

# VII. AREAS WHERE THE POLLUTION LIMIT VALUES ARE EXCEEDED

## VII.1 Areas where the pollution limit values for the protection of human health are exceeded

Annually, areas in the CR are defined where the pollution limit values are exceeded collectively for all pollutants monitored for the protection of human health. The map of areas where at least one pollution limit value<sup>1</sup>, not including ground-level ozone, is exceeded provides comprehensive information on ambient air quality in the CR. In 2021, 6.1 % of the territory of the CR, inhabited by approx. 20 % of the population, was designated as an area where pollution limit values were exceeded (Fig. VII.1.1; Tab. VII.1.1). In the vast majority of cases, the delimitation of these areas is a result

of exceeding the annual pollution limit values for benzo[a]pyrene (Tab. VII.1.1). To a minimal extent, these areas delimited in 2021 were a result of exceeding the 24-hour pollution limit value for suspended particulates PM<sub>10</sub> and the annual pollution limit value for PM<sub>2.5</sub>. The largest extent of areas exceeding the limit values were in the O/K/F-M agglomeration (61 %), and in the Central Moravia zone (24 %) (Tab. VII.1.2). In addition, in the O/K/F-M agglomeration, the vast majority of the population (96 %) has been exposed to above-limit concentrations (Tab. VII.1.3) and it is the most burden area in the CR for a long time. In the year-on-year comparison 2020/2021, the areas where at least one pollution limit value was exceeded except for ozone increased slightly (by approx. 1.5 %). The year-on-year increase of the area with exceeded pollution limits except for ozone occurred mainly in the Central Moravia zone (Fig. VII.1.2). The area with at least one pollution limit value exceeded in 2021 except for ozone is the second smallest within the evaluation period 2012–2021 (Fig. VII.1.3).

**Tab. VII.1.1 Percentage of the area exceeding the pollution limit (%) and percentage of population resident in areas exposed to above-limit values (%) in the Czech Republic, 2021**

Czech republic	Pollutants specified in Annex 1 to Act No. 201/2012 Coll., as amended						
	Item 1 of the Annex			Item 3 of the Annex		Item 4 of the Annex	
	PM <sub>10</sub>	PM <sub>2.5</sub>	Total LV exceedances	BaP	Total exceedances, ozone excluded	O <sub>3</sub>	Total exceedances, including ozone
	36 <sup>th</sup> max. 24-h average > 50 µg·m <sup>-3</sup>	annual average > 20 µg·m <sup>-3</sup>		annual average > 1 ng·m <sup>-3</sup>		26. highest values max. daily 8-h running average (in the three-year average) > 120 µg·m <sup>-3</sup>	
Inhabitants	0.4	1.5	1.5	19.7	19.7	0.02	19.7
Area	0.1	0.3	0.3	6.1	6.1	0.2	6.4

1 The annual pollution limit values for PM<sub>10</sub>, PM<sub>2.5</sub>, benzo[a]pyrene, NO<sub>2</sub>, lead, cadmium, arsenic, nickel, and benzene, the pollution limit value for CO (max. daily 8-hour moving average), the 24-hour pollution limit values for PM<sub>10</sub> and SO<sub>2</sub>, and the hourly pollution limit value for SO<sub>2</sub> and NO<sub>2</sub>.

