public sector might otherwise result in blurring the allocation of competencies across government levels.

In practice, integration remains limited as regulatory impact analysis of sustainable development policies is not systematically undertaken. The authorities have not used cost-benefit analysis as a regular policy integration tool in the past. Such analysis is required for neither policy programmes nor projects, and has only been applied to projects funded by the European Union.

On the other hand, environmental impact assessments (EIA) have been extensively applied to economic development projects since they became mandatory in 1992. Projects have sometimes had to be amended or abandoned as a result of EIAs because the environmental damage was judged to be excessive. The accession to the European Union requires the Czech Republic to subject plans and programmes to strategic environmental assessments (SEA).

rose in the latter part of the 1990s (Table 7.2), the high intensity is due to the high share of carbon-rich domestically-mined lignite and coal and brown coal in primary fuel consumption. In the industrial and residential sectors, where emissions per unit of output and private consumption declined at very fast rates in the 1990s compared with most other OECD countries, the still high intensity is linked to inefficient industrial processes and weak heating insulation (OECD, 1999). The drop in the economy-wide emission intensity was accentuated as output fell in the initial phase of the transition to a market economy and has subsequently been sufficient

Table 7.1. **Main indicators: climate change**
 Indicators of greenhouse gas (GHG) emission intensity, grams of CO₂ equivalent per \$PPP of GDP, in 1995 prices

	Total GHG emissions	CO ₂ emissions, electricity	CO ₂ emissions, transport	Other GHG emissions	Total GHG emissions	CO ₂ emissions, electricity	CO ₂ emissions, transport	Other GHG emissions
	Level, 2000				Average annual percentage change 1990-2000			
Australia	1 061	360	159	542	-1.82	-0.46	-1.52	-2.70
Austria	403	66	96	241	-2.05	-3.20	-0.02	-2.42
Belgium	600	105	97	398	-1.47	-1.27	-0.19	-1.81
Canada	888	156	183	549	-0.94	0.24	-0.85	-1.28
Czech Republic	1 082	468	100	514	-2.77	2.54	6.33	-6.58
Denmark	501	171	88	242	-2.38	-2.73	-0.84	-2.64
Finland	597	178	99	321	-2.56	-0.17	-1.83	-3.84
France	402	30	102	271	-2.00	-2.60	-0.02	-2.57
Germany	519	168	91	260	-3.92	-3.57	-1.05	-4.95
Greece	819	275	122	422	-0.16	0.07	-0.02	-0.34
Hungary	747	192	79	476	-2.60	-1.30	-0.24	-3.40
Iceland	398	0	84	314	-1.82	..	-2.47	..
Ireland	643	152	98	392	-4.63	-2.97	0.23	-6.03
Italy	432	108	89	235	-1.06	-0.43	0.01	-1.70
Japan	441	132	81	229	-0.34	0.13	0.89	-0.99
Luxembourg	314	6	249	59	-12.47	-27.09	0.62	-23.13
Netherlands	553	138	80	335	-2.49	-0.95	-1.09	-3.34
New Zealand	1 078	82	179	817	-2.21	2.87	0.80	-3.12
Norway	454	3	97	354	-2.91	-1.57	-2.86	-2.93
Poland	1 109	458	74	576	-7.12	-6.48	-1.39	-8.08
Portugal	516	129	111	276	-0.06	0.85	3.47	-1.51
Slovakia	846	249	70	526	-5.21	0.98	1.98	-7.60
Spain	536	130	127	278	0.35	1.21	0.97	-0.28
Sweden	340	35	110	195	-1.91	-1.52	-0.77	-2.56
Switzerland	267	2	78	187	-0.94	-3.82	-0.40	-1.11
United Kingdom	512	137	106	268	-3.58	-4.30	-1.41	-3.94
United States	779	273	192	315	-1.86	-0.73	-1.30	-3.04
OECD total	639	201	137	307	-1.88	-0.79	-0.58	-2.90
EU	491	120	100	272	-2.43	-2.36	-0.40	-3.10

Source: Greenhouse gas emissions: national submissions to the UNFCCC and national publications. Carbon dioxide emissions for electricity and transport: IEA (2001). GDP: OECD, SNA database.

