Sustainability indicators of the City of Prague

the text based on the chapter Sustainability indicators of the City of Prague published in yearbook Prague Environment 2006, yearbook Prague Environment 2005 and yearbook Prague Environment 2004

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Sustainability indicators make the evaluation of progress towards sustainable development easier, enable to make benchmarking to recommended values and legal limits, and to compare states, regions, and cities with each other; enable to set the development objectives, and to evaluate effectiveness of resources spent. The indicators are based on principles of sustainable development, which encompass not merely environmental protection but also reinforcement of local self-government, deepening of democracy, equality, and social justice, supplies to local demands at the local level, protection of cultural heritage, harmonisation of economic development and exploitation of natural resources, etc. Many global and European initiatives (ICLEI, WHO, REC, for example) work on the creation of suitable sets of indicators and their implementation not only at national and regional levels yet also at the local levels, they also form parts of research programmes of the European Union.

The City of Prague and Sustainability indicators

In 1998 Prague got involved in the Project " **Cities Environment Report on Internet – CEROI**". Within the framework of the United Nations Environmental Program (UNEP) who supports the Project a set of indicators for the urban level was developed as well. A part of these indicators (30) was marked as crucial indicators so-called core set. Indicators appropriate to Prague were compiled and are presented here, of which mostly environmental indicators were selected. The indicator selection also reflects environmental priorities of the Strategic Plan of the City of Prague. A portion of the indicators used were also a part the set of so-called **European Common Indicators** 1).

In 2004 and within the study of "Evaluation of the Yearbook Prague – Environment and Proposal for Further Development" works on the updating of the existing set of indicators following to so far acquired experience with the set application, the ECI set of indicators applied in European cities and experience from the project TIMUR 2) and namely sets of indicators were formed within the new conceptual documents of the City of Prague (RC EEA, WMP of the City of Prague, TES of the City of Prague, and others) 3). The main outcome of the project was the proposal of new set of crucial sustainable environmental indicators of the City of Prague. The set of indicators here below is based on the set presented in recent years, for the sake of continuity of time series, yet it was supplemented with several new indicators and at the same time some of the indicators were modified.

The overview gives indicators, which express environmental stress (exploitation of natural resources, emissions etc.), indicators referring to the status of the environment, furthermore indicators of the influence and impacts of the status of the environment namely on human health, and indicators of social response to the status of the environment

Note:

1) The project of "Towards local sustainable profile – European Common Indicators" is a result of the cooperation of the European Commission (General Directorate for the Environment), European Environmental Agency, and the Expert Group for Urban Environment and was formed on the basis of consultancies with numerous European municipalities. The indicators are closely related to priorities of the Sub-Programme of the Sixth Action Programme for the Environment in Europe "Thematic Strategy for Urban Environment". Thus the system of indicators represents an instrument for the decision-making and for dissemination of information on best available techniques for sustainable development at local level.

2) Introduction of local indicators in the Czech cities and municipalities has been supported by the Team Initiative for Local Sustainable Development (Timur). Timur is an association of non-government, non-profit organisations and individuals and its core

activity is just the monitoring of sustainability indicators, quality of life and environmental quality at local level.

3) Complete sets of indicators proposed within the framework of aforementioned conceptual documents can be found at the Internet pages of the City of Prague.