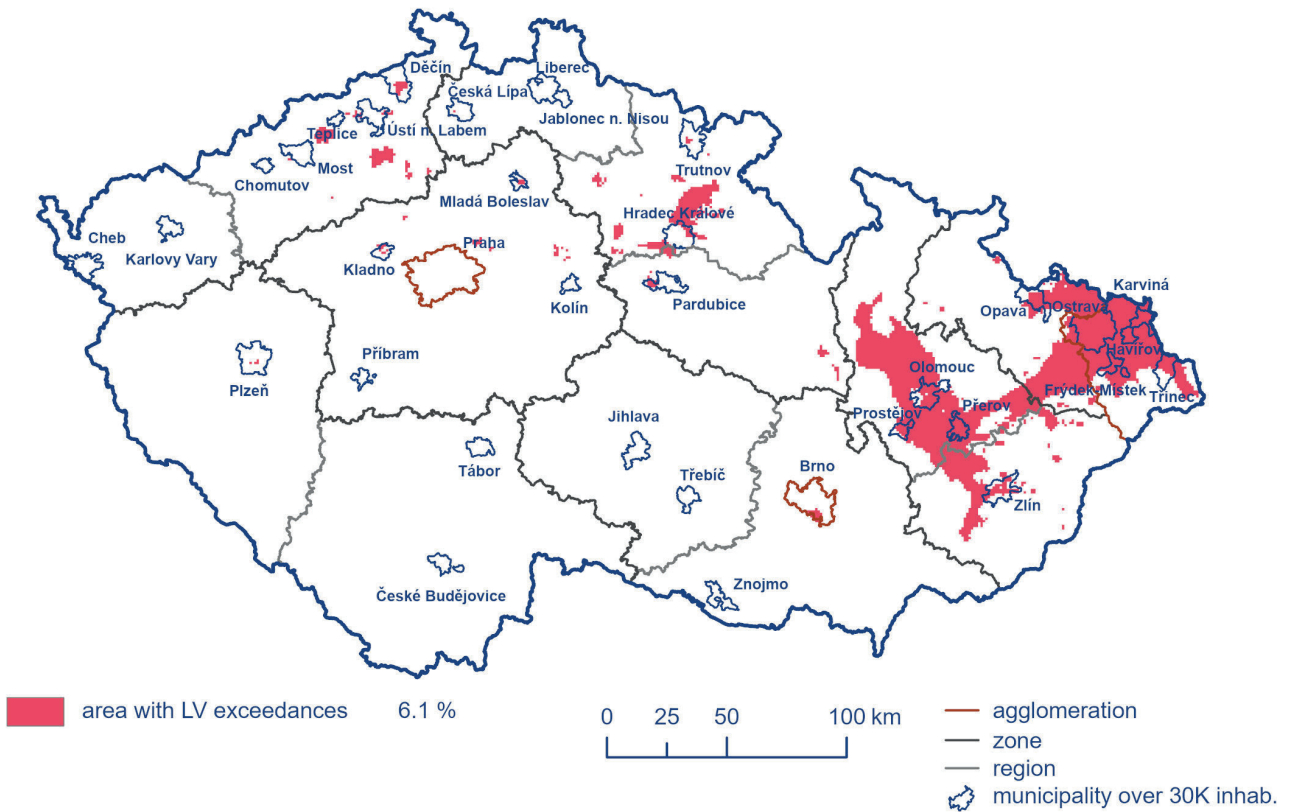


Fig. VII.1.1 Areas with exceeded air pollution limits for the protection of human health excluding ground-level ozone, 2021

