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**Report
on the Environment
of the Czech Republic**

2024

Drawn up by

Department of Environmental Policy and Sustainable Development, Ministry of the Environment

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The evaluation is based on data provided by the cooperating organisations listed above. Data sets for the 2024 Report were collected via the Dataport system, and CENIA was responsible for the technical and graphic processing of the data and most of the map outputs.

The map base is created on the basis of ArcČR 500 v. 3.0 data. The thematic content is created from data provided by the institutions listed as data sources for individual maps.

Authorised version

© Ministry of the Environment, Prague

ISBN 978-80-7212-677-4 (printed version)

ISBN 978-80-7212-678-1 (electronic version)

Published by

Ministry of the Environment

Vršovická 1442/65, Prague 10, 100 10, info@mzp.gov.cz , www.mzp.gov.cz

Prague, 2025

Typesetting and graphic design

Adéla Vorbová, Vojtěch Hytha

List of cooperating organisations

Bohemian Switzerland National Park Administration
Central Institute for Supervising and Testing in Agriculture
Centre for Socio-Economic Research on the Impacts of Environmental Policies
Czech Astronomical Society
Czech Environmental Information Agency
Czech Forestry Institute
Czech Geological Survey
Czech Hydrometeorological Institute
Czech Office for Surveying, Mapping and Cadastre
Czech Ornithological Society
Czech Statistical Office
CzechInvest
Energy Regulatory Office of the Czech Republic
Forestry and Game Management Research Institute, public research institution
Charles University Environment Centre
Institute 2050
Institute of Agricultural Economics and Information
Institute of Public Health based in Ostrava
Krkonoše National Park Administration
Labe River Basin, state enterprise
Ministry of Agriculture of the Czech Republic
Ministry of Environment of the Czech Republic
Ministry of Finance of the Czech Republic
Ministry of Industry and Trade of the Czech Republic
Ministry of Transport of the Czech Republic
Morava River Basin, state enterprise
National Institute of Public Health
National Reference Laboratory for Environmental Noise
Nature Conservation Agency of the Czech Republic
Odra River Basin, state enterprise
Ohře River Basin, state enterprise
Podyjí National Park Administration
Public Opinion Research Center of the Institute of Sociology of the Czech Academy of Sciences
Railway Administration, state organisation
Research Institute for Landscape, public research institution
Research Institute for Soil and Water Conservation, public research institution
Road and Motorway Directorate of the Czech Republic
State Environmental Fund of the Czech Republic
Šumava National Park Administration
T. G. Masaryk Water Research Institute, public research institution
Transport Research Centre, public research institution
Vltava River Basin, state enterprise

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Introduction

The Report on the Environment of the Czech Republic (hereinafter referred to as the “Report”) is prepared annually on the basis of Act No. 224/2023, amending Act No. 123/1998 Coll., on the right to information on the environment, as amended, and Government Resolution No. 446 of 17 August 1994 and Government Resolution No. 934 of 12 November 2014. The report is submitted for approval to the Government of the Czech Republic and subsequently for discussion to the Chamber of Deputies and the Senate of the Parliament of the Czech Republic.

The report is a comprehensive document that assesses the state and development of the environment in the Czech Republic in the context of socio-economic factors and in relation to the fulfilment of the objectives set out in strategic documents. It uses official and verified data sources and the latest data sets available at the time of preparation of the report. The 2024 Report newly integrates the regional dimension into the national assessment, which makes it possible to assess the diversity of regions from the perspective of the indicators evaluated.

The 2024 Report on the Environment of the Czech Republic is prepared by the Ministry of the Environment (hereinafter referred to as “MoE”) and follows on from the Reports on the Environment of the Czech Republic and the reports on the environment in the regions of the Czech Republic from previous years, which were prepared for the MoE by the Czech Environmental Information Agency (hereinafter referred to as “CENIA”). The data sets for the 2024 Report were collected via the Dataport system, and the technical and graphic processing of the data was carried out by CENIA. Starting with the 2020 Report, there has been a change in the content concept and structure of the Report, based on the State Environmental Policy of the Czech Republic 2030 with a view to 2050 (hereinafter referred to as “SEP 2030”), for the purpose of ongoing evaluation of its indicators and the fulfilment of set goals and priorities. The main areas are based on SEP 2030 (1. Environment and Health, 2. Climate-Neutral and Circular Economy, 3. Nature and Landscape) and are framed by other topics that are crucial for the state and development of the environment (Effects of Climate Change in the Czech Republic, Financing Environmental Protection, Opinions and Attitudes of the Czech Public, Planetary Boundaries).

Key messages of the Report

In recent years, Czechia has seen a significant decline in greenhouse gas emissions, reflecting the gradual decarbonisation of the economy supported by investments from national and European sources. As a result of energy savings and a reduction in the share of fossil fuels in Czechia's energy mix, greenhouse gas emissions have fallen by 47% compared to 1990, according to the latest data. The Czechia is thus well on its way to meeting the target of a 55% reduction in emissions by 2030, as set out in EU legislation.

This success is mainly due to the transformation of the energy sector towards greater use of low-emission energy sources and the favourable development of the fuel mix for household heating. In the structure of sources for electricity generation, the share of electricity generation from nuclear power exceeded that from coal in 2023, and in 2024 nuclear power plants generated 40.2% of total electricity production. The share of renewable sources in electricity generation rose to 16.7%, and the structure of electricity generation is thus moving towards the corridors set out in the currently valid State Energy Policy.

The consumption of solid fossil fuels for household heating is declining. In 2023, total energy consumption for household heating also fell by 10.6% year-on-year, which was influenced not only by an above-average warm heating season, but also by a reduction in the energy intensity of buildings. On the other hand, the use of electricity and heat pumps for heating is increasing in households, which is favourable from the point of view of decarbonisation and air protection. The reduction in energy consumption in households and the energy intensity of industry has increased the energy efficiency of the entire economy, bringing Czechia closer to achieving its energy efficiency targets for 2030.

These positive trends are offset by negative developments in transport, where energy consumption continues to grow and has almost doubled since 2000. In addition, more than 90% of the energy consumed in transport is of fossil origin. Although the use of low-emission and zero-emission vehicles has been growing dynamically in recent years and the targets of the National Action Plan for Clean Mobility for their number by 2025 are likely to be met, transport remains the sector with the slowest pace of decarbonisation in Czechia.

Air emissions are falling and national emission commitments for selected air pollutants set for 2030 are very likely to be met. The exception is ammonia emissions, which come mainly from agriculture, where compliance with the commitment is uncertain. However, this uncertainty is mainly due to the methodological approach to predicting emissions for future years. Air quality is improving in terms of the proportion of the territory with exceeded emission limits. However, the carcinogenic benzo[a]pyrene, which is produced during the combustion of carbonaceous fuels, including biomass, remains a problematic air pollutant. Its largest source is local household heating, especially older coal and wood-burning boilers. From an air quality perspective, it is therefore urgent to continue supporting the replacement of domestic heating boilers with modern emission-free methods or less emission-intensive technologies.

In forests, the bark beetle calamity, which began in 2015 in northern Moravia, gradually spread throughout the Czech Republic and peaked in 2020, appears to be stabilising. At the same time, extensive forest restoration is underway in the affected areas, increasingly using natural regeneration. Massive logging after 2018 affected the carbon balance of Czech forests, which temporarily became a source of greenhouse gas emissions, but thanks to the restoration of stands, the LULUCF sector balance returned to negative values in 2023. However, the health of forests remains unsatisfactory, partly due to inappropriate species composition and overly simple stand structure.

The quality of surface water in Czechia has improved significantly since 2000, mainly due to a significant reduction in concentrations of ammoniacal nitrogen and total phosphorus. This progress has been achieved through improvements in treatment technologies at point sources of pollution, in particular through the construction and modernisation of wastewater treatment plants. However, the improvement is not uniform across regions, and in some areas it is still necessary to invest in infrastructure. In recent years, this positive trend has stalled. Water quality is stagnating and further reductions in pollution levels are not being achieved. The main pressures remain inadequate wastewater treatment and diffuse pollution from agriculture, with Czechia being one of the EU countries with the highest proportion of groundwater affected by this type of pollution.

The decline in bird populations, which are the main indicator of biodiversity in forest and agricultural landscapes, continues. The area of agricultural land (especially arable land) continues to decrease, while the area of built-up areas and forest land is increasing. The soil is threatened by degradation due to intensive farming, low heterogeneity of the agricultural landscape and a high degree of ploughing. From a nature conservation perspective, partial successes can be observed in the populations of endangered species, mainly thanks to management in protected areas and active species protection tools.

A positive factor for the transition to a circular economy is that waste management is dominated by waste utilisation, especially material utilisation, which is in line with the current waste management hierarchy. In the area of municipal waste management, the main objective is to significantly reduce landfilling in favour of material recovery in particular, yet a significant proportion of municipal waste continues to be landfilled.

Environmental protection, including climate change mitigation, is financially secured in the long term from both national and European sources through operational programmes (in the long term, these are the Operational Programme Environment or the Rural Development Programme, or the Strategic Plan for the Common Agricultural Policy) and, since 2021, also from the Modernisation Fund and the Recovery and Resilience Facility for the implementation of the National Recovery Plan. As a result of the energy crisis and in view of the geopolitical situation, these sources are essential for ensuring the Czech Republic's energy independence. Examples of successful financing of environmental protection measures include the implementation of the New Green Savings, Rainwater and Boiler Subsidy programmes. These programmes significantly help not only industry and the energy sector, but also households in particular with the transition to green energy from renewable sources, energy savings and more efficient use of water resources.

Climate Change Effects in the Czech Republic

Key messages

- The year 2024 was the warmest in Czechia since 1961. February and the entire spring season (March–May) were record warm. Climate warming in Czechia is faster than the global average.
- Total precipitation in Czechia was above average in 2024. Record high precipitation in September contributed significantly to the above-average annual precipitation total in 2024.
- The climatic drought in 2024 was weaker than in previous years. It occurred in the summer months in the lower-lying areas of Bohemia and southern Moravia and was only of weak intensity.
- At the beginning of September, soil water reserves were below 50% in more than 80% of the Czechia, with large areas of southern Moravia, the Elbe River Basin, the Ohře River Basin, and central and eastern Bohemia having soil saturation below 20% of the maximum water capacity.
- In the second decade of September, the whole of Czechia, with the exception of western Bohemia, was hit by a significant flood situation, with extreme flows occurring mainly in the Jeseníky region.

Climate Change Effects in the Czech Republic

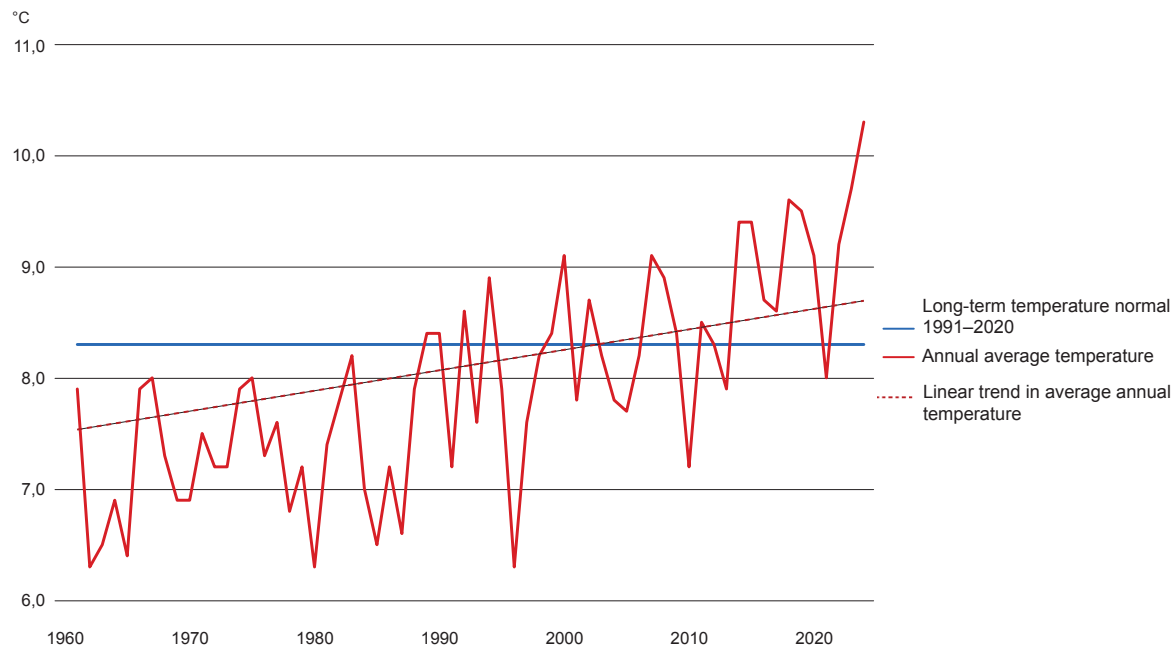
Temperature and precipitation conditions

The year 2024 was a record warm year in Czechia, with an average annual air temperature of 10.3 °C, which was 2 °C higher than the 1991–2020 normal. The year was assessed as **exceptionally above normal in terms of temperature**, with the highest average annual temperature since 1961. The average temperature of the warmest previous year, 2023 (9.7 °C), was exceeded by a significant margin, followed by 2018 (9.6 °C) and 2019 (9.5 °C). Since 2000, the Czech Republic has experienced predominantly above-average warm years (Graph 1), which have significantly prevailed since 2010, with only three cases (2010, 2013 and 2021) the average annual temperature was lower than the average for the normal period 1991–2020, with only 2010 showing a more significant negative temperature deviation.

The annual average temperature in the **Czech Republic is rising by 0.37 °C per decade**, which is statistically significant and approximately double the global average. The rise in air temperature is a factor influencing other manifestations of climate change, such as drought, fire risk, torrential rainfall and the associated risk of flash floods, and the increasing extremity of dangerous hydrometeorological phenomena (storms, strong winds).

Graph 1

Average annual air temperature in the Czech Republic compared to the 1991–2020 normal [°C], 1961–2024



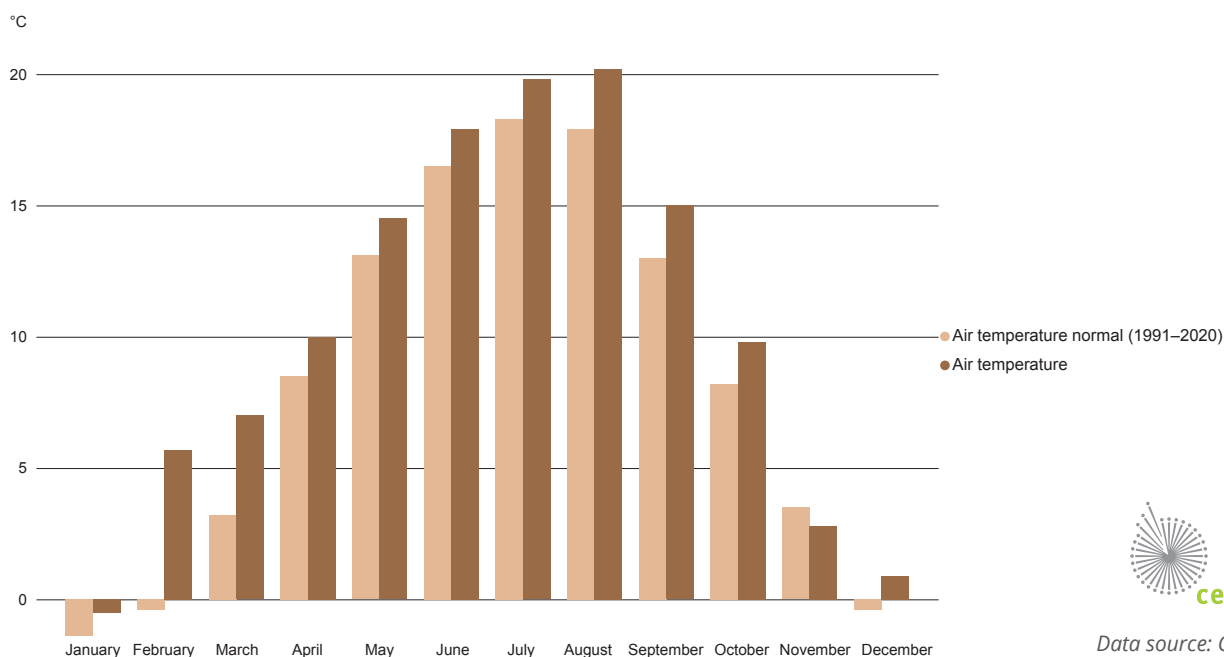
Data source: CHMI

All months of the past year 2024, with the exception of November, were warmer in Czechia compared to the 1991–2020 normal (Graph 2). February (deviation from normal +6.1 °C) and March (+3.8 °C) were **exceptionally warm**, with February and March being the warmest since 1961. The positive temperature deviation in February was the highest recorded for any month in the history of measurements. August was **significantly warmer than normal** (+2.1 °C deviation), while the other months of the year were assessed as warmer than normal, with the exception of January, November and December, which recorded deviations from normal within the range of normal temperatures for those months.

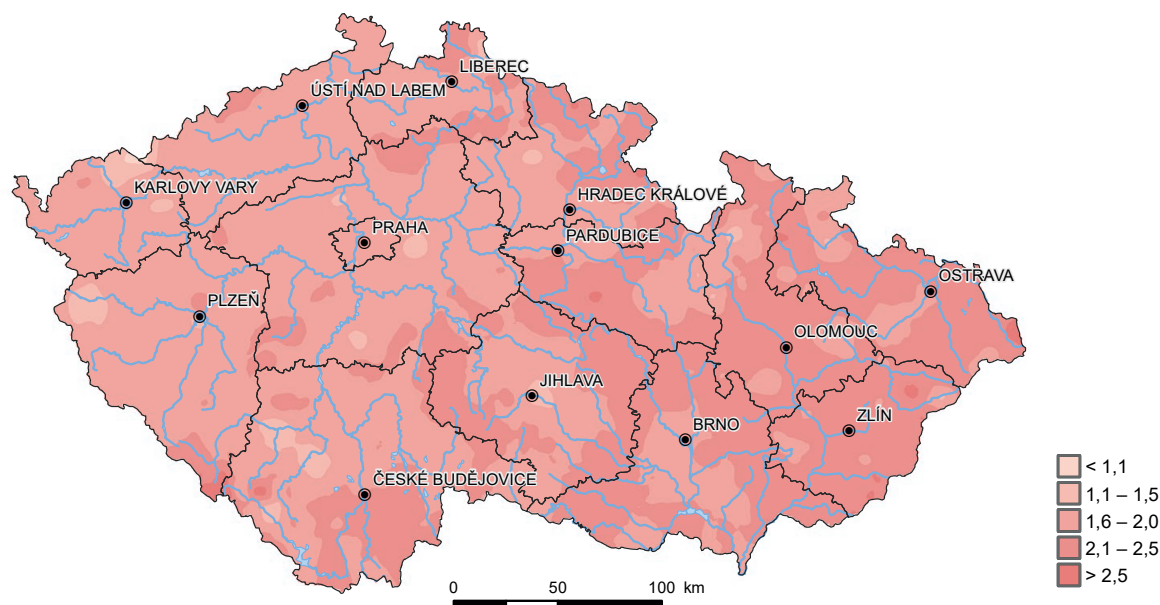
In terms of **seasonal average temperatures**, 2024 was characterised by a **very warm winter season 2023/2024** (the average temperature for December, January and February was 3.1 °C higher than normal), making it the second warmest winter after the winter season 2006/2007. This was followed by **an exceptionally warm spring**, with an average temperature of for the spring months of March, April and May of 10.3 °C, which was 2.2 °C higher than the 1991–2020 normal. **The spring season was the warmest** in the Czech Republic since 1961. The summer of 2024 was also warmer than average, with a seasonal temperature of 19.3 °C and a deviation from the normal of +1.7 °C, making it the 2nd–4th warmest since 1961.

Graph 2

Average monthly air temperature in the Czech Republic compared to the 1991–2020 normal [°C], 2024



The average annual temperature in 2024 exceeded the 1991–2020 normal in **all regions of the Czech Republic**, with a positive deviation of the average annual temperature from the normal also recorded in all altitude categories, including mountainous areas (Fig. 1). The eastern and north-eastern **parts of the country** were the warmest compared to the normal, with the deviation of the average temperature from the normal reaching +2.1 °C in the Olomouc, Zlín and Moravian-Silesian regions. It was somewhat cooler than normal in the west and north-west of Bohemia (Karlovy Vary and Ústí nad Labem regions), where the deviation of the average annual temperature from normal was 1.7 °C. The highest annual average temperature in 2024 was in the South Moravian Region (11.4 °C), followed by Prague and the Central Bohemian Region (10.9 °C).

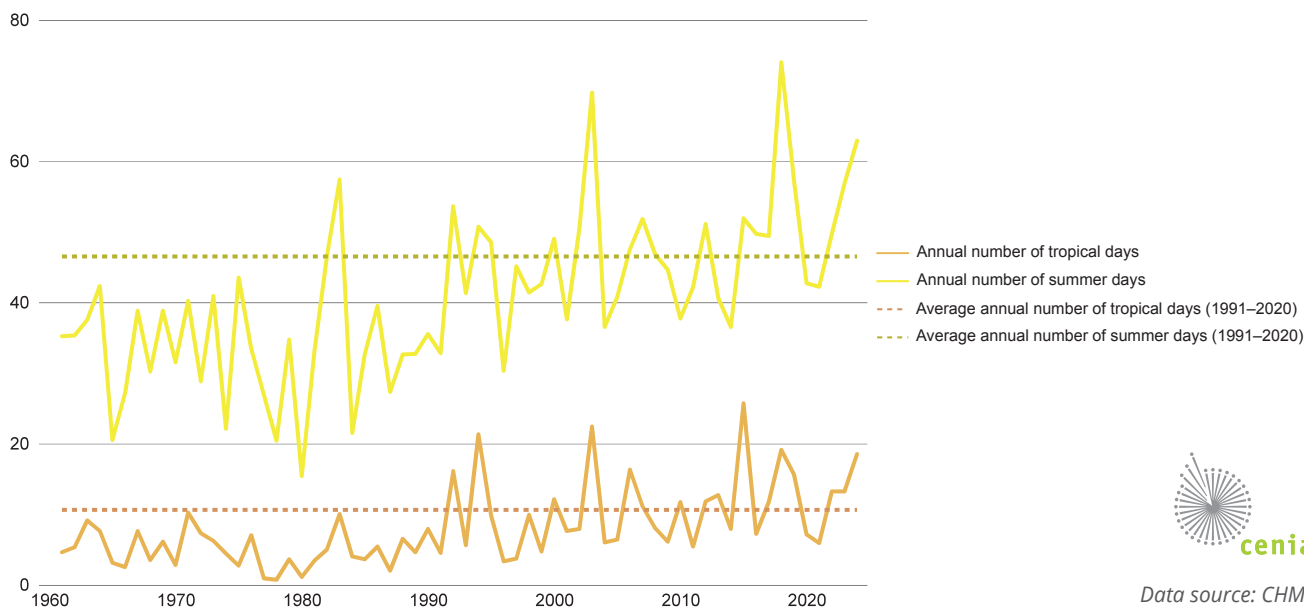
Fig. 1**Deviation of the annual average air temperature from the 1991–2020 normal in the Czech Republic [°C], 2024***Data source: CHMI*

The above-average warmth of 2024 is also documented by the evaluation based on the recorded number of so-called characteristic days. In terms of the territorial average, there were 63 **summer days** with temperatures above 25 °C in 2024 (135.3% of the 1991–2020 normal). There were 19 **tropical days**, when the temperature reached or exceeded 30 °C, on average across the country (174.5% of the normal, Graph 3), but this is an average number including higher altitudes, where tropical days are almost non-existent. In the warmest areas of Bohemia and southern Moravia, **more than 40 tropical days** were recorded in 2024, with the highest numbers at the Strážnice (47) and Doksany (44) stations. The highest maximum daily temperature in 2024 was recorded on 14 August 2024, when the temperature at the Strážnice station in the South Moravian Region rose to 37.1 °C.

Graph 3

Number of summer and tropical days in the Czech Republic (regional average) compared to the 1991–2020 normal [number of days], 1961–2024

number of days



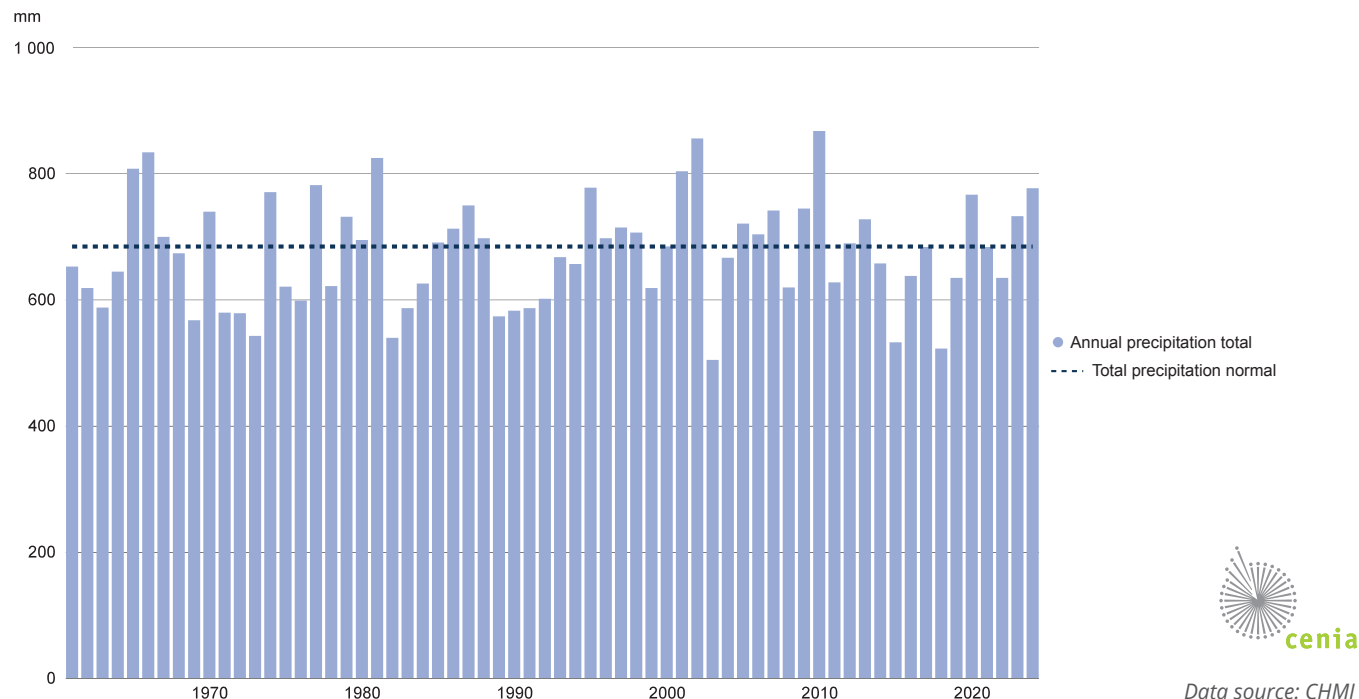
From a health perspective, even more risky than isolated tropical days are so-called **heat waves**, i.e. a continuous period of 3 or more days when the maximum air temperature rises above 30 °C and at the same time exceeds the 1991–2020 normal in a given location by more than 5 °C. A heatwave occurred at some stations in Czechia in 2024 for a total of **41 days**, which is the third highest occurrence of heatwaves after 2003 (43 days) and 2018 (42 days). The highest total length of heat waves was recorded in the South Moravian Region and in Prague and the Central Bohemian Region, with 31 days in each case. The shorter total length of heat waves at the regional level than at the national level is due to the construction of the indicator, which considers only one station in the evaluated territory, and heat waves do not usually occur throughout the whole territory of Czechia at the same time.

Climate warming is also reflected in **the declining occurrence of frost and ice days**. In 2024, there were 82 frost days (73.6% of the 1991–2020 normal) when the minimum temperature fell below 0 °C, and only 15 ice days (46.9% of the normal) when the temperature did not rise above 0 °C, i.e. when there was frost throughout the day. This is the fourth lowest annual occurrence of ice days since 1961, after 1974, 2020 and 2015. Although the occurrence of frost and ice days remains high in mountainous areas (e.g. the Luční bouda station in the Krkonoše Mountains recorded a total of 168 frost days and 69 ice days in 2024), the decrease in the number of these days in middle and lower elevations leads to **lower overall water reserves in the snow cover**, creating conditions for drought in the coming spring and summer seasons.

In terms of precipitation, 2024 was **above normal** in the Czech Republic, with an average annual precipitation of 776 mm, representing 113% of the 1991–2020 normal (Graph 4). This is the 9th highest annual precipitation total since 1961.

Graph 4

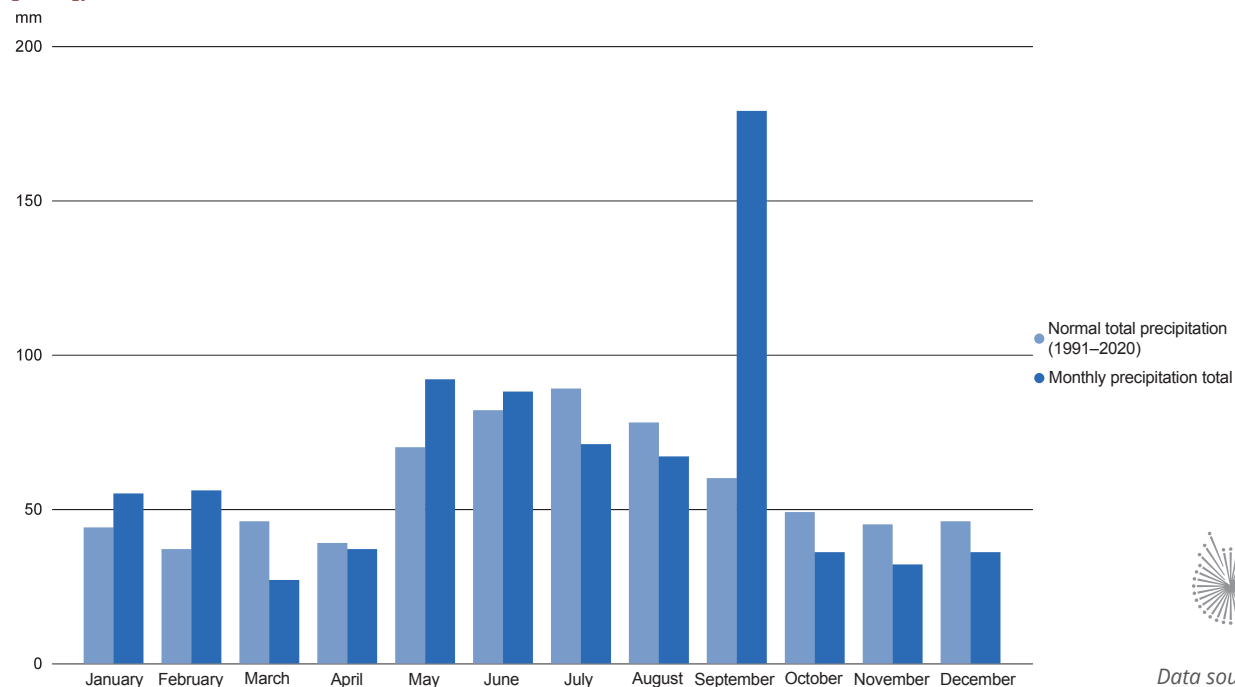
Annual precipitation in the Czech Republic compared to the 1991–2020 normal [mm], 2024



The above-average annual precipitation total in 2024 was significantly influenced by **record high precipitation in September** (Graph 5), when 179 mm of precipitation fell (298% of the 1991–2020 normal), making the month exceptionally wet. The September total, which was the highest for September and the second highest for any month since 1961, was associated with extreme rainfall between 11 and 16 September, which led to catastrophic flooding, particularly in the north-east of the Czech Republic and also in the south of Bohemia. **Precipitation** was also **above normal** in January, February and May, with totals of 55 mm (125% of normal), 56 mm (151% of normal) and 92 mm (131% of normal). In contrast, March saw **below-normal** precipitation, with an average of 27 mm (59% of normal) falling in the Czech Republic. The other months of 2024 were assessed as having normal precipitation.

Graph 5

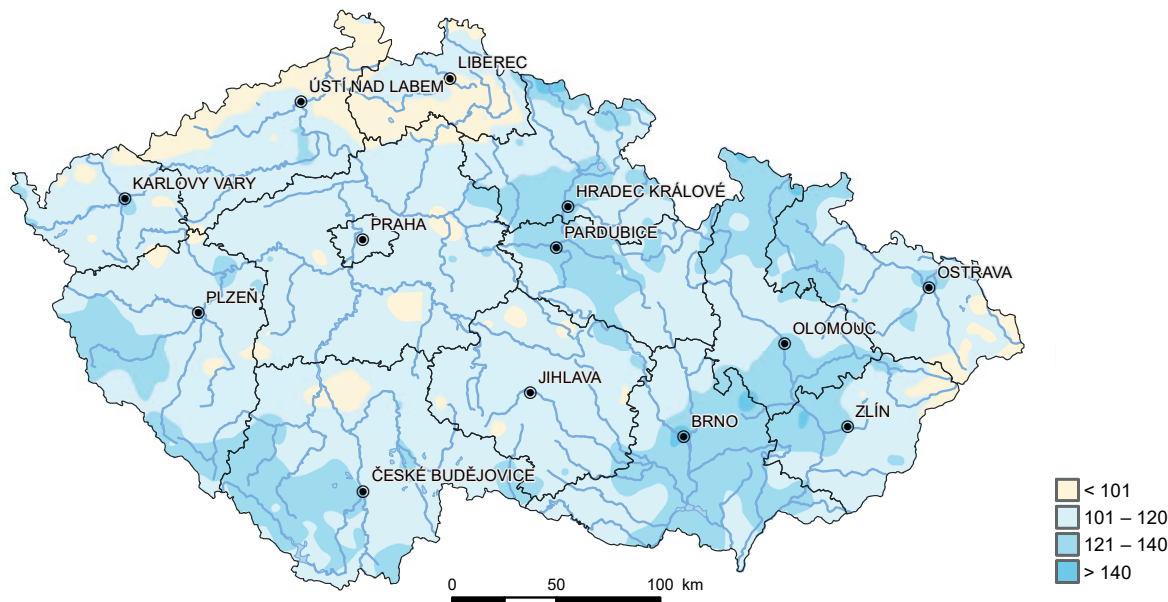
Monthly precipitation totals in the Czech Republic compared to the 1991–2020 precipitation normal [mm], 2024



In 2024, an average of 758 mm of precipitation fell in **Bohemia** (111.1% of normal), and 808 mm in **Moravia and Silesia** (116.9% of normal). In all regions as a whole, the annual precipitation total in 2024 exceeded the 1991–2020 normal. The highest total precipitation was recorded in the Moravian-Silesian Region (927 mm, i.e. 114% of normal), while the highest proportion of precipitation relative to normal (884 mm, i.e. 123%) was in the Olomouc Region. The driest region in 2024 was the north-west of the Czech Republic, with an average rainfall of 649 mm, i.e. 101% of the normal, in the Ústí nad Labem Region. In the north-western part of the Ústí nad Labem Region and also in the south of the Liberec Region, the annual precipitation total was lower than the long-term normal (Fig. 2).

