

3. Emissions

3.1 Introduction

Air quality protection against pollutants is provided for in the Air Quality Act, i.e. Act No.86/2002. The law regulates the rights and obligations of legal and natural persons in respect of the protection of ambient air against intrusion of pollutants caused by man's activities, and also the methods of limiting the causes and mitigating the consequences of pollution. State administration in air quality control is carried out under this Act by the Ministry for the Environment, the Czech Environmental Inspection Office, district authorities, and municipal bodies.

In addition to other activities, the above authorities and bodies are responsible for overseeing adherence to legal regulations and decisions, among other things, for collecting and recording data on pollutant emissions and other related information. This information is collected primarily for the purposes of appraising charges for released emissions and for checking adherence to emission limits. It also serves to determine the total amount of the various pollutants released into the air, i.e. to take stock of emissions. The data is also entered into a database that records more detailed technical information on combustion and technological process equipment, the so-called Inventory of Emissions and Air Pollution Sources known as the REZZO database.

Stationary sources of air pollution are classified into three basic groups in terms of their size and type. The classification and its description is shown in tab. 3.1–1:

Tab. 3.1–1 The classification and description of stationary sources of air pollution

Type of source	Large sources of pollution	Medium-sized sources of pollution	Small sources of pollution
File name	REZZO 1	REZZO 2	REZZO 3
Contains	stationary equipment to burn fuels, thermal capacity over 5 MW, equipment of particularly serious technological processes	stationary equipment to burn fuels, thermal capacity from 0.2 to 5 MW, equipment of serious technological processes, open pit coal mines, surfaces liable to burning, spontaneous fire or pollutant sweeping	stationary equipment to burn fuels, thermal capacity less than 0.2 MW, equipment of technological processes not classified as large or medium-sized sources, surfaces on which work goes on which may cause air pollution, storage areas for fuels, raw materials, products and collected air pollutants, and other structures, equipment and activities causing considerable air pollution
Source nature	point source	point source	area sources
Way of recording	sources monitored individually	sources monitored individually	sources monitored collectively

Mobile sources are categorised separately, monitored across the country, and registered in REZZO 4 inventory.

Information on pollutant emissions and the key technical data on the operation of large and medium-sized pollution sources is collected by the relevant authorities of state administration in charge of air quality control (CEIO, district authorities) as a part of their responsibilities. CHMI's specialised departments collect this data and process it for REZZO needs.

Data on emissions from the operation of small sources is managed by municipal bodies and is not stored in any files on a regular basis or passed over to further processing. Part of this data, emissions from household furnaces, is calculated with the help of data processing models used in the 1991 and 2001 census. The output from the model is information on the consumption of the main types of fuels burned in households [Machálek, Machart, 2003]. This information is updated annually in co-operation with regional fuel and energy suppliers (gas and power distribution companies, regional and local heat generation and supply companies). Information on pollutant emissions at the level of individual communities is obtained through

calculation with the help of emission factors. This data is filled in the REZZO 3 database. Information on emissions from mobile sources is not collected or assessed in any systematic way. Inventories are calculated at a specialised institution, CDV Brno (Brno Transport Research Centre) only at the national and regional level for each type of transport.

3.2 Emissions at the Site

The site being assessed is situated in the Pelhřimov district. For this district, Tab. 3.2–1 shows emissions of principal pollutants from stationary sources between 1990 and 2005 [CHMI–CIZP, 1991–2006].

Table 3.2–1 Emissions from stationary sources in the Pelhřimov district from 1990 to 2005 (in tonnes per year)

Year	TSP	SO ₂	NO _x	CO	VOC
1990	2 167	4 242	586	5 319	1 156
1995	1 391	2 345	681	3 611	772
2000	686	1 116	628	2 650	603
2001	527	966	668	2 388	531
2002	694	806	723	1 809	
2003	726	789	555	1 865	
2004	722	788	684	1 807	
2005	550	735	958	1 697	463

Tab. 3.2–2 shows the share of each source category in total emissions from stationary sources in 2005.

Tab. 3.2–2 Share of each category in total emissions from stationary sources in 2005 (tonnes/year) – preliminary

Source category	TSP		SO ₂		NO _x		CO		VOC		NH ₃	
	t/yr	%	t/yr	%	t/yr	%	t/yr	%	t/yr	%	t/yr	%
Large sources (REZZO 1)	180,7	32,9	191,9	26,1	755,5	78,8	173,1	10,2	139,7	30,2	173,6	31,8
Medium-sized (REZZO 2)	72,2	13,1	66,9	9,1	42,3	4,4	73,6	4,3	23,7	5,1	371,6	68,2
Small sources (REZZO 3)	296,7	54,0	476,0	64,8	160,6	16,8	1 450,1	85,5	299,0	64,7	0,0	0,0
TOTAL stationary sources	549,6	100,0	734,8	100,0	958,3	100,0	1 696,8	100,0	462,5	100,0	545,2	100,0

No major air pollution sources can be found in the immediate vicinity of the Košetice station. Nevertheless, for the sake of illustration, the most important large sources in the Pelhřimov District and in the adjacent Districts of Benešov, Tábor and Havlíčkův Brod have been selected from REZZO 1, including their distance from the station. These sources are listed in Tab. 3.2–3.

