

IV.5 Benzene

IV.5.1 Air pollution by benzene in 2019

The annual pollution limit value for benzene C_6H_6 ($5 \mu g \cdot m^{-3}$) was not exceeded in 2019 at any of the total 36 localities with valid annual average (Tab. XI.13, Fig. IV.5.1). The highest annual average was detected at the Ostrava-Přivoz station ($4.2 \mu g \cdot m^{-3}$). Compared to 2018 at $5.1 \mu g \cdot m^{-3}$, it is a decrease by 18%. The O/K/F-M agglomeration was loaded by the highest concentrations of benzene (Fig. IV.5.2).

In the long term, benzene concentrations in the Czech Republic, 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). From the total of 31 stations measuring benzene concentrations in the Czech Republic in 2018 and 2019, the annual average concentration increased at 4 stations (14%), while it decreased at 23 stations (74%). The concentration did not change at 4 stations (14%).

IV.5.2 Trends in benzene concentrations

At most stations, the trend of annual average benzene concentrations is declining, at some stations the value of the annual average benzene concentration is stagnant. Since 2014, annual concentrations averaged over all types of stations have been below the ten-year average of 2009–2018. The year 2019 is the second year after 2016 with the lowest annual average concentration (Fig. IV.5.4). The highest annual average concentrations are observed at industrial sites which are situated mostly in the O/K/F-M agglomeration. The lowest annual average concentrations are observed at rural and regional localities, which is due to the location of the stations and small impact by the emission sources (Fig. IV.5.5).

IV.5.3 Benzene emissions

Benzene belongs to the group of organic compounds and it is used as a solvent or raw material for production of a range of chemical substances. Benzene is a part of crude oil and its small amount is added to automotive petrol to improve its octane number. It is produced mainly by processing the crude oil and from coal tar yielded during coal coke production. Together with other VOCs it also originates from incomplete combustion.