Fig. 2

Annual precipitation in the Czech Republic expressed as a percentage of the 1991–2020 normal [%], 2024



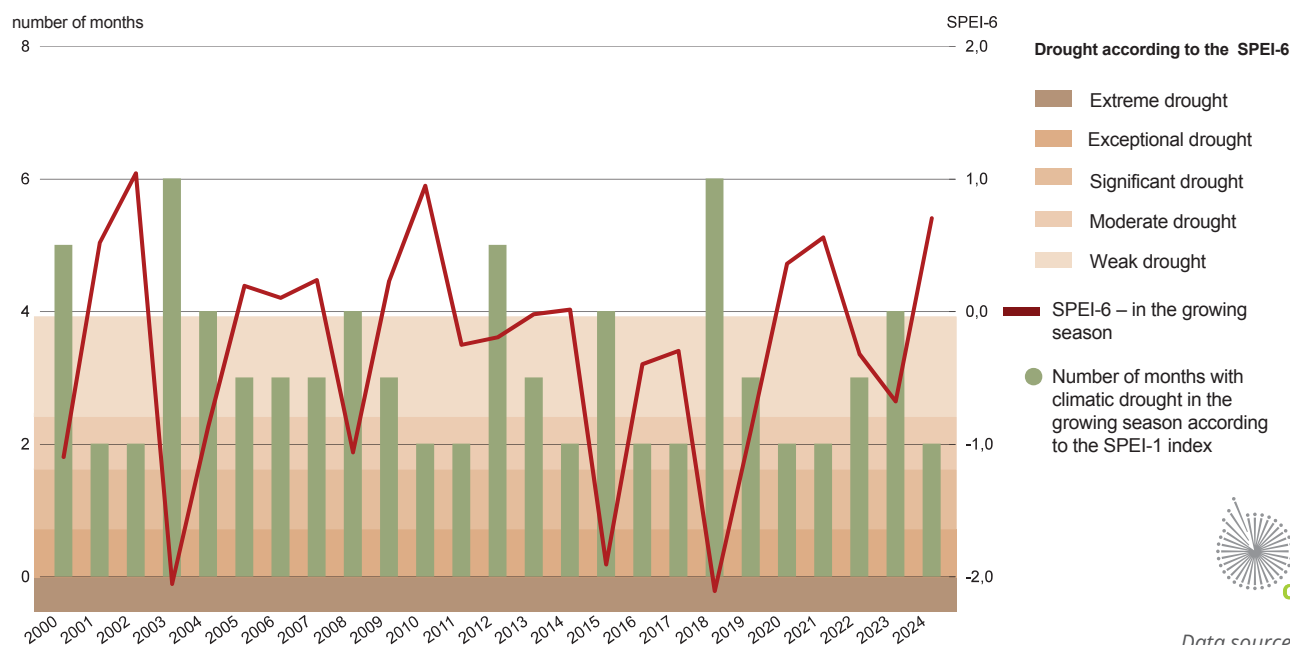
Data source: CHMI

Occurrence of droughts and floods, runoff conditions and groundwater status

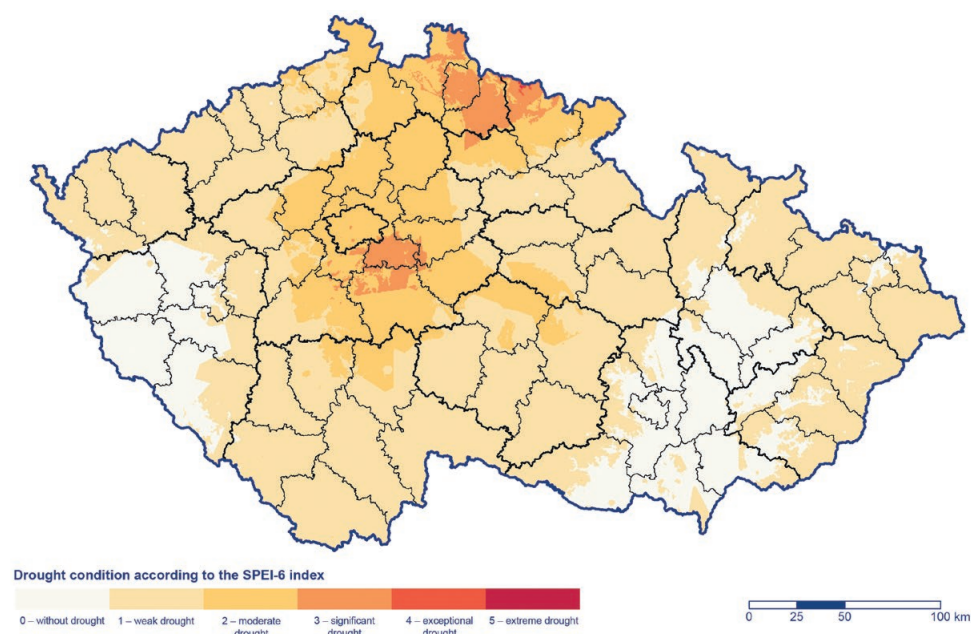
Climatic drought indicators for the entire growing season (i.e. April–September) were influenced by extremely high precipitation totals in September, which is why the results for the period March–August 2024 are also presented in the following assessment.

The SPEI-6 climate drought index¹ for the period April–September 2024 averaged 0.7 for the whole of the Czech Republic, indicating no climate drought (Graph 6). For **the period March–August**, the SPEI-6 index averaged -0.55 , which already represents the onset of (mild) drought in this six-month period. The worst droughts since 2000 were recorded in 2003, 2015 and 2018, with exceptional to extreme climatic droughts. According to the SPEI-1 index, drought occurred in April, July and August of the 2024 growing season, with the drought classified as mild on average for the entire territory in all of these months.

¹ The Standardised Precipitation Evapotranspiration Index (SPEI) is a climate drought index that assesses drought as the difference between precipitation totals and potential evapotranspiration relative to normal. The index is most often calculated on a rolling basis with a step of 1 to 6 months; here, variants with steps of 1 (SPEI-1) and 6 months (SPEI-6) are presented.

Graph 6**Precipitation Evapotranspiration index SPEI-6 during the growing season (April–September) and number of months with drought according to the SPEI-1 index [SPEI], 2024**

Regionally, according to the SPEI-6 index, climatic drought was recorded in **the period March–August 2024**, particularly in the Central Bohemian and Liberec regions, with some parts of these regions experiencing moderate drought (Fig. 3). In the **April–September** period, when assessing the entire six-month period, there was no climatic drought in our territory due to significant rainfall in September, and therefore no map is provided for this period.

Fig. 3**Precipitation Evapotranspiration Index SPEI-6 in the period March–August [SPEI-6], 2024**

Data source: CHMI

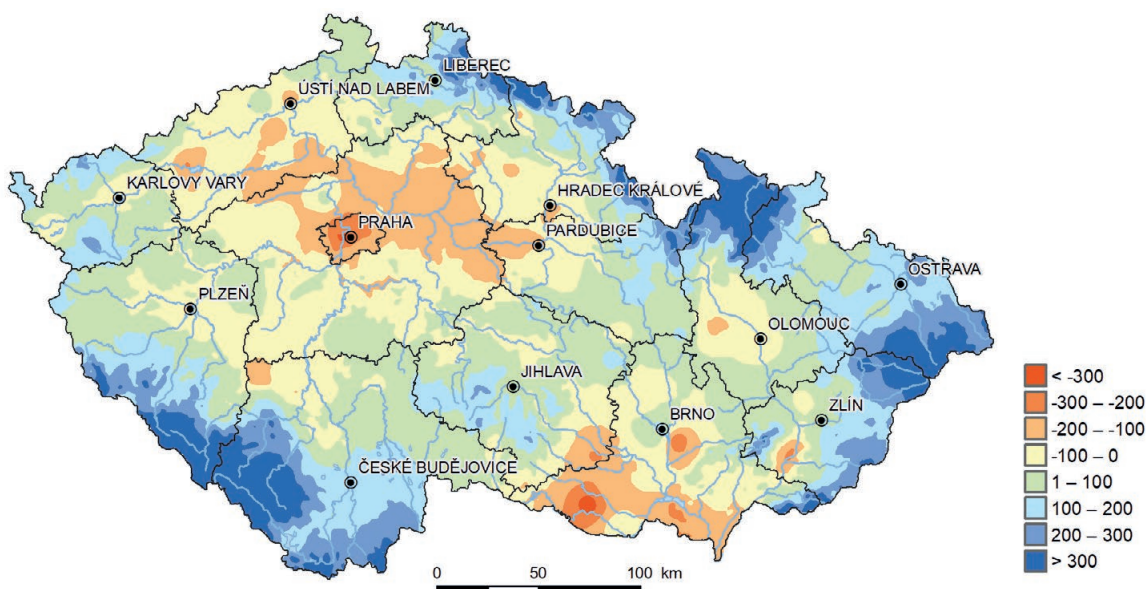
The development of **the moisture balance** (i.e. the difference between precipitation and potential evapotranspiration) at the beginning of 2024 was comparable to the previous year 2023. Until the first half of April, positive moisture balance values prevailed in most areas, which were further increased in the first half of March by a significant precipitation episode, primarily in southern Moravia. Subsequently, due to higher temperatures and increased evaporation, moisture balance values declined. In the second half of April and then in May, negative moisture balance values were recorded in southern Moravia, the Elbe River Basin and the Poohří region. After a temporary improvement at the beginning of June, moisture balance values continued to decline to negative values in southern Moravia and the Polabí region. From mid-July, moisture balance values continued to decline across the entire territory, most significantly in southern Moravia. At the beginning of September, moisture balance values were negative in about 80% of the Czech Republic, and more than 60% of the territory had average balance values lower than -100 mm. The worst situation was in southern Moravia, where values fell below -200 mm, followed by the Elbe River Basin and central and eastern Bohemia. Extreme rainfall between 12 and 16 September associated with the Boris low-pressure system led to a significant jump in moisture balance values across most of the Czech Republic. By the end of the year, the moisture balance had stabilised, with the lowest values of around -100 mm persisting in southern Moravia.

At the end of August and beginning of September, moisture balance values were 100 mm or less below normal in most areas. The total moisture balance was 200 mm lower than the long-term average during this period in the Krkonoše and Jizerské hory mountains and also in the Posázaví region. Thanks to the flood rainfall in September, moisture balance values were subsequently higher than the long-term average in most areas, except for the Polabí, Posázaví and parts of northern Bohemia.

In total for **the entire growing season** (April–September) of 2024 (Fig. 4), a negative moisture balance was recorded only in the lowland areas of the Czech Republic, which are climatically the warmest. The most significant negative moisture balance, with a cumulative total of less than -200 mm, was observed in the western part of the South Moravian Region, in the central Polabí region, the lower Vltava region and the Poohří region. A positive total moisture balance during the growing season occurred in most of Czechia, with a significantly positive balance in the border mountain areas, with the exception of the Ore Mountains, and in areas where the highest precipitation totals were recorded during the September precipitation episode (Jesenícko, southern Bohemia). For the whole of 2024, the total moisture balance for the whole of Czechia was positive and reached +201.5 mm (108.7% of normal), which is more than in the previous year (+174.7 mm).

Fig. 4

Basic moisture balance of precipitation and potential evapotranspiration of grassland in mm for the growing season 1 April – 30 September 2024 in the Czech Republic [mm]

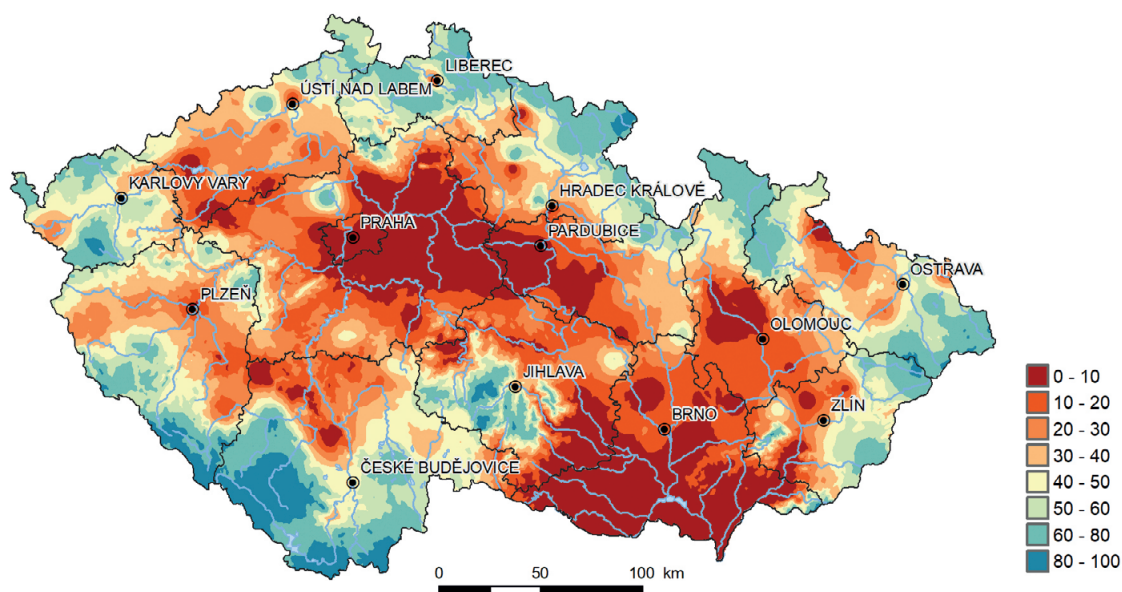


Data source: CHMI

The development of moisture balance conditions was also reflected in the values **of usable water reserves in the soil**. Until mid-March, soil water values remained stable, with significant replenishment due to precipitation in southern Moravia and Haná in mid-March. This was followed by a significant decline in values across the entire territory, with soil water reserves falling below 50% of usable water capacity (hereinafter referred to as UWC) in mid-May in a large part of the lower-lying areas of Czechia. The lowest values below 30% UWC were in southern Moravia, in the Znojmo region. After a temporary improvement in mid-May, soil moisture values continued to decline, with the exception of the Haná region and northern and eastern Moravia, where, on the contrary, thanks to rainfall, reserves rose to values above 70% UWC at the end of June. During July and August, apart from temporary rainfall episodes, soil water reserves decreased. The dependence of soil water replenishment on the spatial distribution and amount of local rainfall was clearly evident. At the beginning of September, soil water reserves were below 50% in more than 80% of the Czech Republic, with large areas of southern Moravia, Polabí, Poohří, central and eastern Bohemia having soil saturation below 20% of the long-term average, indicating severe soil drought (Fig. 5). These water reserves were less than 25% of the long-term average. In contrast, the border mountains, with the exception of the Ore Mountains, had sufficient soil moisture reserves during this period. Significant rainfall in September ended the soil drought, with the vast majority of the Czech Republic having soil water reserves of 70% UWC and above after this rainfall episode in the second half of September, and soil water reserves above 90% UWC in Moravia.

Fig. 5

Usable water reserves in the soil (UWC = 170 mm/m) – current status of modelled values as of 8 September 2024 [% UWC]



Data source: CHMI

From a hydrological point of view, 2024 can be assessed as a year **with slightly above-average runoff** in Czechia, but there were significant differences both in individual main river basins and in terms of seasonal assessment. Overall, all main river basins showed slightly above-average flows, with the exception of the Olše River basin, which had average values.

Of the **main river basins** in Czechia, 119% of the long-term average flowed through the profile in Hřensko on the Labe, 121% in Bohumín on the Odra, 121% in Strážnice on the Morava, and 126% in the Ladná profile on the Dyje. Deviations of annual flows from the long-term average for the period 1991–2020 ranged from 98% on the Olše River in Věřňovice to 136% on the Morava River in Olomouc.

While January and February saw **above-average runoff** in all major river basins, the spring months of March, April, and May were assessed as **below average** in terms of runoff. The summer period was average to below average in terms of runoff, with significant hydrological events mainly associated with localised intense rainfall. **September saw significantly above-average runoff** in all monitored major river basins. Relatively the most water flowed down the Odra and Dyje rivers, more than five times the usual amount of water in September, and slightly less down the Morava, Vltava, Labe and Olše rivers, where the runoff measured by average monthly flow ranged between 300% and 450% of Q_{IX} . The end of 2024 saw mostly average runoff.

Flood events reaching flood activity levels ("FAL") occurred in almost all months **of 2024**. During January and February, the effects of the extensive flooding at the end of 2023 were combined with above-average precipitation. Another significant flood event occurred as a result of heavy rainfall at the beginning of June, when the highest rainfall was recorded in the southwest, west and north of the Czech Republic, reaching up to 50 mm/24 h in some places. The heaviest rainfall caused the most rapid rises in water levels in the foothills of the Bohemian Forest and Šumava, with the 3rd FAL being exceeded on the Úhlava in Trojanov and on the Radbuza in Staňkov. Further significant rises in water levels occurred after heavy rainfall on 10 June in the east of the Czech Republic and again on 21–22 June, when 20 to 70 mm/48 h fell in the south-east of the Czech Republic, with maximums of up to 90 mm/48 h. During the summer, only minor floods occurred due to convective precipitation.

The **most significant flood situation of 2024** occurred in September, affecting the entire country with the exception of western Bohemia. During the second decade of September, Czechia was hit by extreme rainfall, reaching up to 500 mm / 5 days in some places and over 600 mm in 5 days in the Jeseníky Mountains. The highest total was recorded by the Loučná nad Desnou – Švýčárna stations, where five-day cumulative precipitation between 11 and 15 September reached 704.2 mm, and on 14 September 2024, 385.6 mm of rain fell in 24 hours. This is an absolute record for daily precipitation recorded in the Czech Republic. This amount of precipitation caused an extreme runoff response, most notably on watercourses in foothill areas, where precipitation was intensified by orographic effects. The most affected area was Jesenícko, specifically the Opava river basin and, in particular, the basins of all tributaries of the Kladská Nisa (Vidnava, Bělá and other smaller watercourses), where the extreme flood level was exceeded very significantly and reached historic highs in some profiles. Of the total of 366 stations used by the CHMI's Warning and Flood Forecasting Service, the 3rd FAL level was exceeded in 180 profiles, of which 42 reached or exceeded the extreme flood level (with an n-year frequency of Q_{50} or higher). A separate CHMI report is devoted to the evaluation of the flood.

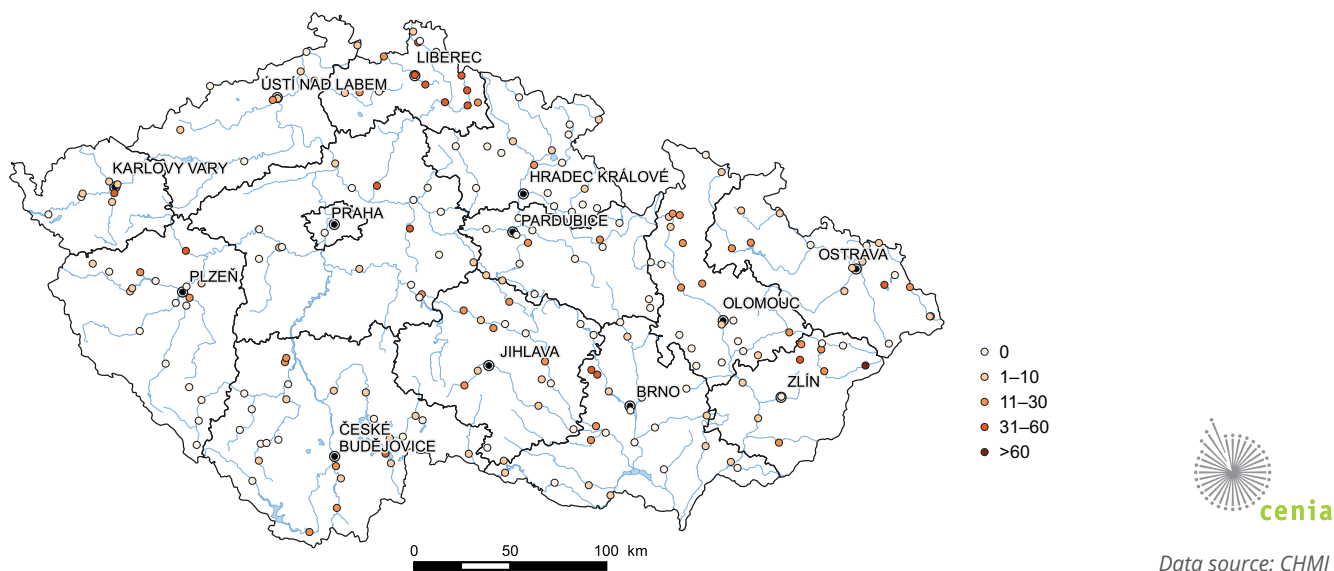
In terms of precipitation and runoff conditions, 2024 was the least dry year since 2020 in terms of **hydrological drought**. Hydrological drought is monitored according to the occurrence of flows below 25% of the monthly average flow (below 25% Q_m , according to the 355-day flow, which was reached or exceeded on average 355 days a year at a given profile (Q_{355d})) and which is important for maintaining the basic water management and ecological functions of the stream, and according to the 364-day flow (Q_{364d}), which indicates extreme hydrological drought.

Based on the proportion of monitored profiles that experienced hydrological drought according to the monitored indicators, 2024 can be divided into **three periods**. In **the period January–June**, hydrological drought was almost non-existent with flows below Q_{355d} occurring in a maximum of 2% of profiles. Only flows below 25% Q_m , which is the indicator of the lowest intensity of hydrological drought, were recorded on some days in April and May in more than 10% of the monitored profiles. **From mid-July**, the occurrence of profiles with hydrological drought began to increase, **peaking at the end of the first decade of September**, when the proportion of profiles indicating drought according to the Q_{355d} and 25% Q_m indicators exceeded 30% of the total number of monitored profiles. The drought ended with heavy rainfall and subsequent flooding in the second decade of September, and there was almost no hydrological drought until the end of the year.

The longest period of hydrological drought according to the Q_{355d} indicator in 2024 (Fig. 6) occurred on the upper reaches of the Vsetínská Bečva River at the Velké Karlovice profile (Zlín Region), with a total duration of 90 days. Hydrological drought was also significant on the Střela River in the Plzeň Region (56 days at the Plasy profile) and on the Jizera River in the Liberec Region (a maximum of 51 days at the Dolní Sytová profile).

Fig. 6

Flow rate lower than the long-term 355-day flow rate in the Czech Republic for the period 1981–2010 [number of days], 2024



Groundwater regime

The groundwater level in shallow circulation was generally well above normal in 2024, which was the best condition in the last 10 years. A slightly to strongly above-normal level prevailed in most of the territory, with the exception of the Ohře and lower Labe river basins, the Horní Odra and Lužická Nisa river basins, where the level was generally only normal.

The yield of springs was generally slightly above normal, with significant regional differences. The worst, exceptionally below-normal condition (97th quantile of the monthly ECm exceedance curve) was recorded in the Ohře and lower Labe river basins, while in the upper Vltava, Berounka and lower Vltava river basins, the yield was strongly above normal (8–13% EC). The proportion of shallow wells and springs with normal conditions averaged 39% for the whole year. Thirty-six percent of shallow wells and 27% of springs were significantly or exceptionally above normal. In contrast, only 2% of shallow wells and 10% of springs were significantly or exceptionally below normal.

In January and February, strongly to exceptionally above-normal **groundwater levels in shallow circulation** prevailed in most of the territory, influenced by the floods of December 2023. The annual exceptionally above-normal maximum level (3% EC) occurred in February, with the highest regional level recorded in the Morava and upper and middle Labe river basins (1–3% EC). By March, the level had fallen to normal and continued to decline, mostly within normal limits, with the exception of the upper Odra and Lužická Nisa, where the situation worsened in May to well below normal (85% EC). During the summer months, water levels continued to fluctuate mostly within normal limits, except again for the Lužická Nisa river basin, where the annual minimum in July (97% of normal) was exceptionally below normal. In September, flooding in all river basins caused a significant rise in water levels to well above normal (10% of normal). In the Morava River basin, the water level was exceptionally above normal (4% of the long-term average), while in the Ohře and lower Labe River basins, it remained normal (45% of the long-term average). By the end of the year, the water level had fallen slightly and remained at slightly above normal to normal values.

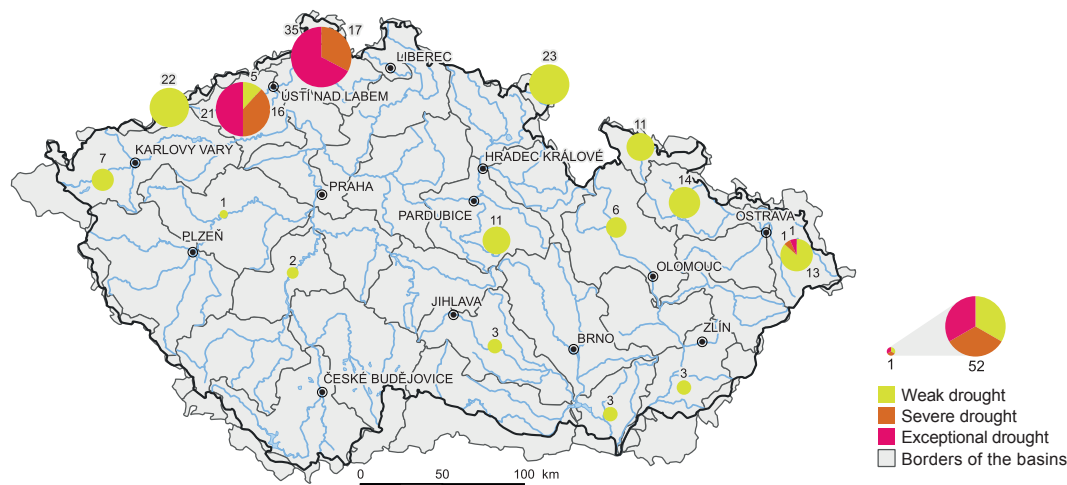
The yield of springs during 2024 declined until August to a slightly below-normal annual minimum (77% of the long-term average), again with large regional differences. In the Ohře and lower Labe river basins, spring yield remained

exceptionally below normal, but in the Berounka river basin, yield increased in May and June to exceptionally to strongly above normal levels (4–8% of normal) as a result of heavier precipitation. In September, yield increased significantly in most areas as a result of flooding, reaching a strongly above-normal level overall (9% of the long-term average), with the exception of the Ohře and Lower Labe river basins, which were least affected by the precipitation episode and where spring yield remained exceptionally below normal (97% of the long-term average). By the end of the year, yield had fallen slightly to above-normal to normal values, again with the exception of the Ohře and Lower Labe river basins, where spring yield remained exceptionally below normal.

The longest-lasting and most severe drought in springs was recorded in 2024 in the Lower Elbe River Basin (Fig. 7), where exceptionally below-normal spring yields prevailed for a total of 35 weeks, i.e. more than two-thirds of the entire year. In shallow wells, a more pronounced drought occurred only in the north and north-west of the Czech Republic (Fig. 8), where exceptionally or strongly below-normal water levels persisted for a total of 17 weeks in the Lužická Nisa river basin.

Fig. 7

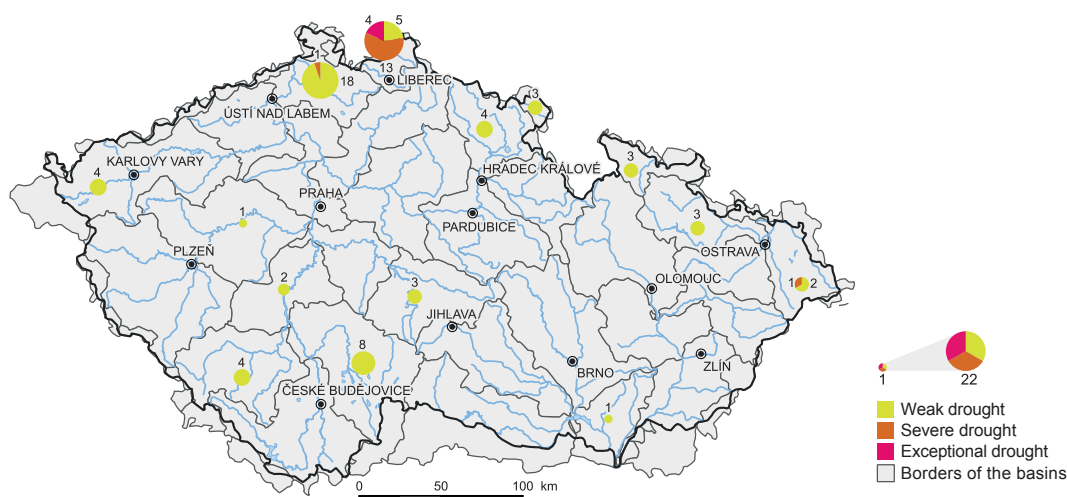
Duration of drought in springs in the Czech Republic [number of weeks], 2024



Data source: CHMI

Fig. 8

Duration of drought in shallow wells in the Czech Republic [number of weeks], 2024



Data source: CHMI

The level of **deep aquifers** in Czechia was generally normal in 2024 and improved compared to previous years. From January, the level rose to a slightly above-normal annual maximum in March (18% of the long-term average), then fell to a slightly below-normal minimum in August (78% of the long-term average), rose significantly in September and October within normal limits, and fell slightly again at the end of the year.

Significant differences in deep groundwater levels persisted in individual **hydrogeological regions** (HGR). In part of the North Bohemian Cretaceous (Turonian, HGR 4B), the level was slightly below normal at the beginning of the year and exceptionally below normal from April onwards (95–99% of the long-term average). In the Permo-Carboniferous of central and western Bohemia (HGR 8A, B), it was strongly to exceptionally below normal throughout the year. In contrast, in the Podkrušnohorský basins and the East Bohemian Cretaceous, the level was slightly above normal, and in the Moravian Tertiary and Permo-Carboniferous of eastern Bohemia, it was strongly above normal. The level of deep groundwater in the Cenomanian of the East Bohemian Cretaceous was strongly to exceptionally above normal throughout the year. Overall, on average for the whole year, 12% of objects were exceptionally below normal, 8% were significantly below normal and 5% were slightly below normal, 28% of objects were normal, 16% of objects were slightly above normal, 20% were significantly above normal and 11% of objects were exceptionally above normal.

Detailed visualisations and data

<https://www.envirometr.cz/data>

1 Environment and health

1.1 Water availability and quality

Key messages

- The quality of water in watercourses has improved significantly since 2000, but has stagnated since 2020 and it has not been possible to further reduce pollution levels significantly. In the assessment of water quality according to ČSN 75 7221, Class III (polluted water) predominates (47.0% of profiles) for the two-year period 2023–2024.
- Water quality in watercourses is particularly problematic in the South Moravian, Central Bohemian and South Bohemian regions, mainly due to intensive agriculture and industry. Inadequate wastewater treatment is another factor affecting surface water quality, with the lowest proportion of the population connected to sewage systems ending in wastewater treatment plants in the Liberec (73.1%), Hradec Králové (75.4%) and Vysočina (76.2%) regions. The situation is particularly problematic in municipalities with up to 2,000 PE (population equivalent), where the construction of sewage systems has not yet been mandated by legislation.
- According to the assessment in the river basin plans within the implementation of the Water Framework Directive, the ecological and chemical status of surface water bodies deteriorated overall between 2015 and 2021. The main pressures are inadequate wastewater treatment and diffuse pollution from intensive agriculture. Czechia is one of the EU countries with the highest proportion of groundwater affected by diffuse pollution from agriculture.
- Thanks to increased water use efficiency through infrastructure development, the total amount of water abstracted, the total volume of wastewater discharged and the amount of pollution discharged are decreasing. 13.4% of the population is not yet connected to a sewage system ending in a wastewater treatment plant.
- A current problem, with regard to ecosystems and human health, is the long-term pollution of surface waters with organic micropollutants, which are repeatedly detected in water samples throughout the Czech Republic.

1.1 Water availability and quality

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Water quality in watercourses	Surface water quality is improving			47.0% of profiles in quality class III (polluted water)	
Bathing water quality	Surface water quality is improving			64.1% of water suitable for bathing (classified as water quality class I or II)	
Groundwater quality	Groundwater quality is improving			Limit values exceeded in at least one indicator in 83.2% of facilities	
Residents supplied with water from public water supply	96.7% share of residents connected to the public water supply in 2030			95.1 %	
Wastewater treatment	89% share of residents living in houses connected to the sewerage system			84.5 %	
Groundwater and surface water abstraction	Water use efficiency, including recycling, is increasing			888.9 million m ³	
Water consumption from public water supply	Water use efficiency, including recycling, is increasing			129.0 l.inhab. ⁻¹ .day ⁻¹	
Water losses in the water supply network	Water use efficiency, including recycling, is increasing			15.1 %	

Current measures supporting the fulfilment of the strategic objective

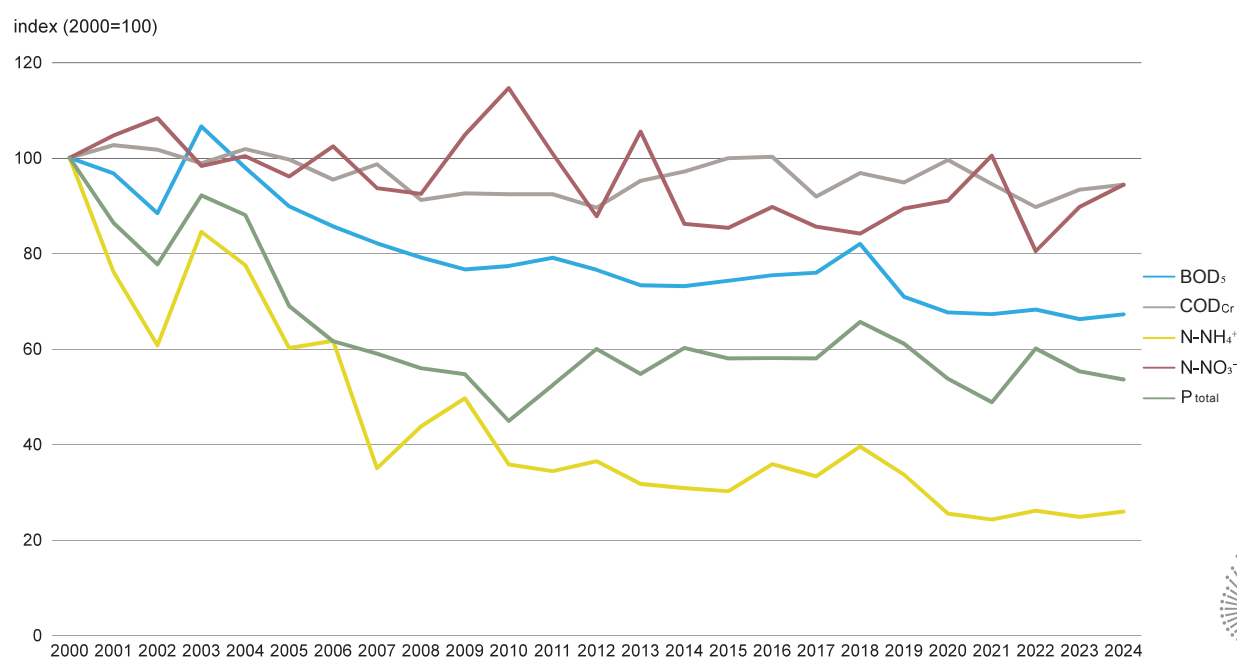
- The amendment to the Water Act will help to limit the impact of accidents on watercourses. Among other things, it introduces a register of wastewater discharges and online monitoring of water discharged from industrial operations into watercourses at the outlets of major polluters where there is a risk of large-scale accidents. In the event of an accident on a watercourse, it will improve the cooperation of the responding authorities.
- A plan for managing drought and water shortages in the Czech Republic has been approved, which serves as a basis for the Central Commission for Drought to decide on measures to be taken in the event of water shortages.
- New sources of surface and groundwater are being sought and developed to supply the population, among other things in connection with long-term water shortages in some regions.
- Financial support is being provided for the construction of new drinking water sources, water mains, the inter-connection of water supply systems, infiltration systems and the use of rainwater and recycled grey water, drinking water treatment technologies, sewerage systems and wastewater treatment systems.
- The adopted Strategic Plan for the Common Agricultural Policy for the period 2023–27 will contribute to reducing the use of pesticides in water source protection zones.