Table 7.2. **GHG emissions and sectoral indicators**

Total GHG emissions		CO ₂ emissions per Kwh electricity	Manufacturing CO ₂ emissions per unit of output	Residential CO ₂ emissions per unit of private consumption	Road transport CO ₂ emissions per vehicle-kilometre	Electricity use per unit of GDP	Manufacturing output per unit of GDP	
Level million tonnes CO ₂ equivalent 2000	Annual average percentage change							
	1990-2000	1990-2000	1990-2000 ¹	1990-2000 ²	1990-1999	1990-2000	1990-2000 ¹	
Australia	502	1.7	0.1	-0.7	-1.1	-0.8	-0.6	-1.6
Austria	80	0.3	-3.3	-1.7	-2.4	-1.8	0.1	0.3
Belgium	152	0.7	-1.1	-0.2	-1.1	-0.8	-0.2	-0.5
Canada	726	1.8	0.7	-2.6	-2.0	-0.4	-0.5	1.0
Czech Republic	147	-2.7	-0.2	-7.7	-15.4	4.1	2.8	0.2
Denmark	69	-0.1	-3.4	-1.7	-4.0	-0.2	0.7	-0.6
Finland	74	-0.4	-0.9	-7.2	-7.0	-1.4	0.7	3.2
France	550	-0.2	-3.2	-2.4	-1.7	-0.5	0.6	0.3
Germany	991	-2.1	-1.5	-1.1	-4.0	0.7	-2.1	-1.8
Greece	130	2.2	-2.0	-0.4	2.6	-4.4	2.1	-1.7
Hungary	84	-1.8	-1.5	-12.7	-5.4	-3.3	0.2	5.3
Iceland	3	0.7	-4.9	..	-7.7	0.3	2.6	..
Ireland	67	2.2	-1.1	..	-6.2	4.8	-1.8	..
Italy	547	0.5	-1.2	-2.0	-1.4	-1.1	0.8	-0.2
Japan	1 386	1.1	-0.9	-0.8	0.1	0.3	1.0	-0.2
Luxembourg	6	-7.8	-24.6	-13.0	-2.3	3.8	-3.4	-2.2
Netherlands	218	0.4	-2.7	-1.8	-2.9	-0.1	1.8	-0.6
New Zealand	77	0.5	3.7	..	-3.2	-2.1	-0.8	..
Norway	55	0.6	0.5	0.8	-8.8	0.5	-1.9	-2.7
Poland	386	-3.7	0.5	-5.8	-6.7	-6.4	-6.9	4.4
Portugal	85	2.7	-0.9	0.7	-1.0	-0.4	1.8	-0.6
Slovakia	49	-4.0	0.8	-4.7	-7.4	2.3	0.2	2.4
Spain	386	3.0	0.0	-0.6	0.4	-0.3	1.2	-0.1
Sweden	69	-0.2	1.0	-4.7	-4.1	-1.4	-0.5	2.5
Switzerland	53	-0.1	-4.7	..	-1.7	-0.3	1.1	..
United Kingdom	649	-1.3	-3.6	-2.1	-1.9	-0.5	-0.7	-1.6
United States	7 001	1.3	-0.3	-4.0	-1.9	-0.2	-0.4	0.4
Total of above OECD Countries	14 543	0.6	-0.8	-2.2	-1.8	-0.3	-0.2	0.0
OECD excluding US	7 542	-0.1	-1.2	-1.5	-1.7	-0.4	0.0	-0.3
EU countries	4 073	-0.3	-2.0	-1.8	-2.4	-0.4	-0.2	-0.7

1. 1991-2000 for Germany and Hungary; 1992-2000 for Poland; 1993-2000 for Slovakia; 1990-1999 for Portugal; no data for Iceland, Ireland, New Zealand and Switzerland.

2. 1991-2000 for Czech Republic; 1993-2000 for Slovakia.

Source: GHG National submissions to UNFCCC, national sources and UNFCCC; carbon dioxide data, IEA; manufacturing output, private consumption, OECD.

Table 7.3. GHG emission projections for reference and high scenarios

	1990	1995	2000	2005	2010	2015	2020
Reference scenario (million tonnes CO ₂ equivalent)	187.5	142.7	141.8	126.4	128.3	123.8	121.2
High growth scenario (million tonnes CO ₂ equivalent)	187.5	142.7	141.8	141.5	141.7	146.6	145.9

Note: Projections have been constructed on the basis of the original value of the total emission balance for 1990.

Source: Ministry of the Environment.

to prevent a marked rebound as the economy recovered. Emission levels were 18 per cent below the Kyoto target in 2000. Official estimates suggest that, even in a fast economic growth scenario with unchanged policies, emission levels by 2010 are likely to be well below the Kyoto target (Table 7.3).

Policy

While not having any GHG emission abatement target apart from the Kyoto one, the authorities are pursuing policies to reduce emissions in coming years in order to sell or bank permits. The key objective is to reduce the overall energy intensity of the economy, with an explicit target of an 11 per cent reduction in energy use, measured in tonnes of oil equivalents, per unit of GDP by 2005 compared with the 1999 level (Ministry of Environment and Czech Hydro-meteorological Institute, 2001). Such an objective would result in only a slightly faster fall in energy intensity than occurred in the whole of the OECD area in the second half of the 1990s. GHG emissions trends will benefit from the commissioning of the first two units of a new nuclear reactor in Temelin that first operated at full capacity in mid-2003. When trials have been successfully completed by the end of 2004, these units will supply about a quarter of all electricity generated in the country if they operate at 80 per cent capacity and could reduce total GHG emissions by 8 per cent. The electricity company may announce in 2004 whether it would consider the construction of third and fourth units at this site as from 2009.