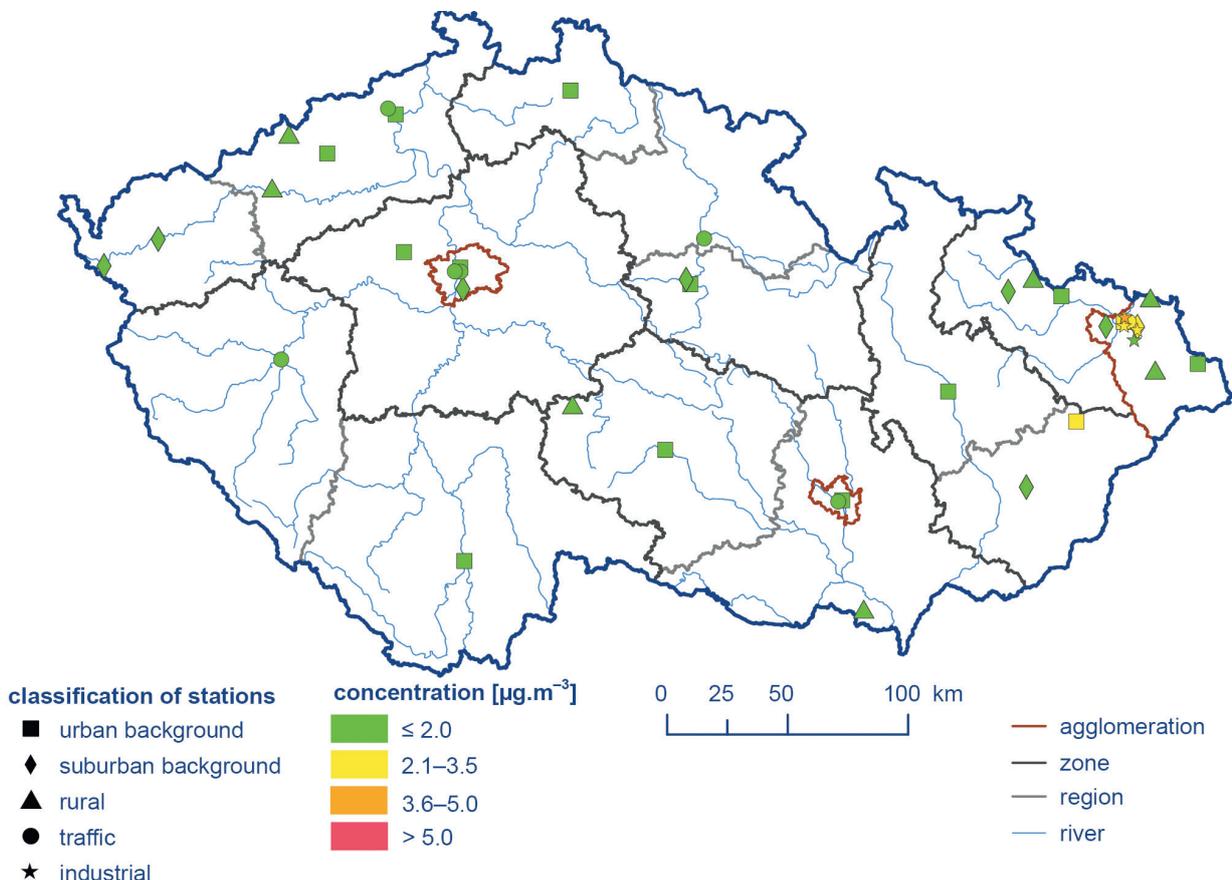


Fig. IV.5.1 Annual average concentrations of benzene at air quality monitoring stations, 2019