Surface water quality

The quality of surface water has improved significantly since 2000. Of the basic indicators, **ammoniacal nitrogen** (N-NH_4^+ ; average concentration decreased by 74.1%, Graph 7) saw the greatest reduction in the period 2000–2024, mainly due to more effective wastewater treatment and a decline in livestock production. The concentration of **total phosphorus** (P_{total}) was reduced by 46.5%, mainly due to more thorough wastewater treatment and restrictions on the amount of phosphates in detergents. However, since 2020, water quality in watercourses has stagnated and it has not been possible to further significantly reduce pollution levels.

Graph 7

Development of pollution indicator concentrations in Czech watercourses [index, 2000 = 100], 2000–2024

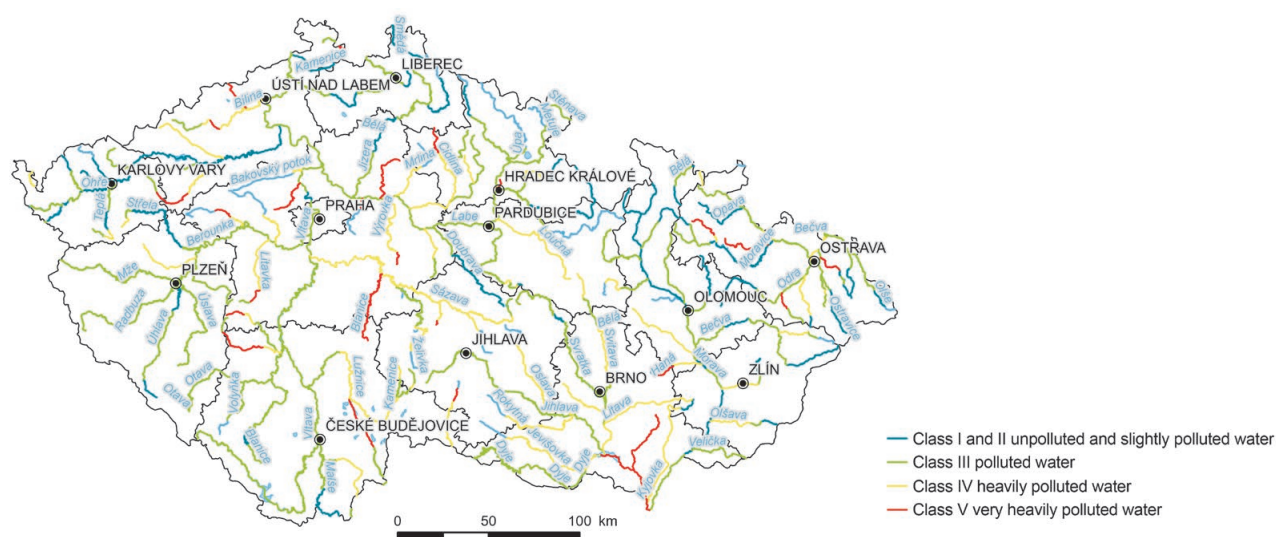


Data source: CHMI from materials provided by River basin enterprises

According to the assessment of **water quality in watercourses** using basic indicators (COD_{Cr} , BOD_5 , N-NH_4^+ , N-NO_3^- and P_{total}) at selected profiles² in 2023–2024, 20% of waters are classified as Class I and II with unpolluted or slightly polluted water, 47% of profiles are classified as Class III with polluted water, 23% of profiles are classified as Class IV with heavily polluted water, and 10% of profiles fall into Class V with very heavily polluted water (Fig. 9). The category of very heavily polluted water was found most frequently in the South Moravian Region, followed by the Central Bohemian and South Bohemian Regions. Water quality in these regions is negatively affected mainly by intensive agriculture and insufficient connection of the population to wastewater treatment plants. In the Central Bohemian Region, industry also contributes to pollution. Unpolluted or only slightly polluted water (quality classes I and II) was mainly assessed, as in the previous assessment, in the mountainous areas of the Karlovy Vary, Liberec, Olomouc and Moravian-Silesian regions.

Fig. 9

Water quality in Czech watercourses, 2023–2024



Data source: T.G.M. WRI, from materials provided by River basin enterprises and CHMI

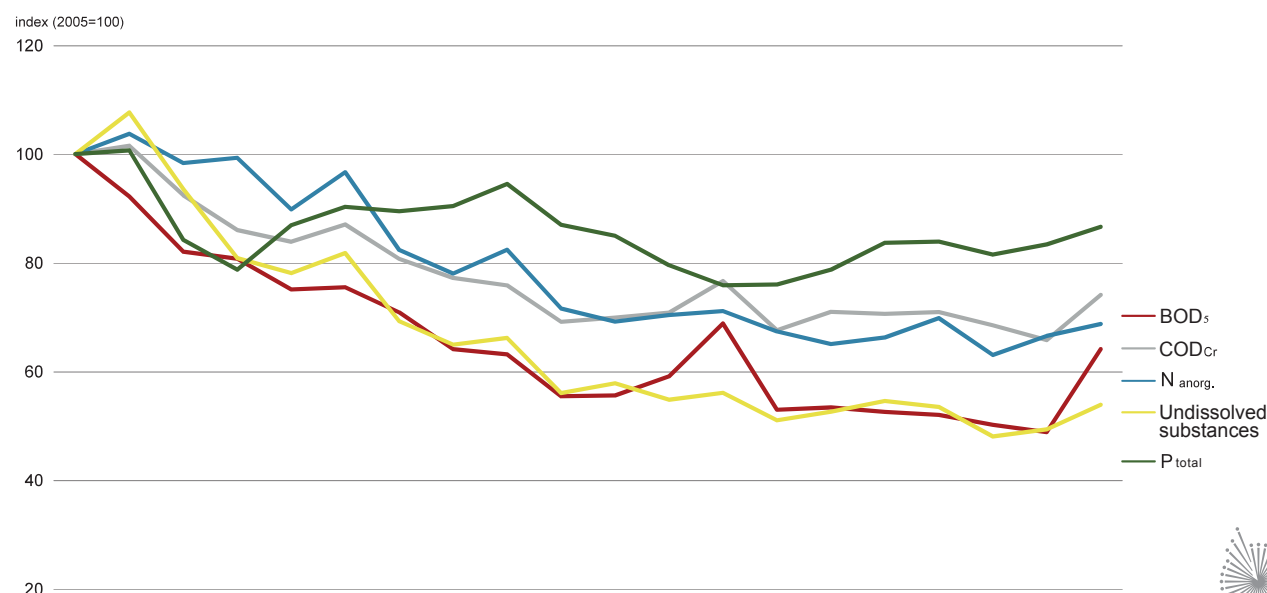
In the long term, there has been a reduction in the discharge of untreated wastewater. Between 1990 and 2024, there was a 95.9% decrease in BOD_5 pollutants, a 95.1% decrease in undissolved substances and a 90.4% decrease in COD_{Cr} pollutants. At the same time, it was also possible to reduce the amount of hazardous and particularly hazardous pollutants discharged. There has also been a significant decrease in macronutrients (nitrogen, phosphorus). Since 2005, the amount of $\text{N}_{\text{anorg.}}$ discharged has decreased by 31.3% and P_{total} by 13.4% (Graph 8). The long-term decline is mainly influenced by the fact that biological nitrogen removal and biological or chemical phosphorus removal are specifically applied in wastewater treatment technology at new and intensified wastewater treatment plants, and is also influenced by the reduction in the amount of phosphates used in detergents.

In connection with the floods in September 2024, there was an increase in discharged pollution for all monitored indicators this year. The highest increase was recorded for BOD_5 (by 31.3%) and COD_{Cr} (by 12.7%), mainly in the Odra river basin, where BOD_5 increased by 264.1% and COD_{Cr} by 48.2%. This situation was primarily caused by the flooding of wastewater treatment plants during the floods, which led to their temporary limitation or complete loss of functionality. In the Odra river basin, the increase in concentrations was mainly caused by the shutdown of the key Ostrava wastewater treatment plant.

² In the Czech Republic, water quality in watercourses is monitored at 1,024 representative river profiles.

Graph 8

Pollution discharged from point sources in terms of $N_{\text{anorg.}}$, P_{total} , BSK_5 , $CHSK_{Cr}$ and undissolved substances in the Czech Republic [index, 2005 = 100], 2005–2024



Data source: River basin enterprises, T.G.M. WRI

The quality of surface and groundwater is also significantly affected by **diffuse pollution**, especially pollution from agricultural management, atmospheric deposition and erosion runoff from the surface. The share of diffuse pollution is growing with the continuing decline in pollution from point sources. The most significant impact on the quality of surface and groundwater can be seen mainly in nitrates, pesticides and acidification, and to a lesser extent in phosphorus.

According to the assessment in the river basin plans within the implementation **of the Water Framework Directive³, the ecological and chemical status of surface water bodies⁴** deteriorated overall between 2015 and 2021. The proportion of water bodies in good ecological status fell from 18.8% to 5.9%. The main pressures are inadequate wastewater treatment (affecting 74% of water bodies) and diffuse pollution from intensive agriculture (67% of water bodies). The deterioration can be partly attributed to stricter environmental quality standards and the inclusion of new indicators in the assessment of chemical and ecological status. Insufficient hydrological continuity of rivers is also a major problem – less than 20% of rivers have sufficient continuity. Only 12.2% of water bodies are likely to achieve **good ecological status** by 2027⁵. The proportion of water bodies with good **chemical status** fell from 70% in 2015 to 38.9% in 2021. Increased monitoring (30% more monitored watercourses) has enabled better identification of pollution, but the main pressures remain discharges outside the sewerage network, pollution from agricultural pesticides and inadequately treated urban waste water. In some river basins (Morava, Vltava, Odra), discharged pollution has increased. The main substances preventing the achievement of good chemical status are persistent organic pollutants (POPs). Nevertheless, it is expected that 38% of water bodies could achieve **good chemical status** by 2027.

³ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD%3A2025%3A33%3AFIN&qid=1738746144581>

⁵ The aim is to achieve good status for all water bodies.

A current problem with regard to ecosystems and human health is the long-term pollution of surface waters with **organic micropollutants**, which have been found in water samples throughout the Czech Republic for a long time.

The water management laboratories of River basin state enterprises most frequently monitor **pesticides** and their metabolites, which were found in 536 profiles (92% of monitored profiles) in a total of 4,540 samples (78.7% of samples) in 2024. In 2024, the most frequently found metabolites (in more than 30% of monitored profiles and simultaneously in more than 10% of samples in these profiles) were those of herbicides used to treat rapeseed, maize and beet, both currently used and already banned, or the total herbicide glyphosate and its metabolite AMPA. For **the sum of pesticides**, the proportion of profiles exceeding the EQS-AA (environmental quality standards – annual average) in the monitored period fluctuated between 10.1% and 36.7%. In 2024, the proportion of profiles above EQS-AA was 17.7%.

In 2024, the occurrence **of pharmaceuticals** was most significant in smaller watercourses into which large settlements or healthcare facilities drain. Pharmaceuticals were found in 340 profiles (92.9% of monitored profiles) in a total of 2,676 samples (84.8% of samples). A total of 66 substances out of 83 monitored were found in surface waters, of which 47 substances were found in more than 5% of samples.

Substances that accumulate in biotic and abiotic components and food chains due to their high stability and lipophilicity are detected as part **of accumulation biomonitoring**⁶. These substances are classified as human carcinogens and endocrine disruptors with serious negative effects on the reproductive system and foetal development. For perfluorooctane sulfonate (PFOS), which belongs to the broader group of PFAS (perfluorinated compounds) used for various surface treatments of materials, there was a decrease in the number of profiles exceeding the EQS (9.1 µg·kg⁻¹) in the fry matrix from 12 (in the previous year) to 5 profiles. The concentration **of mercury**, originating mainly from combustion processes, in fish fry exceeded the EQS value (20 µg·kg⁻¹) in 67% of the monitored profiles, which represents an increase compared to the previous year. In adult fish, the EQS for mercury was exceeded in all monitored profiles, as in previous years. Similarly to previous years, the indicator **polybrominated diphenyl ethers** (sum of PBDE) exceeded the EQS value (0.0085 µg·kg⁻¹) by several orders of magnitude in all profiles.

As part of the monitoring **of the quality of surface waters used for outdoor bathing**, a total of 285 sites were monitored during the 2024 recreational season, 64.1% of which were suitable for bathing (classified as water suitable for bathing or water suitable for bathing with slightly impaired properties). Between 2006 and 2023, this figure remained stable at between 60 and 70%. Fifty-five monitored sites, i.e. 19.3%, showed unsatisfactory bathing water quality. A bathing ban was declared at 21 sites. The most common reason was the excessive occurrence of cyanobacteria, which occur in our waters mainly due to high concentrations of phosphorus. In order to improve water quality, priority should be given to preventing the discharge of nutrients, especially phosphorus, into surface waters. This can be achieved by completing the third stage of wastewater treatment at all existing wastewater treatment plants and by building new wastewater treatment plants in municipalities that do not yet treat wastewater thoroughly. In the 2024 bathing season, according to the assessment under Directive 2006/7/EC of the European Parliament and of the Council, 78.0% of inland **bathing waters in EU countries** were classified as Category I quality⁷. In Czechia, 76.5% of sites had excellent water quality.

⁶ The CHMI regularly monitors the content of almost 90 substances in profiles of major Czech and Moravian rivers. For some substances, Government Regulation No. 401/2015 Coll. sets an environmental quality standard (EQS) against which the measured values are compared. Samples of adult fish (chub), fish fry and benthic organisms (mainly caddisfly larvae, leeches and amphipods) are taken for chemical analysis.

⁷ European Environment Agency: <https://www.eea.europa.eu/en/analysis/publications/european-bathing-water-quality-in-2024>.

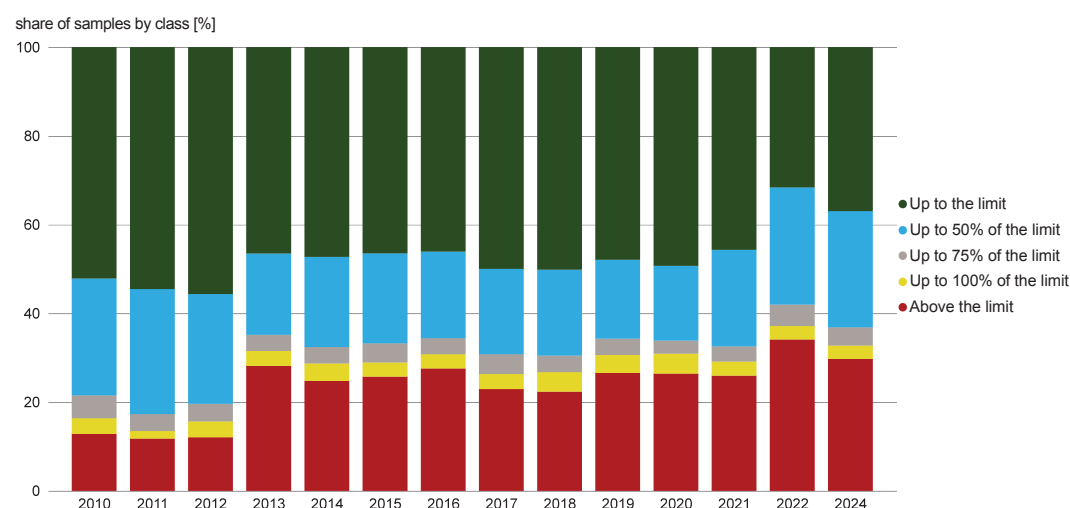
Groundwater quality

The indicators of groundwater **pollution** that most frequently exceed the limit values⁸ are pesticides (metabolites of permitted and prohibited herbicides and fungicides used mainly for the treatment of crops such as rapeseed, maize, beets and cereals), inorganic substances (ammonium ions, nitrates and phosphates), the determination of organic substances in summary (COD_{Mn} and DOC), metals (barium, manganese, arsenic, cobalt and cadmium), VOCs (toluene and 1,2-cis-dichloroethene) and PAHs (phenanthrene and chrysene). In 2024, compared to 2022⁹, there was an increase in the number of sites exceeding groundwater limits in at least one indicator from 79.8% to 83.2%.

There have been no significant changes in **nitrogen** concentrations since 2010. In 2024, the limit values were most frequently exceeded for ammonium ions (10.8% of samples above the limit) and nitrates (10.3% of samples above the limit). For nitrites, samples exceeding the limit ranged between 0.1% and 0.4%. In 2024, a total of 29.8% of objects exceeded the limit for **the sum of pesticides** (Graph 9).

Graph 9

Percentages of determined values for the indicator of total pesticides in groundwater in the Czech Republic [%], 2010–2024



No monitoring was carried out in 2023.

Data source: CHMI

Based on Directive 2000/60/EC of the European Parliament and of the Council (Water Framework Directive), an assessment **of the status of groundwater bodies** is being prepared as part of river basin management plans, which are prepared in six-year cycles. Between 2015 and 2021, there was an improvement in **the quantitative status** of groundwater in Czechia, with the proportion of bodies in good condition increasing from 68.9% to 93.7%. However, this improvement is primarily the result of better monitoring, with 21% of bodies being reclassified from “unknown” to “good” and 3.5% from “poor” to “good”. However, the reliability of this improvement is questionable, as 83% of the assessments are made with a low degree of certainty. The main pressure on groundwater remains abstraction for public supply, industry and agriculture. By 2027, 99.4% of groundwater is expected to achieve good quantitative status, but 13% of bodies are still at risk of not meeting this target.

⁸ According to Decree No. 5/2011 Coll. of the Ministry of the Environment and the Ministry of Agriculture, as amended.

⁹ No monitoring was carried out in 2023.

The proportion of bodies in good **chemical status** was 26.4% in 2021. The Czech Republic is among the EU countries with the highest proportion of groundwater affected by diffuse pollution from agriculture. Pesticides (chloridazon-desphenyl, metazachlor ESA), nitrates and ammonium ions pollute 89% of bodies. In addition, there is an increase in pollution from heavy metals such as nickel, cadmium and aluminium. The low quality of raw water, which affects 43% of bodies, also poses a particular problem. Per- and polyfluoroalkyl substances (PFAS) are not yet systematically monitored in these bodies, but their presence may further exacerbate the situation. By 2027, up to 90% of bodies may be in poor chemical status, highlighting the need to strengthen measures, particularly in the areas of contaminated site remediation, pesticide pollution reduction and diffuse emission control.

Use of water resources

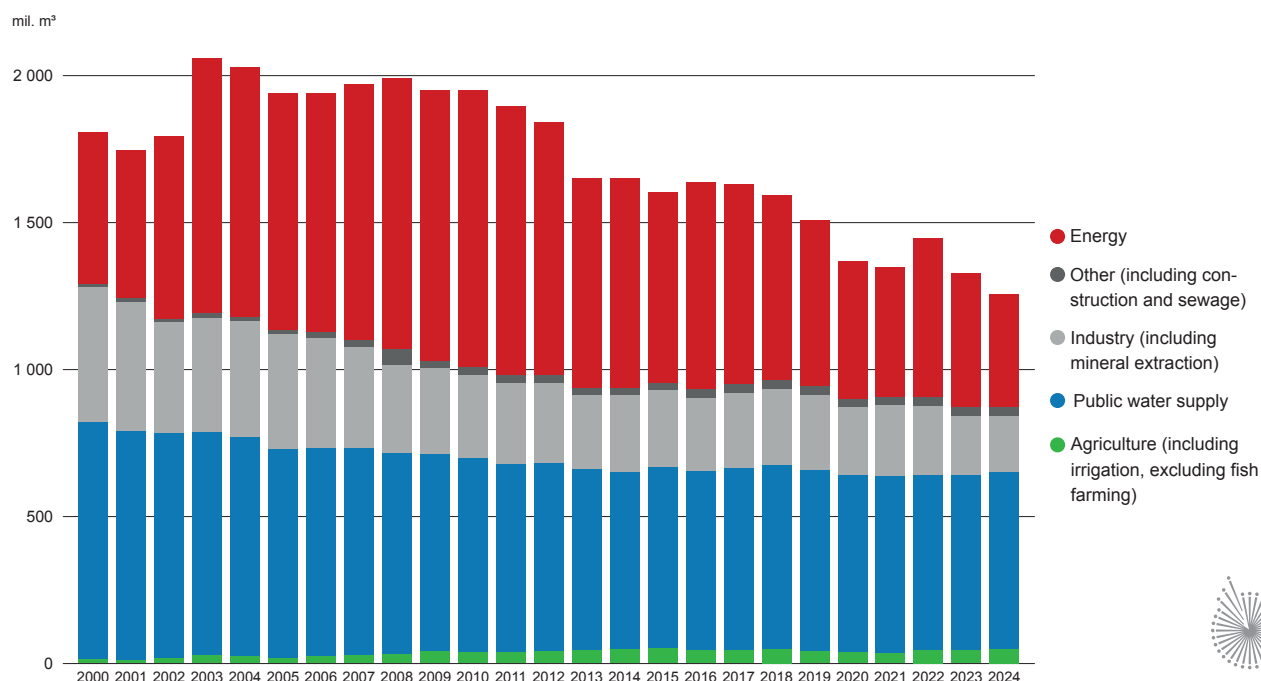
Surface and groundwater abstraction reflects economic developments, hydrometeorological conditions in a given year, and household behaviour. From a longer-term perspective, there has been a significant decline in surface water consumption since 1990, which is due to economic and environmental factors, modernisation of production, which reduces water demand, and a reduction in network losses. In 2024, there was again the lowest historical withdrawal from surface waters, with 888.9 million m³ withdrawn.

The decline in surface water abstraction was particularly evident in the **energy** sector, where there was a year-on-year decrease of 15.9%, mainly due to the modernisation of cooling systems. **Industry** also contributed to greater water efficiency, with abstraction falling by 6.4%. In contrast, **agriculture** saw a year-on-year increase in abstraction of 11.9%.

The highest consumption was for **public water supply systems** (Graph 10). In 2024, the specific amount of water billed per capita supplied from the public water supply system was¹⁰ 129.0 l.capita⁻¹.day⁻¹. Households consumed 88.3 l.inhab.⁻¹.day⁻¹. The highest consumption in the long term was recorded in the capital city of Prague (106.8 l.inhab.⁻¹.day⁻¹ in 2024). The South Moravian Region (92.1 l per capita per day) and the Ústí Region (92.0 l per capita per day) are also above average.

A smaller part of the abstraction is carried out from **groundwater**. The highest groundwater withdrawals were recorded in 1988 and 1989. Since then, there has been a gradual decline. Since 2006, there has been relative stagnation in withdrawals. Groundwater withdrawals in 2024 reached 365 million m³, which represents only a slight increase compared to the previous year.

¹⁰ In connection with the change in the methodology for determining balance and economic data relating to water supply and sewerage systems, data from the Water Supply and Sewerage Information System administered by the Ministry of Agriculture will be used from 2024 onwards.

Graph 10**Total water abstraction by individual sectors in the Czech Republic [million m³], 2000–2024**

Until 2001, water withdrawals exceeding 15,000 m³ per year or 1,250 m³ per month were recorded. Since 2002, water withdrawals by consumers exceeding 6,000 m³ per year or 500 m³ per month – in accordance with Section 10 of Decree No. 431/2001 Coll. of the Ministry of Agriculture. In connection with the change in the methodology for determining balance sheet and economic data relating to water supply and sewerage systems, data from the Water Supply and Sewerage Information System administered by the Ministry of Agriculture will be used from 2024 onwards.

Data source: MoA, River basin enterprises, T.G.M. WRI, CZSO

Access to water resources is strongly dependent on the geographical location and physical conditions of individual countries. Most EU27 countries had an average annual WEI+ value below the threshold set for water stress (i.e. less than 20%)¹¹. In 2022, a total of 20 countries were below this limit¹², with the WEI+ value in Czechia set at 3.9%. However, at the EU level, 34% of the population and 40% of the territory were exposed to water stress in at least one quarter of 2022. Thanks to its milder climate and balanced water resource management, Czechia remains below the critical threshold. However, given the predictions of more frequent and intense droughts, it is essential to continue implementing water-saving measures and modernising water management infrastructure in order to prevent the risk of local water shortages in the future.

¹¹ WEI+ provides an assessment of total water consumption as a percentage of renewable freshwater resources available for a given area and period. Available at: <https://www.eea.europa.eu/en/analysis/indicators/use-of-freshwater-resources-in-europe-1?activeAccordion=546a7c35-9188-4d23-94ee-005d97c26f2b>

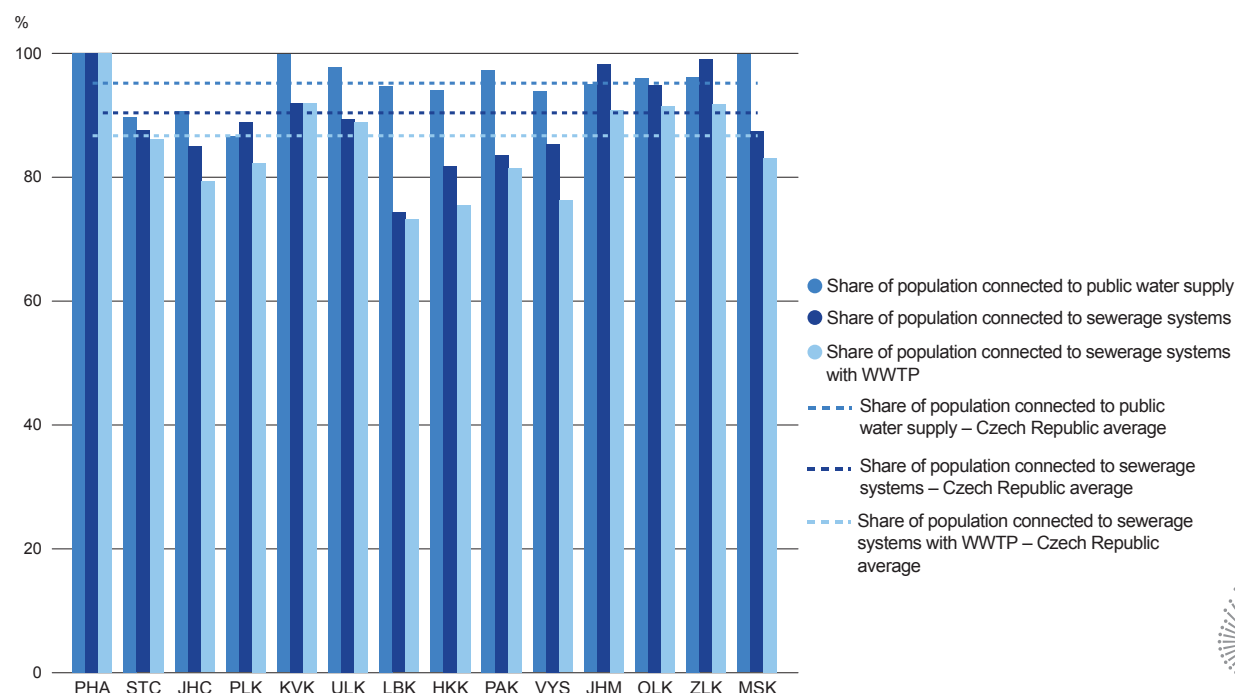
¹² Data for the period 2023–2024 are not available at the time of publication.

Water management infrastructure

Water management infrastructure has been undergoing long-term development and revitalisation, and the proportion of the population connected to the public water supply has been increasing. **The proportion of the population connected to the public water supply** has increased significantly compared to 2000, from 87.1% to 95.1% in 2024. The best availability of water management infrastructure is in regions with centralised settlement patterns (Graph 11). In 2024, 100% of the population was connected to the water supply network in the Prague region. The Karlovy Vary Region (99.8%) and the Moravian-Silesian Region (99.8%) also have a high proportion of the population connected to the public water supply. The lowest proportion of the population supplied with drinking water was in the Plzeň Region (86.5%) and the Central Bohemian Region (89.7%).

Graph 11

Percentage of the population connected to public water supply systems in regions [%], 2024



Data source: MoA

The quality of drinking water supplied has remained consistently high over the years, but there are growing concerns about the harmful effects of PFAS, which are not yet systematically monitored in drinking water. However, the European Environment Agency warns that perfluorooctane sulfonate (PFOS) is widespread in waters across Europe and often exceeds regulatory thresholds set to prevent potential risks to human health and the environment¹³.

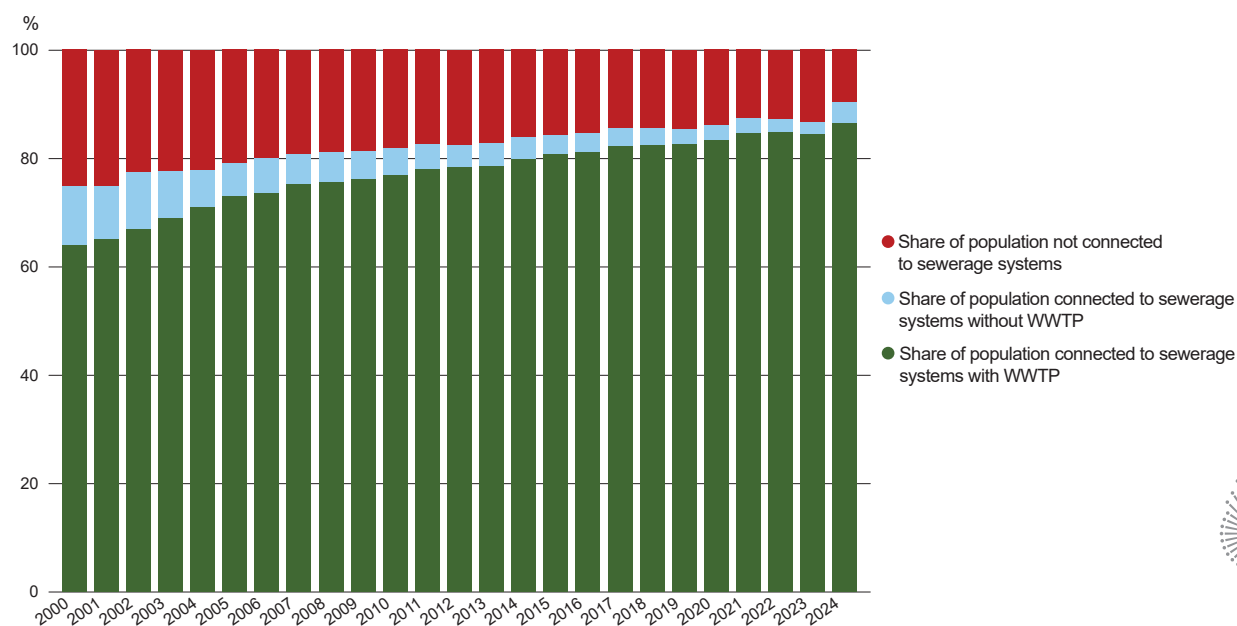
The proportion **of drinking water losses** in the water supply network has decreased significantly since 2000, when it stood at 25.2%. In 2024, drinking water losses in the pipe network reached 15.1% of the total amount of water produced for distribution. Drinking water losses in the water supply network are mainly caused by accidents and leaks from public water mains. Above-average losses of water produced for distribution have long been recorded in the Hradec Králové Region (21.9% in 2024), Pardubice (21.8% in 2024), Ústí nad Labem (20.9% in 2024), Liberec (19.7% in 2024) and Zlín (17.7% in 2024). The lowest water losses in 2024 were in the Moravian-Silesian Region (9.8%) and the South Moravian Region (10.8%).

¹³ PFAS pollution in European waters | European Environment Agency

The proportion of the population connected to the sewerage network in 2024 was 90.3%, while the proportion of the population connected to sewerage ending in a wastewater treatment plant was 86.6% (Graph 12). Compared to 2000, there was an increase of 22.6 percentage points in the proportion of the population connected to a sewerage system ending at a wastewater treatment plant. 13.4% of the population is still not connected to a sewerage system ending at a wastewater treatment plant. Wastewater produced in these cases should be treated, for example, in domestic wastewater treatment plants or collected in drainless sumps and septic tanks and then transported for professional treatment (transport to a wastewater treatment plant). The highest proportion of the population connected to a sewerage system ending at a WWTP was in the regions of Prague (99.9%) and Karlovy Vary (99.7%; Graph 11). The lowest proportion of inhabitants connected to sewerage systems and sewerage systems ending at WWTPs was in the Liberec Region (71.7%) and the Central Bohemian Region (77.4%). The situation is particularly problematic in municipalities with up to 2,000 PE, which are not required by law to build sewerage systems and for which investments in water management infrastructure with sufficient technical parameters are often too costly, despite the existence of subsidies aimed at securing water management infrastructure. **The total number of wastewater treatment plants** in the Czech Republic increased to 3,550 in 2024. The construction and reconstruction of WWTPs increased the total number of WWTPs with nitrogen and/or phosphorus removal (tertiary treatment) to 1,981. The number of treatment plants with only mechanical treatment was 14.

Graph 12

Percentage of population connected to sewerage and sewerage ending in WWTP in the Czech Republic [%], 2000–2024



Data source: CZSO, MoA

Detailed visualisations and data

<https://www.envirometr.cz/data>

1 Environment and health

1.2 Air quality

Key messages

- Emissions of major pollutants into the air are falling. Already in the 2023 emissions inventory, the amount of emissions of selected pollutants was reduced below the level of national emission reduction commitments for 2025. The exception is NH_3 emissions mainly due to the methodological approach used to calculate their projection. It can be expected that after the national emissions inventory for 2025, which is always delayed by two years, has been carried out and the methodological adjustment to this inventory has been applied, this commitment will also be met if current expectations are fulfilled¹⁴. According to current developments and projections for SO_x , NO_x , NMVOC and $\text{PM}_{2.5}$, the national commitments for 2030 will be met, with only NH_3 projected to exceed the national commitment level.
- Emissions of suspended particulates from domestic heating in 2023 fell significantly year-on-year, due not only to the replacement of boilers supported by subsidies, but also to a warmer heating season. However, the combustion of solid fuels, including wood, in households remains a significant source of carcinogenic benzo[a]pyrene, so continuing subsidy support for boiler replacement and, ideally, the transition to non-combustion heating sources is a priority.
- Emissions of pollutants from transport are falling, with the exception of PAHs, reflecting the renewal of the vehicle fleet and the gradual increase in the proportion of low-emission and zero-emission vehicles.
- Air quality in Czechia has been improving in the long term, and in 2024, only 1.3% of the territory of Czechia exceeded any of the emission limits for health protection. In addition to the decline in air pollution, favourable meteorological conditions also contribute to the development of air quality. From a health perspective, benzo[a]pyrene, whose main source is the combustion of solid fuels for domestic heating, is a problematic air pollutant that continues to exceed emission limits.
- Exceedances of emission limits for the protection of ecosystems and vegetation decreased in 2024, occurring only in a small part of three protected landscape areas.

¹⁴ In recent years, there has been a change in the methodological approach to calculating ammonia emissions, which has led to an uneven increase in ammonia emissions in the period monitored since 2005. The relevant Directive (EU) 2016/2284 allows for the adjustment of the national emission inventory results if the results it provides have been affected by changes in binding methodological procedures. This adjustment can only be applied to the inventory, not to future emission projections. Czechia can therefore apply this adjustment to the reported emission inventory data for 2025, i.e. in 2027. A similar procedure will be applied for 2030.

1.2 | Air quality

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2023 ¹⁵)	Target achievement
Emissions of main pollutants	Decrease in NO _x emissions by 49.5% by 2025 and by 64% by 2030 compared to 2005 ¹⁶			116.8 kt, i.e. a decrease of 56.5% since 2005	
	Decrease in NMVOC emissions by 34% by 2025 and by 50% by 2030 compared to 2005			207.4 kt, i.e. a decrease of 38.6% from 2005	
	Decrease in SO _x emissions by 55.5% by 2025 and by 66% by 2030 compared to 2005			48.5 kt, i.e. a decrease of 76.8% from 2005	
	A 38% reduction in PM _{2.5} emissions by 2025 and a 60% reduction by 2030 compared to 2005			42.6 kt, i.e. a decrease of 42.0% since 2005	
	Reduction in NH ₃ emissions by 14% by 2025 and by 22% by 2030 compared to 2005			71.5 kt, i.e. a decrease of 9.4% from 2005	
Emissions from domestic heating	Achievement of the national exposure reduction target for PM _{2.5} (NERP 2023), i.e. a decrease in PM _{2.5} emissions from the main source categories, in particular from domestic heating			Decrease in PM _{2.5} emissions from domestic heating by 37.9% and NMVOC by 26.6% between 2005 and 2023	
Emissions from transport	Decrease in air pollution from transport			Decrease in NO _x emissions from transport by 51.3% between 2005 and 2024, VOC emissions by 69.1%, CO by 79.5% and PM by 31.7%	

¹⁵ Data for 2024 are not available at the time of publication.

