

IV.5 Benzene

IV.5.1 Air pollution by benzene in 2021

The annual pollution limit value for benzene ($5 \mu\text{g}\cdot\text{m}^{-3}$) was not exceeded at any of 36 stations with valid annual average values in 2021 (Fig. IV.5.1). The highest annual average was detected, likewise in 2020, at the Ostrava-Přívov industrial station, reaching the equal value of $3.5 \mu\text{g}\cdot\text{m}^{-3}$. The O/K/F-M agglomeration was exposed to the highest concentrations of benzene (Fig. IV.5.2).

In the long term, benzene concentrations in the CR, except for the O/K/F-M agglomeration, are very low and do not even reach half of the pollution limit value (Fig. IV.5.3). Of the total of 33 stations measuring benzene concentrations in the CR in 2020 and 2021, the annual average concentrations were higher at 10 stations (30 %), while lower at 12 stations (37 %). The concentrations did not change at 11 stations (33 %).

IV.5.2 Trends in benzene concentrations

Until 2016, the trend of annual average benzene concentrations averaged for all types of stations can be characterized as declining, and then as stagnant from 2017. Since 2010, average concentrations have been below half of the limit value, and since 2016 even below the ten-year average of 2011–2020. The year 2021 is the fourth lowest year after 2016, 2019, and 2020 for annual average concentrations (Fig. IV.5.4).

Based on the evaluation of individual types of stations, the highest annual average concentrations are observed at industrial stations, which are situated mostly in the O/K/F-M agglomeration, where, however, the pollution limit value has not been exceeded since 2012, with some exceptions. The lowest annual average concentrations are observed at rural and regional stations that are little affected by emission sources (Fig. IV.5.5).

IV.5.3 Benzene emissions

Benzene is an organic compound, and it is used as a solvent or raw material for the production of a range of chemical substances. Benzene is part of crude oil and small amounts are added to automotive petrol to improve the octane number. It is produced

