

## IV.8 Carbon monoxide

### IV.8.1 Air pollution by carbon monoxide in 2021

Similar to previous years, the 8-hour pollution limit value for carbon monoxide (CO) was not exceeded in the CR in 2021 at any of the total 21 stations with sufficient amount of measured data available for air quality assessment. The highest daily 8-hour average CO concentration occurred at the Tobolka-Čertovy schody rural station ( $6\,863\ \mu\text{g}\cdot\text{m}^{-3}$ ), whereas the pollution limit value is  $10\,000\ \mu\text{g}\cdot\text{m}^{-3}$ . This locality has long been affected by emissions from the nearby Čertovy schody lime manufacturing facility. Taking into account only a single maximum reported at a station, then the second highest 8-hour CO concentration was measured at the Ostrava-Radvanice ZÚ station ( $3\,987\ \mu\text{g}\cdot\text{m}^{-3}$ ). This station is in a very exposed locality affected by industry, traffic and local emission sources. The third, fourth and fifth highest 8-hour CO concentrations were measured at the Beroun ( $2\,524\ \mu\text{g}\cdot\text{m}^{-3}$ ), Chotěbuz ( $2\,434\ \mu\text{g}\cdot\text{m}^{-3}$ ), and Ostrava-Českobratrská (hot spot) ( $2\,157\ \mu\text{g}\cdot\text{m}^{-3}$ ) traffic stations, where

an impact from traffic emissions has a role due to the location of the stations near busy roads.

Elevated CO concentrations occur primarily at urban locations affected significantly by traffic, so measurements of this substance have continued at localities classified as traffic sites. At urban and rural background locations, CO concentrations fall well below the pollution limit values. An exception is the Tobolka-Čertovy schody station, where 8-hour CO concentrations reached in several cases almost 70 % of the air pollution limit in 2021.

### IV.8.2 Trends in carbon monoxide concentrations

A decreasing trend in the maximum daily 8-hour CO concentrations can be seen at most stations in the CR, as shown in Fig. IV.8.1. In 2021, the decrease in CO concentrations continued at most stations (Ostrava-Radvanice ZÚ, Chotěbuz, Tábor, Ostrava-Hošťálkovic, Studénka, Praha 4-Libuš, Hradec Králové-Brněnská). On the contrary, there was an increase in CO concentrations at some stations (Tobolka-Čertovy schody, Ostrava-Českobratrská, hot spot, Ústí nad Labem-Všebořická, hot spot).