¹⁶ Directive (EU) 2016/2284 of the European Parliament and of the Council (NEC Directive, all targets listed). According to Article 4(3)(d) of the NEC Directive, NFR categories 3B (Manure management) and 3D (Agricultural soils) are not included in the fulfilment of national emission commitments for NO_x and NMVOC emissions.

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2023)	Target achievement
Air quality in terms of human health protection	Compliance with emission limits for health protection pursuant to Act No. 201/2012 Coll., on air protection, as amended			Emission limits not met in 2024 in 1.3% of the territory, where 7.4% of the Czech population lives	
Air quality in terms of ecosystem and vegetation protection	Compliance with emission limits for the protection of ecosystems and vegetation pursuant to Act No. 201/2012 Coll., on Air Protection, as amended			Emission limits not met in 2024 in 3 protected landscape areas covering 0.02% of the total area of national parks and protected landscape areas	

Current measures supporting the achievement of the target

- An amendment to the Air Protection Act No. 42/2025 Coll. has been approved, transposing the current state of EU legislation (effective from 1 March 2025).
- An update to the Czech Republic's National Emission Reduction Programme has been approved.
- Financial support continues for the replacement of non-ecological heating in households with zero-emission and low-emission heat sources and for reducing the energy intensity of buildings, with an emphasis on low-income households. In the 2021–2027 programming period, support for the replacement of non-compliant solid fuel combustion sources in households was part of the OPE with an allocated budget of CZK 4 billion. For other groups of applicants who do not meet the criteria for low-income households, support for the replacement of unsuitable solid fuel heating sources is provided under the New Green Savings programme, but at a lower rate (50–60%). Support for low-income households continues after the OPE allocation has been exhausted from the New Green Savings Light programme, where it is possible to obtain up to 100% support.
- The National Action Plan for Clean Mobility (NAP CM), which was updated and approved by the government in December 2024, is key to reducing emissions from transport. Strategic documents of the Ministry of Transport also deal with reducing emissions from transport and decarbonising transport. The purchase of low-emission and zero-emission vehicles for public passenger transport was supported through calls for proposals under the Integrated Regional Operational Programme (IROP).
- In the field of agriculture, measures focus on reducing ammonia and greenhouse gas emissions from the production, storage and application of farm manure, including the development of precision farming and livestock housing. Reducing emissions from agriculture is the subject of priority measures in the updated NERP CB8 (Tightening of obligations for the storage and application of fertilisers) and CA2 (Support for grazing), given the need to reduce ammonia emissions from agriculture more rapidly in view of the unfavourable outcome of the emission projection, which indicates that the national emission commitment will not be met. Even before the implementation of the methodological adjustment to the calculation of NH₃ emissions, which was the primary cause of the prediction of non-compliance with the national emission reduction commitment, the amount of emissions projected for 2030 corresponded almost exactly to the amount of the national commitment. This situation can be considered unfavourable. This is largely due to the lack of data from the agricultural sector, which is necessary for calculating the emissions inventory and projections.
- The strategic tools for improving air quality are the Air Quality Improvement Programmes developed for individual agglomerations and zones, and action plans for improving air quality developed at the municipal level.

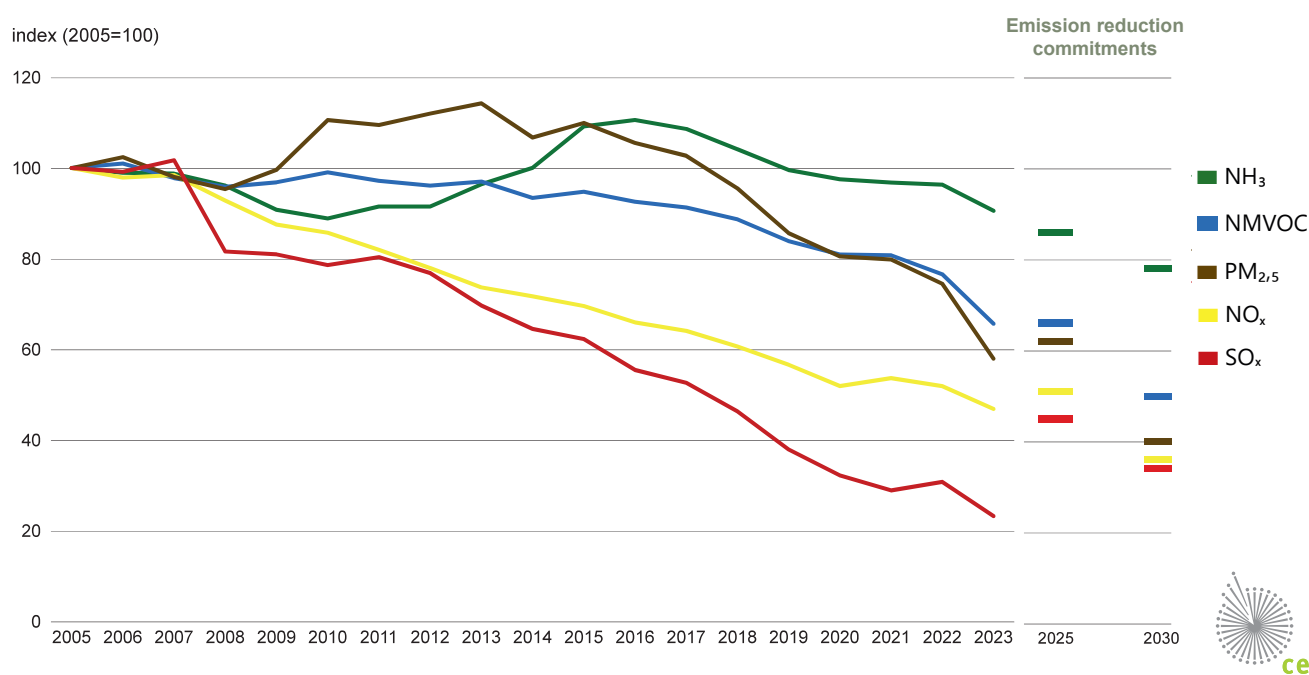
Pollutant emissions

Emissions of selected pollutants into the air (substances with national emission reduction commitments – NO_x , SO_2 , NH_3 , NMVOC, $\text{PM}_{2.5}$) decreased in the period 2005–2023, with a more pronounced downward trend in emissions observed particularly at the end of this period. Technological developments in all sectors contributed to the decline in emissions, reducing the material and energy intensity of the economy, meeting legislative requirements for emissions from air pollution sources, and, at the end of the period, the gradual decarbonisation of the economy, which has a synergistic effect on reducing air pollution and is significantly supported by national and European subsidies. These factors contributed to an acceleration in the downward trend in emissions in the short term over the last five years monitored (i.e. 2019–2023), including for substances for which the reduction in emissions since 2005 has so far been insufficient ($\text{PM}_{2.5}$).

National emission commitments, which are defined as reductions in the emissions of selected pollutants compared to 2005 levels, are set for individual Member States by **Directive 2016/2284 of the European Parliament and of the Council** on the reduction of national emissions of certain atmospheric pollutants. According to the latest emission inventory¹⁷ and the emission projections (see Informative Inventory Report, IIR¹⁸), it is clear that the national commitments for 2025 have already been achieved for all substances except NH_3 have already been achieved in 2023 (Graph 13). According to projections, the national emission commitments for 2030 for SO_2 , NO_x and NMVOC will be met with a margin, while for $\text{PM}_{2.5}$ the projections indicate a close but also likely fulfilment. Only in the case of NH_3 emissions is the projected emission level (64.9 kt) above the national commitment (61.6 kt, i.e. a 22% reduction in the period 2005–2030). Fulfilment of this national commitment is therefore uncertain. Czechia is considering using the methodological adjustment of the national inventory permitted by the directive, which would probably enable the commitment to be met. Regardless of this assumption, it is necessary to seek further measures to reduce ammonia emissions in agriculture and to improve the quality of the data used in the emission inventory and projections.

Graph 13

Emissions of selected pollutants in the Czech Republic and national emission reduction commitments for 2025 and 2030 [index, 2005 = 100], 2005–2023



Data for 2024 are not available at the time of publication.

Data source: CHMI

¹⁷ Emissions inventory data for 2024 are not available due to the data collection and processing regime.

¹⁸ National Inventory Report 2025 (Informative Inventory Report, IIR), see <https://cdr.eionet.europa.eu/cz/un/clrtap/iir/envz63ada/>.

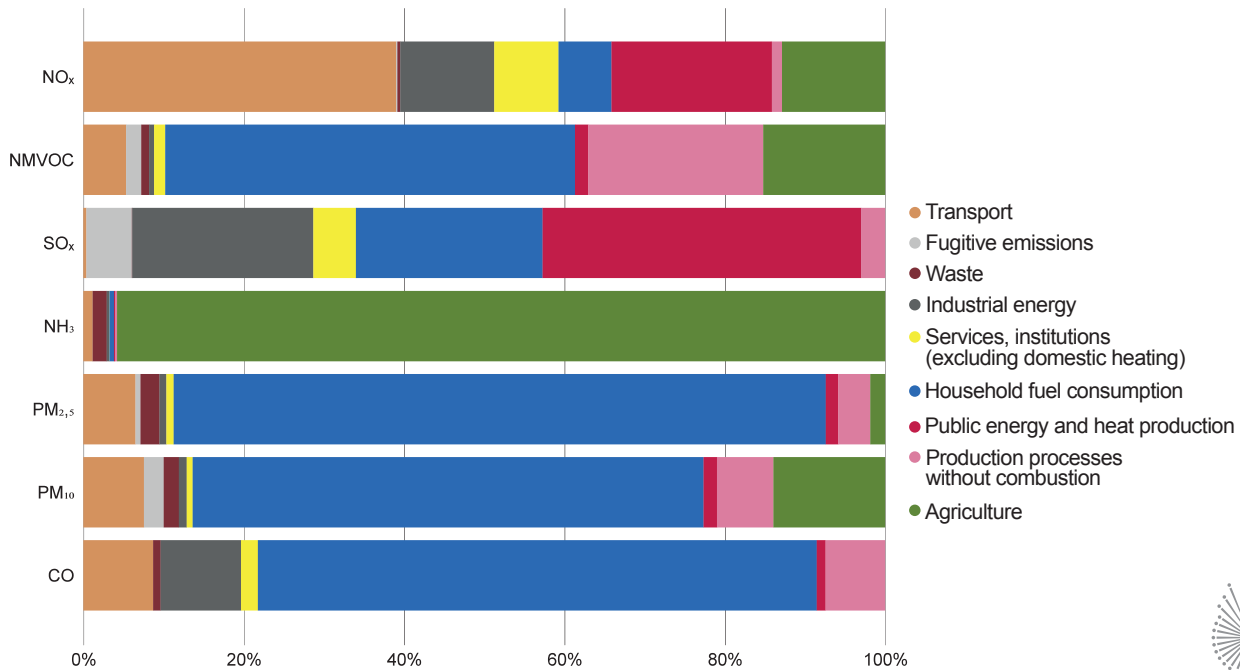
SO_x and NO_x emissions are being significantly reduced in the long term (SO_x by 76.8%, NO_x by 53.1% between 2005 and 2023¹⁹) as a result of the introduction of technologies and production processes in line with the requirements for the application of best available techniques, changes in the fuels used and reductions in the energy intensity of the economy. A significant role is played by the change in the energy mix for electricity generation, in which the share of solid fossil fuels is decreasing and the share of electricity generation in nuclear power plants and from renewable energy sources is increasing. The long-term reduction in NO_x emissions is also linked to the decline in emissions from transport, mainly as a result of the gradual modernisation and replacement of the vehicle fleet and the gradual increase in the share of low-emission and zero-emission vehicles. The fulfilment of national emission commitments for NO_x (and also NMVOC) is considered without source categories 3B and 3D (agriculture) in accordance with Directive 2016/2284. Given the stagnation of NO_x emissions from agriculture during the period under review, the reduction in NO_x emissions for the purposes of meeting the requirements of the Directive is more significant (by 56.5%).

The development of **PM_{2.5}, PM₁₀ and NMVOC** emissions is determined by the development of emissions of these substances from the main categories of their sources, which are fuel combustion in households (especially for household heating) and, in the case of NMVOC, also industrial processes and transport. Significant factors in the development of emissions are therefore the method of household heating, the replacement of household heating technologies, temperatures during the heating season and the state of the transport fleet. Between 2005 and 2023, there was a 42.0% decrease in **PM_{2.5} emissions**, **PM₁₀ emissions** by 40.0% and **NMVOC** emissions by 34.4%. Excluding the agricultural sector, where emissions rose by 6.5% between 2005 and 2023, the decline in NMVOC emissions was more pronounced (38.6%) in order to meet national emission commitments. CO emissions, which are not covered by national emission commitments, fell by 31.2% between 2005 and 2023.

The long-term trend in **NH₃ emissions** is volatile and does not show a significant trend. Between 2005 and 2023, emissions fell by only 9.4%, and between 2010 and 2016, NH₃ emissions actually increased. In the short term of the last five years (2019–2023), however, NH₃ emissions fell by 9.0% (7.1 kt), which is mainly related to the new agricultural policy of the Czech Republic and the decline in livestock numbers.

The structure of emissions by source category varies according to pollutant (Figure 14). For NO_x emissions the main sources in 2023 were **transport** (39.0%) and the public energy and heat production sector (20.0%). **Public energy and heat production and industrial energy** are the largest sources of **SO_x emissions** with both categories together accounting for 62.3% of total emissions of this substance. NMVOC emissions came mainly from fuel combustion in households (51.1%) and from non-combustion production processes (21.8%). The most hazardous emissions in terms of health are suspended particulate matter of PM₁₀ and PM_{2.5} size fractions, the predominant source of which is **domestic heating** (fuel combustion in households), which accounted for 63.7% of PM₁₀ emissions in 2023 emissions in 2023 (other sources include agriculture, transport and non-combustion production processes) and 81.3% of PM_{2.5}. Household fuel consumption is also the largest source of CO emissions (69.7% of total emissions). NH₃ emissions were mainly emitted by the agricultural sector (95.8%), from livestock production and the use of nitrogen fertilisers.

¹⁹ Data for 2024 are not available at the time of publication.

Graph 14**Sources of emissions of selected pollutants in the Czech Republic [%], 2023**

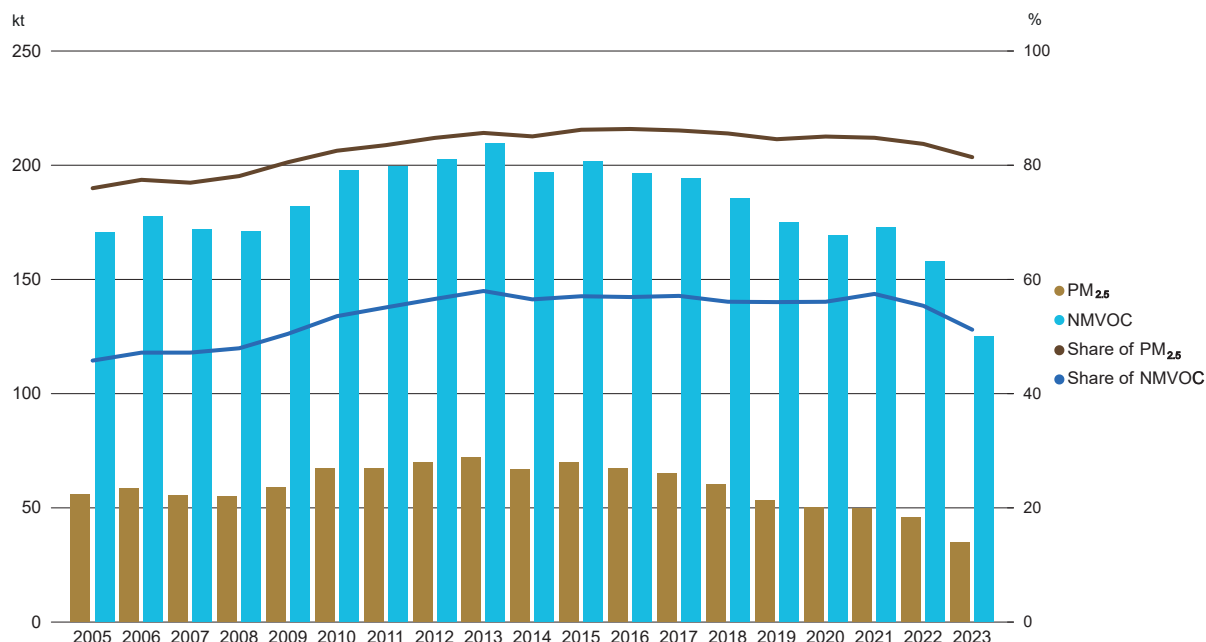
Data for 2024 are not available at the time of publication.

Data source: CHMI

Emissions from household heating began to decline more significantly after 2015 (Chart 15), when intensive subsidy support for boiler replacement, and later also for building insulation and the use of renewable energy sources in family homes (OPE and New Green Savings Programme), began to take effect, combined with legislative restrictions on heating methods. Between 2005 and 2023, PM_{2.5} emissions from domestic heating fell by 37.9% and NMVOC emissions by 26.6%. The year-on-year decline in emissions in 2023 (PM_{2.5} by 24.3% and NMVOC by 20.7%) was the most significant since 2005. Although this decline in emissions from heating was supported by a short and warm heating season of 3,696 degree-days, which is 11.2% less than the long-term average for 1986–2015, it represents significant progress towards meeting national emission commitments for these pollutants.

Graph 15

Development of PM_{2.5} and NMVOC emissions from household heating (NFR category 1A4bi – Residential – stationary) and the share of this category in total emissions in the Czech Republic [kt, %], 2005–2023



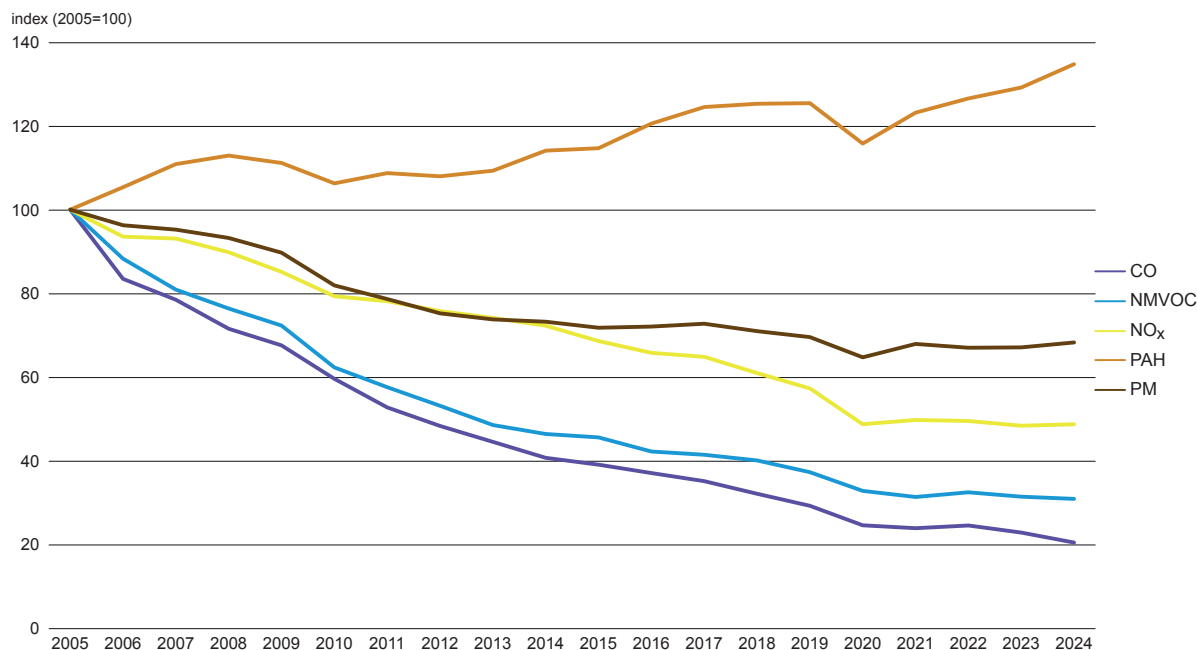
Data for 2024 are not available at the time of publication.



Data source: CHMI

Another category of sources with dynamic emissions development is **transport**, where, apart from polyaromatic hydrocarbons, for which no national emission commitments have been set, a downward trend in pollutant emissions can be observed after 2005. The favourable development of emissions is influenced by the gradual replacement of the vehicle fleet with vehicles with higher EURO emission standards and, at the end of the period, by the growth in the use of low-emission and zero-emission vehicles as part of the transition to clean mobility.

Overall, **between 2005 and 2024**, NO_x emissions from transport fell by 51.3%, VOC emissions by 69.1%, CO emissions by 79.5% and PM emissions by 31.7% (Chart 16). However, PAH emissions from transport rose by 34.8%. Emissions fluctuated in line with economic performance, which was reflected in the development of freight and passenger transport performance. In a year-on-year comparison between 2023 and 2024, VOC and CO emissions from transport continued to decline, with CO falling by a significant 10.4%. However, NO_x emissions rose slightly by 0.7% year-on-year, which was caused by a 30.9% increase in NO_x emissions from air transport, while NO_x emissions from road transport continued to decline. Emissions of particulate matter (PM) increased by 1.8% year-on-year, with emissions from private car transport increasing by 1.1% and emissions from road freight transport increasing by 2.6%. PM and PAH emissions respond more significantly to growth in transport performance and energy consumption in transport due to the significant share of diesel vehicles in the passenger car fleet, high and growing diesel consumption and, in the case of PM emissions, non-combustion emissions of suspended particulates from tyre and brake wear.

Graph 16**Emissions of pollutants from transport in the Czech Republic [index, 2005 = 100], 2005–2024**

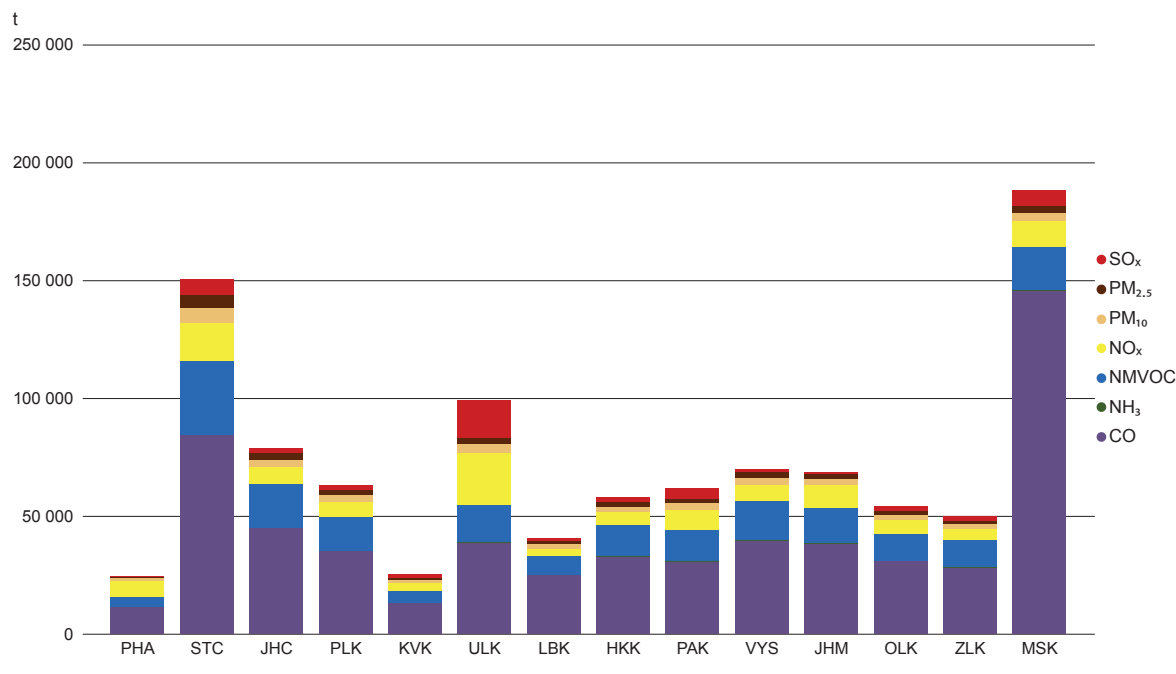
Data source: TRC

The most significant category of emission sources in transport in 2024 for all monitored substances was **private car transport**, with the highest shares of total VOC (73.3%) and CO (69.5%) emissions from transport. This is due to the high energy and fuel consumption of private transport, which accounts for almost three quarters of total passenger transport in Czechia. In 2024, road freight transport accounted for about one third of total NO_x, PM and PAH emissions. Of non-road transport modes, air transport accounted for 12.0% and motorised rail transport for 7.0% of total NO_x emissions from transport.

At **the regional level**, the amount and structure of pollutant emissions by source category are related to the economic focus of the regions, the nature of the population, the density of the road network and the intensity of road transport. In absolute terms, the highest levels of air pollutants are emitted in the industrially focused regions of **Moravia-Silesia and Ústí nad Labem**, followed by the **Central Bohemian Region**, due to its size, settlement structure and intensive road traffic (Graph 17).

Graph 17

Emissions of major pollutants in regions [t], 2024

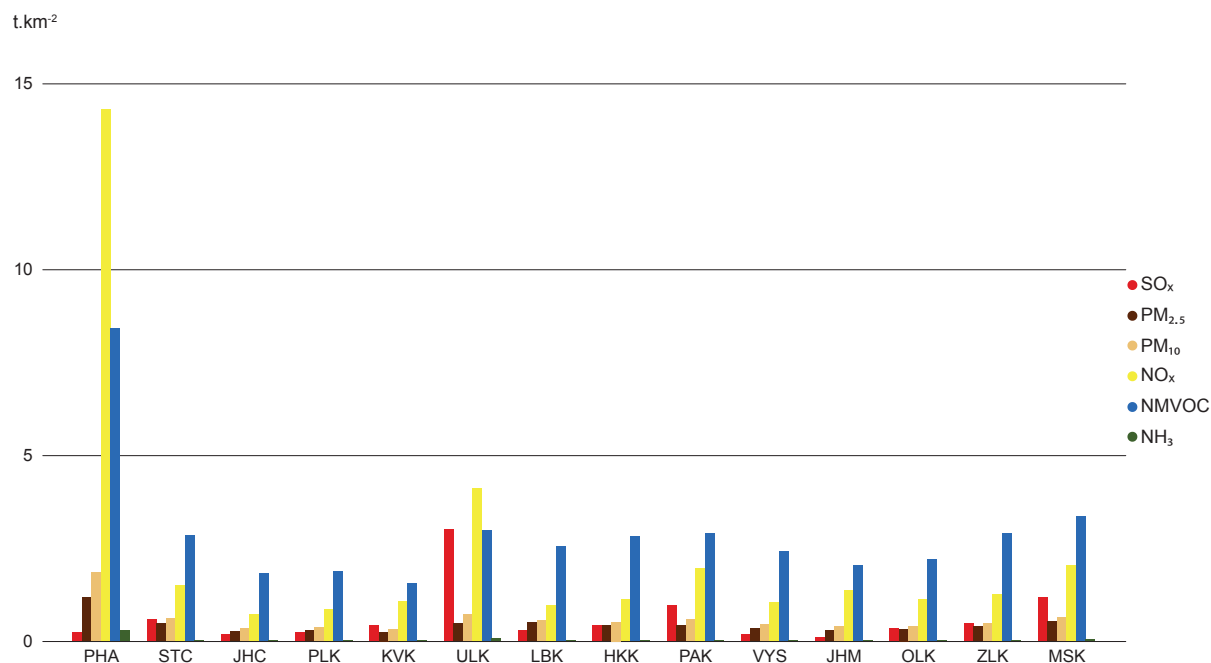


Data source: CHMI

The largest volume of **CO emissions** among Czech regions has long come from **the Moravian-Silesian Region** (24.3% of CO emissions in Czechia in 2024), where this substance is emitted in significant quantities by the metallurgical industry. In the case of **SO_x and NO_x** emissions the largest volumes are emitted in the **Ústí nad Labem Region** (34.6% and 18.5% of emissions of these substances in Czechia, respectively), where their dominant sources are fossil fuel power plants and the chemical industry. The Karlovy Vary Region also has significant air pollution from public energy production (46.9% of NO_x emissions and 76.7% of SO_x emissions from REZZO 1 and 2). **Transport** (mainly road transport) is the largest source of air pollution in the capital city of Prague (80.5% of NO_x emissions, 69.5% of CO emissions and 54.6% of PM_{2.5} emissions). In other regions, most pollutant emissions, with the exception of SO_x, come from **small stationary sources** of air pollution (REZZO category 3), i.e. mainly from local household heating, and in the case of NO_x emissions, from transport. The highest shares of small stationary sources are recorded for PM_{2.5} emissions in the South Bohemian Region (89.7%) and the Liberec Region (86.4%). Slightly lower shares of fine suspended particles from small stationary sources are found in industrial regions (Ústí nad Labem 74.5%) and especially in the capital city of Prague (38.1%), where a higher share of PM_{2.5} emissions is produced by transport.

The source of **NH₃** emissions is mainly agriculture, with the highest ammonia emissions in 2024 calculated in the Ústí nad Labem Region, the Moravian-Silesian Region and the Central Bohemian Region.

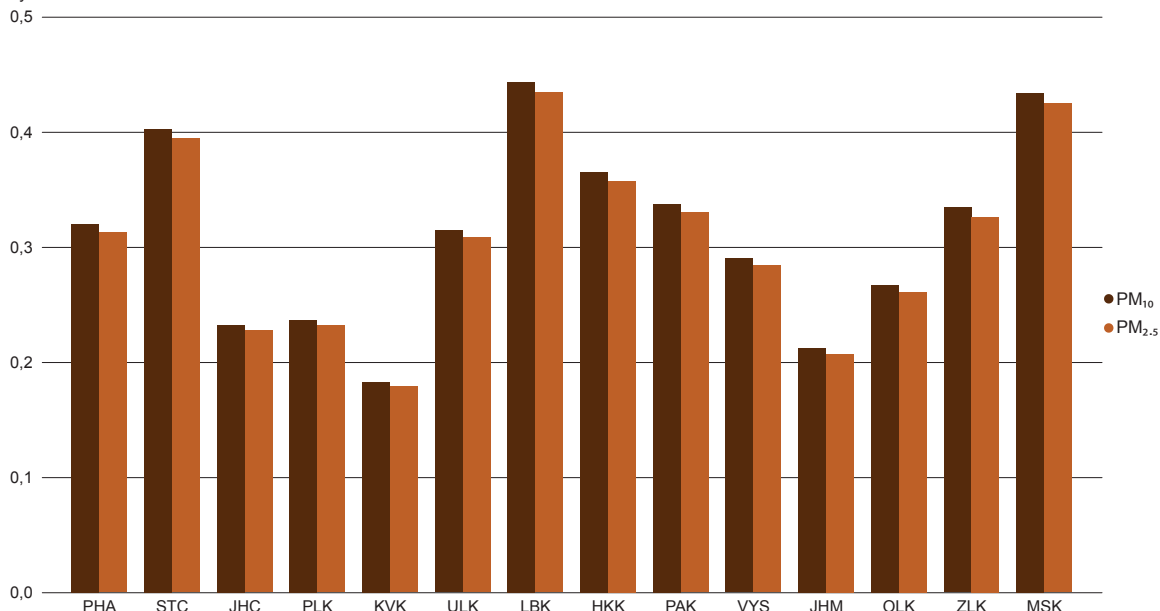
Despite the lowest volume of pollutant emissions in absolute terms, the highest **emission load per unit area** (specific emissions) for NO_x, VOCs and suspended particles of both size fractions PM₁₀ and PM_{2.5} the Capital City of Prague (Graph 18), mainly due to the high traffic load concentrated in a small area. Overall, the South Bohemian Region (absence of the most significant sources of pollution) and the Plzeň Region have the lowest emission load per unit area. The specific emissions of other pollutants correspond to the representation of the main source categories in the given region. The highest specific CO emissions, exceeding the national average by up to four times, are in the Moravian-Silesian Region (mainly due to the metallurgical industry), while the highest specific SO_x emissions are in the Ústí Region.

Graph 18**Specific emissions of selected substances per unit area [t.km⁻²], 2024**

Data source: CHMI

In 2024, the highest **specific emissions from household heating** were recorded in the Moravian-Silesian, Liberec and Central Bohemian regions (Chart 19). The emission load from heating is influenced by natural conditions (in colder climates or at higher altitudes, e.g. in the Liberec Region, air pollution from heating is more significant than in warmer regions), the nature of settlement (centralised vs. dispersed), population density, and the proportion of households connected to district heating, or the method of heating households. For example, in the Vysočina Region, which has a low population density compared to other regions (28 households per km² compared to an average density of 54 households per km²), specific emissions are below average despite the relatively unfavourable structure of fuels used for heating, in contrast to the Moravian-Silesian Region, where the method of heating is more environmentally friendly, but due to the high population density (90 households per km²), specific emissions from household heating in this region are high.

Graph 19

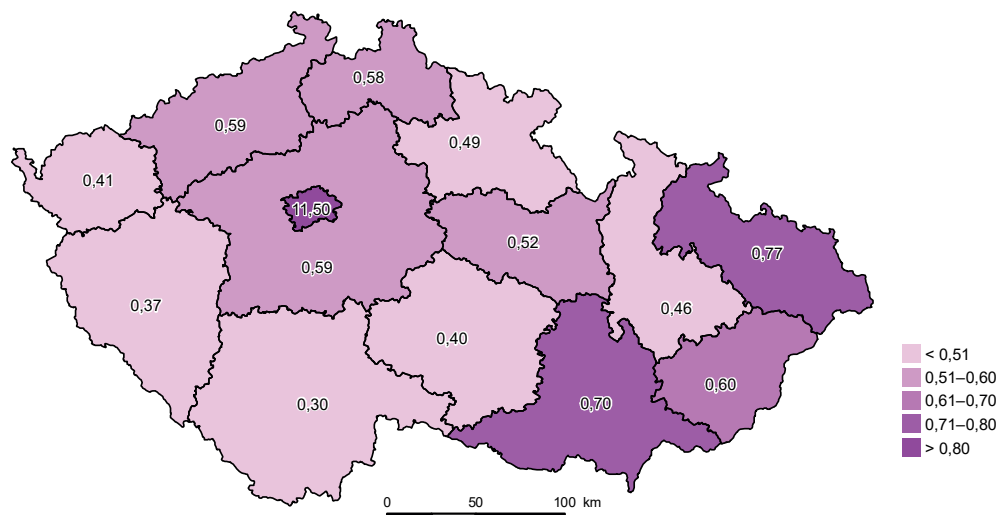
Specific emissions of PM₁₀ and PM_{2.5} from household heating in regions [t.km⁻²], 2024t.year⁻¹.km⁻²

Data for 2024 are preliminary.

Data source: CHMI

The highest **emission loads from transport** are found in urban agglomerations, followed by towns and regions located on main road transport routes with high traffic intensity. The region of the Czech Republic with the highest transport emissions is the capital city of Prague, where NO_x emissions from transport per unit area in 2024 amounted to 11.5 t.km⁻² (a year-on-year decrease of 6.5%), which is roughly twenty times the national average (0.6 t.km⁻²). The South Moravian and Moravian-Silesian regions are also significantly affected by transport emissions, as they are heavily burdened by traffic in urban agglomerations (Brno and Ostrava) and are crossed by major international transit routes (Fig. 10).