Although increased energy efficiency in the past is likely to have reduced GHG emissions at little or no cost, additional improvements may be expensive if the authorities pursue them by regulating and subsidising instead of further adjusting prices. A history of pricing energy below costs has contributed significantly to the country's very high energy intensity boosting GHG emissions. The regulators have gradually raised energy prices since the early 1990s, which has improved energy efficiency in most sectors of the economy. This has not only reduced GHG emissions but also lifted the output potential of the economy by releasing resources from the energy sectors to be employed more productively

elsewhere. In particular, the regulator ended cross-subsidies to the households from industrial consumers in 2002. As a result, domestic electricity prices jumped some 15 per cent, bringing them closer in to line with costs than before. Natural gas prices to households have also risen significantly between 2000 and 2003. Further price hikes might entail negative social consequences, which can be addressed through the general social safety net. Alternative policies to raise energy efficiency (such as energy audits, fiscal subsidies and voluntary agreements) are unlikely to represent an efficient means for reducing greenhouse gas emissions, given the experience of other OECD countries in this area, and building code regulations, while useful, only affect new construction.

The government aims to increase the share of renewable energy in total primary energy supply to 5-6 per cent by 2010 and to 8-10 per cent in 2020. Such a programme is at the limits of what is technically feasible given the possibilities for renewable energy sources, notably biomass (World Bank, 1999); as a result it could be costly in relation to alternative methods of reducing greenhouse gas emissions. Indeed, the government gives substantial fiscal subsidies to producers and users of renewable energy, including tax exemptions and direct investment subsidies (the latter amounting on average to 17 per cent of total investment costs). It also mandates distribution companies to buy electricity from renewable plants at guaranteed feed-in tariffs. As is the case in most OECD countries, the associated abatement costs have been very high, at around EUR 235 per tonne of saved carbon in the case of biomass and up to EUR 560 in the case of photovoltaic power.¹ Moreover, producing electricity from renewable sources also avoids emissions of local air pollutants. When those additional benefits are factored in the analysis, the estimated abatement costs are lowered to EUR 222 per tonne of saved carbon in the case of biomass and EUR 547 per tonne of saved carbon in the case of photovoltaic power. These estimates are far above the permit price on the EU emissions market, which is forecast to lie in the range of EUR 15 to EUR 73 per tonne of carbon (IEA, 2002 and Criqui and Kitous, 2003). This discrepancy suggests that promoting renewable energy is a costly way to reduce greenhouse gas emissions, needing subsidies from the government and cross-subsidies within the electricity industry to be economic, even allowing for the value of the saved local air pollutant emissions.

Climate change policies have so far not aimed at reducing the very high GHG emission intensity of electricity production. Thus, the fuel mix in electricity generation is based on commercial criteria without any official directives or taxes that would encourage the use of cleaner fuels. In this environment, it has been the most profitable for producers to use carbon-rich domestic brown coal for electricity generation. Thanks to very low extraction costs, this fuel has remained competitive even *vis-à-vis* natural gas without any production subsidies. The reluctance to impose a tax that would reduce the demand for coal is partly due to concerns about the social implications in mining communities in Northern Bohemia where

rationalisation of the coal industry has already resulted in high unemployment rates. Motivated by similar concerns and the goal of preserving energy independence, the state energy policy released in March 2004 even foresees the construction of new brown coal power plants and a relaxation of environmental regulation for brown coal mining.²

However, such choices will be increasingly costly. Pressures on carbon intensive activities will be intensified in coming years as international trading with emissions will raise the cost of coal as a fuel, providing an impetus for carbon abatement by large users in industry and power generation. The possibility to sell allowances on the world and EU markets will create incentives for carbon abatement measures. At the moment, the most pressing issue is to implement the EU emissions trading directive by putting in place the necessary infrastructure and by establishing a national allocation plan. In this respect, the EU directive requires that a minimum proportion of the permits should be issued free of charge: 95 per cent for the first trading period (2005-2007) and 90 per cent for the second period. The Czech authorities will allocate all of the first period permits without charge and plan to do so for second period permits as well. Such grandfathering amounts to transferring the scarcity rent created by the carbon constraint to past polluters. The extent of the transfer is significant as the EU emissions trading scheme will cover more than three quarters of emissions in the Czech Republic. Outside of the EU trading scheme international carbon commerce will also create economic incentives for reducing emissions because of the possibility to sell project-based carbon credits. The legal framework for the market in project-based credits remains to be finalised at the EU and international levels and is contingent upon the entry into force of the Kyoto protocol. Nevertheless, when the price at which the Czech authorities can sell carbon permits becomes clearer, it should be used as a cap on the level of marginal costs in domestic abatement programmes since more costly actions would entail a net welfare loss for the Czech Republic.