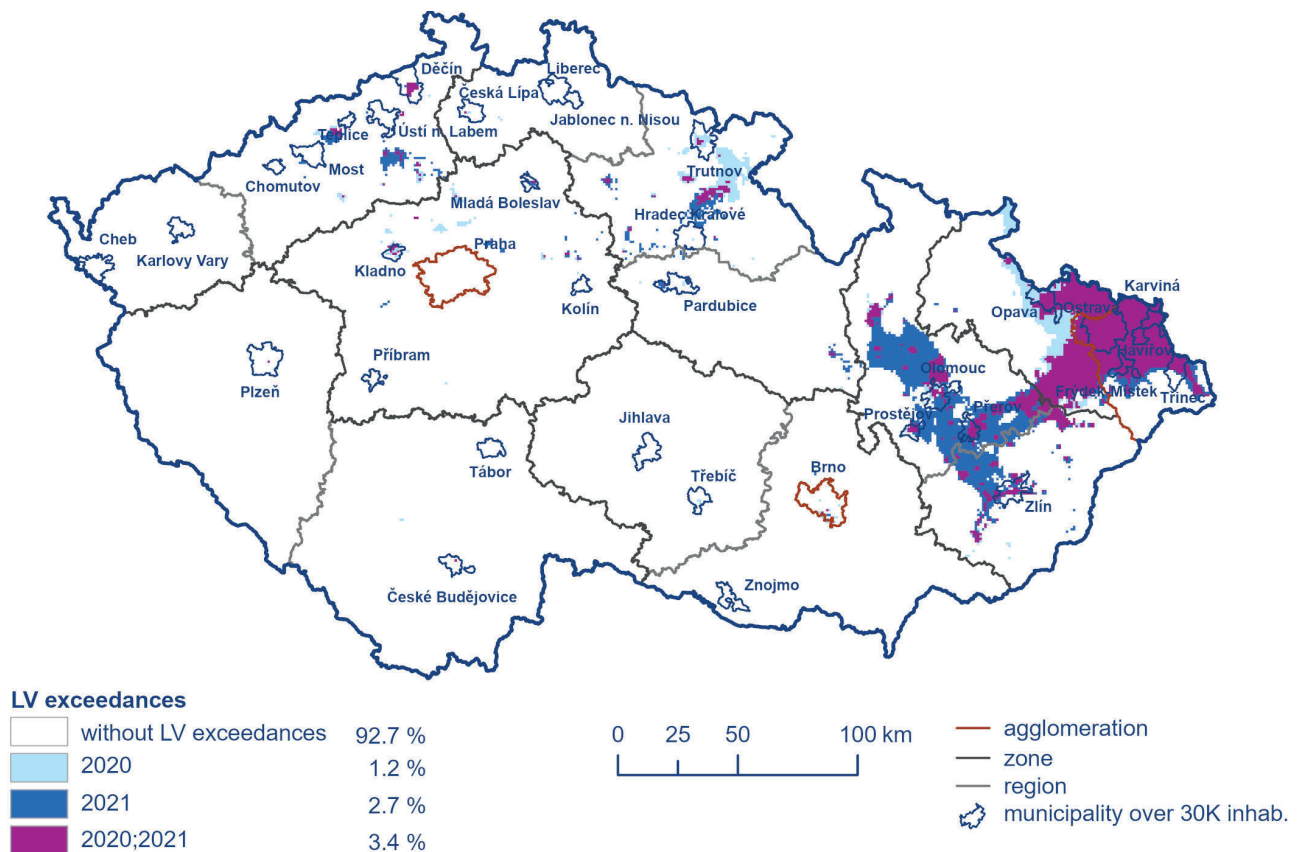


Fig. VII.1.2 Comparison of areas with exceeded air pollution limits for the protection of human health excluding ground-level ozone in 2020 and 2021

VII. Areas with Exceedances of Limit Values

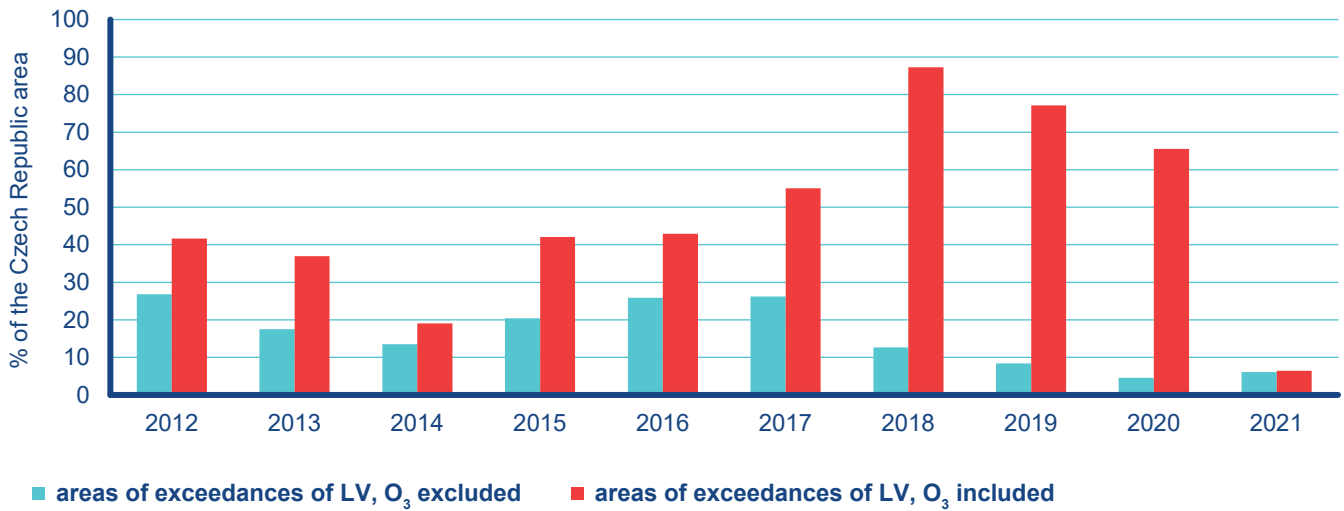


Fig. VII.1.3 Exceeded air pollution limit in the Czech Republic, percentage of the area, 2012–2021