Tab. - Sustainability Indicators of the City of Prague

Indicator Name	Unit	Value Year 2000	Value Year 2001	Value Year 2002	Value Year 2003	Value Year 2004	Value Year 2005	Source	Note
Annual consumption of fuel and energy per inhabitant after the conversion	GJ/capita/year	.	50,4 (out of that solid fuel 4.7 %, liquid fuel 0.4 %, gaseous fuel 41,1 %, central heat 25 %, electricity 28.8 %)	.	.	.	49,1 (out of that solid fuel 4.0 %, liquid fuel 0.3 %, gaseous fuel 40.3 %, central heat 24.9 %, electricity 30.6 %)	OIM MHMP (1996, 1998, 2001), Data for the year 2005: The Central Data Warehouse of Energy Information (CDS-EI), ÚRM 2006	Energy consumption after the conversion gives objective need for heat and energy at the inlet to premises (or technologies) . Year 1996: 54.3, year 1998: 50.9.
Annual electricity consumption per capita	kWh/capita/year	1 021,8	1 137,6	1 136,8	1 171,3	1 192,7	1 239,1	PRE, ČSÚ comp. MHMP	In 2005 share of renewable energy sources accounted for 1.0 %. 1)
Annual vehicle-kilometrest ravelled per capita	thousand vehicle-km/capita/year	4,64	4,85	5,04	5,34	5,58	5,61	ÚDI, comp. MHMP	
Total number of vehicles per capita	number/capita	0,63	0,65	0,67	0,67 2)	0,63 2)	0,635 2	ÚDI	
Air emissions NO x	tonnes/capita/year	0,015	0,019	0,018	0,019	0,020	0,017	ČHMÚ, ATEM, comp. MHMP	3)
Air emissions SO 2	tonnes/capita/year	0,0029	0,0030	0,0022	0,0022	0,0023	0.0022	ČHMÚ, ATEM, comp. MHMP	
Quality of local air – Number of exceedances of PM 10 limit value	number	.	.	**85** 74 71 (measuring stations Square of the Republic, Počernická, and Veleslavín)	**140** 74 73 (measuring stations Smíchov, Počernická, and Braník)	**135** 58 36 (measuring stations Smíchov, Legerova, and Braník)	**66** 53 43 (measuring stations Legerova, Karlín, and Vysočany)	ČHMÚ comp. MHMP	**European common indicator A5** Values for 3 stations with the highest number of limit value exceedances.
Average household water consumption	l/day/capita	143,3	137,9	134,7	136,6	130,8	126,8	PVK, ČSÚ, comp. MHMP	**CEROI Core set**

Indicator Name	Unit	Value Year 2000	Value Year 2001	Value Year 2002	Value Year 2003	Value Year 2004	Value Year 2005	Source	Note
Waste production per capita	tonnes/capita /year – total amount of waste produced	2,7	2,2	3,2	2,9	3,15	3,00	VÚV TGM, MHMP, comp. MHMP	**CEROI Core set Indicator of the WMP of the City of Prague4)**– Basic indicator I.4. Within the support to the achieving objectives of the WMP CR the objective is set to create conditions for the reduction of specific waste production (continuously) and for related indicator of specific production of hazardous waste the objective set is the reduction by 20 % till 2010 compared to the year 2000. Waste production of households – **Indicator of the WMP of the City of Prague4)I.1 9.** Within the framework of municipal waste disposal the joint duty for retake of packaging shall be fulfilled by 2010.
of which: – municipal waste	0,426	0,402	0,450	0,418	0,475	0,409			
– hazardous waste	0,272	0,225	0,309	0,181	0,105	0,160			
– household waste	0,21	0,22	0,24	0,25	0,26	0,27			

Indicator Name	Unit	Value Year 2000	Value Year 2001	Value Year 2002	Value Year 2003	Value Year 2004	Value Year 2005	Source	Note
Percentage of waste disposed by landfilling	%	11,5	10,3	18,5	11,0	7,6	7,9	VÚV TGM, MHMP, comp. MHMP	**Indicator of the WMP of the City of Prague4)**– Basic indicator I.8 (values of waste in total) The objective set is to reduce the percentage of landfilling by 20 % till 2010 compared to the year 2000.
Percentage of waste disposed by incineration	%	5,4	9,0	5,7	6,5	5,9	0,1	VÚV TGM, MHMP, comp. MHMP	**Indicator of the WMP of the City of Prague4)**– Basic indicator I.10 (values of waste in total)
Percentage of reused waste	%	12,8	8,7	22,2	29,7	38,8	36,6	VÚV TGM, MHMP, comp. MHMP	**Indicator of the WMP of the City of Prague4)**– Basic indicator I.5 (values of waste in total) Values for 2002–2004 include use of waste for land reclamation. Within the support to the achieving objectives of the WMP the objective is set to increase reuse of waste (of all produced) to 55 % by 2012. Similarly for municipal waste the objective set is to attain material reuse of 50 % by 2010.
Noise – percentage of population exposed to noise	%	.	23	.					**European common indicator B8** from road traffic
Water quality of surface watercourses	BOD (mg O 2/l)	3,41	1,74	2,14	2,53	2,21	2,10	ČHMÚ	Hydrometric profile at the Vltava River Podolí