Fig. 10

NO_x emissions from transport per unit area in regions [t.km⁻²], 2024

Data source: TRC

Conversely, the Karlovy Vary Region had the lowest air pollution from transport in terms of the volume of emissions produced in 2024 (approximately 3% of emissions of individual substances from transport in Czechia), due to the peripheral location of the region within Czechia and the absence of significant transit traffic in the region. The lowest specific emissions from transport per unit area were in the South Bohemian Region (0.3 t NO_x.km⁻², i.e. 52% of the national average), a significant part of which is only minimally affected by emissions from transport.

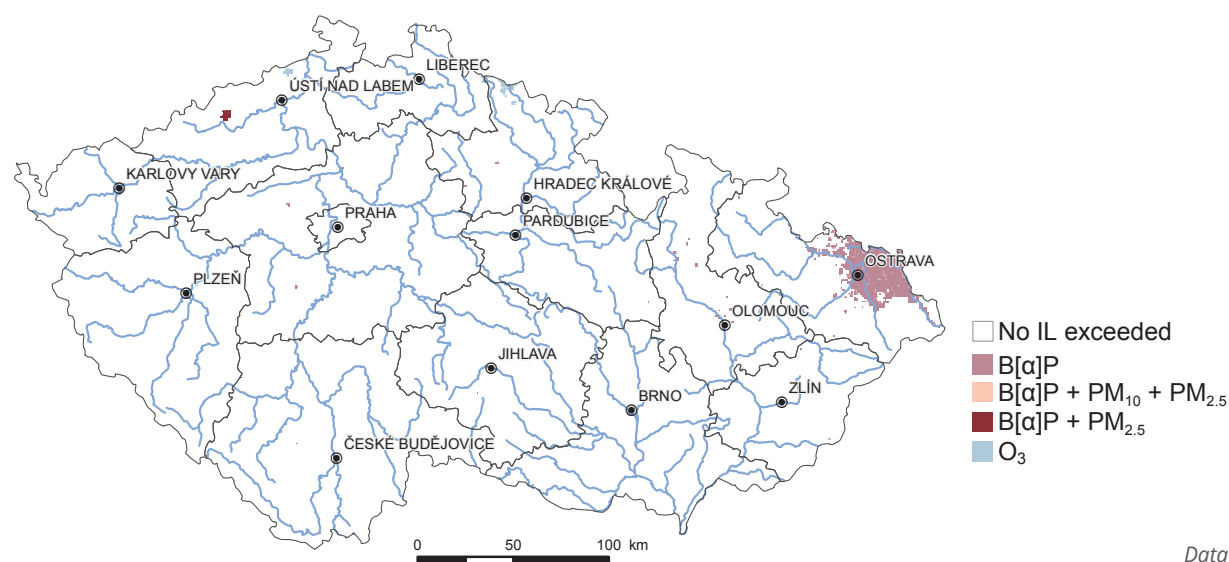
Air pollution situation

Air quality has a fundamental impact on human health and quality of life, as well as on ecosystems and vegetation, which is why it is necessary to ensure compliance with emission limits for pollutants and a long-term reduction in overall pollution levels. Currently, the most significant air pollutants in Czechia, for which emission limits are exceeded, include suspended particles of size fractions PM₁₀ and PM_{2.5}, benzo[*a*]pyrene from the group of polycyclic aromatic hydrocarbons, nitrogen oxides and ground-level ozone.

In 2024, 1.3% of the territory of Czechia was defined as having exceeded at least one **emission limit**²⁰, excluding ground-level ozone, and 7.4% of the population of Czechia lived in this area (Fig. 11). In 2023, this was 0.9% of the territory and 5.9% of the population, so there was a slight year-on-year increase in the proportion of territory and the proportion of exposed population; this increase was exclusively related to the exceedance of the emission limit for benzo[*a*]pyrene. The emission limit for ground-level ozone was exceeded in 2024 only in a minimal area (0.1%), as in the previous year.

Fig. 11

Areas with exceeded emission limits for human health protection in the Czech Republic [%], 2024



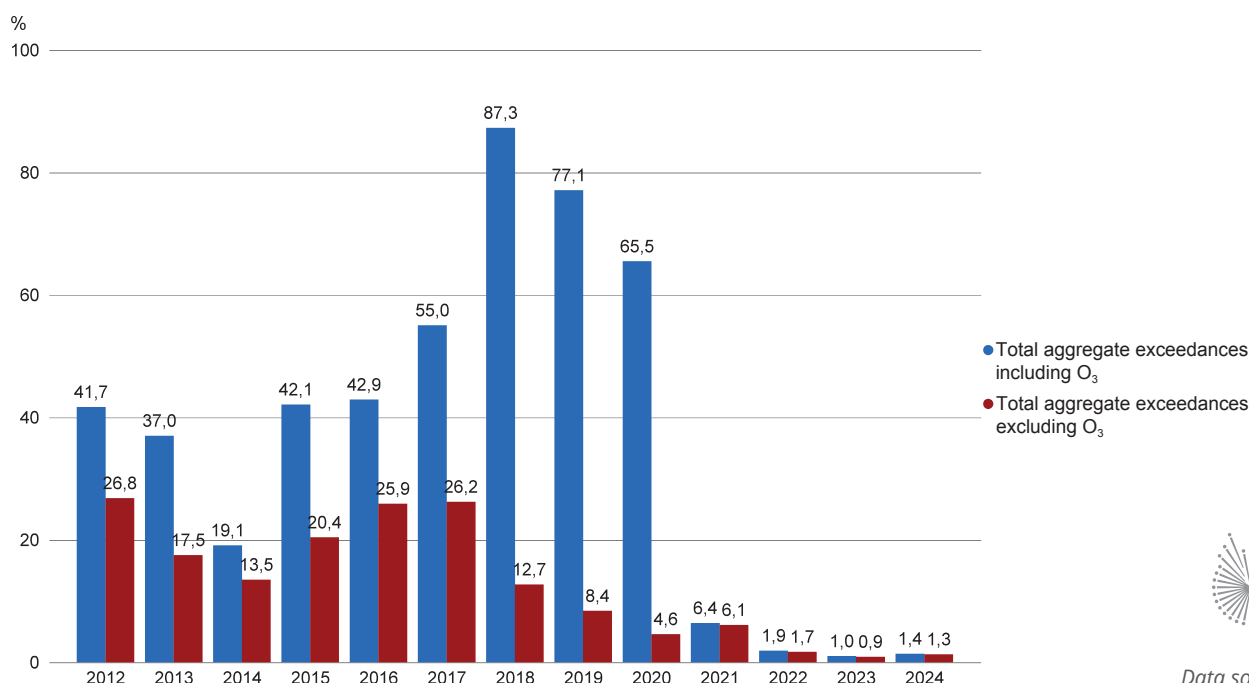
Data source: CHMI

²⁰ Act No. 201/2012 Coll., on Air Protection, as amended, Annex No. 1, Parts 1–3 (emission limits for sulphur dioxide, nitrogen dioxide, carbon monoxide, suspended particulates, benzene, lead, benzo[*a*]pyrene, arsenic, cadmium, nickel).

Over the past 10 years (2015–2024), **air quality in Czechia has improved** in terms of the proportion of the territory with exceeded emission limits for the protection of human health (Graph 20). In the last 3 years (2022–2024), the proportion of areas exceeding emission limits has stagnated at low levels, with air quality in these years supported by favourable meteorological (dispersion) conditions and warmer heating seasons, during which air pollution from household heating decreased. The long-term improvement in air quality in Czechia is linked to the introduction of modern technologies in production, the modernisation of combustion equipment in households (the effect of boiler subsidies) and the gradual renewal of the road vehicle fleet with lower-emission vehicles.

Graph 20

Share of Czechia's territory with exceeded emission limits for human health protection [%], 2012–2024

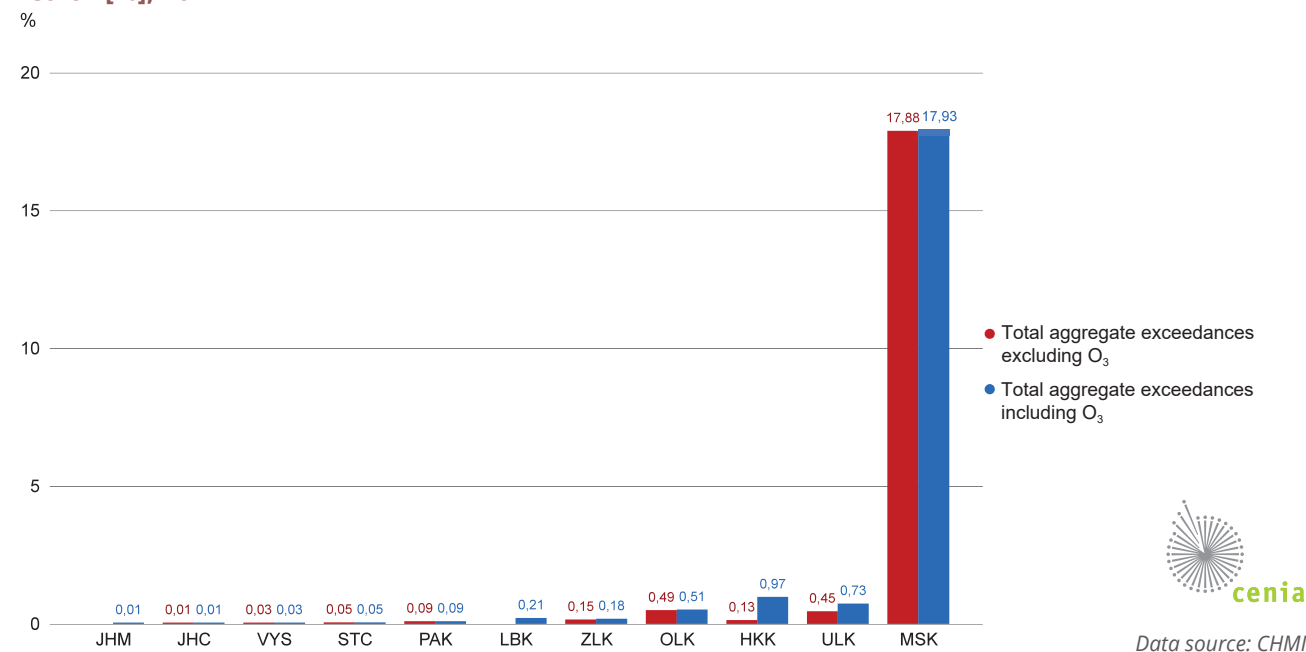


For PM₁₀ substances, these are daily concentrations, while for PM_{2.5} and B[a]P, they are annual concentrations. In 2020, a stricter emission limit of 20 µg.m⁻³ came into force for the annual average concentration of PM_{2.5}.

The region with the worst air quality remains the Moravian-Silesian Region (Graph 21), where the emission limit (excluding O₃) was exceeded in 17.9% of the territory, where 61.4% of the region's population lived (in the Ostrava/Karviná/Frýdek-Místek agglomeration, it was exceeded in 40.7% of the territory, where 80.1% of the agglomeration's population lived). In other regions, emission limits were exceeded in 2024 only in a very small area.

Graph 21

Proportion of the territory of Czech regions exceeding emission limits for the protection of human health [%], 2024



Note: Regions without exceedances of the emission limit are not shown in the graph.

B[a]P – annual average higher than 1 ng.m⁻³

O₃ – 26th maximum value of the daily 8-hour moving average over the last 3 years higher than 120 µg.m⁻³

PM₁₀ – 36th maximum daily average value higher than 50 µg.m⁻³

PM_{2.5} – annual average higher than 20 µg.m⁻³

Air pollution limits for **PM₁₀ and PM_{2.5} suspended particles** are currently rarely exceeded, or only in a very small area of the Czech Republic. The air pollution limit for **the daily (24-hour) average concentration of PM₁₀** was exceeded in 2024 in only 0.003% of the Czech Republic (the same as in the previous year). The emission limit was exceeded only in the Moravian-Silesian Region, on 0.04% of the region's territory (0.11% of the Ostrava/Karviná/Frýdek-Místek agglomeration). In 2020, a stricter emission limit of 20 µg.m⁻³ for the annual average concentration of PM_{2.5} came into force, which was not exceeded at all in 2024. However, taking into account the recommended values for concentrations of pollutants in outdoor air set by the WHO in 2021, which are stricter than the emission limits set by legislation, the risk to public health from exposure to fine suspended particles remains significant.

The emission limit for **the annual average concentration of nitrogen dioxide (NO₂)**, which causes respiratory problems and reaches its highest concentrations in areas with heavy traffic, was not exceeded in any location in 2024. The emission limit for the daily (24-hour) concentration of sulphur dioxide (SO₂) was exceeded in 0.03% of the Czech Republic, specifically in 0.41% of the Ústí nad Labem Region, where pollution from this substance is linked to the energy industry. The emission limits set for arsenic, cadmium, lead, nickel and carbon monoxide (CO) were not exceeded in the Czech Republic in 2024.

Benzo[a]pyrene (B[a]P) from the group of polycyclic aromatic hydrocarbons is currently considered the most problematic air pollutant in Czechia. It is produced by the incomplete combustion of carbonaceous substances (e.g. coal, but also wood) at lower temperatures and is usually bound in the air to the fine fraction of suspended particles PM_{2.5}, through which it enters the body. Due to its carcinogenic and mutagenic effects, exposure to benzo[a]pyrene poses a significant health risk. High concentrations of this substance are found not only in industrial areas, but especially in small settlements where solid fuels are used for heating. B[a]P concentrations show a marked annual cycle with peaks in winter due to poorer dispersion conditions and pollution from local domestic heating.

The emission limit for the annual average concentration of B[a]P was 1 ng.m⁻³ was exceeded in 2024 in 1.3% of the Czech Republic, where 7.3% of the population lived. In the Moravian-Silesian Region, the emission limit for B[a]P was exceeded in 17.9% of the region (40.7% of the Ostrava/Karviná/Frýdek-Místek agglomeration). In other regions, with the exception of the Karlovy Vary, Liberec, Plzeň and Prague regions, the emission limit for B[a]P was also exceeded, but only in a small part of the territory of these regions.

The persistent **exceedance of the emission limit for B[a]P** confirms the high importance of ongoing measures to reduce emissions from local household heating, which is the main source of air pollution not only with benzo[a]pyrene but also with fine particulate matter. The biggest problem is posed by older boilers for burning solid fuels, including biomass, in which combustion is incomplete. From an air quality perspective, the solution is not only to switch to renewable energy sources as part of the decarbonisation of the economy, but also to modernise heating technology, increase the proportion of households heated by emission-free sources (electricity, heat pumps, photovoltaics) or natural gas, and reduce the energy intensity of buildings.

Ground-level ozone (O₃), formed by chemical reactions from so-called ozone precursors (VOC, NO_x, CO and CH₄), is a specific pollutant which, due to its strong oxidising properties, has a negative impact on human health and ecosystems. Its concentrations are mainly influenced by meteorological conditions (intensity and duration of sunshine, air temperature and precipitation). In 2024, the emission limit for the 8-hour average rolling concentration of ozone was exceeded in only 0.1% of the territory, with 0.03% of the population exposed to concentrations above the limit. The largest share of the territory exceeding the emission limit for ground-level ozone was in the Hradec Králové Region (0.85%).

Air pollution, together with atmospheric deposition, has a negative impact not only on humans but also on **ecosystems and vegetation**. Air pollutants reduce the resistance of vegetation to external influences, thereby also affecting the water regime in the landscape and biodiversity.

Ground-level ozone damages the assimilation organs of plants and thus has a negative impact on vegetation, which is subsequently less resistant to the effects of biotic and abiotic factors, which also affects individual habitats and ecosystems. In 2024 (according to data for the five-year period 2020–2024), the emission limit for the AOT40 exposure index²¹ was exceeded at only one station (Sněžník in the Děčín district) out of a total of 40 rural and suburban stations where, according to current Czech legislation, the level of annual O₃ in accordance with the emission limit for the protection of ecosystems and vegetation. Year-on-year changes in the AOT40 exposure index are influenced not only by the total emissions of ozone precursors, but above all by meteorological conditions in the period from May to July, when warm weather with intense sunshine contributes to the formation of ground-level ozone.

The emission limit for the protection of ecosystems and vegetation was not exceeded in national parks in 2024, and in protected landscape areas it was only exceeded in 0.03% of their territory. Exceedances of the emission limit were recorded only in a very small proportion of the territory in the České středohoří Protected Landscape Area, the Labské pískovce Protected Landscape Area and the Litovelské Pomoraví Protected Landscape Area (Table 1). Compared to the previous year 2023, the proportion of territory with exceedances of the emission limit in national parks and protected landscape areas decreased significantly.

²¹ Average AOT40 value for 5 years, i.e. for the years 2020–2024.

Table 1

Proportion of the territory of individual protected landscape areas and national parks with exceeded emission limits for the protection of ecosystems and vegetation [%], 2024

National park + protected landscape area	NO _x Annual average > 30 µg.m ⁻³ %	O ₃ AOT40 > 18,000 µg.m ⁻³ .h %	Summary %
České středohoří Protected Landscape Area	0.2	–	0.2
Labské pískovce Protected Landscape Area	–	0.4	0.4
Litovelské Pomoraví Protected Landscape Area	0.1	–	0.1

Note: Protected landscape areas and national parks that do not exceed the emission limit are not included in the table.

Data source: CHMI

Detailed visualisations and data

<https://www.envirometr.cz/data>

1 Environment and health

1.3 Exposure of the population and the environment to hazardous substances

Key messages

- Emissions of most heavy metals (Zn, Pb, Cr, Se, Ni, Hg, Cd) into the air have decreased since 2005, but in the last 5 years assessed (2019–2023²²), there have been significant fluctuations in emissions influenced by the characteristics of the heating seasons and the variable content of heavy metals in the fuels and raw materials used. Copper emissions are slowly increasing in line with the growth in road transport, which is their main source.
- Emissions of persistent organic pollutants into the air have fallen significantly since 2015, thanks to a decline in emissions of these substances from the main source categories, which are domestic heating, public energy and heat production.
- At the end of 2024, the CSR database contained 10,113 individual records of contaminated and potentially contaminated sites. By 2023²³, the remediation of a total of 1,166 contaminated sites had been completed, while the remediation of 84 sites had been terminated due to unsatisfactory results.

²² Data for 2024 were not available at the time of publication.

²³ Data for 2024 were not available at the time of publication.

1.3 | Exposure of the population and the environment to hazardous substances

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Emissions of heavy metals and POPs into the air	Emissions and releases of hazardous chemicals into all components of the environment are decreasing (SEP 2030)			Decrease in emissions of heavy metals, with the exception of copper, since 2005. Significant decrease in POPs emissions after 2015.	
Contaminated sites (recording and remediation)	Contaminated sites, including old environmental burdens, are recorded and effectively remediated (SEP 2030)			Ongoing implementation and updating of CSR. Remediation of contaminated sites continues, with priority given to remediation.	

Current measures supporting the achievement of the objective

- The release of hazardous substances into the environment and their presence in food and products is regulated and addressed in accordance with applicable legislation, and intensive international cooperation is taking place in this area. The occurrence of hazardous substances in food is monitored by the relevant supervisory authorities under the Ministry of Agriculture.
- Supervision of the non-food products market and compliance with the requirements of the REACH Regulation is primarily ensured by the Czech Environmental Inspectorate (CEI) in cooperation with other product market surveillance authorities.
- The Ministry of Industry and Trade provides consulting services in the implementation of the REACH and CLP Regulations, provides consultations to companies affected by the process of authorising or restricting chemical substances and related obligations, and encourages companies to replace substances of very high concern with safer alternatives.
- In 2024, due to risks to human and animal health and the environment, the European Commission decided not to approve four pesticide substances, which will not be allowed to be placed on the market.
- A major accident prevention system is being developed for facilities handling hazardous substances.
- The OPE 2021–2027 continues to support the remediation of contaminated sites, with a new emphasis on addressing the issue of contaminated brownfields. Since 2023, the DNSH (Do No Significant Harm) principles have been applied in new subsidy programmes.
- In 2024, the so-called Brownfield Fund was launched in the Moravian-Silesian Region with an allocation of CZK 1 billion. The fund's investment strategy covers both the reconstruction of obsolete industrial facilities and the transformation of strategic sites of former coal mines.

Emissions and leaks of hazardous chemicals

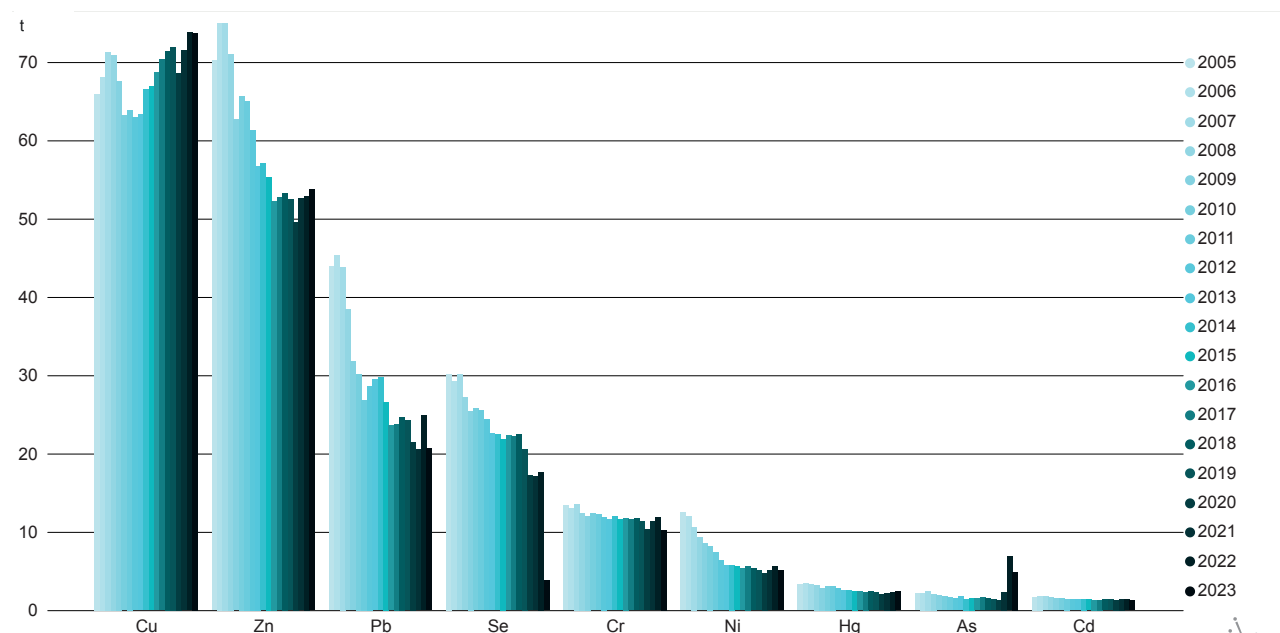
For the reporting year 2023²⁴, the required data on emissions into water, soil and air were reported to **the Integrated Pollution Register (IPR)** from a total of 2,637 facilities. By economic activity category, the most reports were submitted by companies in the category of manufacture of metal structures and metal products, except machinery and equipment (486) and animal production (344). A total of 1,285 releases into the air, water and soil were reported, of which 1,024 were above-limit reports, where the reporting threshold was exceeded for at least one substance. A total of 1,071 releases into the air were reported (of which 827 were above the limit), with above-limit reports concerning a total of 33 substances. There were 214 reports of releases into water (197 of which exceeded the limit), and of the total number of 75 substances monitored in releases into water, 25 substances exceeded the limit. In total, 858.9 kg of arsenic and its compounds, 612.5 kg of chromium and its compounds, and 2,783.5 kg of cyanides (as total CN) were reported in water releases in 2023. A total of 1,175 reports (of which 1,041 were above the limit) concerned transfers in waste, in which transfers of a total of 22 substances in quantities above the limit were reported, e.g. fluorides (474.0 t), cadmium and its compounds (10.9 t) and copper and its compounds (21,827.5 t).

Emissions of heavy metals into the air based on emission inventory data for the UN Convention on Long-Range Transboundary Air Pollution (CLRTAP), with the exception of copper, are declining in the long term. However, in the last five years monitored (2019–2023), there have been significant year-on-year fluctuations in emissions, which have also led to an increase in emissions during this period. The fluctuations in emissions between individual years are caused by developments in the economy and industrial production, as well as by the characteristics of the heating seasons and the variable content of heavy metals in the fuels and raw materials used (Graph 22). Reported emissions after 2021 were also influenced by the use of individual reported emissions from the Chvaletice power plant. In the case of heavy metals, emission factors for Cd, Pb, Hg and As were adjusted, with the most significant adjustment occurring for As, where the new emission factor, calculated as the average emissions per GJ of energy produced in 2021–2023²⁵ (78.14 mg.GJ⁻¹) is approximately 100 times higher than the current emission factor used for coal-fired power plants in NFR sector 1A1. As a result of this methodological adjustment, which was also applied to emissions from other steam power plants, there was a sharp increase in reported arsenic emissions from public energy production, and thus in total As emissions between 2020 and 2022, which increased approximately fivefold. Between 2005 and 2023, arsenic emissions in the emissions inventory therefore increased by 125.6%, but this was due to an adjustment in the emissions estimation methodology to bring it into line with the methodology for emissions reporting for so-called significant point sources.

The most significant decreases in heavy metal emissions between 2005 and 2023 were recorded for selenium (by 87.5%), nickel (by 59.1%) and lead (by 53.0%). A significant decrease in lead emissions occurred between 2000 and 2005 (by approximately 80%) in connection with the end of leaded petrol sales. Copper emissions increased by 11.8% between 2005 and 2023, with the increase in copper emissions linked to the growth in road transport, which is their main source.

²⁴ IPR data for 2024 were not available at the time of publication.

²⁵ Data for 2024 are not available at the time of publication.

Graph 22**Development of heavy metal emissions into the air in the Czech Republic [%], 2005–2023**

Data for 2024 are not available at the time of publication. They will be published in February 2026 at the earliest.

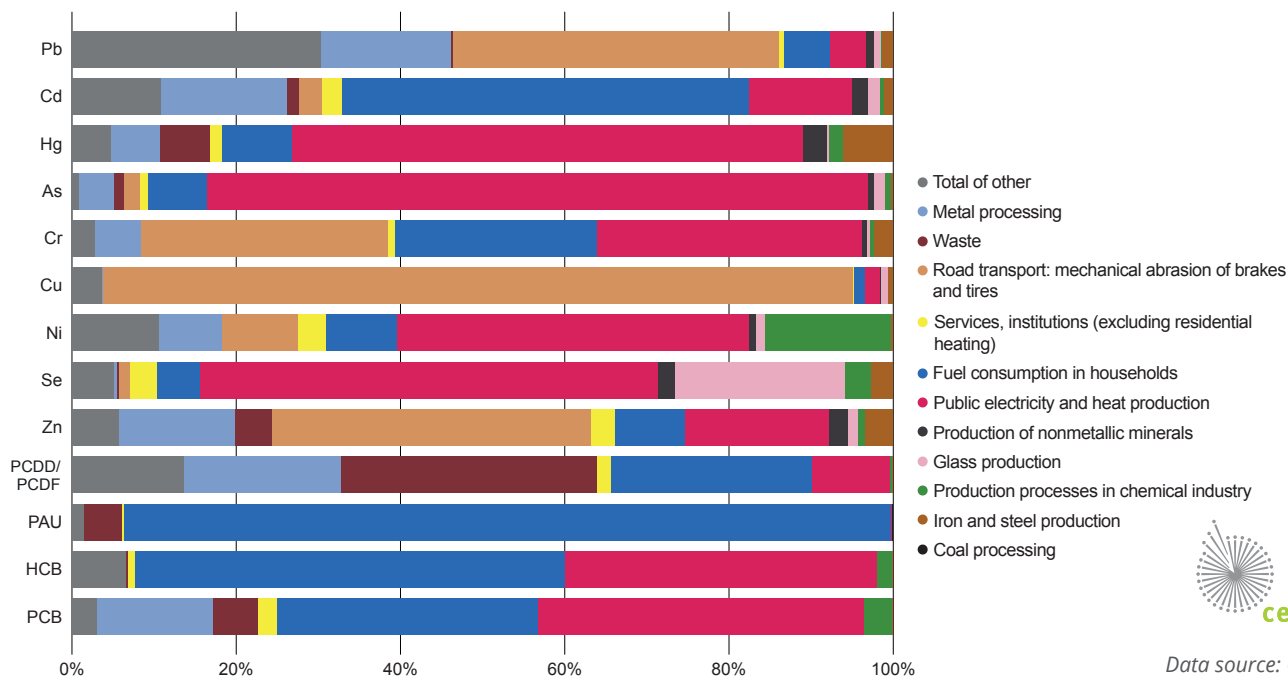


Data source: CHMI

Heavy metals are metals with a specific gravity greater than 4.5 g.cm^{-3} . They are bound in most fossil fuels, from which they are released during combustion. They have carcinogenic and mutagenic effects, and their danger also lies in their potential transfer from the air to other components of the environment, especially soil, where they accumulate. The main **sources of heavy metal emissions** (Graph 23) in Czechia include the public energy and heat production sector burning solid fossil fuels, which in 2023 emitted 80.5% of total arsenic emissions (after adjustment of the emission factor, see above), 62.3% of mercury emissions, 55.8% of selenium emissions and 42.0% of nickel emissions. Local household heating is the most significant source of cadmium (49.6%) and chromium (24.5%) emissions. Road transport, specifically brake and tyre wear, accounted for 91.3% of copper emissions, 39.7% of lead emissions and 38.7% of zinc emissions.

Graph 23

Sources of emissions of selected heavy metals and POPs into the air in the Czech Republic [%], 2023



Data for 2024 are not available at the time of publication. They will be published in February 2026 at the earliest.

Persistent organic pollutants (POPs) are bioaccumulative and toxic, posing risks to human health in the form of damage to internal organs, reduced immunity and an increased risk of malignant tumours. These substances are very difficult to break down in the environment and remain there for many years. Environmental contamination continues to be a persistent problem due to their persistence. POPs enter the air from a number of industrial sources, but also from domestic heating, transport, the use of pesticides in agriculture and waste landfills.

The development of emissions of individual groups of POPs is volatile, but overall, emissions of all monitored substances show a downward trend (in the case of HCB only after 2015), which is significant in the short term of the last 5 years (Graph 24). The most significant reduction in emissions since 2005 has been achieved for **polychlorinated biphenyls**, by 63.3%, while emissions of **hexachlorobenzene** (HCB) have fallen by 54.1%. A significant decrease in HCB emissions occurred between 2000 and 2003 to almost one tenth of the original value, when emissions of this substance from secondary aluminium production fell significantly. In further developments, HCB emissions fluctuated with a more significant decline after 2015. The main source of HCB during this period was the combustion of biomass in domestic heating systems (mainly wood), due to the chlorine compounds contained in biomass. In a year-on-year comparison between 2023 and 2022, HCB and PCB emissions fell significantly by 37.9% and 37.0%, respectively, as a result of a significant year-on-year decline in emissions of these substances from their main source categories, which are domestic heating, public energy and heat production.

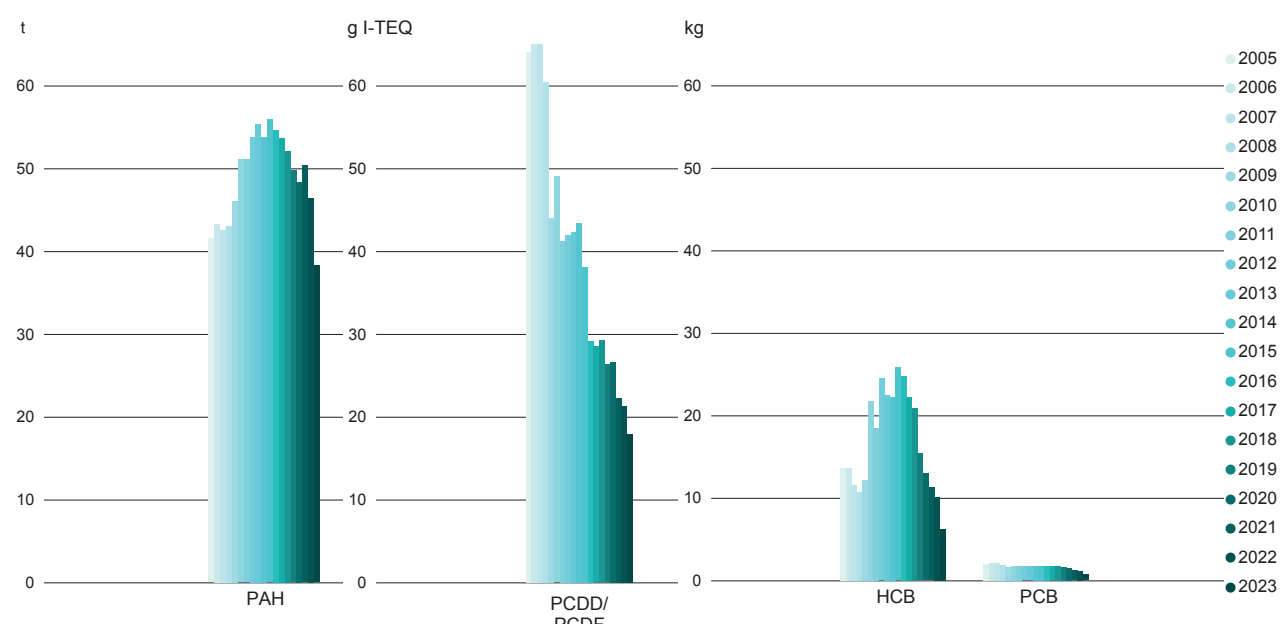
Emissions of **polychlorinated dioxins and furans** (PCDD/PCDF) fell by 72.0% between 2000 and 2023, with a significant decline particularly at the end of the period. The most significant sources of dioxin and furan emissions are waste management (31.2% of emissions), domestic heating (24.4%) and the metallurgical industry (19.0%). Within waste management, PCDD/PCDF emissions arise mainly in facilities for biodegradation, solidification and waste sanitation, as well as in building and car fires. Remediation facilities are used to remediate old environmental burdens

from chlorinated hydrocarbons and petroleum substances. These sources (NFR sector 5E – Other Waste) accounted for 23.4% of total dioxin and furan emissions in 2023. A further 7.8% of dioxin and furan emissions were reported in category 5C2 Open burning of waste. The contribution of waste incineration and energy recovery to dioxin and furan emissions is insignificant compared to the sources mentioned above.

Emissions of **polycyclic aromatic hydrocarbons (PAHs)**, which originate almost exclusively (93.5% in 2023) from domestic heating, fell by 7.8% in the period under review and fluctuate according to the characteristics of the heating seasons and the composition of fuels for domestic heating, then fell by 17.6% year-on-year.

Graph 24

POPs emissions into the air in the Czech Republic [t, g I-TEQ, kg], 2005–2023



Data for 2024 are not available at the time of publication.