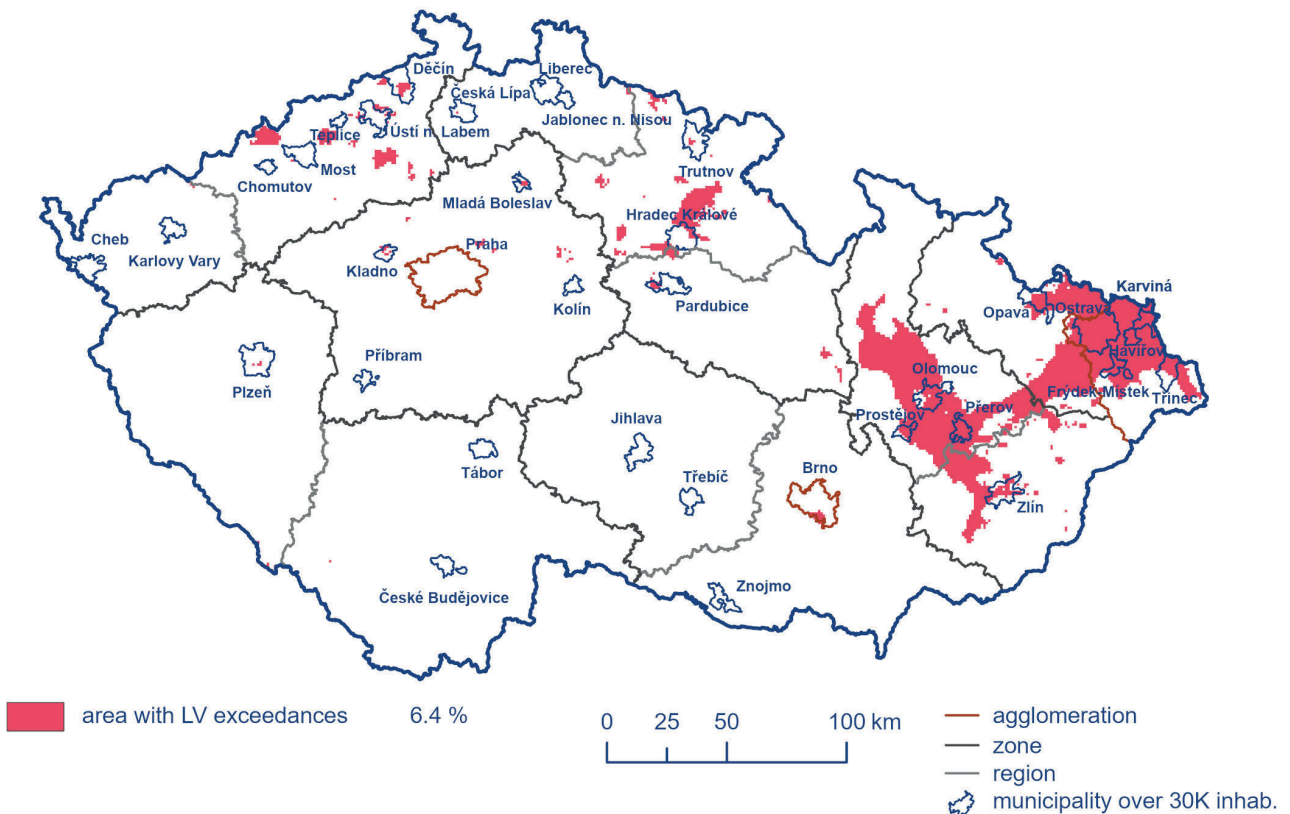


Fig. VII.1.4 Areas with exceeded air pollution limits for the protection of human health including ground-level ozone, 2021

The relatively good air quality in the CR in 2021 was mainly contributed by the less frequent occurrence of adverse conditions in January and November compared to ten-year values (Fig. III.3, Fig. III.4). The improvement of air quality in the long term can also be attributed to already implemented measures to improve air quality (particularly the replacement of boilers), the ongoing

renewal of the vehicle fleet, and measures taken at large source facilities (for more see Chapters II and IV.).