Conclusions

Although the Kyoto target is set to be attained comfortably and a programme for energy saving and use of alternative fuels in transport is in place, the very high level of emission intensity in the Czech Republic indicates unfinished business in this area. International emission trading will provide a targeted and cost-effective instrument to reduce greenhouse gas emissions. A rising price of carbon emissions will make coal use increasingly costly, which casts doubt on the consistency of pro-coal policies with long term climate change targets. One problem with the implementation of the EU emission trading scheme relates to the allocation rule that requires 95 and then 90 per cent grandfathering. The Czech authorities intend to go beyond this requirement and plan to allocate the totality of the permits free of charge in both periods. Such grandfathering involves a trans-

fer of resources to the industry which ought to be limited to the minimum mandated by EU law. Besides, when it can be ascertained, the price at which the Czech authorities will be able to sell permits internationally should serve as a benchmark for acceptable abatement costs in domestic programmes. The policy of raising energy prices closer to economic costs has proved effective in reducing emissions without causing the economy any adverse effect, and this process should be completed to stimulate energy saving. Concurrently, an excise duty on coal and other fossil fuels should be introduced in the sectors that are not covered by the trading system to avoid inducing any switch from electricity or gas to coal. Conversely, programmes to promote renewable sources ought to be scaled down until the extra costs of the programme (relative to investment in new less-polluting power stations) is in line with value of lower air pollution externalities and reduced greenhouse gas emissions. One very cost-effective way to achieve this result is to allocate renewable energy production subsidies by a competitive reverse auction. In this case, the government sets a maximum price that it is prepared to pay and invites bids from suppliers at lower prices.

Air pollution

Main issues

Air pollution is a threat to health and quality of life, and damages ecosystems and structures. The corresponding economic costs, which are often indirect and appear with a long lag, are estimated to be substantial.³ The air quality in the Czech Republic was poor at the start of the transition to a market economy in the early 1990s, but significant improvements have taken place since then. Continued improvements in the future are necessary. However, future improvements are likely to become more expensive and might lack the same public support as in the 1990s when the change in air quality was clearly visible, the main issue now is to achieve abatement at a low cost so as to limit the adverse impact in the economic dimension of sustainable development.

Performance

Notwithstanding the very significant reductions in emissions of traditional air pollutants relative to GDP in the 1990s, the economy-wide emission intensity is still relatively high (Table 7.4). Sulphur dioxide emissions per unit of GDP fell by 85 per cent in the course of the 1990s, but their level was still more than twice that of the EU average at the end of the decade, although lower than Hungary, Poland and the Slovak Republic (Figure 7.1). The high level of emissions per unit of GDP is principally due to the intensive use of sulphur-rich brown coal in electricity generation. The fall in nitrogen dioxide emissions relative to GDP during the 1990s was less striking, as a strong reduction in the emission intensity from stationary sources was partly offset by sharp increases in traffic-related emissions. In 2000,

Table 7.4. Main indicators: air pollution

	Change in emissions per unit of GDP, 1990-99 ¹			Level of emissions , 1999 ²			Improvement in productive efficiency, 1990-1999	
	Sulphur dioxide	Nitrogen dioxide	VOCs	Sulphur dioxide	Nitrogen dioxide	VOCs	Sulphur dioxide per unit of electricity output	Nitrogen dioxide per vehicle
	Per cent per year			Grams per dollar of GDP				
Australia	3.1	-1.9	-2.9	3.9	5.5	4.1	n.a.	n.a.
Austria	-10.2	-3.5	-6.5	0.2	0.9	1.2	-77.2	-32.5
Belgium	-9.2	-3.6	-4.8	0.8	1.2	1.1	-64.4	-22.6
Canada	-5.3	-2.8	-2.9	3.2	2.6	3.5	n.a.	n.a.
Czech Republic	-19.1	-6.6	-5.7	2.1	3.0	1.9	n.a.	n.a.
Denmark	-14.2	-4.9	-5.2	0.4	1.6	1.0	-79.8	-38.9
Finland	-13.0	-3.8	-4.1	0.7	2.1	1.4	-65.3	-28.7
France	-8.3	-3.8	-5.1	0.5	1.2	1.4	-52.0	-37.8
Germany	-20.1	-7.1	-8.8	0.4	0.9	0.9	-85.2	-43.7
Greece	-1.4	-0.3	-0.2	3.6	2.5	2.6	-4.6	-22.3
Hungary	-6.1	-1.1	-3.8	5.5	2.1	1.4	n.a.	n.a.
Iceland	-1.1	-1.7	-4.9	3.7	3.9	1.4	n.a.	n.a.
Ireland	-8.1	-6.3	-7.9	1.7	1.3	1.0	-35.8	-19.0
Italy	-7.6	-4.3	-4.4	0.8	1.2	1.4	-52.8	-31.3
Japan	-1.7	-1.3	-2.4	0.3	0.5	0.6	n.a.	n.a.
Korea	-8.9	-3.3	-9.7	1.6	1.9	0.2	n.a.	n.a.
Luxembourg	-18.7	-9.1	-7.9	0.2	0.9	0.9	n.a.	n.a.
Mexico	-0.4	-0.9	-9.3	1.6	1.6	1.4	n.a.	n.a.
Netherlands	-10.1	-6.5	-8.8	0.3	1.1	0.7	-50.2	
New Zealand	-0.4	-0.5	-1.6	0.7	3.0	2.6	n.a.	n.a.
Norway	-9.7	-2.8	-1.8	0.2	2.0	3.0	n.a.	n.a.
Poland	-10.0	-6.6	-4.8	5.1	2.8	2.2	n.a.	n.a.
Portugal	-2.1	-0.9	0.1	2.4	2.3	3.1	-17.7	-18.3 ³
Slovakia	-13.7	-7.4	-5.6	3.3	2.4	2.0	n.a.	n.a.
Spain	-5.8	-2.1	-3.5	2.2	1.7	3.6	-39.4	-14.4
Sweden	-8.3	-4.3	-3.9	0.3	1.3	2.1	-26.0	
Switzerland	-6.0	-5.4	-6.3	0.1	0.5	0.9	n.a.	n.a.
Turkey	3.2	1.0	0.0	3.4	2.3	1.6	n.a.	n.a.
United Kingdom	-13.9	-7.9	-6.6	1.0	1.3	1.4	-72.8	-51.0

Table 7.4. **Main indicators: air pollution** (cont.)