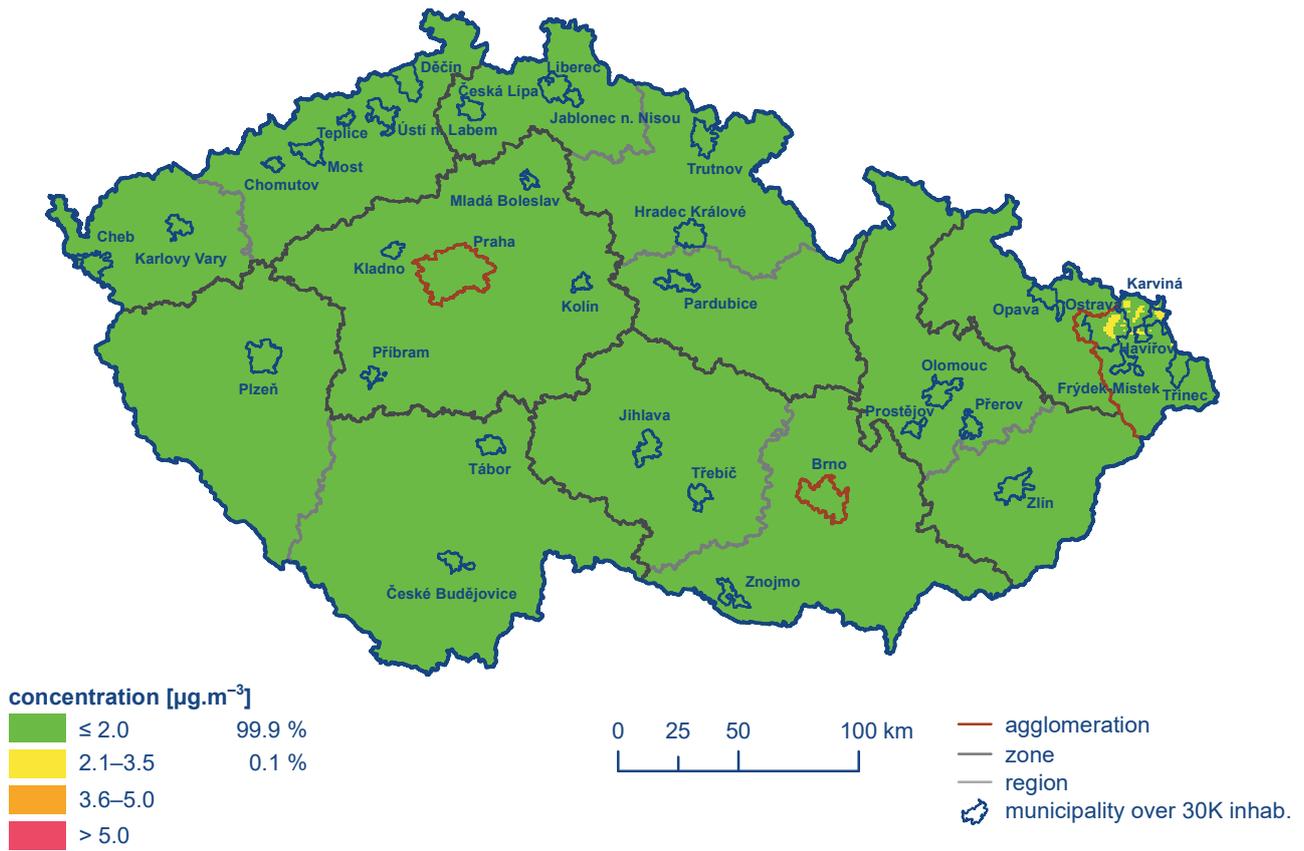


Fig. IV.5.2 Field of annual average concentration of benzene, 2019

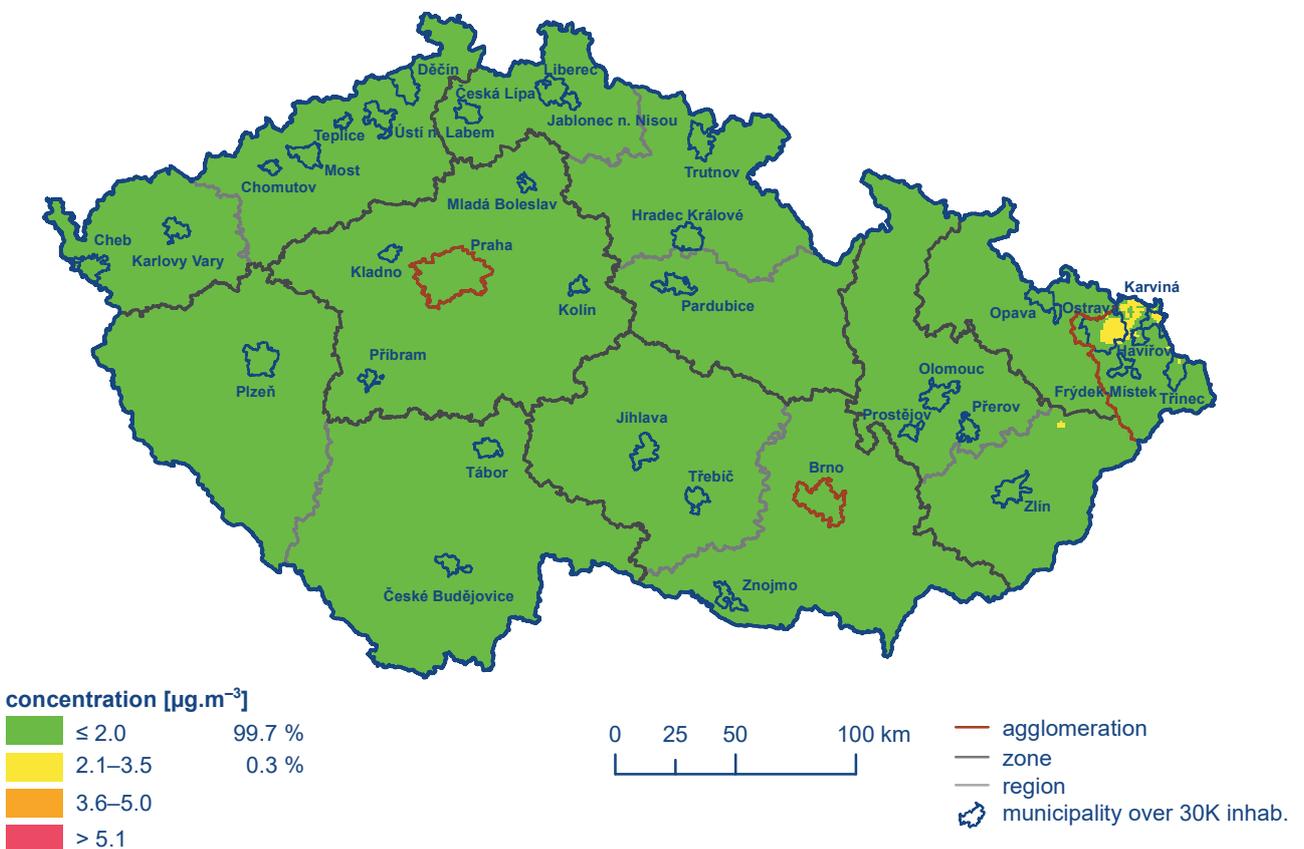


Fig. IV.5.3 Five-year average of annual average concentrations of benzene, 2015–2019

Benzene does not belong to the range of pollutants covered by the LRTAP Convention and therefore its inventory is not available according to the NFR sectors structure but by the REZZO categories only. According to the evaluation carried out for the purpose of updating the PZKO, 672.6 tonnes of benzene were released into the air in 2016. The biggest benzene emissions were produced by REZZO 4 category sources (75%) of which benzene is emitted through exhaust gasses and by leaking from vehicle fuel systems. A significant amount of benzene emissions were produced by

REZZO 3 category sources through household combustion of solid fuels (13%), flat use of organic solvents (5%) or fuel extraction (3%). A contribution of REZZO 1 and REZZO 2 category sources amounted 4% to the total benzene emissions of which the major share related to the 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%.

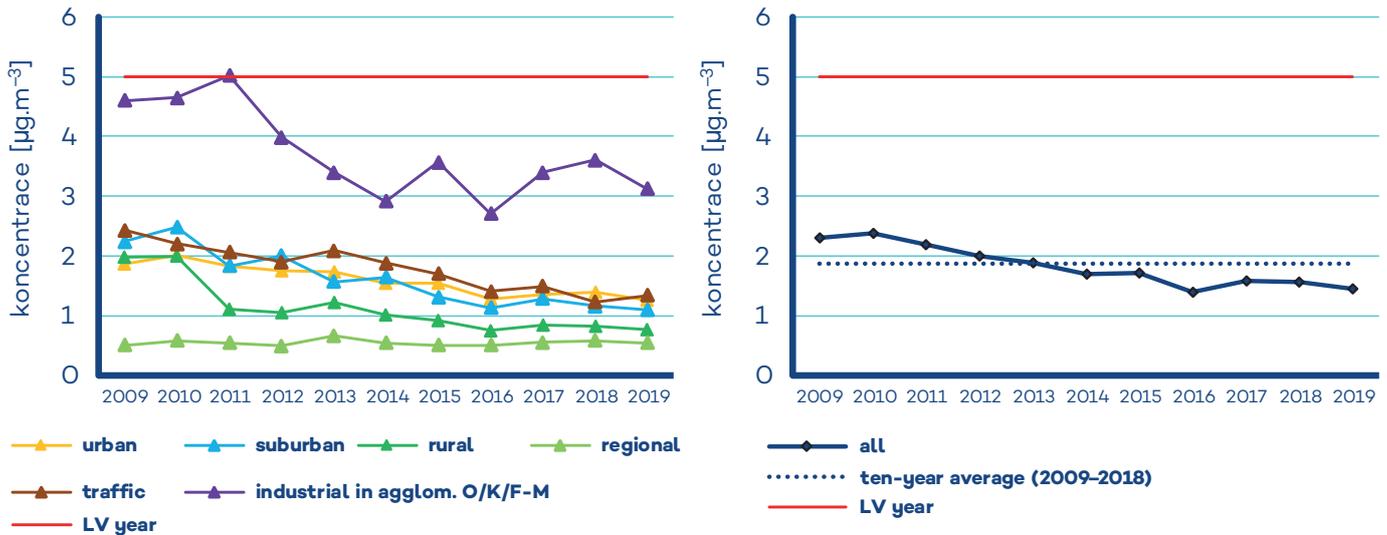


Fig. IV.5.4 Annual average concentrations of benzene at particular types of stations in the Czech Republic, 2009–2019