After including ground-level ozone, the area where at least one pollution limit value was exceeded in 2021 corresponded to 6.4 % of the territory of the CR (Fig. VII.1.4) with approximately

**Tab. VII.1.2 Limit value (LV) exceedances in the zones/agglomerations, regions and municipalities with extended competencies of the Czech Republic, % of the area of the administrative unit, 2021**

Zone / agglomeration	Region	Pollutants specified in Annex 1 to Act No. 201/2012 Coll. as amended						
		Item 1 of the Annex		Item 3 of the Annex		Item 4 of the Annex		Total exceedances, including ozone
		PM <sub>10</sub> 36 <sup>th</sup> max. 24-h average > 50 µg·m <sup>-3</sup>	PM <sub>2,5</sub> annual average > 20 µg·m <sup>-3</sup>	Total LV exceedances	BaP annual average > 1 ng·m <sup>-3</sup>	Total exceedances, excluding ozone	O <sub>3</sub> 26. highest values max. daily 8-h running average (in the three-year average) > 120 µg·m <sup>-3</sup>	
Agglomeration of Prague	Prague	-	-	-	-	-	-	-
Central Bohemia zone	Central Bohemia region	-	-	-	0.41	0.41	-	0.41
South-western zone	South Bohemia region	-	-	-	-	-	0.02	0.02
	Pižeň Region	-	-	-	0.05	0.05	0.14	0.19
North-western zone	Karlovy Vary region	-	-	-	-	-	0.07	0.09
	Ústí nad Labem region	-	-	-	3.05	3.05	1.92	4.97
North-eastern zone	Liberec region	-	-	-	1.89	1.89	1.23	3.11
	Hradec Králové region	-	-	-	0.03	0.03	0.24	0.27
	Pardubice region	-	-	-	7.28	7.28	0.88	8.16
South-eastern zone	South Moravia region without agglomeration of Brno	-	-	-	0.05	0.05	-	0.05
	Agglomeration of Brno	-	-	-	0.05	0.05	-	0.05
Central Moravia zone	Olomouc region	-	-	-	7.75	7.75	-	7.75
	Zlín region	-	0.03	0.03	32.29	32.29	-	32.29
Moravia-Silesia zone	Moravia-Silesia region	-	0.01	0.01	23.98	23.98	-	23.98
	Agglomeration of Ostrava/Karviná/Frýdek-Místek	4.40	11.60	11.60	61.09	61.09	-	61.09
		1.54	4.05	4.05	36.56	36.56	-	36.56