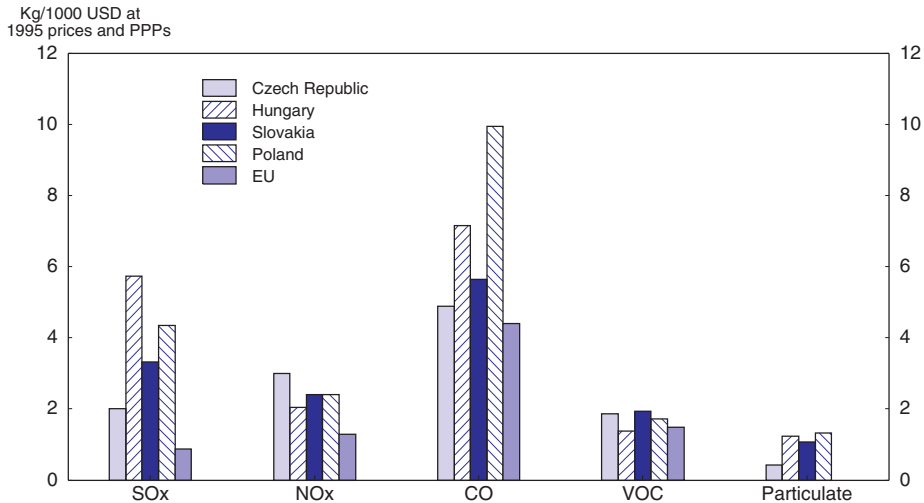
	Change in emissions per unit of GDP, 1990-99 ¹			Level of emissions , 1999 ²			Improvement in productive efficiency, 1990-1999	
	Sulphur dioxide	Nitrogen dioxide	VOCs	Sulphur dioxide	Nitrogen dioxide	VOCs	Sulphur dioxide per unit of electricity output	Nitrogen dioxide per vehicle
	Per cent per year			Grams per dollar of GDP				
United States	-5.5	-2.5	-4.7	2.0	2.7	1.9	n.a.	n.a.
European Union	-11.1	-5.0	-5.3	0.8	1.2	1.5		
OECD Europe	-10.1	-4.8	-5.0	1.2	1.4	1.5		
OECD	-6.7	-2.9	-4.4	1.5	1.9	1.6		

Note: For the OECD average data for countries with missing data for either 1990 or 1999, data for the latest year has been substituted. Estimated data for 1999 represents about 5 per cent of the area total. GDP is measured in 1995 prices. Cross-country aggregations use 1995 purchasing power parity exchange rates.

1. Australia: 1995-99 for sulphur dioxide; New Zealand: 1990-98; Mexico: 1994-98 for sulphur dioxide and VOCs and 1990-98 for nitrogen dioxide; Slovakia: 1990-98 for sulphur dioxide and nitrogen dioxide and 1990-97 for VOCs.
2. 2000 for the Czech Republic. 1998 for Mexico, New Zealand and sulphur dioxide and nitrogen dioxide in Slovakia; 1997 for VOCs in Slovakia.
3. Between 1990 and 1997 for Portugal.

Source: Cooperative Programme for Monitoring and Evaluating of Long-Range Transmission of Air Pollutants in Europe (EMEP); World Health Organisation; OECD (2002a).

Figure 7.1. Emission intensities of traditional air pollutants in late 1990s



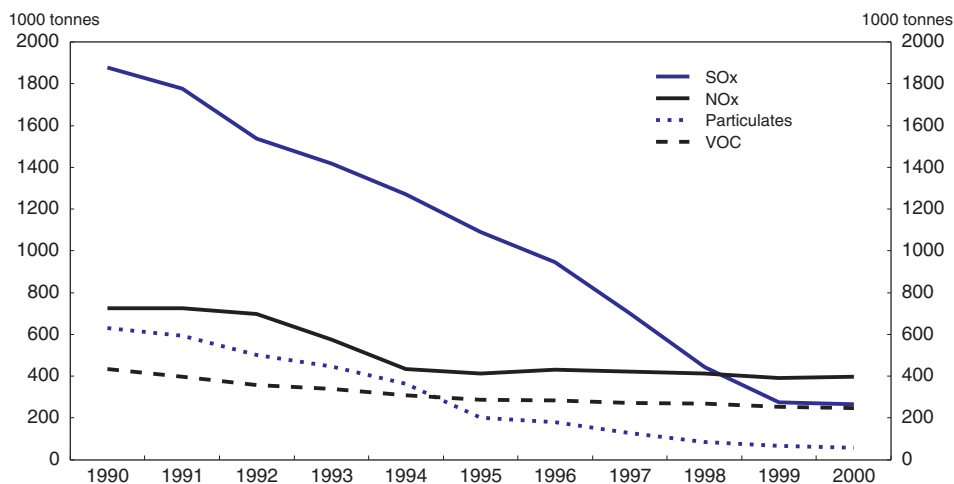
Source: OECD Environmental Directorate Statistics.