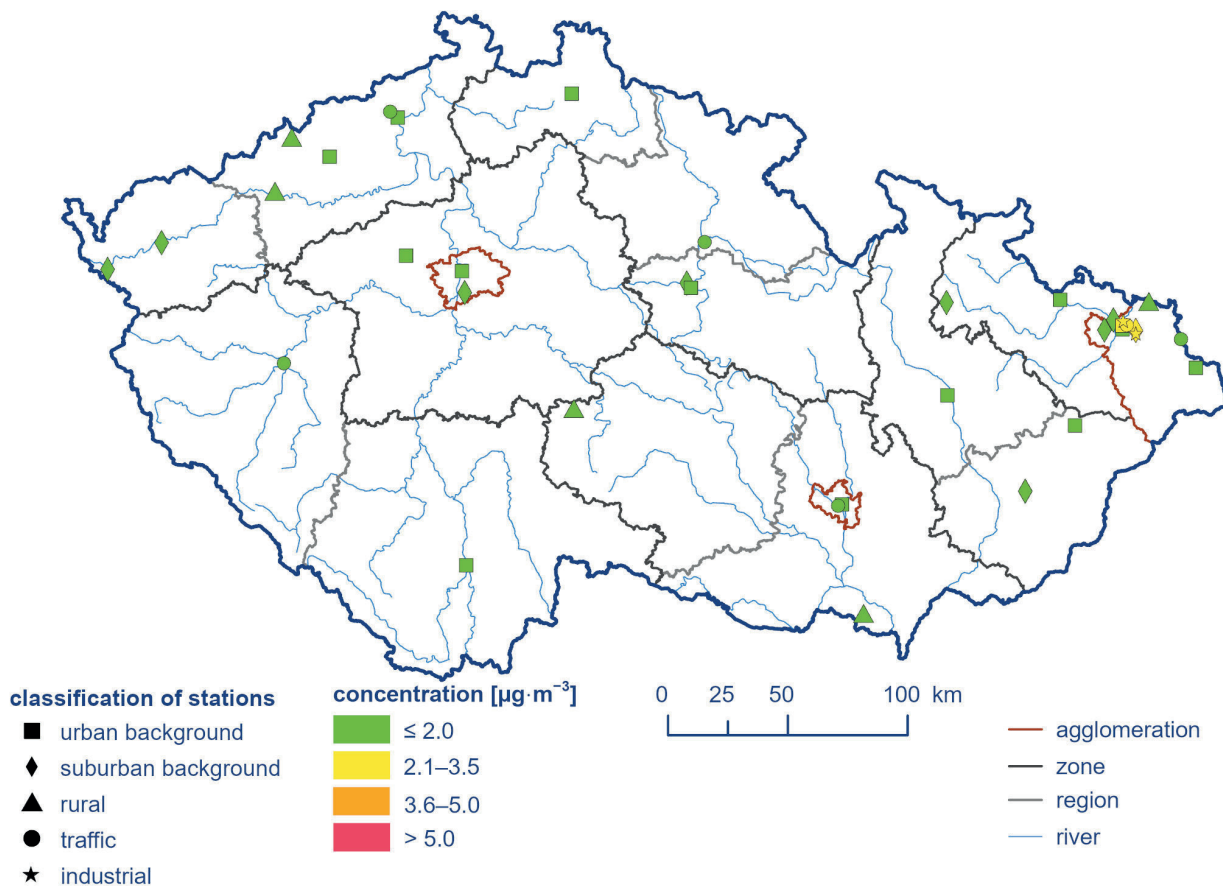


Fig. IV.5.1 Annual average concentrations of benzene at air quality monitoring stations, 2021