Data source: CHMI

Contaminated sites

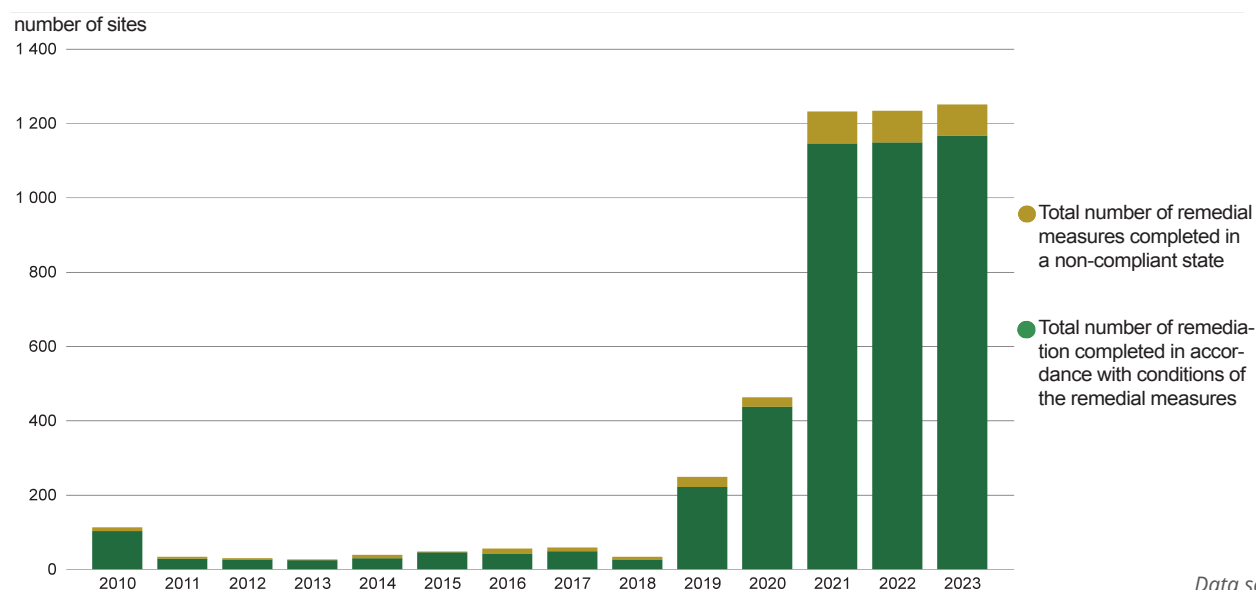
Contaminated sites, or old environmental burdens, are the result of anthropogenic activities during which one-off (accidental) or chronic releases of pollutants into the environment occurred or are still occurring. Although pollutants are already widespread in the environment, it is possible to find truly contaminated sites in cities and the countryside where the concentration or volume of pollution is significantly higher than in the surrounding environment, posing risks to human health and ecosystems. Some of these sites have a very long and complicated history and are therefore referred to as old environmental burdens. We consider a contaminated site to be an area with serious contamination of the rock environment, groundwater or surface water, which has occurred due to the inappropriate handling of hazardous substances, such as petroleum substances, pesticides, polychlorinated biphenyls, chlorinated and aromatic hydrocarbons, heavy metals, etc. Detected contamination is usually considered an old environmental burden if it occurred before privatisation or if the source of the contamination does not exist or is unknown.

The Ministry of the Environment operates a database called **the Contaminated Sites Register (CSR)**, which as of 31 December 2024 contained 10,113 individual records of contaminated and potentially contaminated sites. There were 6,061 sites registered as priority for investigation and 121 sites registered as priority for remediation in the database. Between 2018 and 2022, in connection with the implementation of the National Inventory of Contaminated Sites (NICS) project, the originally exclusively incremental database was filled with updates on already known sites. Although the database contains more than 10,000 official records, it should be noted that the absence of a potential site (location) in the CSR database does not mean that the site is not contaminated. The database only records sites for which the Ministry of the Environment has relevant information about possible contamination.

The number of sites in the CSR database changes dynamically as individual sites are remediated or, conversely, new, previously unknown sites are identified. Between 2010 and 2023²⁶, a total of 1,166 contaminated sites were remediated in accordance with the conditions of the remedial measures, while 84 sites were remediated in an unsatisfactory condition during this period (Graph 25). These data are significantly influenced by the implementation of the National Inventory of Contaminated Sites (NICS) project²⁷.

Graph 25

Number of sites with old environmental burdens with completed remediation registered in CSR in the Czech Republic. Until 2020, the number of remediations in individual years; from 2021, the cumulative number [number of sites], 2010–2023



Data source: MoE

Note: The increase in the number of remediation projects after 2020 was influenced by the implementation of the NICS project, when data on sites whose remediation had been completed earlier but were not recorded in the database were also entered into the database in these years. Data for 2024 are not available at the time of publication.

²⁶ Data for 2024 are not available at the time of publication.

²⁷ As part of the NICS, data from older remediation work (prior to 2010) was also added to the database, which had not been entered into the CSR database by the contractor performing the remediation work, in violation of Decree No. 369/2004 Coll., which imposes such an obligation.

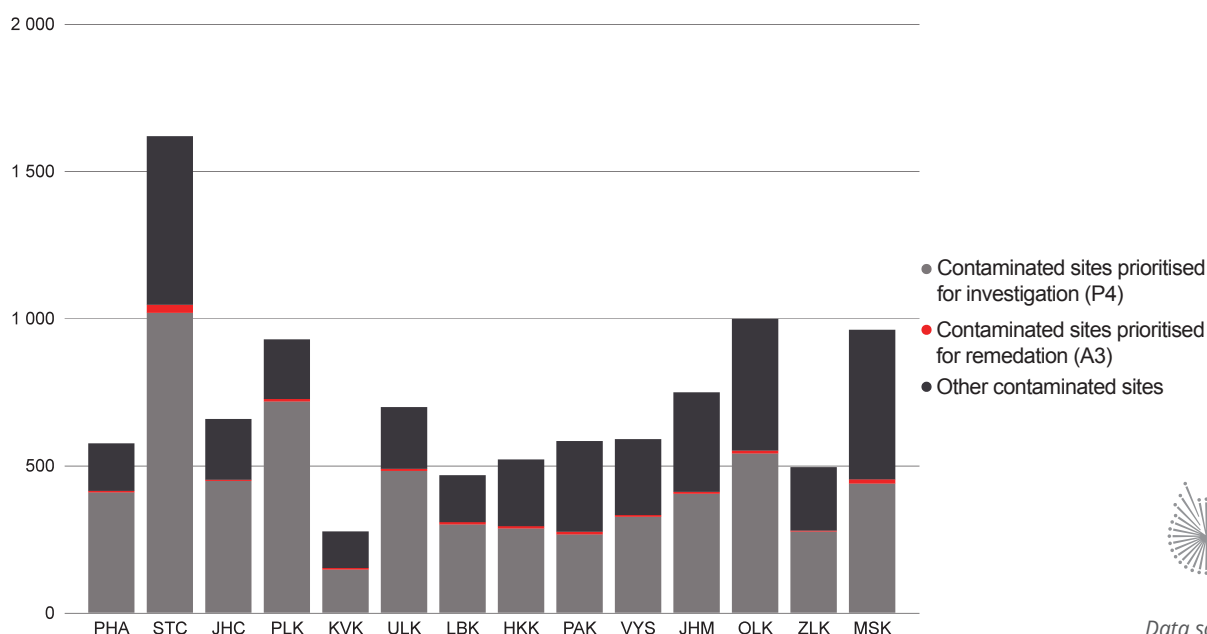
The remediation of old environmental burdens in Czechia is **financed** from European funds drawn through operational programmes, primarily the Operational Programme Environment, and also from the Ministry of Finance (so-called “Environmental Contracts”) and, in some cases, from the funds of individual ministries.

At the regional level, the largest number of contaminated sites in the CSR database is recorded in the Central Bohemian Region (1,618, Graph 26), which also has the highest number of sites (27) prioritised for remediation. A high number of contaminated sites is also recorded in the Olomouc (998), Moravian-Silesian (961) and Pilsen regions (928), while the fewest contaminated sites were recorded in the Karlovy Vary region (276 sites). The Plzeň Region had the second highest number of contaminated sites with priority for investigation (718) after the Central Bohemian Region.

Graph 26

Number of old environmental burdens recorded in CSR in individual regions of the Czech Republic, by type of site [number of sites], 2024

number of sites



Data source: MoE

Detailed visualisations and data

<https://www.enviometr.cz/data>

1 Environment and health

1.4 Noise pollution and light pollution

Key messages

- Approximately one-fifth of the Czech population is exposed to road traffic noise levels above 55 dB.
- 210,600 inhabitants of the Czech Republic are exposed to high noise pollution from road traffic above the limit value, which is why action plans to reduce noise pollution are being developed and implemented in the affected areas. Of these, 71% live in urban agglomerations.
- There is currently no methodology for assessing light pollution, but several research projects on this topic are underway.

1.4 Noise pollution and light pollution

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Noise exposure of the population	Reduction in the number of people chronically exposed to road traffic noise (according to HA and HSD indicators) by 30% by 2030 compared to 2017 levels (zero pollution AP)			According to available data, the number of people exposed to road traffic noise is not decreasing.	
Brightness of the night sky	Light pollution is decreasing (SEP 2030)			The current level of light pollution is worsening due to the increasing number of light sources and illuminated areas.	

Current measures supporting the achievement of the objective

- Noise reduction measures are being adopted in individual regions and agglomerations in accordance with the 4th round of action plans to reduce traffic noise, which are based on the results of the 4th round of Strategic Noise Mapping (SNM, 2022) and which have undergone a consultation process (including public consultation) and were finalised in 2024.
- The need to reduce noise pollution when planning transport services in the area is taken into account in the spatial planning activities of municipalities. The impact of noise on the health of the population and ecosystems is minimised by the proposed spatial layout and by appropriate functional regulation of individual areas.
- Information on noise pollution is published and disseminated in the form of a map application available on the Ministry of Health's geoportal (<https://geoportal.mzcr.cz/shm/?locale=cs>).
- With effect from 1 March 2023, the original Czech technical standard ČSN 36 0459 Limiting the undesirable effects of outdoor lighting was issued.
- In cooperation with the Ministry of Regional Development, light is part of the health and environmental protection requirements under the new Building Act No. 283/2021 Coll. The reduction of undesirable effects of outdoor lighting is also part of its implementing decree No. 146/2024 Coll. on construction requirements and decree No. 131/2024 Coll. on construction documentation.
- Czechia also promotes the issue of light pollution at the international level through workshops and conferences (Light pollution 2023 webinar).
- The Ministry of the Environment has published a new Guide to Proper Lighting, which explains the parameters and application of the ČSN 36 0459 standard.
- On 29 September 2023, the Ministry of the Environment issued an updated Methodological Guideline for the Prevention and Reduction of Light Pollution.

Noise pollution affecting the population

Noise pollution affects the quality of the environment and poses a risk to public health. Excessive noise causes stress, which is the cause of a number of lifestyle diseases. The most common effect of noise on humans is considered to be noise nuisance, i.e. the subjective effects of acoustic discomfort, followed by sleep disturbance and interference with activities. The most serious health effects of noise are those on the auditory organ and the cardiovascular system.

Noise pollution in outdoor environments in Czechia and throughout the EU is mainly caused by **road traffic**. According to the results of the 4th round of Strategic Noise Mapping from 2022²⁸, a total of approximately 2.2 million people in Czechia are exposed to road traffic noise above 55 dB, which corresponds to roughly one fifth of the population of Czechia. Of this number, 1.7 million inhabitants (i.e. 77%) live in **urban agglomerations with more than 100,000 inhabitants**. Road traffic noise levels exceeding the specified **limit of 70 dB** (for the L_{den} indicator) affect 210,600 inhabitants, of whom 149,100 (71%) live in agglomerations. Action plans to reduce noise pollution are being prepared for the affected areas. During the night (between 10 p.m. and 6 a.m., indicator L_n , when a lower limit of 60 dB applies, 272,100 inhabitants are exposed to noise above the limit, of which 187,500 (69%) live in agglomerations. When interpreting these data, it is necessary to take into account that noise mapping is not carried out across the board outside agglomerations, but only in areas where the criteria set out in Directive 2002/49/EC for traffic intensity are met.

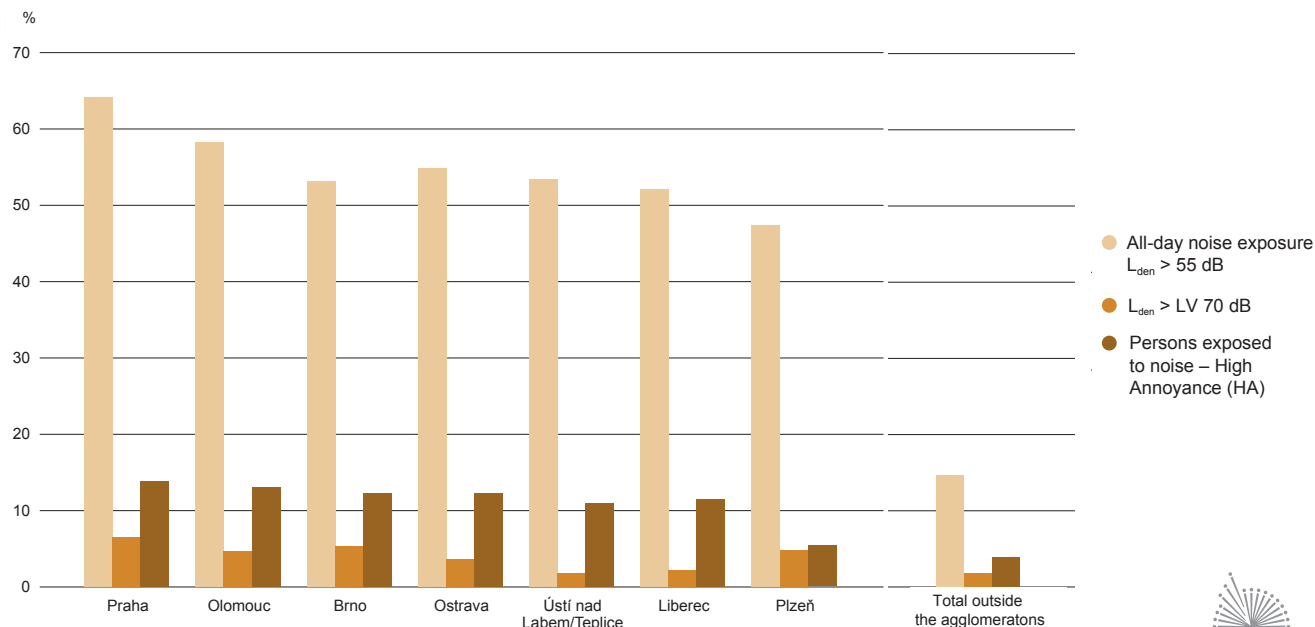
To assess **the health risks of noise exposure**, indicators of high annoyance (HA) and high sleep disturbance (HSD) are used. The methodology for determining these indicators and subsequently the exposure of the population takes into account not only the intensity of noise (i.e. acoustic pressure), but also the development of noise over time and its other characteristics. According to the latest SNM results, a total of 496,600 people in Czechia are exposed to noise meeting the criteria for high annoyance, of which 360,800 people, i.e. 73%, live in agglomerations. From a health perspective, 162,200 inhabitants are exposed to even more serious sleep disturbance, 70% of whom (113,200) live in urban agglomerations.

The Prague agglomeration is most affected by road traffic noise, with 91,300 inhabitants, i.e. 6.4% of the population included in the noise mapping, exposed to noise above the limit value throughout the day and 13.8% of the population highly disturbed by noise with a risk of health effects (Graph 27). Prague is also significantly affected by road traffic noise at night, with 4.2% of the population suffering from high sleep disturbance (Graph 28). According to the monitored noise indicators, the Olomouc and Brno agglomerations also have above-average noise pollution within the agglomerations.

²⁸ Strategic noise mapping is carried out in accordance with the requirements of Directive 2002/49/EC of the European Parliament and of the Council on the assessment and management of environmental noise at five-year intervals, so more recent data are not available. In 2020, an amendment to this legislation was adopted (Commission Directive (EU) 2020/367), which specifies in Annex III the methodology for calculating noise indicators and health impact indicators.

Graph 27

All-day (24-hour) noise exposure from road traffic in agglomerations and outside agglomerations according to L_{den} and HA indicators [% of exposed population included in noise mapping], 2022



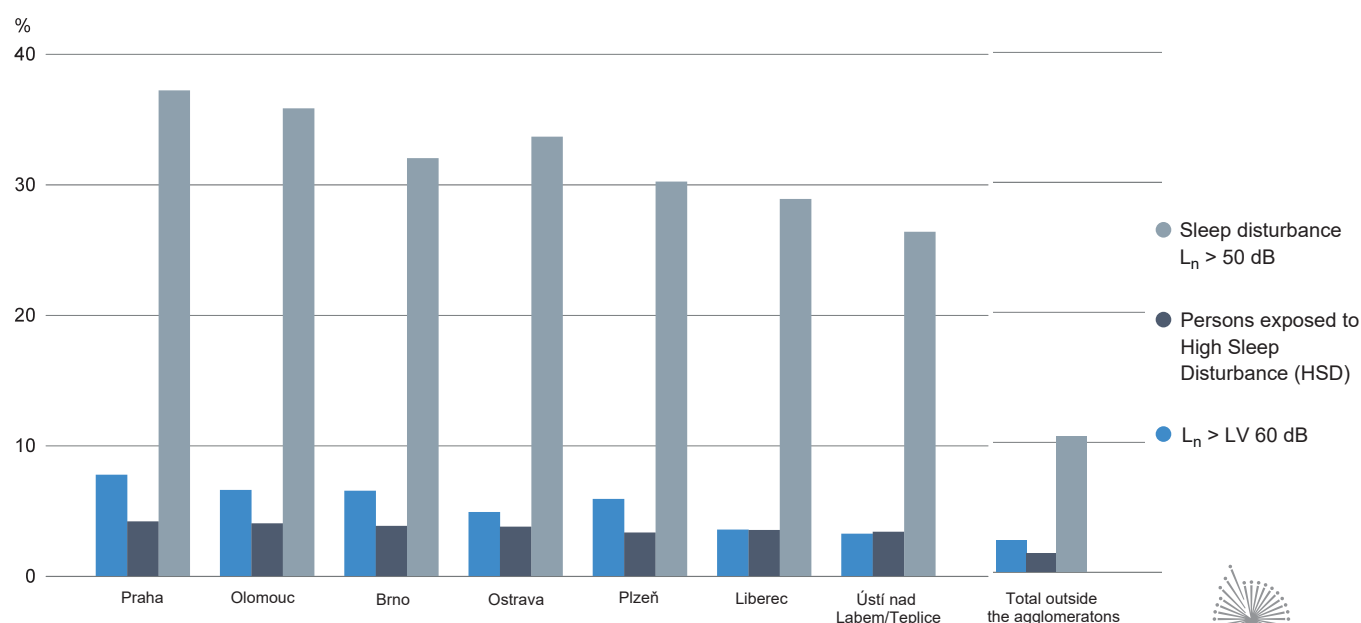
Outside agglomerations, data are only available for roads with traffic intensity exceeding 3 million vehicles per year. Data for 2024 are not available, as noise mapping is carried out in five-year cycles.



Data source: NRL

Graph 28

Night-time (10 p.m. to 6 a.m.) noise exposure from road traffic in agglomerations and outside agglomerations according to L_n and HSD indicators [% of exposed population included in noise mapping], 2022



Outside agglomerations, data are only available for roads with traffic intensity exceeding 3 million vehicles per year. Data for 2024 are not available, as noise mapping is carried out in five-year cycles.

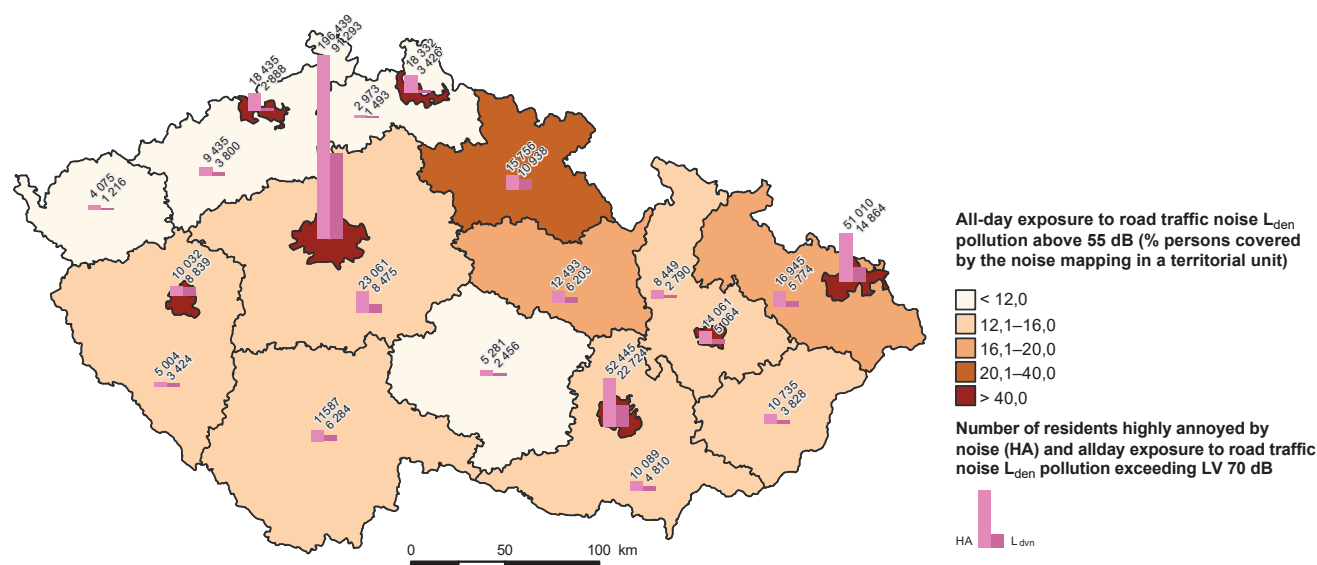


Data source: NRL

Outside urban agglomerations, noise maps are produced in accordance with legislative requirements only in the vicinity of roads with traffic intensity exceeding 3 million vehicles per year. Among the regions of the Czech Republic, the highest number of people exposed to all-day noise pollution from road traffic above the limit value was identified in the Hradec Králové (10,900) and Central Bohemia (8,500) regions (Fig. 12). The Central Bohemian Region also has the highest number of people highly disturbed by noise (23,100) and people with high sleep disturbance (8,300). The situation in the region is influenced by high road traffic intensity due to the central location of the region within the Czech Republic and its proximity to the Prague agglomeration. The Moravian-Silesian Region also has significant noise pollution outside the agglomeration. The lowest numbers of people exposed to high noise pollution outside agglomerations are in the Karlovy Vary Region and (except for the Liberec agglomeration) the Liberec Region. Lower noise pollution is associated with the geographical location of these regions in relation to road transport transit routes and their lower population density.

Fig. 12

Proportion of the population of agglomerations and regions affected by all-day road traffic noise levels above 55 dB in the total population included in noise mapping, number of people highly disturbed by noise (HA) and number of people exposed to noise above the limit value according to the L_{den} indicator [% , number of inhabitants], 2022



Outside agglomerations, data are only available for roads with traffic intensity exceeding 3 million vehicles per year. Data for 2024 are not available at the time of publication.

Data source: NRL

It is currently not possible to objectively assess **noise pollution trends**. Methodological changes in noise pollution calculations (transition to the CNOSSOS-EU methodology) and the use of the WHO methodology for determining noise pollution health risk indicators (HA and HSD) since 2018 (i.e. since the last round of SNM for 2022) mean that the data between individual rounds of SNM are not comparable. However, with reference to the available data on transport development in Czechia and the conclusions of the EEA study²⁹, it can be stated that the objective **of the EU Action Plan for Zero Pollution** (AP Zero Pollution), which sets a target of reducing the number of people chronically exposed to road traffic noise by 30% by 2030 compared to 2017, **is currently not being met by** Czechia or most other EU27 countries.

²⁹ <https://www.eionet.europa.eu/etcs/etc-he/products/etc-he-products/etc-he-reports/etc-he-report-2024-7-methodology-for-calculating-projected-health-impacts-from-transportation-noise-2013-exploring-two-scenarios-for-2030>

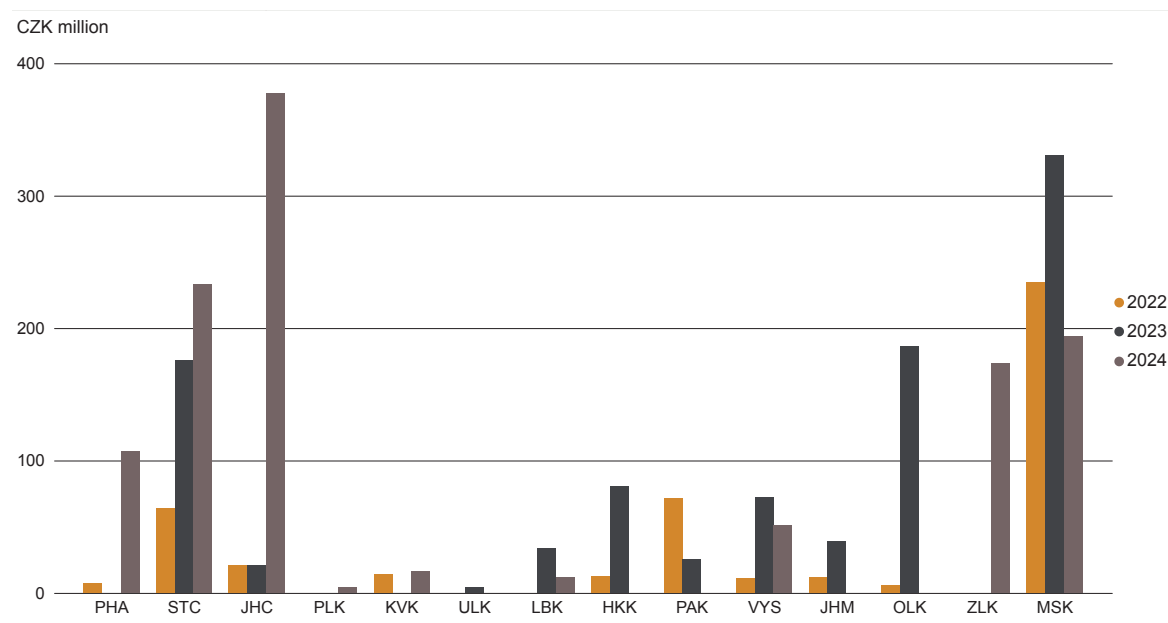
According to the results of the current round of noise mapping, **traffic on main railway lines** with at least 30,000 trains per year is a source of all-day noise pollution (L_{den} indicator) above 55 dB for a total of 194,100 inhabitants, of which 9,400 inhabitants are exposed to noise levels above the limit value of 70 dB. Roughly two-thirds of the total population exposed to railway noise live outside urban agglomerations; in cities, there is greater equipment of lines with noise reduction measures and trains also run at lower speeds. A total of 5,100 inhabitants are exposed to night-time railway noise above the limit value of 65 dB, and noise from main railway lines causes significant sleep disturbance for 35,600 inhabitants. Of the Czech regions, the highest noise pollution from railways is in the Central Bohemian, Ústí and Pardubice regions, through which high-traffic corridor railway lines pass.

Noise **reduction measures** are being adopted in individual regions and agglomerations in accordance with the 4th round of action plans to reduce traffic noise, which are based on the results of the 4th round of SNM (2022) and which have undergone a consultation process (including public consultation) and were finalised in 2024. The action plans are drawn up for the main roads administered by the Czech Road and Motorway Directorate and the regions, as well as for the main railway lines and the main airport (Václav Havel Airport in Ruzyně). The action plans identify critical locations based on the exceedance of noise indicator limit values and population density in a given locality, for which they propose specific noise reduction measures.

Road traffic noise pollution is reduced **by developing road infrastructure** to divert transit traffic away from residential areas and **implementing noise reduction measures** on transport infrastructure, such as noise barriers and low-noise asphalt. In 2024, CZK 1.17 billion was spent on the implementation of noise reduction measures on road infrastructure managed by the Road and Motorway Directorate, which represents a further year-on-year increase in investment of 20.6% compared to the previous year (Graph 29). The largest volume of investment went to noise reduction measures in the South Bohemian (CZK 377 million) and Central Bohemian (CZK 233 million) regions, mainly in connection with the development of the motorway network in these regions, where noise reduction measures are a standard part of construction. The total length of noise barriers on roads and motorways at the end of 2024 was 562.4 km, an increase of 31.1 km year-on-year.

Graph 29

Funds spent on the implementation of noise protection measures on road infrastructure in the regions [CZK], 2022–2024



Data source: Road and Motorway Directorate

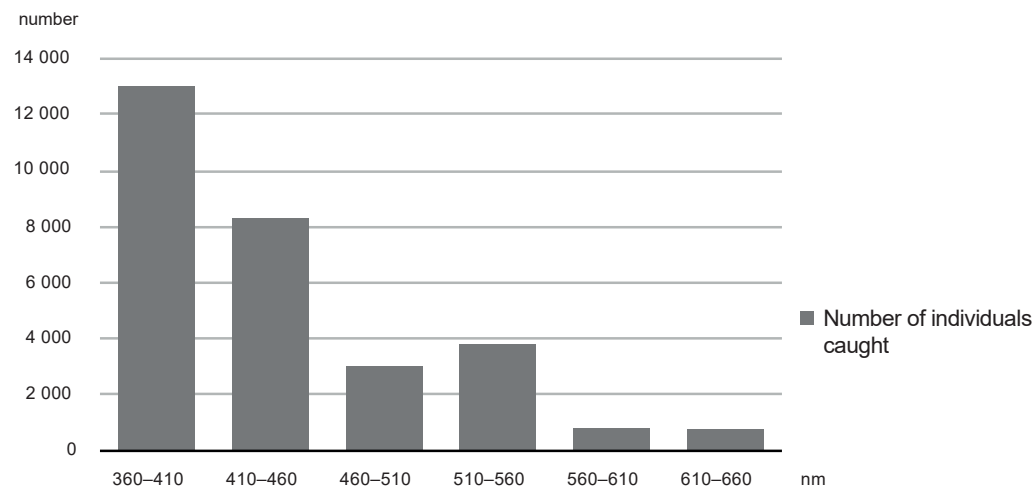
In 2024, a record 110 km **of new motorways** were opened. These were new sections of the D3 motorway in the South Bohemian Region (Úsilné–Hodějovice–Třebonín), three sections of the D55 motorway from Břeclav to Olomouc in the South Moravian and Zlín Regions, the D49 motorway in the Hulín–Fryšták section, and the D4 motorway between Prague and Písek, where the total length of new sections, the construction of which was financed through PPP projects (public-private partnerships), was 31.9 km. A further 182.8 km of motorways were under construction, including the continuation of the D3 motorway at the state border with Austria and the D35 motorway to Mohelnice and Olomouc, which forms the northern backbone route connecting Bohemia and Moravia. A total of 28.2 km of bypasses and relocations were put into operation on first-class roads administered by the Road and Motorway Directorate in 2024, including the Klatovy relocation on road I/27, the Jaroměř bypasses on road I/33, and the relocation of road I/9 in the Nový Bor–Svor section. A further 70.2 km of bypasses and relocations were under construction, with the most expensive projects including the Nová Paka bypass on the I/16 road, with an investment cost of CZK 1.31 billion.

In 2024, CZK 87.9 million was invested in the construction **of noise barriers on the railway**, and the length of tracks newly equipped with noise barriers increased by 4.0 km, most of which was in the capital city of Prague and the South Moravian Region. A further CZK 393,500 was invested in individual noise reduction measures (e.g. replacement of windows in apartment buildings near the railway). Non-investment noise reduction measures on the railway included grinding the tops of rails to reduce acoustic pollution. In 2024, CZK 8.6 million was spent on rail grinding (roughly double the amount spent in 2023), with the length of ground sections on lines falling within the TEN-T system amounting to 23.9 km, most of which was in the Pardubice and South Moravian regions.

Light pollution

Light pollution (also known as light smog) refers to artificially created light that increases the natural level of light in the outdoor environment. It is now considered a significant problem of civilisation with negative effects on human health, the environment, the economy, safety and the visibility of the night sky. It occurs in several ways or through a combination of these. Most often, it is the direction of light into undesirable areas (e.g. into the sky, into open countryside or through windows into or out of interiors), lighting outside the necessary time period (e.g. lighting a shopping centre car park outside opening hours), or the use of sources with unsuitable spectral characteristics (especially a large proportion of blue light). Not only are the much-discussed giant greenhouses in Poland near the Czechia-Poland border problematic, but also stadiums, ski slopes, powerful outdoor lasers, roadside advertisements and poorly designed street lighting.

Inappropriate types of artificial lighting, and especially insufficient differences between daytime and night-time light intensity, result in disruption **of circadian rhythms** (natural cycles of hormonal processes dependent on the alternation of light and dark parts of the day), which leads to changes in the behaviour of organisms. The spectrum of lighting used also plays a major role, with most living organisms being particularly sensitive to short-wave “blue” light up to 500 nm. This is also confirmed by the results of field research conducted by the Czech University of Life Sciences, where most individuals were caught in traps with blue spectrum lighting. With increasing light wavelength, the response of most organisms decreased (Graph 30). If animals are found in an environment where artificial light reaches intensities that disrupt natural processes, the impacts are observable across entire communities and affect the associated ecosystem, ultimately reducing biodiversity.

Graph 30**Total number of individuals caught depending on the light spectrum [number], 2022**

Source: Tomáš Kadlec. Total number of individuals caught depending on the light spectrum, Czechia 2022. TACR TITSMZP012 project The impact of light pollution on sensitive animal species, ecosystems and landscape character

In humans, night-time exposure to light radiation leads to insufficient regeneration during sleep and suppressed production of the hormone melatonin (which affects the circadian rhythm), even at very low light intensities. Repeated disruption of the dark phase of the night by light (especially if it contains a blue spectral component) significantly increases the risk of so-called lifestyle diseases, such as immune disorders, psychiatric illnesses including depression, sleep disorders and memory disorders, cardiovascular disease, insulin resistance and obesity, and in particular a whole range of cancers.

Although experts have been warning for almost 30 years about the negative effects of light pollution, which harms people, animals and plants, the competence to control it and the limit values for light pollution are not currently comprehensively regulated by legislation in Czechia. The first significant steps to reverse this trend began in 2023. Effective from 1 March 2023, the original Czech technical standard ČSN 36 0459 Limiting the undesirable effects of outdoor lighting was issued. This standard summarises the basic rules and specifies the maximum values for lighting parameters so that they are technologically available. It defines five types of zones, from the darkest (undeveloped areas in protected areas) to the brightest (centres of statutory cities and the capital city), and specifies requirements such as facade brightness values, luminous intensity classes, correlated colour temperature and others.

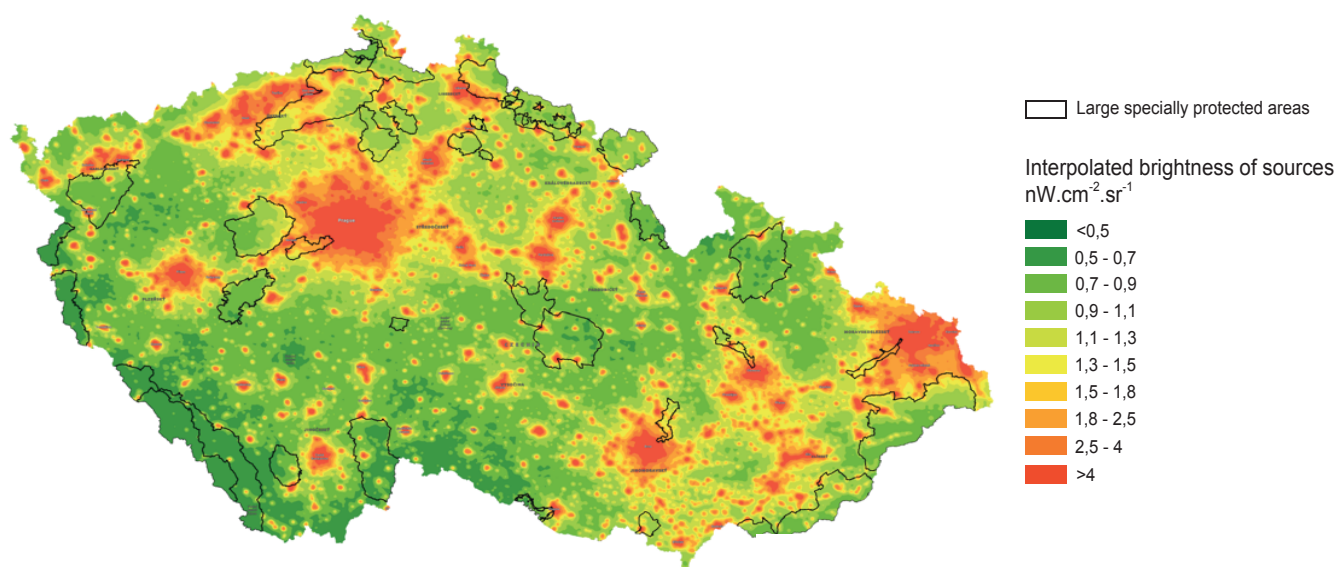
Another significant step towards the introduction of light pollution regulation followed in 2024 with the entry into force of the new Building Act and its implementing regulations. Light has become part of health and environmental protection requirements. Decree No. 146/2024 Coll., on construction requirements, includes the provision of §24 Limiting the undesirable effects of outdoor lighting. Although this provision will not limit all lighting, such as construction sites, and will not be enforceable retrospectively, it is a significant step forward.