the ratio of nitrogen dioxide emissions to GDP was still double that in the EU area. On the other hand, emission intensities of volatile organic compounds (VOCs) per unit of GDP were close to the EU average even in 1990 and have generally evolved much in line with trends in the EU over the decade (Figure 7.2). The reduction in domestic emissions combined with a sharp fall in inflows of air pollutants from western Europe has reduced concentrations of sulphur and nitrogen dioxide markedly over the 1990s. As a consequence, problems related to soil acidification, smog and ozone have diminished but remain very serious in some regions of the Czech Republic.

Policy

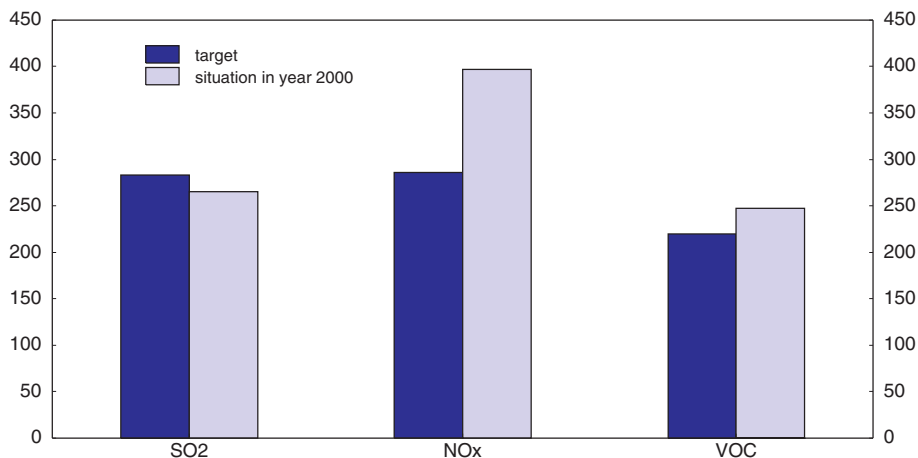
The Czech Republic is committed to reducing the emission of selected air pollutants in the UNECE Convention on Long-Range Transboundary Air Pollution⁴ (CLRTAP) (Figure 7.3). The targets established in the 1999 CLRTAP agreement imply a significant additional abatement for nitrogen dioxides and (non-methane) VOCs by 2010. By contrast, the sulphur dioxide emission target for 2010 had already been met in 1999. The 2002 Clean Air Act⁵ transposes EU directives on air pollution and protection of the ozone layer into Czech law (Commission of the European Communities, 2002). All secondary legislation in these fields has

Figure 7.2. Air pollution emissions in 1990-2000



Source: OECD environmental data, Compendium (2002).

Figure 7.3. Target in the UNECE Convention on Long-Range Transboundary Air Pollution and the situation in year 2000



Source: Ministry of Environment (2001) and OECD environmental data.

already been adopted, but limit values and emission ceilings have yet to be established.

Continued use of regulations to reduce the emission of air pollutants is likely to become increasingly expensive in coming years. The principal method so far, emission limits on new and old stationary sources based on best available technology, has resulted in significant falls in emissions. It has, however, entailed very high investment in abatement technology, exceeding one per cent of GDP in the 1990s on average. By imposing emission limits that are unrelated to their abatement costs, this approach is unlikely to deliver the lowest abatement cost for the economy as a whole. Nonetheless, studies from other countries indicate that the benefits of this policy have exceeded the costs. However, as a future member of the European Union, the Czech Republic is committed to applying emission limits to all large plants irrespective of their ages. Upgrading all large plants has been effective in reducing sulphur emissions and by 2000, the main electricity producer had retrofitted all of its coal plants with desulphurisation units to conform to current Czech legislation,⁶ significantly reducing their emissions. However, compliance with the Large Plant Combustion Directive will require a further 60 per cent reduction in emissions for the largest generating plants and more than 80 per cent reduction for smaller plants.⁷ The retrofitting of the old capital stock to further reduce emissions will be expensive and costs are likely to vary from plant to plant.

Economy-wide abatement costs could be lowered by a greater use of economic instruments. Emission charges are applied to various air pollutants, but they are generally set at too low a level to have a significant impact. For example, the emission charge for sulphur dioxide is only EUR 30 per tonne, compared with EUR 48 and EUR 3 300 per tonne in Slovakia and Sweden, respectively. Tradable emission permits for air pollutants are not used at all in the Czech Republic and might be difficult to implement as the bulk of the fossil fuel power stations are owned by one company though there are a larger number of smaller plants that are independently owned. Under these circumstances emission charges might be a more effective route but in that case taxes would have to be seen as an alternative to regulation by emission limits. Economic instruments have been employed with greater determination to discourage air pollution from diffuse sources. The road tax on commercial vehicles (levied on a per car basis) is differentiated according to the emission characteristic of the vehicle, a surcharge of 15 per cent being levied on cars from before 1990 and a discount of 50 per cent being given to vehicles that conform to the EURO 3 standard. Motor fuels are also differentiated according to their pollution content and road pricing is being considered by the government.