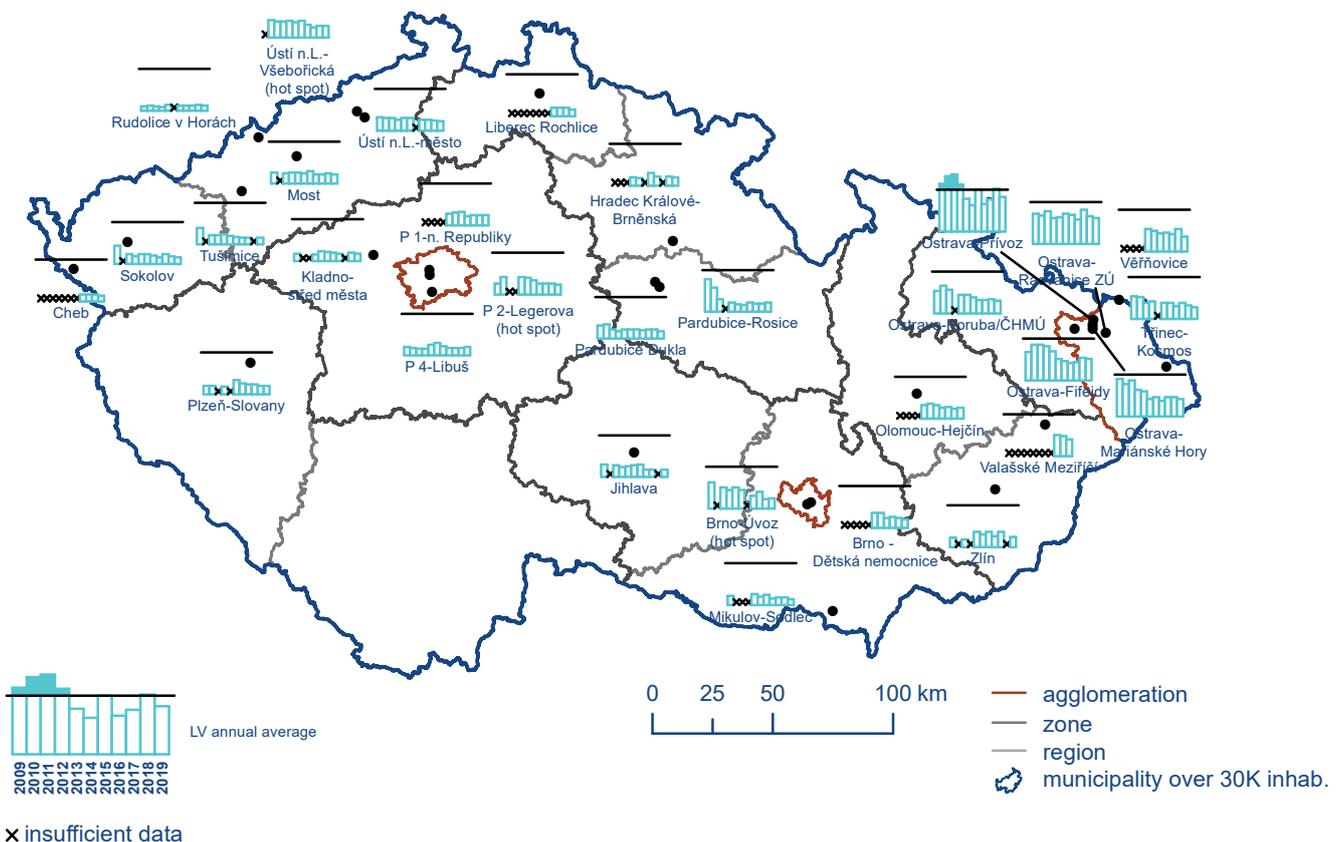


Fig. IV.5.5 Annual average concentrations of benzene at selected stations, 2009–2019