Satellite data or ground measurements are most commonly used **to monitor light pollution**. Currently, the most appropriate measure for assessing the degree of light pollution is **the brightness of the night sky**³⁰. The overall brightness of the night sky is a combination of natural light sources and artificial light scattered in the Earth's atmosphere (Fig. 13). The brightness of the sky is influenced both by the light sources themselves (their quantity, location and parameters) and by the environmental conditions in which the light spreads (amount of greenery, snow cover, amount and type of aerosols (smog, haze), street width, building height, cloud cover, etc.).

Available maps of night sky brightness show that the number of light sources is increasing. Large cities have the most artificial brightness in the night sky, especially the centre of the capital city of Prague, but the wider areas around Prague, Brno, Ostrava, Plzeň, Most, Teplice, Olomouc, České Budějovice and many others also shine brightly. Very often, light from cities penetrates large specially protected areas (national parks and protected landscape areas, Fig. 13).

Fig. 13

Night sky brightness [$\text{nW.cm}^{-2}.\text{sr}^{-1}$], 2022



Source: David Moravec. Night sky brightness, Czechia 2022.

TACR TITSMZP012 project The impact of light pollution on sensitive animal species, ecosystems and landscape character

The best situation can be observed in the northern part of the Šumava Mountains, as well as in mountainous areas and rural areas in the south-western part of Czechia and in the Bohemian-Moravian Highlands. Such areas also include so-called dark sky areas, which aim to protect the preserved night environment. Currently, there are three such areas in Czechia – in 2009, the Czech-Polish Jizera Dark Sky Area was declared, which became the first such area in Europe and the first cross-border area in the world. In 2013, the Beskydy area (on the Czech and Slovak sides of the Beskydy Mountains) was added, and in 2014, the Manětín Dark Sky Park (between Plzeň and Karlovy Vary). Since 2016, a dark sky park has been in preparation in the Podyjí National Park.

³⁰ Luminous intensity is a photometric quantity and can be defined as the luminous flux into a unit solid angle relative to a unit area of the source.

With the aim of obtaining valid and long-term sustainable data, light pollution is the subject of two TACR research projects. These are “TITSMZP012 The Impact of Light Pollution on Sensitive Animal Species, Ecosystems and Landscape Character”, the outputs of which provide us with information on light-sensitive animal species and the extent of pollution in the Czech Republic. The second project, “SS05010159 Research and development in the field of measuring and evaluating artificial light in the night environment and its impact on living organisms and the environment as a whole,” deals with the development of a measuring device that will be particularly suitable for local measurements in areas with ecosystems sensitive to light at night.

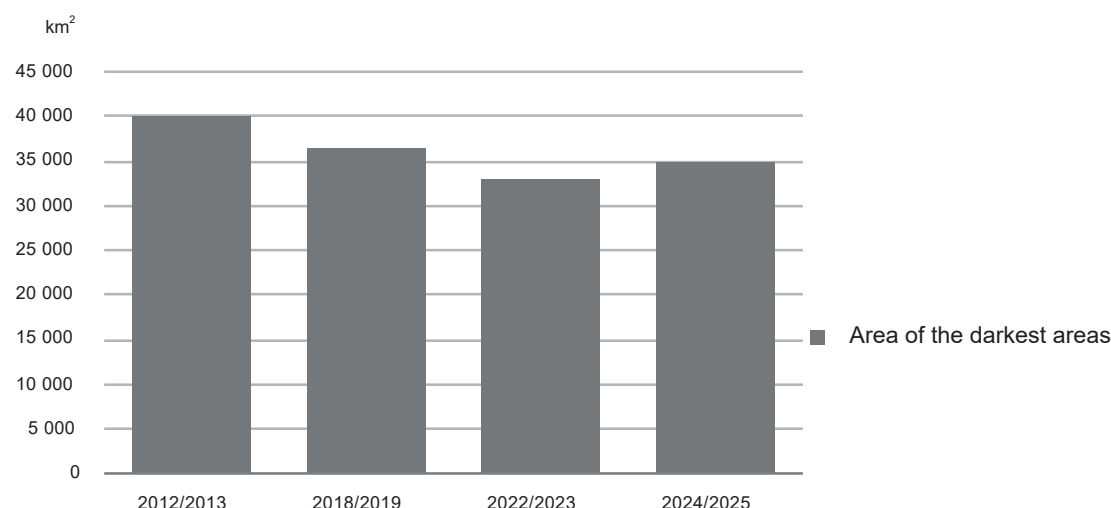
The outputs of the TITSMZP012 project are already being used to set up long-term monitoring in the Czech Republic. This is carried out by the Czech Hydrometeorological Institute, which uses and further develops the methodologies of the Czech University of Life Sciences, obtains satellite data from the Visible Infrared Imaging Radiometer Suite (**VIIRS**), which cleans it of noise and further processes it. However, the pitfall remains that VIIRS sensors only see light sources, not their spread, and are unable to detect short-wave “blue” light, which is most harmful to living organisms.

Since 2024, the CHMI has therefore been cooperating with the Astronomical Institute of the Czech Academy of Sciences and the Czech Astronomical Society, whose goal is to create a monitoring network of luminance meters to measure the brightness of the night sky. These luminance meters are installed at selected CHMI stations and are capable of providing information on sky brightness across the entire light spectrum, including the blue component, and also provide information on the spread of light into the surrounding area. They will thus serve as a suitable method of long-term ground-based measurement, supplementing and expanding the information provided by satellites.

However, available data confirms that there is no longer any area in the Czech Republic that is not affected by artificial light. This is due to the physical properties of light, which spreads tens or even hundreds of kilometres in the atmosphere. In order to determine the area of the darkest regions, a threshold value of 0.3–0.5 nW.cm⁻².sr⁻¹ (the lowest light emissions measurable by VIIRS, where artificial light can no longer be distinguished from natural night light) was set for satellite measurements. The graph below (Graph 31) shows the long-term decline in these darkest areas. Although an improvement in the situation is observed in 2024, it is not possible at this stage to assess whether this is a reversal of the trend or a short-term deviation.

Graph 31

Decline in the darkest areas in the Czech Republic (according to data obtained from the VIIRS set) [km²], 2012–2025

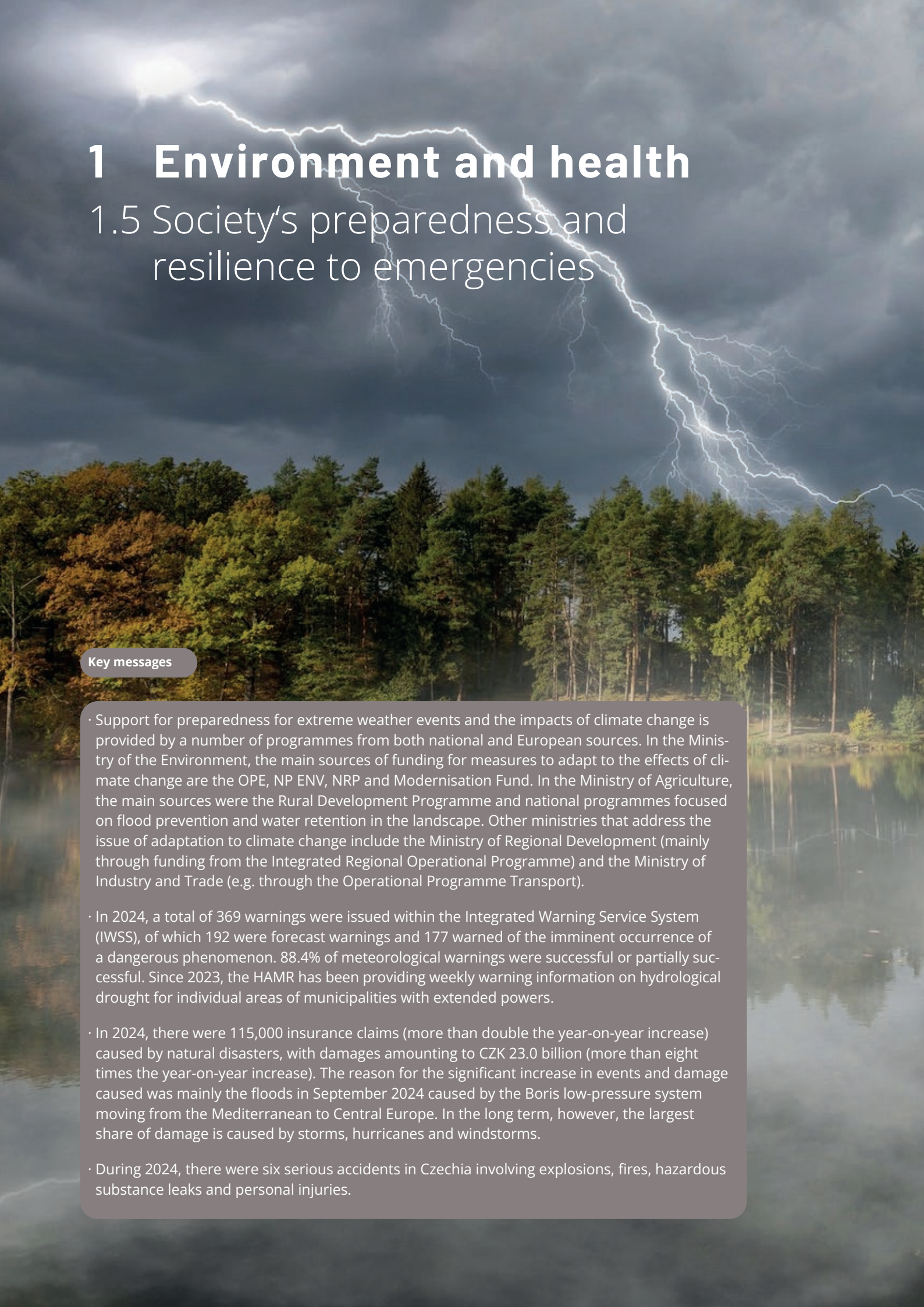


Source: CHMI

Since 2024, the CHMI has therefore been cooperating with the Astronomical Institute of the Czech Academy of Sciences and the Czech Astronomical Society, whose goal is to create a monitoring network of luminance meters to measure the brightness of the night sky. These luminance meters are installed at selected CHMI stations and are capable of providing information on sky brightness across the entire light spectrum, including the blue component, and also provide information on the spread of light into the surrounding area. They will thus serve as a suitable method of long-term ground-based measurement, which will supplement and expand the information from satellites. In addition to the expansion of illuminated areas, **the degree of light pollution** is also influenced by the type of light source used. In particular, LED-based sources producing cool white light (with a correlated colour temperature CCT > 3,000 K) are more energy-efficient than warm white sources (with CCT < 3,000 K) and can therefore be cheaper to operate. However, their spectral composition contains a high proportion of blue light, which is a powerful biological activator. It is therefore necessary to find ways to ensure that the lighting used is not only cost-effective, but also causes as little disruption as possible to the health of people, animals and entire ecosystems, including the appearance of the night landscape. To this end, financial support is provided for projects to reconstruct or modify public lighting systems that also include a requirement for maximum CCT. In 2024, the State Environmental Fund issued a call for municipalities in national parks as part of the Modernisation Fund, which combines energy savings with compliance with the parameters of the ČSN 36 0459 standard on the reduction of undesirable effects of outdoor lighting.

Detailed visualisations and data

<https://www.envirometr.cz/data>



1 Environment and health

1.5 Society's preparedness and resilience to emergencies

Key messages

- Support for preparedness for extreme weather events and the impacts of climate change is provided by a number of programmes from both national and European sources. In the Ministry of the Environment, the main sources of funding for measures to adapt to the effects of climate change are the OPE, NP ENV, NRP and Modernisation Fund. In the Ministry of Agriculture, the main sources were the Rural Development Programme and national programmes focused on flood prevention and water retention in the landscape. Other ministries that address the issue of adaptation to climate change include the Ministry of Regional Development (mainly through funding from the Integrated Regional Operational Programme) and the Ministry of Industry and Trade (e.g. through the Operational Programme Transport).
- In 2024, a total of 369 warnings were issued within the Integrated Warning Service System (IWSS), of which 192 were forecast warnings and 177 warned of the imminent occurrence of a dangerous phenomenon. 88.4% of meteorological warnings were successful or partially successful. Since 2023, the HAMR has been providing weekly warning information on hydrological drought for individual areas of municipalities with extended powers.
- In 2024, there were 115,000 insurance claims (more than double the year-on-year increase) caused by natural disasters, with damages amounting to CZK 23.0 billion (more than eight times the year-on-year increase). The reason for the significant increase in events and damage caused was mainly the floods in September 2024 caused by the Boris low-pressure system moving from the Mediterranean to Central Europe. In the long term, however, the largest share of damage is caused by storms, hurricanes and windstorms.
- During 2024, there were six serious accidents in Czechia involving explosions, fires, hazardous substance leaks and personal injuries.

1.5 Society's preparedness and resilience to emergencies

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2024)	Target achievement
Issuing warnings Integrated Warning Service System (IWSS)*	Preparedness, resilience and adaptation to extreme weather conditions are increasing			A total of 369 warnings were issued within the IWSS. 88.4% of meteorological warnings were successful or partially successful.	
Events and interventions as a result of natural disasters	The negative impacts of extraordinary events and crisis situations of anthropogenic and natural origin are minimised			47,593 events (70% year-on-year increase, mainly in connection with the floods in September 2024)	
Amount of damage caused by natural disasters				115,000 insurance claims (more than double the year-on-year increase) with damages amounting to CZK 23.0 billion (more than eight times the year-on-year increase)	
Preventive educational activities in the area of civil protection and crisis management				5,956 events for 213,924 participants (since 2022, there has been a gradual return to the normal pre-COVID regime)	
Number of serious reported accidents	The occurrence of extraordinary events and crisis situations of anthropogenic origin is minimised			6 serious accidents, the number does not deviate from the long-term average	

* It is not possible or meaningful to establish a trend for the operation of the warning system. The criterion for its success is not the number of warnings issued, but the quality, accuracy and timeliness of the warnings.

Current measures supporting the achievement of the objective

- Options for preventing emergencies are enshrined in the sub-strategies, concepts and methodologies of the Ministry of the Environment and its organisations (e.g. Strategy for Adaptation to Climate Change in the Czech Republic; Environmental Security Concept 2021–2030 with a view to 2050; Concept of Protection against the Effects of Drought for the Czech Republic for the Period 2023–2027). These include possible measures to improve preparedness in the context of various risks and potential threats.
- The new Act No. 62/2024 Coll. on the public hydrometeorological service should also contribute to the prevention of the negative impacts of extraordinary events.
- The need to adapt to the increasing severity of threats and the state of the environment is highlighted in the Security Strategy of the Czech Republic 2023, which emphasises ensuring environmental security.
- The issue of public education is addressed in the Civil Protection Concept until 2025 with a view to 2030.
- Flood protection measures were supported by the OP Environment 2014–2020, with a total of more than CZK 5 billion in Czech crowns spent on flood protection from the OP Environment during this programming period. In the follow-up OP Environment for the 2021–2027 programming period, over CZK 12.6 billion is allocated to support adaptation to climate change, including flood protection measures.
- The IROP 2021–2027 supports the purchase of material and technical equipment for the basic components of the Integrated Rescue System, the purchase of equipment for preventing climate change and new threats, for addressing and eliminating their consequences and the consequences of emergencies, and for ensuring the long-term evacuation of the population with emergency survival. The total allocation for Integrated Rescue System support from IROP 2021–2027 is CZK 9.3 billion.
- Experience from past emergencies and crisis situations in the Czech Republic and around the world is taken into account in regular updates to crisis documentation, and this experience is also used in cooperation on projects aimed at improving responsiveness in crisis management.

Preparedness for extreme weather

Effective financial support for measures to protect against the risks of climate change and natural hazards is essential for increasing the adaptation of the population and economic sectors to these risks. The main objective of the measures is to reduce the level of risk (e.g. reducing flood risks in flood-prone areas of watercourses) and to effectively combat the extreme manifestations of climate change and their impact not only on the landscape but also on the socio-economic system.

In **the OP Environment 2014–2020**, this issue was primarily addressed by Priority Axis 1 (improving water quality and reducing flood risk) in Support Areas 1.3 (ensuring flood protection of built-up areas and rainwater management) and 1.4 (support for preventive flood protection measures). Projects in these areas also address water retention in the landscape and settlements, including better water management, also in connection with the growing importance of addressing the issue **of drought**. The OP Environment focused on supporting the development of water supply infrastructure to ensure sufficient drinking water for the population, specifically supported area 1.2 (ensuring the supply of drinking water of adequate quality and quantity). Drought was also addressed in priority axis 4 (nature and landscape protection and care) in supported area 4.3 (strengthening the natural functions of the landscape). In total, more than 1,600 projects worth CZK 10.9 billion were approved for the above-mentioned areas in the OP Environment 2014–2020 by the end of 2024 (of which more than CZK 5 billion was specifically for flood protection measures).

In 2022, the European Commission approved **the OP Environment for the 2021–2027 programming period** with a total allocation of EUR 2.5 billion (CZK 63.3 billion) in EU funds and EUR 3.0 billion (CZK 75.9 billion) in TEE by the end of 2024. The main areas of support include support for adaptation to climate change, including flood protection measures, with an allocation of over CZK 12.6 billion in TEE, and support for access to water and sustainable water management, with an allocation of CZK 17.5 billion in TEE. By the end of 2024, over 360 projects had been approved in these areas, with a total value of CZK 8.6 billion.

Since 2017, the issue of drought has also been addressed through the national subsidy programme **Dešťovka**, announced in the National Environment Programme (NP ENV). The aim of the programme is to encourage efficient water management and thus reduce the amount of drinking water extracted from surface and groundwater sources. A total of CZK 540 million has been allocated in two calls for proposals to date, with 10,265 projects approved by the end of 2024 with total support of CZK 403 million (for more information on the Dešťovka programme, see Chapter 1.6 Adapted Settlements).

Adaptation measures to mitigate the effects of climate change are also addressed by the Ministry of the Environment's national subsidy programme, **the Landscape Care Programme**, in particular its Sub-programme B for the improvement of the preserved natural and landscape environment, which supported approximately 7,300 projects worth CZK 393.2 million between 2014 and 2024. Another programme is **Support for the Restoration of Natural Landscape Functions**, which aims to mitigate the impacts of climate change on aquatic, forest and non-forest ecosystems. Between 2014 and 2023, CZK 122.8 million was spent on 975 projects under this programme. Since 2022, this programme has been financed from the National Recovery Plan, and between 2022 and 2024, more than 1,904 projects worth over CZK 375 million have been supported as part of climate change adaptation measures.

At the Ministry of Agriculture, measures to mitigate the negative impacts of climate change (i.e. mainly flood protection measures and water retention in the landscape in connection with drought) were implemented through more than 10 national programmes and, in particular, through **the Rural Development Programme (RDP)** as a transnational source. The total amount of funds disbursed from national programmes administered by the Ministry of Agriculture in 2014–2024 was approximately CZK 21.6 billion (of which approximately CZK 6.6 billion was under the Flood Prevention III–V programme). It is important to mention land consolidation financed mainly from the RDP or the SP CAP (complex or simple), which contributes to mitigating the negative effects of climate change, particularly in terms of reducing the adverse effects of floods and droughts and addressing drainage conditions in the landscape. By the end of 2024, comprehensive and simple land consolidation had been carried out on 42.3% of the agricultural land fund (approximately 1.8 million ha). Between 2014 and 2024, CZK 3.5 billion was spent on anti-erosion, hydrological and ecological measures as part of land consolidation. The RDP and the SP CAP also finance agri-environment-climate measures (AECM), specifically in the area of landscape management, approximately CZK 2.7 billion was spent on these measures between 2014 and 2024, and the area of agricultural land with such AECM measures implemented amounted to approximately 21,000 ha in 2024. In the area of forest protection, or rather within the framework of support for investments in the development of forest areas, improving the viability of forests and forestry-environmental and climate measures, CZK 2.8 billion was spent from the RDP during the same period.

In addition to the Ministry of the Environment and the Ministry of Agriculture, the issue of adaptation to climate change is also addressed **by the Ministry of Regional Development and the Ministry of Industry and Trade**. The Ministry of Regional Development administers **the Integrated Regional Operational Programme (IROP)**, which has a specific objective 2.1 in the area of protection against natural risks: Support for adaptation to climate change, disaster risk prevention and resilience, taking into account ecosystem approaches. Specifically, in this context, support is provided for greater preparedness of the basic components of the Integrated Rescue System (IRS) to deal with emergencies related to climate change and accidents involving hazardous substances. In the 2021–2027 programming period, 41 projects with a total volume of CZK 2.4 billion were approved in five IROP calls with a total allocation of CZK 9.3 billion by the end of 2024. In the previous programming period 2014–2020, approximately 600 projects were supported for the same purpose, with a total of CZK 11.9 billion in TEE.

In connection with preventing the negative impacts of drought on industrial enterprises, the Ministry of Industry and Trade supports the implementation of measures aimed at saving water in the business sector, for example within the framework of **the OP EIC** and **OP TAC** operational programmes. With the contribution of the Real Estate programme from OP EIC, small and medium-sized enterprises were able to implement measures aimed at saving water (i.e. rain-water harvesting and utilisation, water recycling, grey water utilisation, etc.) as part of comprehensive projects to revitalise buildings for business and directly connected infrastructure. The total allocation for the relevant calls was CZK 2 billion. Similar support within the Sustainable Water Management activity, intended for all types of businesses, is also offered by OP TAC through a relevant call with an allocation of CZK 1.2 billion. Further support is also available from the National Recovery Plan (NRP, component 2.7 Circular Economy, Recycling and Industrial Water), specifically through the call for proposals Water Savings in Industry with a total allocation of CZK 1 billion. The MIT has also prepared a methodology aimed at assessing the water management of industrial enterprises (**known as a water audit**). The main benefit of the water audit should be more economical use of water and water resources by enterprises.

Preparedness for extreme weather is also ensured by **the Integrated Warning Service System (IWSS)**, which is jointly provided by the Czech Hydrometeorological Institute (CHMI) and the Czech Army Meteorological Service in the field of operational meteorology and hydrology. Warning information on dangerous meteorological and hydrological phenomena is issued in accordance with the recommendations of the World Meteorological Organisation (WMO) and is forwarded to the European warning system Metealarm³¹. The purpose of the warning messages is to alert the public, state administration and economic entities in a timely manner to the risk of dangerous phenomena, thereby reducing their consequences or supporting the elimination of consequences that have already occurred. Alerts are divided into forecast warning information, which predicts and warns of dangerous meteorological or hydrological phenomena, and information on the occurrence of dangerous phenomena, which alerts to selected particularly dangerous phenomena that have already occurred.

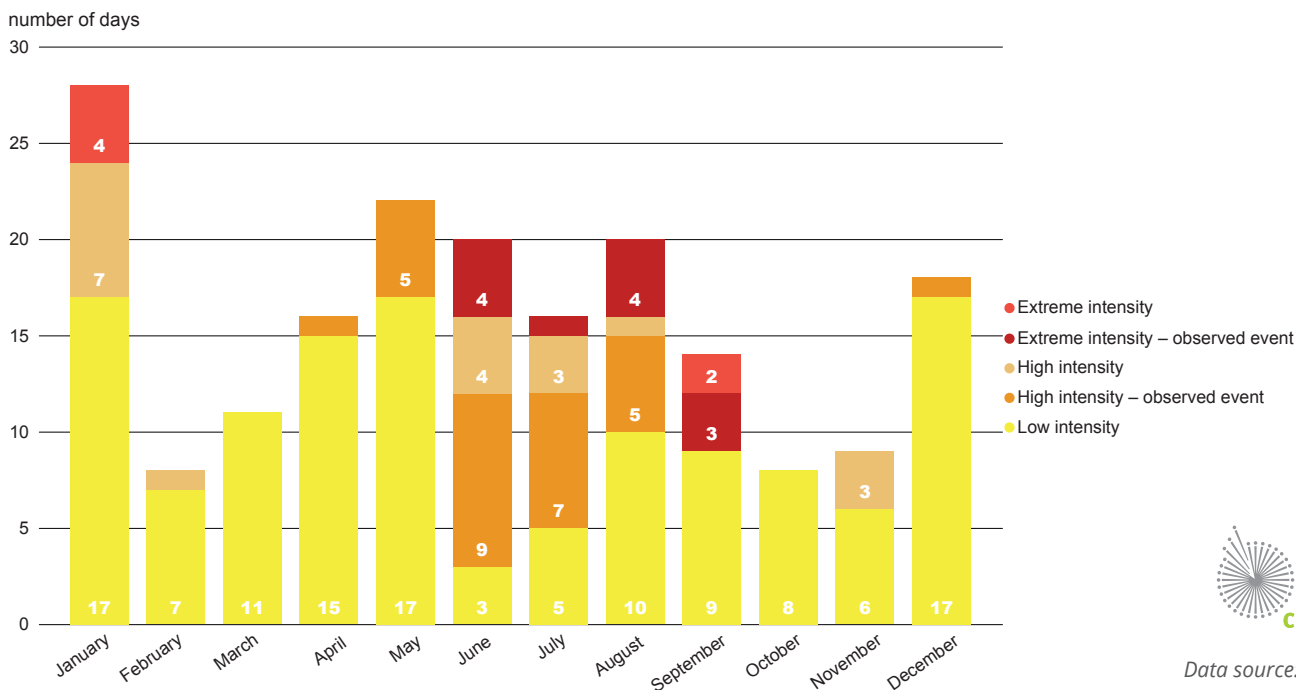
In 2024, **a total of 369 warnings** were issued within the IWSS (92 more than in 2023), of which 192 were predictive warnings and 177 warned of the imminent occurrence of a dangerous phenomenon. The number of short-term warnings about the occurrence of a dangerous phenomenon was particularly high due to a very active storm season and the occurrence of floods in September. A total of 280 warnings were issued about **meteorological phenomena**, of which 171 were predictive. There were a total of 89 **hydrological warnings** warning of rising water levels and the onset of flood activity. Since 2023, HAMR has been providing weekly warning information on hydrological drought for individual municipalities with extended powers.

Meteorological warnings were in effect on a total of **190 days** in 2024, i.e. 52% of the days in the year. Warnings about **low-intensity** phenomena prevailed (125 days, Graph 32). Warnings about **high-intensity** phenomena were in effect on a total of 47 days, with **extreme intensity** on 18 days. The highest number of warnings for high and extreme intensity phenomena was issued in June and August, when warnings were issued for high temperatures and storms, in September (extreme precipitation) and also in January (rain, snow phenomena, black ice). The highest number of days with warnings was in January (28), while the lowest number of days with warnings was in February and October (8 each).

³¹ www.meteoalarm.org

Graph 32

Number of days with IWSS warnings for expected and observed hazardous phenomena [number of days], 2024

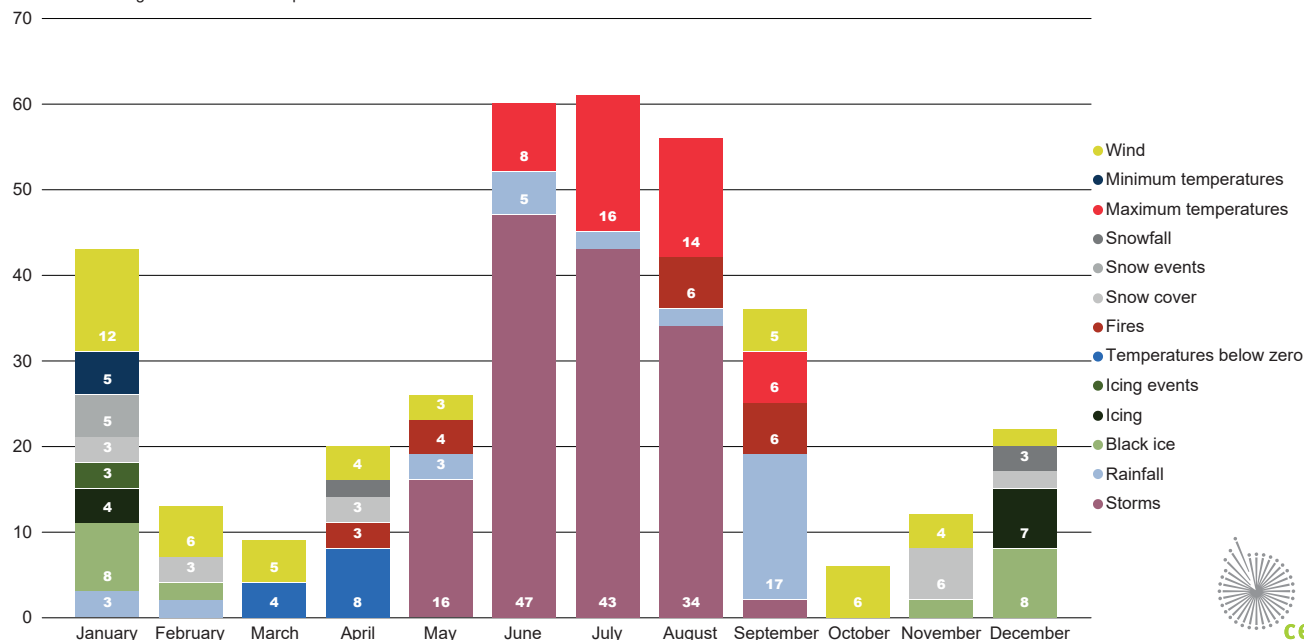


Of the total number of meteorological warnings issued, **storm** warnings were the most common, accounting for 142 warnings, or 51% of the total. Graph 33. Almost two-thirds of these (92 out of 142) were short-term warnings warning of the imminent occurrence of very strong and extremely strong storms. Of the other groups of phenomena, warnings about wind (47 warnings), maximum temperatures (44 warnings) and rain (34 warnings) were also significant.

Graph 33

Representation of phenomenon groups in IWSS warnings in individual months of the year [number of warnings], 2024

number of warnings with occurrence of phenomena



Data source: CHMI

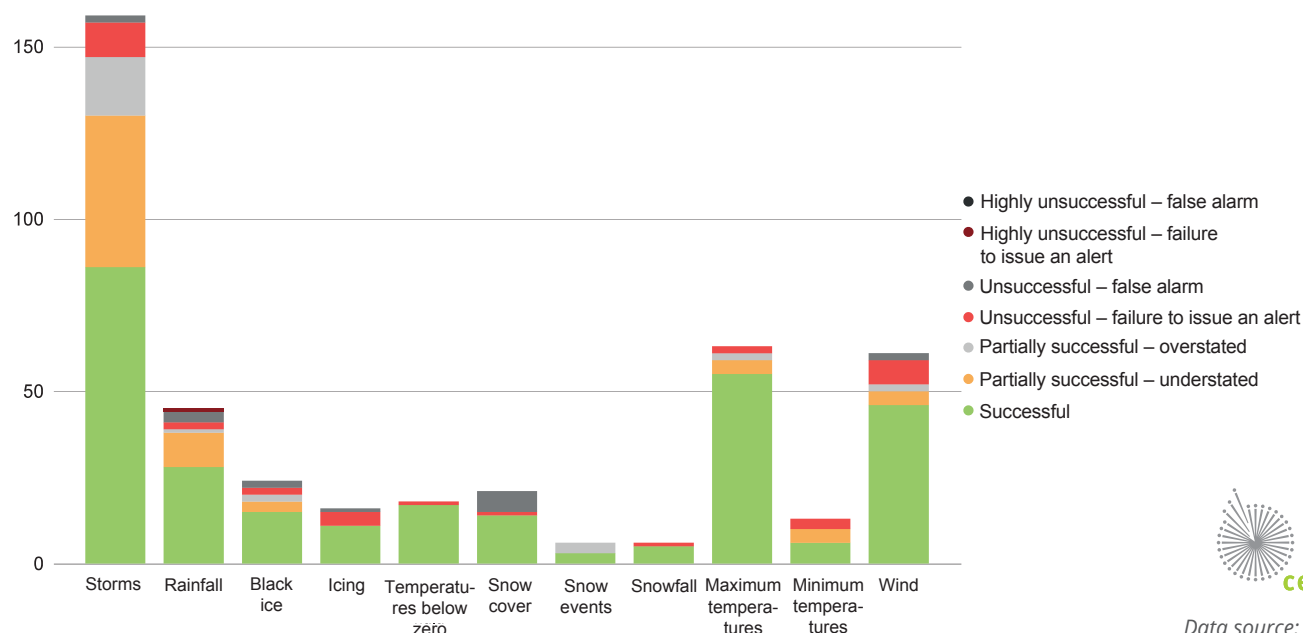
Meteorological warnings are evaluated in relation to the phenomena actually measured or observed on individual calendar days. The warning as a whole is not evaluated, but rather the individual phenomena with regard to their intensity for the area covered by the warning for that phenomenon. The success of warnings is evaluated for the whole of Czechia and separately for individual regions. Statistics from 2024 onwards do not include an evaluation of the success of warnings in the category of fires, due to insufficient objective data for evaluating the fulfilment of criteria in the category of fires and thus the success/failure of the warning. Fire statistics are not suitable because the occurrence of fires is largely influenced by human activity, and under the same natural conditions indicated by the warning, the occurrence of fires can vary considerably.

The evaluation of IWSS weather warnings for 2024 was processed for a total of 432 events, i.e. warnings issued and dangerous phenomena recorded (Graph 34). Of these, 286 events, i.e. 66.2% of the total number of events evaluated, were assessed as successful. 96 events (22.2%) were assessed as partially successful, 49 as unsuccessful and 1 as very unsuccessful. Alerts for events assessed as partially successful were more often underestimated (69 out of 96 events, i.e. 71.9%), where the alert was issued for a lower intensity of the phenomenon than actually occurred. More frequent underestimation of partially successful warnings was recorded in all categories of phenomena except snow phenomena. In the case of events rated as unsuccessful, high-intensity phenomena not covered by warnings (missing warnings) prevailed, occurring in 33 of the 49 events rated (67.3%), with the highest number of missing warnings for storms (10 events) and strong winds (7 events). Sixteen events were assessed as unsuccessful due to the issuance of warnings for phenomena that did not occur (false alarms), with the most common types of phenomena being warnings for snow cover (six events) and rain (three events). Only one event in 2024 was rated as very unsuccessful. This was a missing warning for extreme precipitation, the occurrence of which was later captured by a warning for an observed phenomenon.