Conclusions

The Czech Republic has improved air quality primarily by raising energy prices and by using regulations. Accession to the EU has led to a renewed empha-

sis on regulatory measures to reduce air pollution. However, further cuts in emissions should be mainly achieved through more cost-efficient economic instruments. Raising emission charges would be a cost effective way to concentrate abatement where it can be achieved at the lowest cost. For diffuse sources of air pollution, the differentiation of the car tax according to the emission characteristic of the vehicle is a useful device to speed up the renewal of the car fleet with more environmentally friendly vehicles. However, at present it is only levied on commercial vehicles and consideration should be given to extend its coverage. Moreover, specifying the tax in terms of kilometres driven rather than on a per car basis would make it more targeted. The introduction of road pricing would also help to reduce diffuse emissions in cities very efficiently. The annual mileage tax and road pricing could be implemented for trucks at low cost since most of them will in any case be fitted with the corresponding technical devices in order to travel on Austrian and German motorways.

Notes

1. The abatement cost estimate is the quotient of the costs by the amount of GHG emissions avoided. For each renewable source, the costs considered comprise expenditure on subsidies and the difference between the feed-in tariff and the wholesale electricity price (multiplied by the corresponding volume). Additional savings come from reduced air pollution. However, in any cost-benefit study pollution savings should be evaluated against an alternative investment, an obvious candidate being the construction of a gas-fired power plant.
2. It is envisaged to transfer the responsibility for environmental regulation of brown coal mining to regions.
3. For example, the cost of air pollution in Austria, France and Switzerland was estimated to be as high as 3 per cent of GDP in 1996 (WHO, 1999).
4. This treaty addressed some environmental problems of the UNECE region and has been extended by eight protocols which identify specific obligations or measures to be taken by Parties and so lays down the general principles of international cooperation for air pollution abatement.
5. Adopted in February 2002 and entering into force on 1 June 2002.
6. The limits under the 1997 Air Act required emissions less than 500 mg of sulphur per cubic metre of exhaust gas. The Large Combustion Plant directive requires an upper limit of 200 mg per cubic metre.
7. The 1997 law sets a limit of 1 700 mg per cubic metre against an EU limit of 300 mg per cubic metre (Regional Environmental Centre, 1998).

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Glossary of acronyms

AETR	Average Effective Tax Rates
ALMP	Active labour market policy
ARP	Agency for Business Development
a.s	Joint stock company
CEEC	Central and eastern European countries
CEZ	Czech Power Company
CKA	Czech Consolidation Agency
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CNB	Czech National Bank
CPI	Consumer Price Index
CSSD	Czech Social Democratic Party
CzechIndustry	Agency for Development of Industry
CzechInvest	Agency for Foreign Investment
CZSO	Czech Statistical Office
ECB	European Central Bank
EIA	Environmental impact assessments
EMS	European Monetary System
EPL	Employment Protection Legislation
ERM II	Exchange Rate Mechanism II
ESA95	European Standard Accounting
EURES	European Employment Services
FDI	Foreign Direct Investment
FNM	National Property Fund
GFS	Government Finance Statistics
GHG	Greenhouse gas
ICT	Information and communication technology
IT	Information technology
KDU-CSL	Christian Democratic Party
KOB	Consolidation Bank
MLA	Adult minimum subsistence allowance
MLS	Minimum Living Standard
MTEF	Medium-term expenditure framework
NDC	National Defined Contribution pension scheme
NGO	Non-governmental Organisation
PIRLS	Progress in Reading Literacy Study
PISA	Programme for International Student Assessment
PPP	Purchasing power parities
R&D	Research and Development
RILSA	Research Institute for Labour and Social Affairs

Roma NGOs	Roma non-governmental organisations
SDVR	The proposed new medium-term budgeting framework
SEA	Strategic environmental assessments
SMEs	Small and medium enterprises
SNA	System of National Accounts
SZDC	Railway Infrastructure Administration
VAT	Value-added tax
VOCs	Volatile organic compounds

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BASIC STATISTICS OF THE CZECH REPUBLIC, 2003

LAND

Area (1 000 km ²)	79	Major cities, 31.12.2002 (1 000 inhabitants)	
Agriculture, 2002 (%)	54	Prague	1 187
Forest, 2002 (%)	34	Brno	387
		Ostrava	315

PEOPLE

Population (1 000)	10 211	Employment (1 000)	4 698
Inhabitants per km ²	129	Agriculture (%)	5
Natural increase in population (1 000)	-18	Industry (%)	40
Net immigration (1 000)	26	Services (%)	56

GOVERNMENT

Public consumption (% of GDP)	24	Chamber of Deputies, as at March 2003	Seats
General government total revenue (% of GDP)	42	Social Democratic Party	70
Public debt, national accounts definition (% of GDP)	37	Civic Democratic Party	58
		Communist Party	41
		Freedom Union/Christian Democratic Union	31
		– People's Party Coalition	
		Total	200