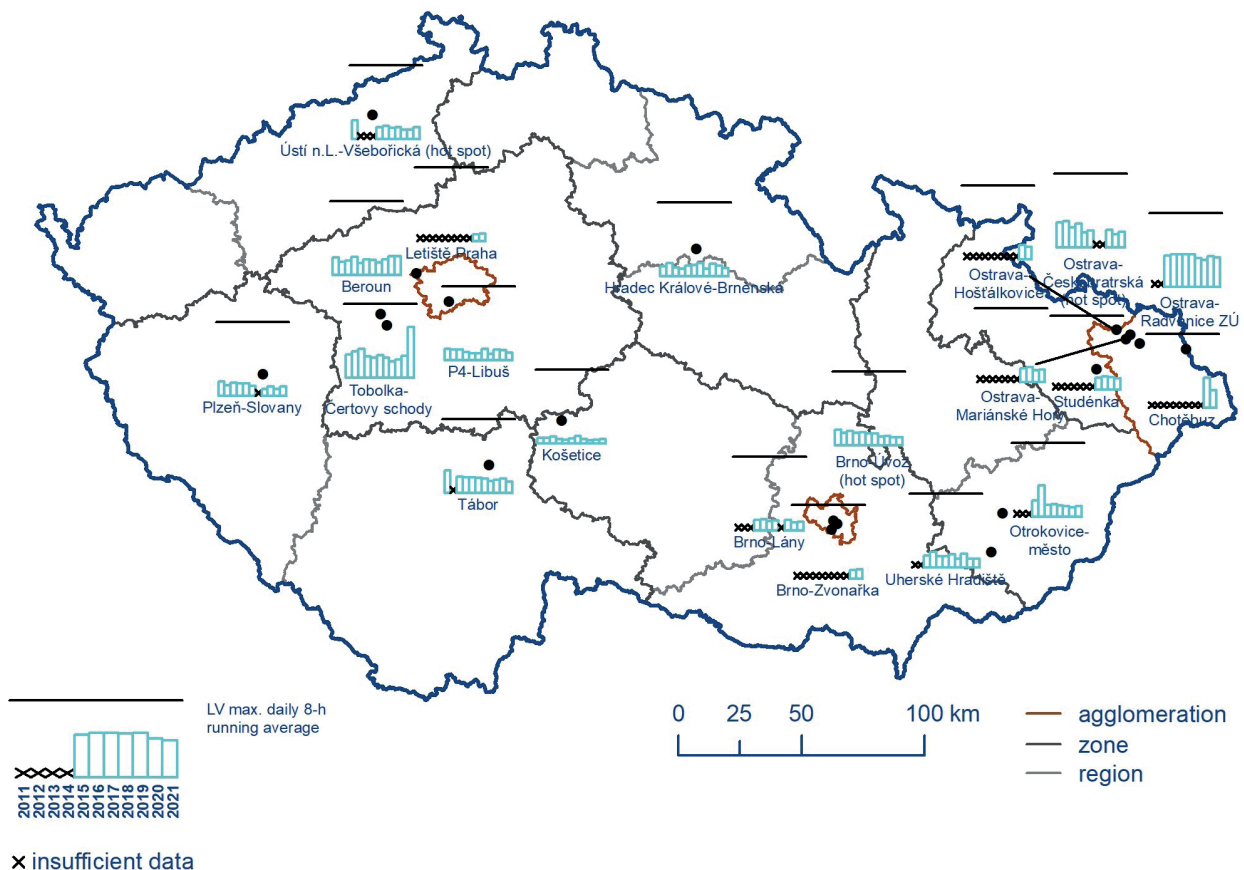
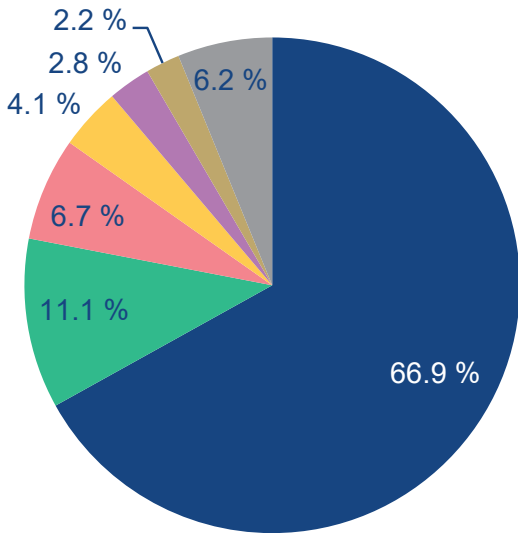


Fig. IV.8.1 Maximum hourly 8-hour running average concentrations of CO at selected stations, 2011–2021