Tab. 3.2-3 Emissions from selected large air pollution sources around the Košetice station in 2005

District	Name of company	Community	TSP	SO ₂	NO _x	CO	VOC	Distance [km]
Benešov	Sklárny Kavaller	Sázava	1,5	6,8	142,2	9,2	0,5	36
Benešov	Best, s. r. o.	Benešov u Prahy	3,2	55,8	10,3	11,1	14,4	37
Benešov	Kooperativa	Postupice	0,7	0,9	0,1	3,3	36,1	27
Benešov	Městská tepelná zařízení	Benešov u Prahy	3,7	26,8	8,6	0,3	0,7	38
Havlíčkův Brod	Sklobohemia, a. s.	Světlá nad Sázavou	2,5	0,9	142,8	2,4	0,5	27
Havlíčkův Brod	Stora enso timber	Ždírec	24,7	2,1	29,4	17,6	0,3	41
Havlíčkův Brod	Slévárna a modelárna, s. r. o.	Nové Ransko	2,0	0,7	0,9	24,0	0,1	53
Havlíčkův Brod	Asap, s. r. o.	Věž	0,1	0,1	9,6	0,9	1,2	27
Pelhřimov	Dřevozpracující družstvo	Lukavec	130,7	121,9	601,8	72,8	78,1	7
Pelhřimov	Iromez, s. r. o.	Pelhřimov	28,8	1,0	64,9	34,0	2,4	18
Pelhřimov	DH Dekor, s. r. o.	Humpolec	11,8	11,3	49,9	42,9	1,0	20
Pelhřimov	Ing. Miroslav Rezka, teplárna	Kamenice nad Lipou	2,0	29,3	6,9	1,6	3,3	31
Tábor	AES Bohemia	Planá nad Lužnicí	76,6	2 360,6	795,6	163,3	42,9	37
Tábor	Teplárna Tábor, a. s. TTA I.	Tábor	2,9	268,7	161,6	3,8	8,7	34
Tábor	Grena, a. s.	Veselí nad Lužnicí	38,5	4,4	68,7	54,9	10,6	48
Tábor	RWE Transgas	Veselí nad Lužnicí	0,2	0,0	52,3	11,7	1,4	50
Total emissions from selected sources			330	2 891	2 146	454	202	
Total emissions from all large sources in the districts listed			390	3 045	2 353	591	420	

Emissions from household furnaces contribute significantly to total emissions from stationary sources. Between 1991 and 2005, for which data on emissions from each of the communities is available in the form of results from model computations, major changes took place in some areas of the Czech Republic in terms of the fuels used, and in turn changes in the levels of the emissions produced. Connection of the various communities or their parts to natural gas supplies is the most important factor in those changes. According to the information available for 1991 to 2005, the communities in the immediate vicinity of the Košetice station were not connected to gas supplies.

Emissions of major air pollutants from the communities under review (Košetice, Čechtice, Hořepník, Křešín) are listed in tab. 3.2–4.

Tab. 3.2–4 Emissions from selected small sources of air pollution – communities around the Košetice station (1991; 1995; 2000; 2005)

Year	TSP		SO ₂		NO _x		CO		CxHy	
	t/yr	% of 1991 level	t/yr	% of 1991 level	t/yr	% of 1991 level	t/yr	% of 1991 level	t/yr	% of 1991 level
1991	54,6	100	97,9	100	15,5	100	242,9	100	54,0	100
1995	37,5	69	68,4	70	13,3	86	212,7	88	47,3	88
2000	21,0	38	32,5	33	8,7	56	107,1	44	24,4	45
2005	22,1	40	40,4	41	10,5	68	126,0	52	25,5	47

** The data after 2000 are calculated by new method including wood combustion*

3.3 Conclusion

Between 1990 and 2005, major changes took place in the amount of air pollutants emitted throughout the Czech Republic. Total SO₂ emissions dropped by more than 76%, TSPs by nearly 88%. In addition to improved air quality at the regional level, long-range pollutant transport also declined. It was expected that this trend will slow down in the next decade.

In the beginning of new millennium the stagnation of emissions from stationary sources was registered. Due to increase of traffic the emissions from mobile sources have been increasing in the Pelhřimov district as well as in the whole Vysočina region.