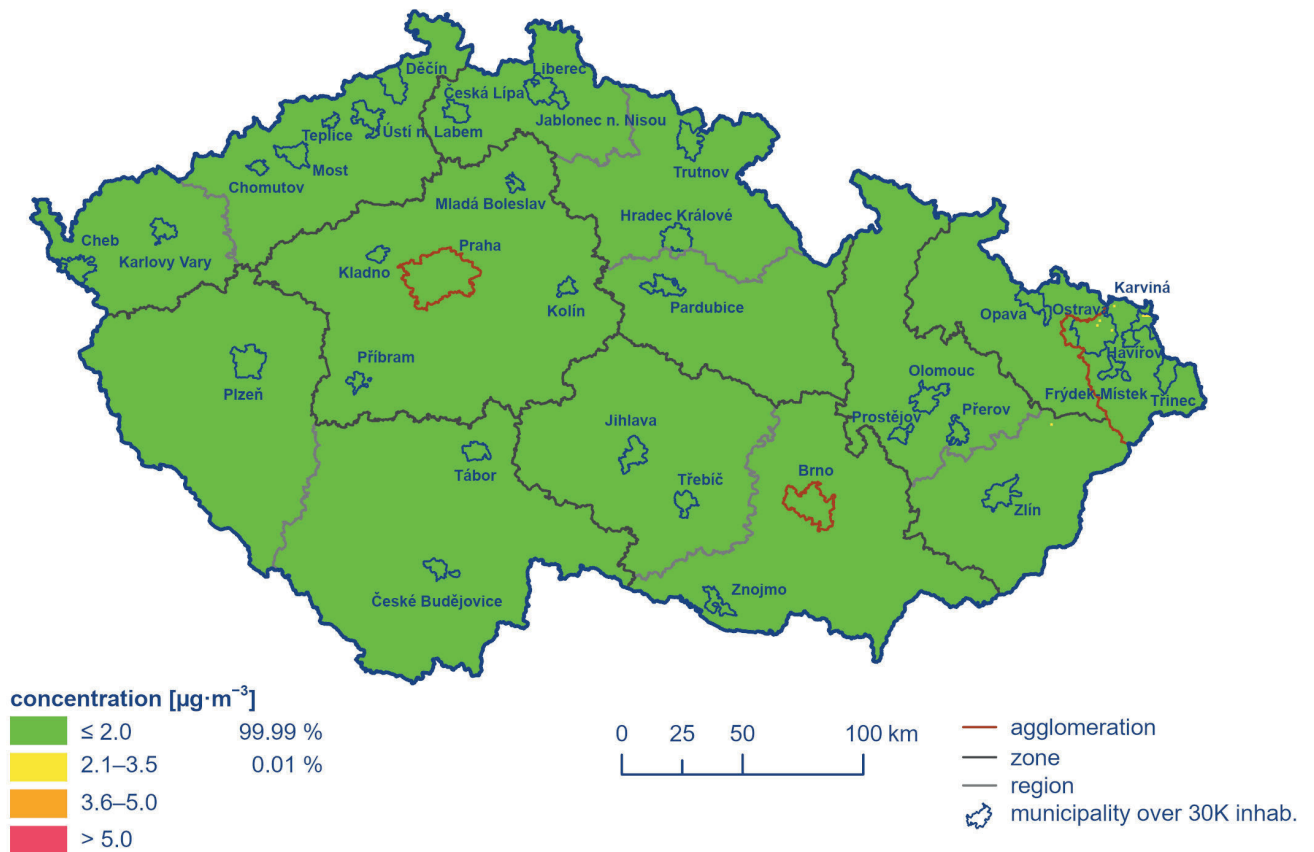


Fig. IV.5.2 Field of annual average concentration of benzene, 2021

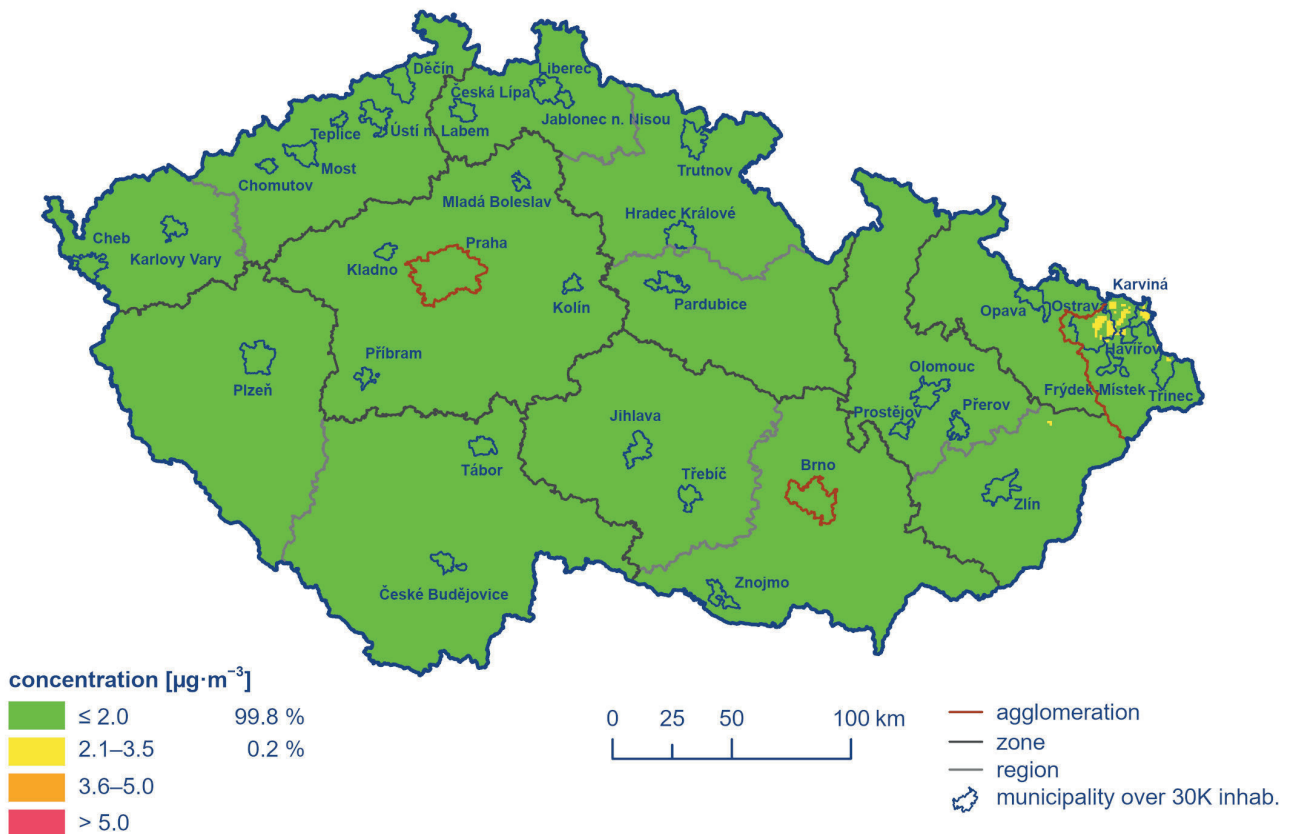


Fig. IV.5.3 Five-year average of annual average concentrations of benzene, 2017–2021

mainly by processing crude oil and from coal tar formed during coal coke production. As with other VOCs, it also originates from incomplete combustion.

Benzene is not included in the range of pollutants covered by the LRTAP Convention, and therefore inventories are not available based on the structure of NFR sectors but on REZZO categories only. According to an evaluation carried out for the purpose of updating the PZKO, 672.6 tonnes of benzene were released into the air in 2016. The largest benzene emissions were produced by REZZO 4 category sources (75 %), from which benzene is emitted through

exhaust gases and by leaking from vehicle fuel systems. A significant amount of benzene emissions were produced by REZZO 3 category sources, through the household combustion of solid fuels (13 %), the general use of organic solvents (5 %) and fuel extraction (3 %). The contribution of REZZO 1 and REZZO 2 category sources amounted 4 % to the total benzene emissions, with the major proportion associated with the sectors Energy – fuel combustion (codes 1.1.–1.4. of the Annex No. 2 to the Act No. 201/2012 Coll., on protection of the air), reaching 2.2 %, and the Use of organic solvents (codes 9.1.–9.24. of the Annex No. 2 to the Act No. 201/2012 Coll., on protection of the air), reaching 0.7 %.