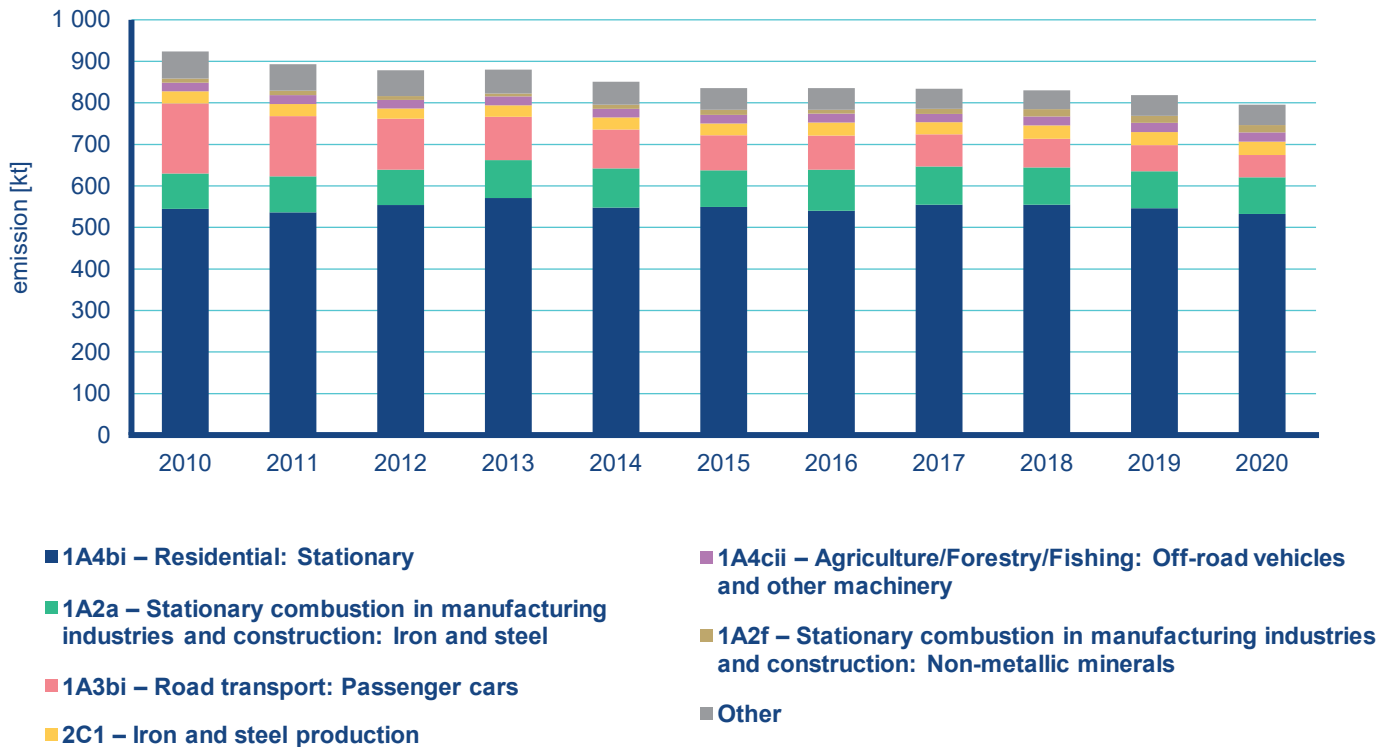


**Fig. IV.8.2 Total emissions of CO sorted out by NFR sectors, 2020**

### IV.8.3 Carbon monoxide emissions

Carbon monoxide is a product of the combustion of carbon-containing fuels at low temperatures and insufficient availability of air for combustion. The greatest amounts of CO are formed in sector 1A4bi – Residential: Heating, water heating, cooking, which produced 66.9 % of national emissions in 2020. Other important sources included sectors 1A2a – Stationary combustion in manufacturing industries and construction: Iron and steel (11.1 %) and 1A3bi – Road transport: Passenger cars (6.7 %; Fig. IV.8.2). The decreasing trend in CO emissions in 2010–2020 (Fig. IV.8.3) was caused primarily by natural renewal of the vehicle fleet and a reduction in the production of iron and steel after 2011. In view of the predominant effect of sector 1A4bi, this trend is substantially affected by developments in the consumption of solid fuels by households (Fig. II.7).

For individual regions of the CR, contributions from sectors differ in relation to the composition of sources in a given area. Due to the predominant effect of local heating, CO emissions in the CR are distributed over the entire residential built-up area. The impact of transportation dominates alongside motorways, roadways with high traffic levels and in larger urban units. The large amount of CO emissions in the O/K/F-M agglomeration originates from the production of iron and steel (Fig. IV.8.4).