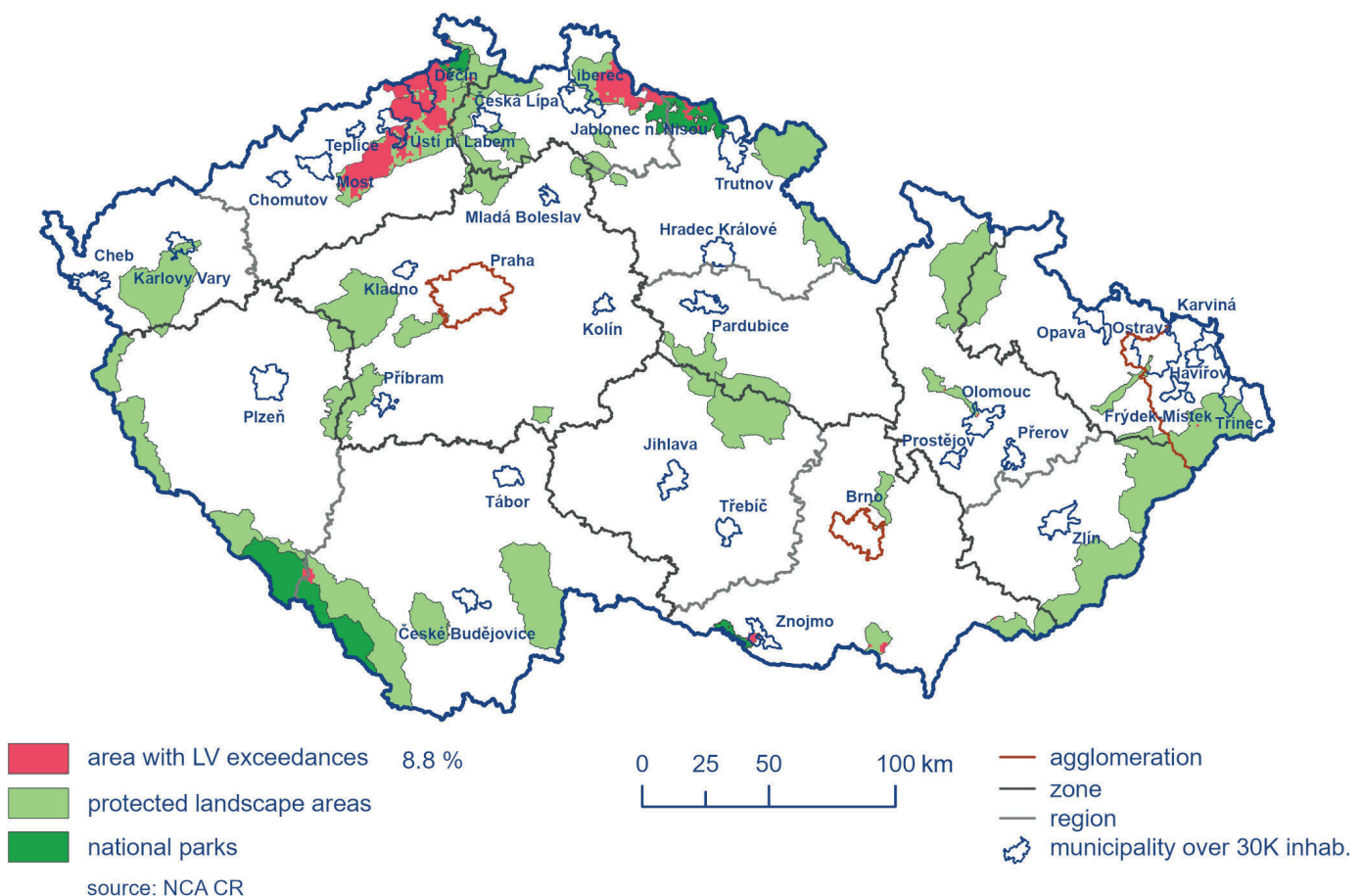
Tab. VII.1.3 Limit value (LV) exceedances in the zones/agglomerations, regions and municipalities with extended competencies of the Czech Republic, % of the inhabitants, 2021

Zone / agglomeration	Region	Pollutants specified in Annex 1 to Act No. 201/2012 Coll., as amended							
		Item 1 of the Annex		Item 3 of the Annex		Item 4 of the Annex		Total exceedances, including ozone	
		PM <sub>10</sub> 36 <sup>th</sup> max. 24-h average > 50 µg·m <sup>-3</sup>	PM <sub>2.5</sub> annual average > 20 µg·m <sup>-3</sup>	Total LV exceedances	BaP annual average > 1 ng·m <sup>-3</sup>	Total exceedances, ozone excluded	O <sub>3</sub> 26. highest values max. daily 8-h running average (in the three-year average) > 120 µg·m <sup>-3</sup>		
Agglomeration of Prague	Prague	-	-	-	-	-	-	-	-
Central Bohemia zone	Central Bohemia region	-	-	-	4.97	4.97	-	4.97	4.97
South-western zone	South Bohemia region	-	-	-	-	-	-	-	-
	Píseň Region	-	-	-	2.88	2.88	-	2.88	2.88
North-western zone		-	-	-	1.37	1.37	-	1.37	1.37
	Karlovy Vary region	-	-	-	-	-	0.0005	-	0.0005
	Ústí nad Labem region	-	-	-	12.81	12.81	0.31	12.81	13.11
North-eastern zone		-	-	-	9.37	9.37	0.23	9.37	9.59
	Liberec region	-	-	-	0.36	0.36	0.0004	0.36	0.36
	Hradec Králové region	-	-	-	17.02	17.02	0.01	17.02	17.03
	Pardubice region	-	-	-	3.50	3.50	-	3.50	3.50
South-eastern zone		-	-	-	7.55	7.55	0.0004	7.55	7.55
	Vysočina region	-	-	-	-	-	-	-	-
	South Moravia region without agglomeration of Brno	-	-	-	0.80	0.80	-	0.80	0.80
Agglomeration of Brno		-	-	-	0.49	0.49	-	0.49	0.49
Central Moravia zone		-	-	-	6.34	6.34	-	6.34	6.34
	Olomouc region	-	-	-	64.21	64.21	-	64.21	64.21
Moravia-Silesia zone	Zlín region	-	1.13	1.13	49.08	49.08	-	49.08	49.08
		-	0.54	0.54	56.95	56.95	-	56.95	56.95
Agglomeration of Ostrava/Karviná/Frýdek-Místek		-	0.01	0.01	66.72	66.72	-	66.72	66.72
	Moravia-Silesia region	5.52	19.50	19.50	96.31	96.31	-	96.31	96.31
		3.61	12.76	12.76	86.07	86.07	-	86.07	86.07