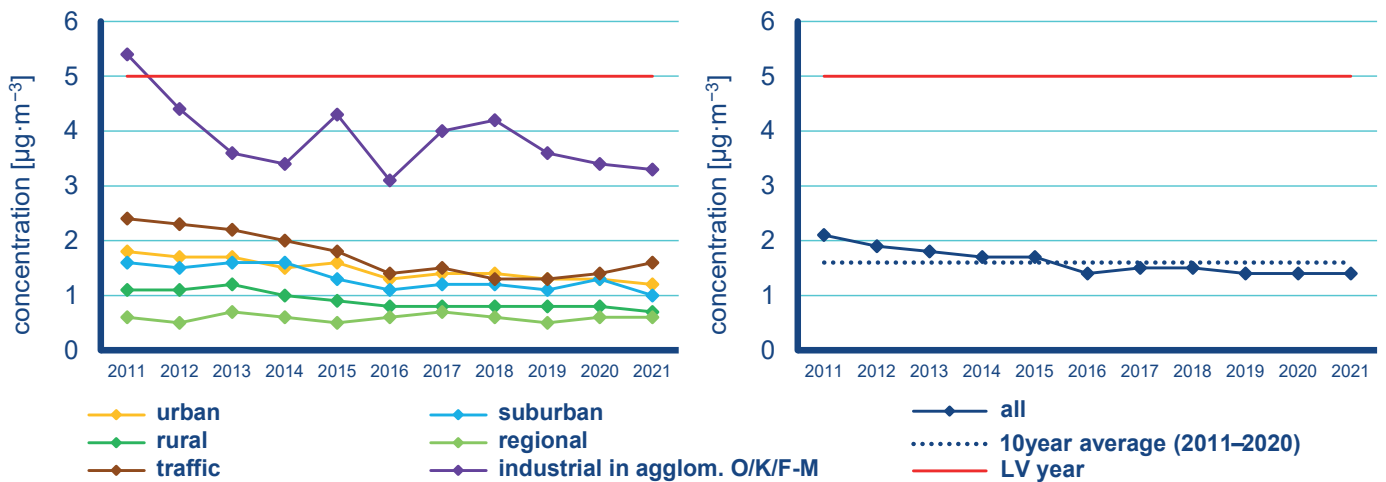


Fig. IV.5.4 Annual average concentrations of benzene, 2011–2021

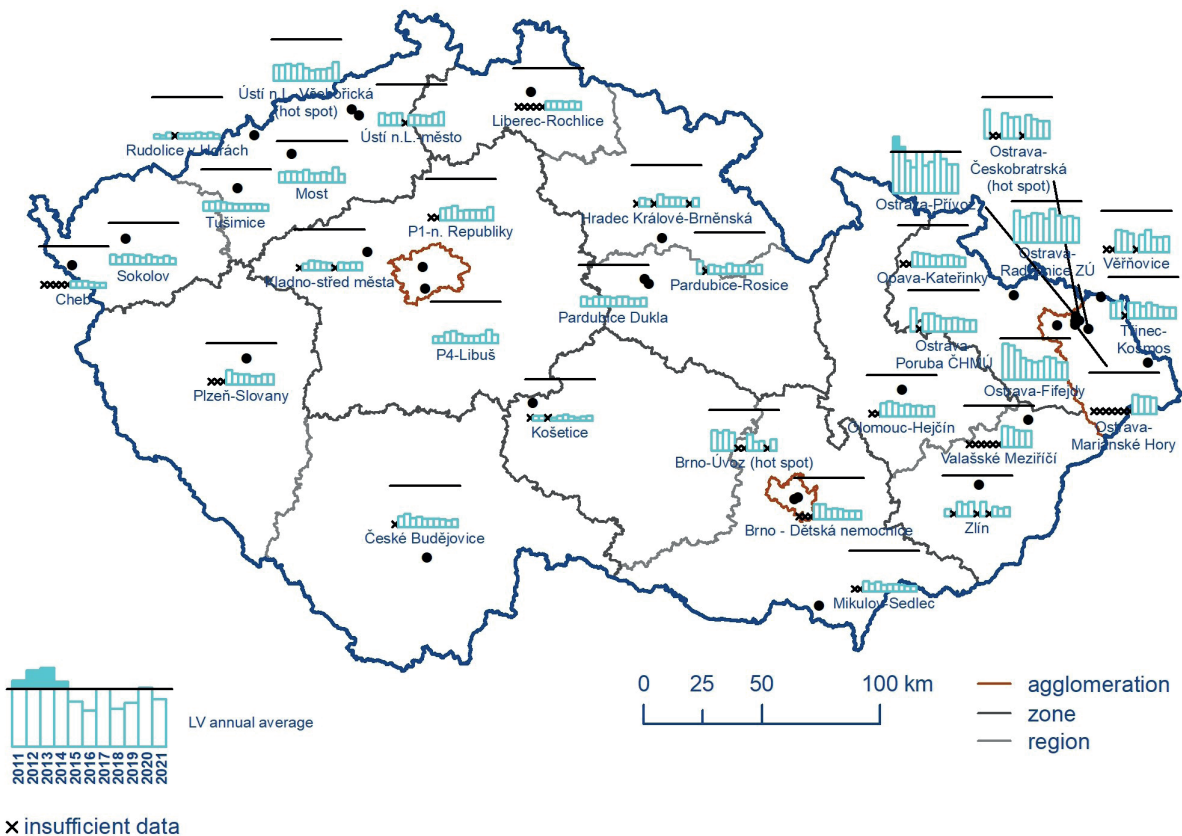


Fig. IV.5.5 Annual average concentrations of benzene at selected stations, 2011–2021