PRODUCTION

GDP, current prices (billion CZK)	2 551	Origin of value added (%)	
GDP per capita (USD, current prices)	8 864	Agriculture	3
Gross fixed investment (% GDP)	27	Industry	38
		Services	59

FOREIGN TRADE

Exports of goods and services (% GDP)	62	Imports of goods and services (% GDP)	65
Main exports (% of total merchandise)		Main imports (% of total merchandise)	
Machinery and transport equipment	50	Machinery and transport equipment	43
Manufactures	35	Manufactures	31
Chemicals	12	Chemicals	11

CURRENCY

Monetary unit: Czech koruna		Currency units per euro	
Currency units per \$, 2003	28.13	Year 2003	31.84
		Aug 2004	31.63

Note: An international comparison of certain basic statistics is given in an annex table.

Executive summary

Following accession to the European Union the big issue for the Czech Republic is to strengthen growth prospects. Growth potential at present is somewhat above 3 per cent, implying a moderate pace of catch-up to living standards in the EU and elsewhere. There is room for greater ambition in growth performance, and it is welcome to see this reflected in the programme of the new Czech government. This *Survey* underscores four main challenges.

Fiscal consolidation

Fiscal consolidation is the dominant challenge for macroeconomic policy, and is not only necessary to cope with ageing and to bring down the tax burden but is also needed to fulfil euro-area entry conditions. A welcome programme of fiscal reform has begun, including proposals for a system of multi-year aggregate spending ceilings and significant expenditure cuts. However, to date, mainly revenue-raising measures have been implemented while the full impact of expenditure measures is yet to be realised. The attempt to secure broad political consensus on pension reform is commendable, but it must be underscored that whatever reform is finally implemented, it will have to bring considerable fiscal savings. Health-care reform also has to deliver savings, but concrete proposals have yet to be made. To facilitate assessment of the true fiscal position, extra-budgetary funds need to be more fully integrated in mainstream government budgeting procedures. Also, with the further decentralisation of public services, the need for good budgeting practices and accountability in regional and municipal governments is all the more important.

A successful entry into the euro area

The Central Bank and the Ministry of Finance have formulated a transparent strategy for entering the euro area, that foresees minimising the time spent in the Exchange Rate Mechanism (ERM II). Annual reports will assess the economic conditions in relation to the Maastricht Criteria and a request to enter ERM II will only be made if the probability of a positive first assessment by the EU authorities is high. The choice of a 3 per cent inflation target for the run-up to euro entry is justi-

fiable on medium-term grounds. However there may be some difficulty communicating the consistency of this target with the Maastricht criterion for price stability. The Czech authorities should therefore pay *close attention to how the Maastricht criteria are interpreted and applied by the European Commission and the ECB and adjust their communication strategy accordingly.*

Making the environment for business more growth-friendly

Most of the catch-up in living standards will have to come from boosting productivity growth. This means swifter re-allocation of resources across firms as well as stronger in-firm productivity growth. While the Czech Republic is a strong competitor for attracting foreign direct investment, policy towards poorly performing firms and business start-ups has problems, slowing down the exit and entry of firms. Bankruptcy procedures are cumbersome, often long and usually end up in liquidation, with asset stripping not uncommon. Reforms have long-since been planned, and it is welcome that new legislation looks finally set to go ahead. The legislation aims at strengthening the role of creditors, speeding up proceedings and allowing composition to play a bigger role. Likewise, efforts to streamline business registration are welcome and should be implemented as soon as possible. The general business climate is also damaged by issues in network-industry competition, as some services, notably Internet, are expensive in international comparison.

Improving the functioning of the labour market

Mobility between jobs and regions is weak. Administrative extensions of collective wage agreements, strict employment protection legislation (EPL) on individual dismissals, rent control, severe poverty traps (particularly for families) and a high tax wedge have contributed to considerable long-term unemployment. The Roma population is hit especially hard in this respect. Migration is to some extent mitigating the labour-market rigidities with Slovaks filling skilled vacancies and other eastern Europeans (mainly Ukrainians) taking up unskilled jobs that are unattractive for locals. Tackling the unemployment problem requires measures across a wide front, but most notably social benefit reform is needed along with reduction in the tax wedge as well as easing of EPL. The widespread social and economic exclusion of the Roma needs more attention, particularly in the education system. A more open immigration policy is needed to address immediate issues such as the inconsistency between granting work permits as well as for better alignment of immigrants' skills with those needed on the Czech labour market.

This Survey is published on the responsibility of the Economic and Development Review Committee of the OECD, which is charged with the examination of the economic situation of member countries.

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The economic situation and policies of the Czech Republic were reviewed by the Committee on 11 October 2004. The draft report was then revised in the light of the discussions and given final approval as the agreed report by the whole Committee on 28 October 2004.

•

The Secretariat's draft report was prepared for the Committee by Philip Hemmings, Ann Vourc'h, Dana Hajkova and Boris Cournede under the supervision of Andreas Wörgötter.

•

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