Indicator Name	Unit	Value Year 2000	Value Year 2001	Value Year 2002	Value Year 2003	Value Year 2004	Value Year 2005	Source	Note
P total (µg/l)	0,2	0,18	0,15	0,14	0,13	0,12			
N as NO 3 (mg/l)	3,01	3,17	3,68	2,86	3,1	3,06			
The number of respiratory diseases hospital admissions per 1,000 inhabitants	Number per 1,000 inhabitants	14,7	14,8	15,3	16,2	15,4	17,6	ÚZIS comp. MHMP	
Percentage of inhabitants connected to the public sewage system	%	99,3	99,4	99,2	99,6	99,5	99,2	ČSÚ	**CEROI Core set**
Percentage of waste water treated	%	100	100	5)	100	100	100	ČSÚ	**CEROI Core set** Share of water discharged into sewerage systems, excl. rainwater
Waste water treatment – percentage of pollution removed as BOD	%	93,7	93	4)	96	97,3	97,7	PVK, ČOV, comp. MHMP	
Life expectancy at birth	years	73,29 males	73,58 males	73,71 males	73,68 males	74,1 males	74,7 males	ČSÚ	
79,03 females	79,03 females	78,94 females	79,15 females	79,6 females	80,0 females				
Area of protected areas as percentage of the City total area	% – protected areas	4,3	4,3	4,3	4,3	4,3	4,4	MHMP, ÚRM, IMIP	**European common indicator B9** nature parks - area including protected areas located inside the territory
– nature parks	19,7	19,7	19,7	19,7	19,7	19,7			
Length of marked bicycle paths and cycling routes	km – bicycle paths	.	.	.	.	89,5	93,0	Working group for bicycle transport in Prague	**Objective set:** 450 km of cycling routes (Concept of the basic system of cycling routes on the territory of the City of Prague.) 6)
– cycling routes	.	.	.	.	165	198			

1) The data are calculated from electricity consumption in households in the City of Prague and in Roztoky near Prague (PRE, a. s.; the value includes seasonal and migration effects) and the sum of inhabitants in the City of Prague and in Roztoky near Prague (CSO; mean value).

2) Data on the number of registered motor vehicles in 2003 have the error in the registry up to 130,000 vehicles as it is given in the note in chapter A7, data for 2004 and 2005 also have an error yet not specified above.

3) Since 2001 mobile source emissions have been calculated by applying a new methodology. The application of the new methodology in 2002 on small stationary sources, using the data of Census 2001, caused a relatively significant annual decrease in small source emissions.

4) WMP of the City of Prague – Waste Management Plan of the City of Prague. The values for 2002–2004 were modified in accordance to a new methodology for the calculation of the indicators of the WMP of the regions of the Czech Republic. (In the column “Note” there are selected basic objectives given only, their exhaustive list is given in the Binding Part of the WMP of the City of Prague.)

5) The value is not given due to the floods in August 2002.

6) Here sections marked by the vertical traffic signs type C8, C9, and C10, and moreover sections running on local or purpose communications without any automotive traffic are registered as the paths. There are no comparable data for previous years.

Information sources:

Regional Environmental Centre for Central and Eastern Europe
www.reccr.cz/projektys/indikator/indikator.html

Team Initiative for Local Sustainable Development (Timur)
www.timur.cz

CEROI – Cities environment reports on the Internet
www.ceroi.net

Indicators for the Cities21 pilot project
www.cities21.com/cities21/index.htm

European Environment Agency
www.eea.eu.int