20 % of population (Tab. VII.1.1). In the year-on-year comparison 2020/2021, the area exceeding at least one limit value including ozone significantly decreased (by approx. 59 %). In the evaluated period 2012–2021 (Fig. VII.1.3), the territory with above-limit concentrations of at least one polluting substance covered the smallest area. The graph also shows a decrease in the extent of the above-limit concentration area in the last four years associated with decreasing ozone concentrations (Chap. IV.4).

## VII.2 Areas where the pollution limit values for the protection of ecosystems and vegetation are exceeded

From the viewpoint of the protection of the most valuable natural locations of the CR, the exceeding of pollution limit values for the protection of ecosystems and vegetation<sup>2</sup> in National Parks (NPs) and Protected Landscape Areas (PLAs) are also evaluated (Tab. VII.2.1). In 2021, at least one of these limit values was exceeded over nearly 9 % of the territory of NPs and PLAs (Fig. VII.2.1).

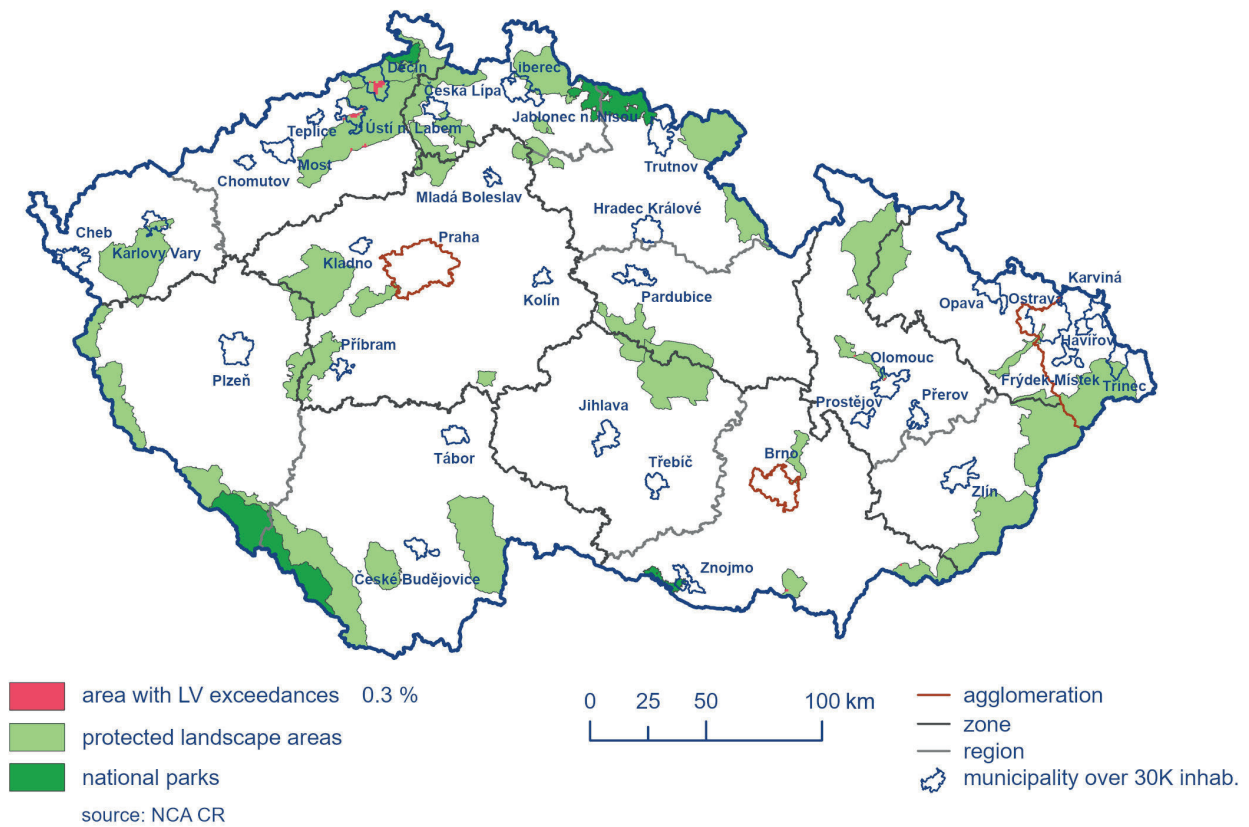


**Fig. VII.2.1 Areas with exceeded air pollution limits for the protection of ecosystems and vegetation in NPs and PLAs including ground-level ozone, 2021**

<sup>2</sup> Pollution limit values for the annual and winter average concentrations of SO<sub>2</sub>, the pollution limit value for the annual average concentration of NO<sub>x</sub>, and the pollution limit value for O<sub>3</sub> expressed as the AOT40 exposure index.

**Tab. VII.2.1 Exceedances of the limit value (NO<sub>x</sub> and AOT40) for the protection of ecosystems and vegetation within NP and CHKO, % of the territory of NP and CHKO, 2021**

National park and protected landscape area	NO <sub>x</sub>	O <sub>3</sub>	Sum