**Fig. IV.8.3 CO total emissions, 2010–2020**

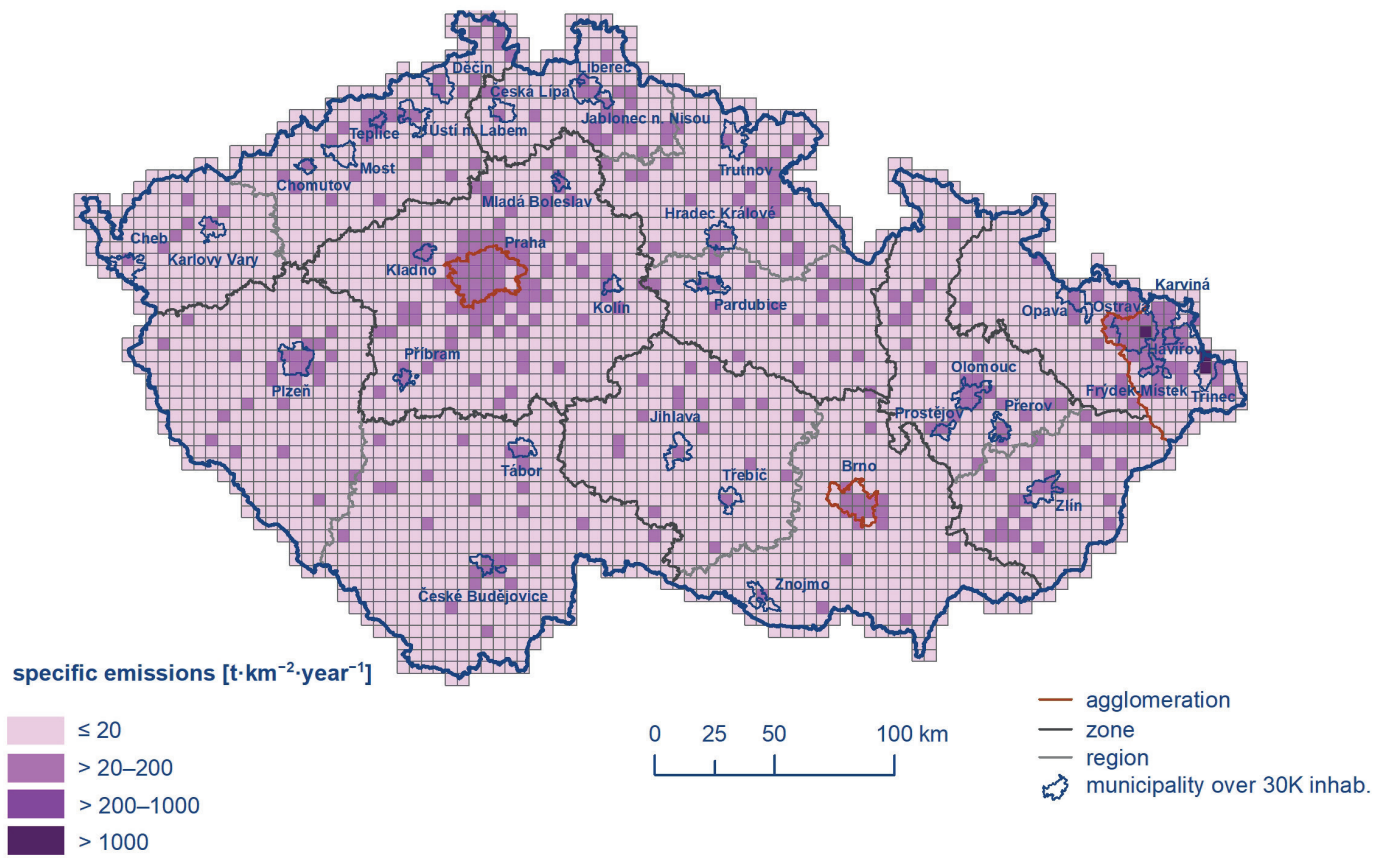


Fig. IV.8.4 CO total emission in 5×5 km resolution, 2020