

Air pollution in the Czech Republic in 2019

Air Quality Division

Overall editing:

H. Škáchová, L. Vlasáková

I. INTRODUCTION

B. Kotlík, L. Vlasáková

II. AIR POLLUTION

P. Machálek, J. Šmejdiřová

III. METEOROLOGICAL AND DISPERSION CONDITIONS

K. Sedláková, H. Škáchová

IV. AIR QUALITY IN THE CZECH REPUBLIC

J. Brzezina, J. Díšková, A. Holubová Šmejkalová, J. Horálek, I. Hůnová, B. Krejčí, H. Plachá, M. Schreiberová,
J. Sládeček, H. Škáchová, J. Šmejdiřová, L. Vlasáková, V. Volná

V. AGGLOMERATIONS

J. Brzezina, B. Krejčí, P. Machálek, J. Schovánková, M. Schreiberová, H. Škáchová,
J. Šmejdiřová, L. Vlasáková, V. Volná

VI. SMOG WARNING AND REGULATION SYSTEM

O. Vlček, Š. Nápravníková, F. Šopko

VII. AREAS WITH EXCEEDANCES OF LIMIT VALUES

M. Schreiberová, L. Vlasáková

VIII. EUROPEAN CONTEXT

J. Horálek, E. Krtková, H. Škáchová

IX. ATMOSPHERIC DEPOSITION IN THE CZECH REPUBLIC

I. Hůnová, P. Kurfürst, H. Škáchová

X. GREENHOUSE GAS EMISSIONS

E. Krtková

XI. TABLES

J. Schovánková

Annex I Detailed specification of the presented air pollution level maps

J. Horálek, M. Schreiberová

Annex II Evaluation of PM_{2,5} concentrations in relation to the limit value valid from 2020

M. Schreiberová, L. Vlasáková

Translation:

V. Dvořák

Technical co-operation, consultants:

I. Hůnová, B. Krejčí, J. Macoun, V. Novák, P. Novotný, H. Plachá, J. Schovánková, J. Sládeček,
R. Srněnský, F. Šopko, E. Svobodová, O. Vlček

© CHMI 2020

ISBN 978-80-7653-013-3

TABLE OF CONTENTS

ACKNOWLEDGEMENT	5
SUMMARY	6
I. INTRODUCTION	10
I.1 Objectives of the publication	12
I.2 Political and legislative framework of ambient air quality protection	12
II. AIR POLLUTION	19
III. METEOROLOGICAL AND DISPERSION CONDITIONS	25
IV. AIR QUALITY IN THE CZECH REPUBLIC	29
IV.1 Suspended particulate matter	30
IV.1.1 Air pollution by suspended particulates in 2019.....	30
IV.1.2 Trends in the concentrations of suspended particulates PM ₁₀ and PM _{2,5}	39
IV.1.3 Emissions of PM ₁₀ and PM _{2,5}	41
IV.2 Benzo[a]pyrene	44
IV.2.1 Air pollution by benzo[a]pyrene in 2019	44
IV.2.2 Trends in benzo[a]pyrene concentrations.....	48
IV.2.3 Emissions of benzo[a]pyrene	49
IV.3 Nitrogen oxides	51
IV.3.1 Air pollution by nitrogen oxides in 2019	51
IV.3.2 Trends in nitrogen oxide concentrations.....	53
IV.3.3 Nitrogen oxide emissions.....	56
IV.4 Ground-level ozone	58
IV.4.1 Air pollution by ground-level ozone in 2019	58
IV.4.2 Trends in the concentration of ground-level ozone.....	63
IV.4.3 Formation of ground-level ozone	64
IV.5 Benzene	65
IV.5.1 Air pollution by benzene in 2019	65
IV.5.2 Trends in benzene concentrations	65
IV.5.3 Benzene emissions	65
IV.6 Heavy metals	68
IV.6.1 Air pollution by heavy metals in 2019.....	68
IV.6.2 Trends in heavy metal concentrations	72
IV.6.3 Emissions of heavy metals	75
IV.7 Sulphur dioxide	80
IV.7.1 Air pollution by sulphur dioxide in 2019	80
IV.7.2 Trends in sulphur dioxide concentrations	83
IV.7.3 Sulphur dioxide emissions.....	85
IV.8 Carbon monoxide	87
IV.8.1 Air pollution by carbon monoxide in 2019.....	87
IV.8.2 Trends in carbon monoxide concentrations.....	87
IV.8.3 Carbon monoxide emissions.....	88

IV.9 Pollutants without set limit values.....	90
IV.9.1 Volatile organic compounds	90
IV.9.2 Measurement of the numerical size distribution of aerosol particles.....	93
IV.9.3 Monitoring concentrations of elemental, organic and black carbon.....	97
V. AIR QUALITY IN AGGLOMERATIONS AND CITIES	100
V.1 Prague agglomeration	100
V.1.1 Air quality in the Prague agglomeration	101
V.1.2 Emissions in the Prague agglomeration	106
V.1.3 Summary.....	106
V.2 The Brno agglomeration.....	107
V.2.1 Air quality in the Brno agglomeration.....	108
V.2.2 Emissions in the Brno agglomeration.....	113
V.2.3 Summary.....	113
V.3 The Ostrava/Karviná/Frýdek-Místek agglomeration.....	114
V.3.1 Air quality in the Ostrava/Karviná/Frýdek-Místek agglomeration.....	115
V.3.2 Emissions in the Ostrava/Karviná/Frýdek-Místek agglomeration.....	120
V.3.3 Summary.....	120
V.4 Air quality index in cities.....	121
VI. SMOG WARNING AND REGULATION SYSTEM	124
VII. AREAS WHERE THE POLLUTION LIMIT VALUES ARE EXCEEDED	130
VII.1 Areas where the pollution limit values for protection of human health are exceeded.....	130
VII.2 Areas where the pollution limit values for protection of ecosystems and vegetation are exceeded	136
VIII. EUROPEAN CONTEXT	139
IX. ATMOSPHERIC DEPOSITION IN THE TERRITORY OF THE CZECH REPUBLIC	144
X. GREENHOUSE GAS EMISSIONS	161
XI. TABLES	166
LITERATURA	189
LIST OF ABBREVIATIONS	195
ANNEX I.....	197
ANNEX II.....	202