	annual average > 30 µg·m <sup>-3</sup>	AOT 40 > 18 000 µg·m <sup>-3</sup> ·h	
Krkonoše Mountains NP	–	25.1	25.1
České Švýcarsko NP	–	23.0	23.0
Podjí NP	–	21.6	21.6
Šumava NP	–	1.9	1.9
Beskydy PLA	–	0.2	0.2
Bílé Karpaty PLA	0.1	–	0.1
Blaník PLA	–	–	–
Blanský les PLA	–	–	–
Brdy PLA	–	–	–
Broumovsko PLA	–	–	–
České středohoří PLA	2.7	52.4	54.8
Český kras PLA	1.0	2.0	2.9
Český les PLA	–	–	–
Český ráj PLA	–	–	–
Jeseníky PLA	–	–	–
Jizerské hory PLA	–	51.0	51.0
Kokořínsko - Máchův kraj PLA	–	–	–
Křivoklátsko PLA	–	–	–
Labské pískovce PLA	1.7	66.9	68.6
Litovelské Pomoraví PLA	1.8	–	1.8
Lužické hory PLA	–	1.9	1.9
Moravský kras PLA	0.6	–	0.6
Orlické hory PLA	–	–	–
Pálava PLA	1.7	9.6	11.3
Poodří PLA	0.1	–	0.1
Slavkovský les PLA	–	–	–
Šumava PLA	–	0.7	0.7
Třeboňsko PLA	–	–	–
Žďárské vrchy PLA	–	–	–
Železné hory PLA	–	–	–



**Fig. VII.2.2 Areas with exceeded air pollution limits for the protection of ecosystems and vegetation in NPs and PLAs excluding ground-level ozone, 2021**

Above-limit  $\text{NO}_x$  concentrations occur particularly around transport roads; concerning the most valuable natural territories of the CR, the pollution limit value for  $\text{NO}_x$  was exceeded over only a very small area of several PLAs (Tab. VII.2.1, Fig. VII.2.2).

In 2021, the limit value for AOT40 was exceeded at least in part of the territory in all NPs and some PLAs (Tab. VII.2.1).

The pollution limit values for the annual and winter average concentrations of  $\text{SO}_2$  were not exceeded in 2021 in the territory of any PLA or NP, similarly as in previous years.