Graph 34

Evaluation of the success of issued warning information for individual categories of hazardous phenomena [number of events evaluated], 2024

number of assessed events



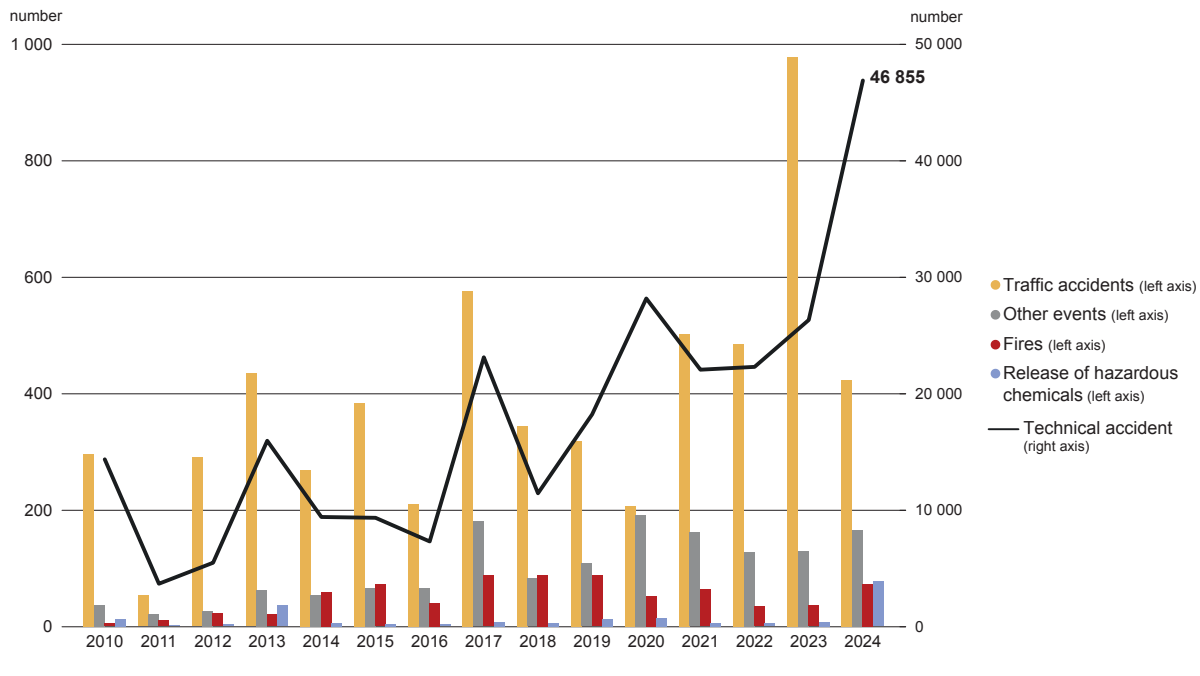
Broken down by phenomenon category, warnings are most successful in capturing high temperatures (87.3% of events assessed as successful), temperatures falling below zero (94.4% with a lower number of events assessed) and wind (78.0%). Warnings for storms are less successful (54.1% of events were rated as successful) due to the difficulty of predicting the exact location and intensity of convective phenomena.

Impacts of extraordinary events and crisis situations

In connection with the increasing impacts of climate change, an increased occurrence of extreme events requiring the activation of the Integrated Rescue System (IRS) can be expected. The main coordinator of the IRS is the Fire and Rescue Service of the Czech Republic, which, in addition to fires, must also deal with other **extraordinary events caused by climate change**, such as prolonged drought, hurricanes and windstorms, floods, above-average snowfall or massive frost, but also emergencies caused by human activity, such as accidents involving the release of hazardous substances.

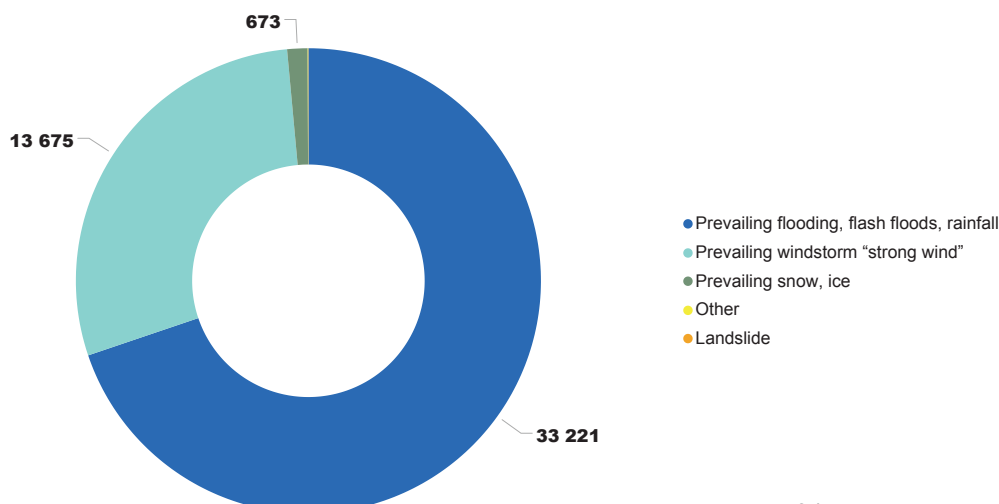
In 2024, there were a total of 47,593 incidents related to natural disasters, requiring 72,024 related interventions involving 59,097 firefighting units. Compared to 2023, there was a significant increase in the number of incidents, by more than 70%, mainly in connection with the floods in September 2024 caused by the Boris low-pressure system moving from the Mediterranean to Central Europe. As a result of natural disasters in 2024, 17 people died, 303 were injured and 8,092 were evacuated. The damage caused by fires due to natural disasters amounted to CZK 7.9 million. On the other hand, a total of 2,786 people were rescued, and the value of property saved in the case of fires amounted to CZK 42.5 million.

In terms of developments since 2010 (Graph 35), there has been an increase in the number of incidents, particularly in the case of technical accidents, whose sharp increase in 2024, together with the increase in leaks of hazardous chemicals, was mainly caused by the aforementioned September floods. The category of technical accidents dominates the number of extraordinary events overall, with a share of more than 95%. These mainly involve damage to or destruction of buildings, removal of fallen trees and electrical wires, and rescue of people and animals.

Graph 35**Number of incidents caused by natural disasters in the Czech Republic, 2010–2024**

Data source: Ministry of the Interior – General Directorate of the Fire and Rescue Service of the Czech Republic

The main cause of emergencies has long been strong winds, with the exception of traffic accidents, which are mainly caused by snow and ice. Floods, inundations and rain have also been a significant cause over the long term, ranking first in terms of the number of incidents caused in 2024 for the first time in 10 years, in connection with the September floods, particularly in the north-east and east of the country (Graph 36).

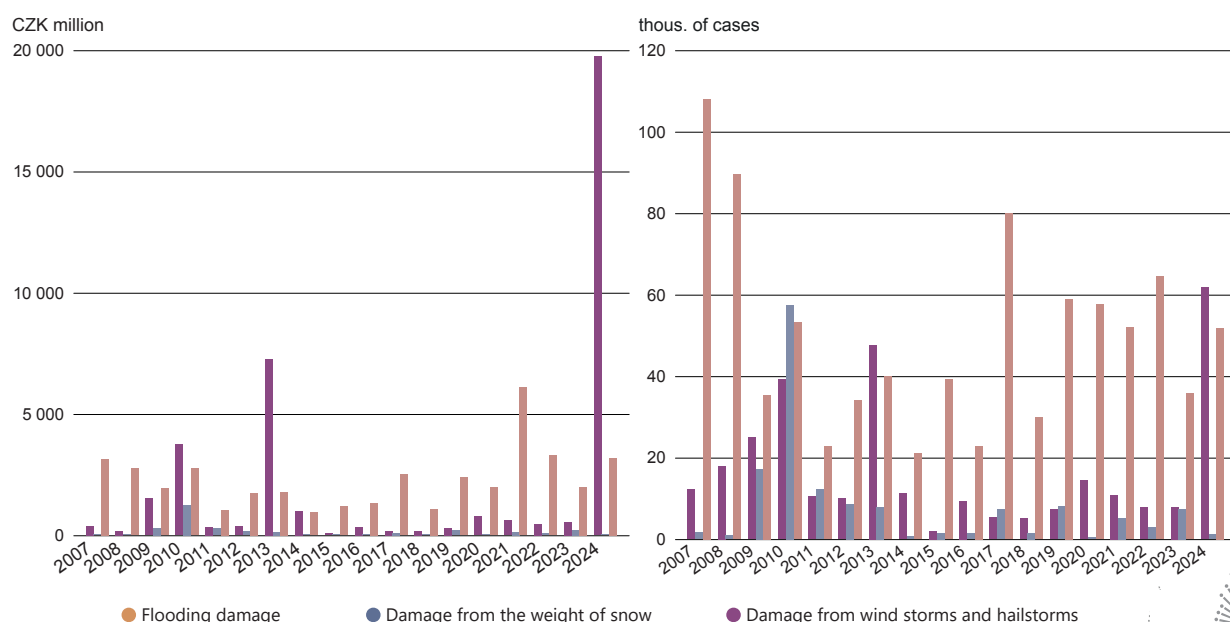
Graph 36**Share of individual natural disasters in the total number of events in the Czech Republic [number], 2024**

Data source: Ministry of the Interior – General Directorate of the Fire Rescue Service of the Czech Republic

A comprehensive view of the issue of **monitoring and liquidating damage after natural disasters** is provided by statistics from the Czech Insurance Association, which, in addition to other reported property damage, also monitors damage caused by floods, windstorms, hailstorms and heavy snow (Graph 37). These statistics show fluctuations in both the volume and number of claims related to extraordinary natural disasters. Since 2006, insurance companies have recorded almost 1.5 million insurance claims caused by the above-mentioned natural disasters, with total damages amounting to CZK 86.7 billion. of which 115,000 claims were recorded in 2024 (more than double the year-on-year increase) with damages amounting to CZK 23.0 billion (more than eight times the year-on-year increase). These statistics also show that storms and hailstorms have long accounted for the largest share of both the number of insurance claims and total damage, with the exception of 2013 and 2024, when flood damage predominated.

Graph 37

Insurance claims in natural disaster insurance in the Czech Republic [CZK million, thousand cases], 2007–2024



Data source: Czech Insurance Association



However, another manifestation of climate change, namely **long-term drought**, has not yet appeared in insurance company statistics. This is becoming a problem which, in the Czech context, represents the most serious manifestation of climate change with the greatest potential impact not only on biodiversity, but also on the population and the economy. Although drought has not been as much of a problem in the last five years as it was in the extremely dry year of 2018, its economic consequences can be long-term. This was particularly evident in the case of forests, where several years of extensive logging and subsequent reforestation took place after a bark beetle calamity caused mainly by excessive drought. In connection with this, compensation of more than CZK 4.5 billion was paid to farmers from national sources, and in the case of forestry, contributions of more than CZK 12.9 billion were provided to mitigate the effects of the bark beetle calamity in forests.

Recurring natural disasters caused by natural influences require a comprehensive approach to dealing with damage and restoring property after such disasters. Therefore, the Ministry of Regional Development, in cooperation with other ministries, is developing **strategies for the restoration of the territory**. These strategies are documents that create the framework conditions for the provision of state aid, primarily through programme financing within the competence of the designated ministries (e.g. through the Ministry of the Environment's programmes "Removal of damage after natural disasters", Ministry of Agriculture programme "Removal of the consequences of floods on state water management property", Ministry of Regional Development programme "Restoration of municipal and regional property after natural disasters" or "Natural disasters", or relevant operational programmes within EU funds).

In the period 2005–2024, land restoration strategies were developed mainly in connection with devastating floods, storms or hurricanes. The total amount of damage (represented by the total cost of restoration) caused by these floods or inundations reached approximately CZK 112 billion in the period 2005–2024, with the largest share of this amount (more than CZK 68 billion) falling in 2024. In the case of storms or hurricanes, the land restoration strategy was developed in connection with Hurricane Kyrill in 2007, when the total cost of property restoration reached almost CZK 7.5 billion. In connection with the tornado in Moravia in 2021, damage to private and public property was estimated at CZK 6.9 billion.

The issue of protecting people in normal risks and emergencies is covered by **preventive educational activities related to civil protection and crisis management**. The guarantor of civil protection, fire prevention and the Integrated Rescue System is the Fire and Rescue Service of the Czech Republic, which, in the area of public education through preventive education and awareness-raising activities, reaches out to children in kindergartens, pupils and students in primary and secondary schools, universities, the adult population, senior citizens and disabled citizens. Preventive education is based primarily on personal contact between members of the Fire and Rescue Service of the Czech Republic and the public. Specifically, this involves preparing the population through various educational projects, programmes, discussions, lectures and excursions, training primary and secondary school teachers, and organising physical and knowledge competitions, etc. The years 2020 and 2021 were completely extraordinary due to the measures related to the spread of **COVID-19** and therefore cannot be evaluated in comparison with the previous period. Since 2022, there has been a gradual return to the normal pre-COVID regime, which was confirmed in 2024. Social networks and regional media are particularly effective tools for communicating preventive information to citizens. Thanks to the aforementioned availability of preventive information, there has been a significant increase not only in the number of media outlets that reproduce this content, but also in the number of citizens who have received the necessary information in a timely manner in connection with emergencies or other current risks.

Occurrence of emergencies

The Major Accident Prevention System³² requires operators of facilities where selected hazardous chemicals or mixtures are located to implement all measures to prevent a major accident, as well as to establish procedures to manage it in the event that an accident occurs despite the preventive measures taken.

In 2024, a total of 211 facilities were included in the major accident prevention system in the Czech Republic, of which 88 were in group A (lower risk) and 123 in group B (higher risk). These are most often chemical plants or manufacturing plants where hazardous substances are handled, but also, for example, fuel or chemical storage facilities.

During 2024, there were six serious accidents in Czechia involving explosions, fires, leaks of hazardous substances and personal injuries. One reported incident was assessed by the operator as a technical equipment failure; in some cases, inspections by the Czech Environmental Inspectorate (CEI) found violations of the obligations set out in the Act on the Prevention of Serious Accidents, and a complaint was filed with the relevant regional authority. In other cases, administrative proceedings will be conducted by the CEI. Less serious deficiencies were remedied during the inspections.

Accidents with a significant impact on the quality of surface and groundwater, which in recent years include, for example, accidents on the Bečva River (2020), Bílina and Odra rivers (2024) and, more recently, the accident involving a train carrying benzene near Hustopeče nad Bečvou (2025), are dealt with under other legislative acts, such as the Water Act or the Regulations for the International Carriage of Dangerous Goods by Rail, and do not fall within the scope of the Act on the Prevention of Major Accidents.

Detailed visualisations and data

<https://www.envirometr.cz/data>

³² Act No. 224/2015 Coll., on the prevention of major accidents, implements the relevant European Union regulation (Directive 2012/18/EU of the European Parliament and of the Council, known as Seveso III) and establishes a prevention system.

1 Environment and health

1.6 Adapted settlements

Key messages

- In 2024, 75 cities or city districts and 14 micro-regions or voluntary associations of municipalities bringing together another 370 municipalities had an adaptation strategy or plan in Czechia, with the number of affected inhabitants living in these settlements exceeding 4.2 million. In addition to these cities and municipalities, adaptation strategies or plans were also approved for four regions, including Prague.
- All cities and urban agglomerations in Czechia with more than 100,000 inhabitants have a verified Sustainable Urban Mobility Plan (SUMP), and 3.4 million inhabitants of Czechia live in cities with a verified SUMP or SUMF. A methodology and web tool for evaluating SUMP implementation is available.
- A total of 2,344 brownfields with a total area of 6,838.5 ha were newly registered for the period 2014–2024. In 2024, six sites with a total area of 1.9 ha were deactivated from the National Brownfield Database due to successful regeneration.
- Rainwater and greywater management is financially supported mainly in the form of subsidies through the OPE (Operational Programme Environment) or the Dešťovka programme. The New Green Savings Programme also supports the construction of green roofs on family and apartment buildings.

1.6 Adapted settlements

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2024)	Target achievement
Number of municipalities with adaptation plans	Settlements are effectively adapting to the risks associated with climate change			75 towns or city districts and 14 micro-regions or voluntary associations of municipalities bringing together a further 370 municipalities with an adaptation strategy or plan in place; the number of inhabitants living in these settlements was more than 4.2 million.	
Brownfields	Settlement development is conceptual, with priority given to the use of brownfields and already utilised land			In 2024, 167 brownfields with a total area of 835 ha were newly registered. Six sites with a total area of 1.9 ha were successfully regenerated.	
Local Agenda 21	Increase the total number of registered entities in LA21 to 500 by 2030 ³³			In 2023 ³⁴ , LA21 had 37 implementers at levels A–C (i.e. active), including 54 implementers at level D, together with the Interested Parties category, there were 115 participants involved.	
Sustainable urban mobility plans	The development of settlements is conceptual, with priority given to brownfields and already used areas			All Czech cities with more than 100,000 inhabitants had a verified SUMP at the end of 2024. A total of 3.4 million Czech inhabitants live in cities with a verified SUMP or SUMF.	

³³ Target value of the indicator according to SEP.

³⁴ Data for 2024 are not available at the time of publication due to the ongoing reform of the LA.

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2024)	Target achievement
Supported projects for the use of rainwater and greywater	A water management system, including rainwater, is in place in settlements			Subsidies are available for the use of rainwater for citizens, municipalities, regions and public institutions (e.g. in the Dešťovka programme for households, over 15,000 applications were supported with a total volume of storage tanks of approximately 100,000 m ³).	
Green spaces in cities	The quality of green infrastructure contributing to the improvement of the microclimate in settlements is increasing			The average share of green and water areas in 2020 ³⁵ was 76.0% of the total urban area. However, low greenery predominates, whose potential for providing ecosystem functions and increasing adaptation capacity is low compared to high greenery.	

Current measures supporting the achievement of the objective

- The Concept of Protection against the Effects of Drought for the Territory of the Czech Republic was updated in 2023.
- The Ministry of the Environment supports municipalities, LAGs and voluntary associations of municipalities through NP ENV calls for proposals to support the development of Sustainable Energy and Climate Action Plans (SECAP) as part of the European Covenant of Mayors for Climate and Energy initiative.
- The Ministry of the Environment has developed a methodological tool for municipalities to prepare adaptation strategies.
- Financial support for brownfield regeneration continues for both non-business and business use.
- Within the framework of the National Environmental Programme, the National Climate Programme and relevant operational programmes, support continues in the area of blue-green infrastructure, e.g. support for rainwater management, the construction of green roofs and the replacement of impermeable surfaces.
- The NGO Support Programme supports projects focused on awareness-raising and education in the field of climate change adaptation in settlements. Topics include green roofs, greening of inner courtyards, planting greenery in settlements and training local government employees.
- A comprehensive methodology for rainwater management in relation to green infrastructure has been completed and published. It is primarily intended for mayors and elected representatives of Czech towns and city councils and local government employees, providing them with a brief but comprehensive introduction to the issue.

³⁵ Data for 2021–2024 are not available at the time of publication. The data will be updated in 2026.

Adaptation of settlements to climate change

The manifestations of the impacts of climate change in settlements and urbanised areas are a complex cross-sectoral environmental issue that has come to the forefront of strategic documents at both national and local level in recent years. At the national level, various strategic and conceptual documents consider climate change to be a priority environmental issue for the Czech Republic, and an increasing number of cities and municipalities are beginning to realise that the ability to adapt to climate change through appropriate adaptation measures will be a determining factor in improving the quality of life of their residents. This is reflected in the relatively high increase in recent years in the number of towns and municipalities that have developed or approved their own adaptation strategies or plans enabling **the implementation of specific adaptation measures in planning practice**.

Not only at EU, international and national level, but also at local level, it is necessary to adopt adaptation strategies that will enable us to prepare for the adverse effects of climate change and thus prevent or minimise potential damage. These strategies often have an urban dimension, as it is local public administration that is best placed to respond to climate change and gradually adapt to it. The impacts of climate change may manifest themselves in a particular city in the near future, with significant economic, environmental and social consequences. Measures taken now are much more effective and cheaper than future solutions to problems such as damage caused by flash floods, overheating of buildings and public transport, or water shortages.

The first urban adaptation strategies began to emerge after 2015 (Prague, Brno, Pilsen), followed by other cities that financed adaptation strategies mainly with the support of the EEA and Norway Grants (e.g. within the UrbanAdapt project) and also through the NP ENV, which aimed, among other things, to support the involvement of municipalities in the Covenant of Mayors (hereinafter referred to as the “Covenant”). The Covenant is a joint initiative of cities, municipalities and the European Commission and is the main source of support provided by the EU to cities in their activities aimed at adapting to climate change. By joining the Covenant, a municipality is obliged to draw up a Sustainable Energy and Climate Action Plan (SECAP) within two years. Although the SECAP is not a standard adaptation strategy, its scope means that it can be considered a document addressing the adaptation of settlements to climate change.

In 2024, 75 cities or city districts and 14 micro-regions or voluntary associations of municipalities bringing together another 370 municipalities had **an adaptation strategy or plan** (or a non-binding “roadmap” for adaptation) in place in Czechia. 75 cities or city districts and 14 micro-regions or voluntary associations of municipalities bringing together another 370 municipalities, with the number of affected inhabitants living in these settlements exceeding 4.2 million. In addition to these cities and municipalities, adaptation strategies or plans were also approved for four regions, including Prague and Mendel University in Brno. However, the issue of adaptation to climate change is also addressed, at least in part, by the Smart City concept, which has been developed by approximately 20 cities, either independently or in addition to an already developed adaptation strategy or plan. The key themes of the adaptation strategies or plans of cities and municipalities are transport, greenery and energy. The introduction of sustainable urban mobility plans contributes to the adaptation of transport systems, while in the case of greenery, the emphasis is usually placed on urban greenery and its aesthetic/recreational functions, but without a comprehensive solution to its functionality in terms of adaptation to climate change. Rainwater and greywater management is also a frequently addressed issue in most cities.

It should be noted that the preparation and implementation of an adaptation strategy at the local level is a very demanding process, in which a number of obstacles must be taken into account. In the context of adapting settlements to climate change, or in the context of efforts to achieve climate neutrality, settlements encounter obstacles in the preparatory phase, particularly those related to insufficient competences and personnel capacities of authorities. In the planning phase, settlements face problems mainly related to property rights and coordination between municipal districts, authorities and institutions. In the implementation phase, the main obstacles are finances and the readiness of legislation, which can significantly limit or even prevent the implementation of certain adaptation measures. The above-mentioned obstacles could be addressed through systematic support for settlements at the national level, or through support for platforms for climate-neutral cities, which is not yet optimally set up.

Conceptual development of settlements and use of brownfields

Conceptual development of settlements is not possible without continuous updating of spatial and strategic plans. In this context, it is necessary to use, among other things, incentives for the reuse of **brownfields**, which are often located in the centres of towns and municipalities and represent a major problem for the sustainable development of settlements. These are abandoned properties (land, buildings, complexes) that are unused, neglected and possibly even contaminated. They cannot be used effectively without undergoing a process of complete regeneration and are the remnants of industrial, agricultural, military or other activities. In most cases, the costs of revitalising these areas are so high that they exceed the real financial possibilities of the owners, and they continue to deteriorate and burden their surroundings.

The issue of brownfields has long been addressed by CzechInvest, an agency for business and investment support, which manages a publicly accessible **National Brownfield Database**. A total of 2,344 brownfields with a total area of 6,838.5 ha were **registered** in this database between 2014 and 2024. In 2024, a total of 167 brownfields with a total area of 835.0 ha were newly registered in Czechia. Compared to the results from previous years, the number of newly registered brownfields reached the long-term average.

At the end of 2024, a total of **4,625 sites with a total area of 14,929 ha** were registered in the National Brownfield Database, with the largest number of brownfields in 2024 registered in the Moravian-Silesian Region (713 sites) and the Ústí Region (524 sites). The largest areas in total were occupied by unused sites in the Ústí nad Labem Region (2,838 hectares), the Moravian-Silesian Region (2,234 hectares) and the Karlovy Vary Region (2,034 hectares). The average size of a brownfield site was 3.2 ha. In terms of previous use, most of the registered brownfield sites are located on former industrial and agricultural sites, but the most extensive brownfield sites are located on former industrial and mining sites.

In 2024, only six sites with a total area of 1.9 hectares were deactivated from the National Brownfield Database due to successful **regeneration**. With the aim of giving greater priority to brownfields and already used areas, thereby limiting the seizure of agricultural land, an amendment to the Act on the Protection of Agricultural Land³⁶ was approved in 2024, which, among other things, tightens the rules for the seizure of agricultural land and increases levies for the removal of agricultural land. In addition to the existing brownfield regeneration programmes (for non-business use), a new programme for the regeneration of brownfields for business use was also created as part of the National Recovery Plan (component 2.8.3.), which aims to transform brownfields into fully-fledged business units and build new energy-efficient buildings on brownfield sites.

Conceptual and sustainable development of settlements is supported by the voluntary **Local Agenda 21 (hereinafter "LA21")** tool, which is managed by the Ministry of the Environment. This is a state-guaranteed programme to support the sustainable development of municipalities and regions. This tool is based on close cooperation between the relevant authorities and not only commercial entities and associations operating in the area, but above all with the public, i.e. the inhabitants living in the settlement or region in question.

However, over the last 30 years, during which this model of supporting sustainable development in municipalities has been used worldwide, the objectives, problems to be solved, related instruments (other policies) and relevant rules have gradually changed. In 2024, preparations began for a draft reform of LA21, which was discussed within various platforms, either in a narrower sense at meetings of the newly established LA21 Expert Team and the LA21 Consultation Platform, or in a broader sense through meetings of the LA21 Working Group of the Government Council for Sustainable Development, expanded to include an expert team of evaluators. Expert Team on LA21 and the so-called Consultation Platform on LA21, or in a broader sense through meetings of the Government Council for Sustainable Development Working Group on LA21, expanded to include an expert team of evaluators of the implementation of the original LA21 and the current implementers of LA21. The draft Concept was also presented and discussed at discussion seminars organised by the Society for Sustainable Living, which were open to the general public (including online).

³⁶ Act No. 183/2024 Coll., amending Act No. 334/1992 Coll., on the protection of agricultural land, as amended, and other related acts.

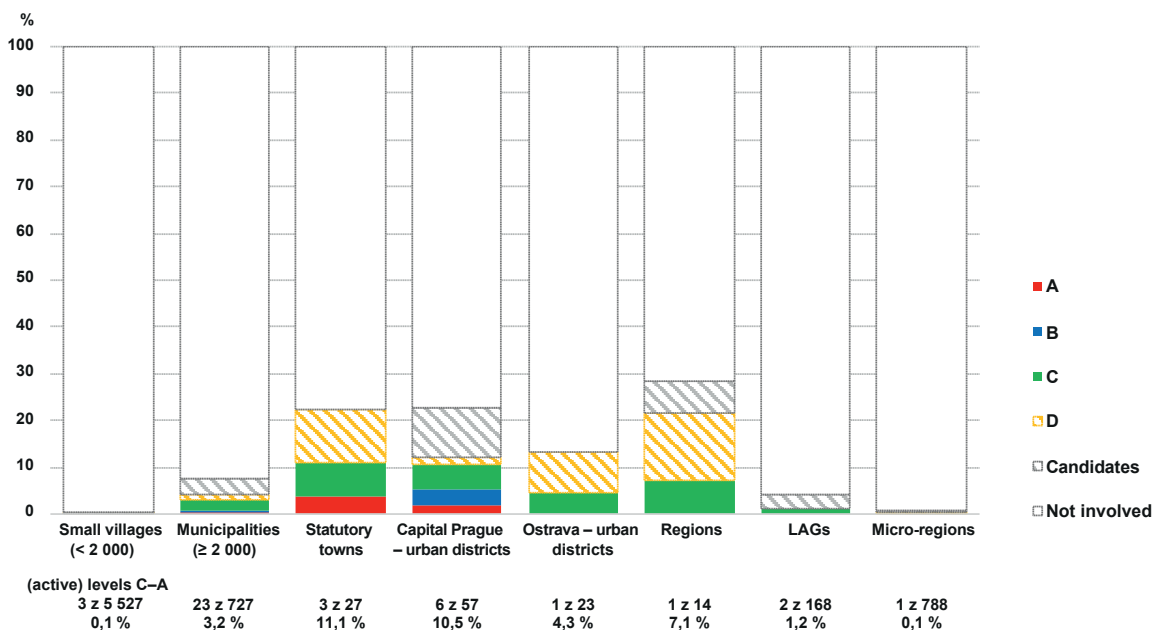
The main objective of the proposed Concept is to divide LA into two parts, which are provisionally referred to as “Basic” (the current purpose of LA21 remains unchanged) and its extension as “Investment” (which additionally focuses on the preparation of large investments). Both levels are primarily based on the UN’s global sustainable development goals, the approved Strategic Framework of the Czech Republic 2030 (extended to 2050), the European policy on combating climate change (ESG regime and EU taxonomy) and current fundamental global trends that are reflected at the local level. These are climate change and deeper environmental protection, an ageing population and its health status (so-called lifestyle diseases), and the development of digital technologies, including AI. There are many movements, competitions and titles in the Czech Republic that relate to various aspects of sustainable development, so the new LA model focuses on what is irreplaceable and, if possible, different from other initiatives and tools, with an emphasis on the above-mentioned fundamental trends in society. The new system emphasises simplicity, low cost and, therefore, attractiveness even for smaller municipalities, for which an adjustment will be prepared, particularly in terms of simplification and the possibility of forming larger units.

Municipalities that want to invest advantageously can also adopt the LA Investment Level, where they will meet the requirements of ESG (Environmental, Social, and Governance) and EU taxonomy as currently required by investors such as banks or IROP. The LA Investment Level is intended to lead municipalities to obtain a “socially responsible investor” certificate.

In 2023³⁷ had 37 implementers at levels A–C (i.e. active) of LA21, including 54 implementers at level D, and together with the Interested Parties category, there were 115 participants involved (Graph 38).

Graph 38

Percentage of participants involved in LA21 [%], 2023



The share of city districts and boroughs not included in the graph that were not involved in LA21 was 100%.

Data for 2024 are not available at the time of publication due to the ongoing LA reform.

Data source: MoE³⁸

³⁷ Data for 2024 are not available at the time of publication due to the ongoing LA reform.

³⁸ The figure of 168 LAGs was reported in its member database as of 12 August 2024 by the National Network of Local Action Groups of the Czech Republic, z. s., which covered most LAGs in Czechia (available at: <http://database.nsmascr.cz/index.php>). The figure of 788 micro-regions is given in the update (as of 31 December 2018) of the overview of functional micro-regions and Euroregions in the Czech Republic, see ŠIMKOVÁ, Hana. *Micro-regions and Euroregions in the Czech Republic: Information on the 2018 update*. Online. Urbanism and Territorial Development. 2019, vol. XXII, no. 1, p. 54. ISSN 1212-0855. Available at: <https://www.uur.cz/media/fxqjvxhf/08-mikroregiony.pdf>. [cited 2024-08-12].

LA21 covers a wide range of areas, from the environment, health, spatial development, social issues and education to transport. Sustainable urban mobility is one of the key issues addressed by **the Sustainable Urban Development Plan (SUMP)**. This is a Europe-wide concept for changing the approach to urban mobility, which aims to ensure that urban areas develop in a more sustainable way and that the EU's objectives for a competitive European transport system that makes efficient use of resources are met. The purpose of SUMP is to ensure the availability of transport in cities while minimising its negative impacts on health and the environment (noise and pollution), thereby improving the quality of life of residents.

The creation and implementation of SUMP in Czechia is taking place within the framework of **the Concept of Urban and Active Mobility for the period 2021–2030**, approved by the government in January 2021, for six size categories of cities (A–F). SUMP development has so far been carried out in accordance with **the Methodology for the Preparation of Sustainable Urban Mobility Plans in the Czech Republic** (TRC, 2015). One of the conditions for financing urban projects from the Transport Programme and IROP in the 2014–2020 programming period was to have either a full-fledged SUMP or its simplified version, SUMF (Sustainable Urban Mobility Framework), which focuses on public transport. In September 2021, a new **SUMP 2.0 Sustainable Urban Mobility Plan Methodology**³⁹ was submitted for final comments and certification. It was developed as an output of the TACR MOBILMAN project – The Human Dimension of Sustainable Urban and Regional Mobility Plans. The methodology also includes a communication plan for the preparation and implementation of SUMP.

The Ministry of Transport of the Czech Republic is responsible for the SUMP and SUMF approval process, in cooperation with the Ministry of Regional Development and relevant partners, particularly from the professional and academic spheres. The SUMP and SUMF approval process is overseen by the Commission for the Assessment of Urban Mobility Documents (CAUMD), which is appointed by the First Deputy Minister of Transport. The evaluation of the success of SUMP implementation is carried out **in accordance with the Methodology for the Evaluation of Sustainable Urban Mobility** (UJEP Ústí n. L., May 2022)⁴⁰.

By the end of 2024, a total of **25 sustainable urban mobility documents** for statutory cities in the Czech Republic had been verified by the CAUMD. Applications from the agglomerations of Liberec/Jablonec n. N., Hradec Králové, Ústí n. L., Pardubice and Zlín were first submitted as SUMFs, while the other cities submitted full-fledged SUMP. In 2024, the SUMP of Hradec Králové, Chomutov and Písek were verified.

All cities and urban agglomerations in the Czech Republic with more than 100,000 inhabitants had a verified SUMP by the end of 2024. Approximately 3.4 million inhabitants live in cities with verified sustainable urban mobility documents.

Water management system in settlements

A **rainwater management** system can be defined as a method of managing rainwater (mainly from rainfall) that emphasises **maintaining the natural water balance in an area after its urbanisation**. The basic approach of HDV is decentralised drainage. This involves managing rainwater in a way that focuses on the entire spectrum of rainfall variability, from normal rainfall to extreme rainfall, and aims to mimic as closely as possible the natural drainage characteristics of the site before urbanisation, protect urbanised areas from flooding and pollution entering surface and groundwater, and reduce the impacts of drought. It is one of **the basic tools for adapting urbanised areas to climate change**.

Subsidies for rainwater harvesting are currently available **to citizens, municipalities, regions, public institutions**, etc. Municipalities can, for example, use the subsidy to collect rainwater in underground tanks and use it to irrigate municipal greenery, cool streets or flush public buildings. In addition to reducing water consumption from the

³⁹ <https://md.gov.cz/Dokumenty/Veda-a-vyzkum/Certifikovane-metodiky/Ostatni-metodiky/Metodika-planu-udrzitelne-mestske-mobility-SUMP-2>

⁴⁰ The methodology includes the PLUMM (Sustainable Urban Mobility Planner) web tool.

public water supply, the aim is to ensure **the meaningful use of rainwater as close as possible to the point of impact, with the priority being to irrigate vegetation in the area, leading to an improvement in its microclimatic function** and an increase in the level of underground water resources. Furthermore, there should be a reduction in pressure on the capacity of the rainwater drainage system, which becomes overwhelmed during periods of heavy rainfall. Subsidies for municipalities and regions can be used, for example, for underground storage tanks and infiltration facilities, as well as for the construction of green roofs and the replacement of impermeable surfaces in car parks or other public areas with permeable ones. Subsidies for citizens can be used for rainwater storage for garden irrigation and toilet flushing, as well as for the use of treated wastewater (grey water).

The above-mentioned financial support can be drawn primarily from **the “Dešťovka” subsidy programme** intended for the family and apartment building segment. This programme was announced in 2017 and was financed from national funds of the State Environmental Fund of the Czech Republic (SEF) under the National Environment Programme (NP ENV) until 2021. A total of CZK 540 million has been allocated in two calls for proposals to date, with 10,265 projects approved by the end of 2024, with a total amount of CZK 403 million in support. In the vast majority of cases, projects or applications related to the accumulation of rainwater for garden irrigation or for simultaneous toilet flushing and garden irrigation (over 10,000 applications) prevailed, with the remainder consisting of projects or applications concerning the use of treated waste (grey) water with the possible use of rainwater. The total volume of storage tanks purchased with the support of the Dešťovka programme is over 63,000 m³.

The Dešťovka programme, intended for owners and builders of family, recreational and apartment buildings, has been incorporated into the New Green Savings Programme subsidy programme since October 2021, initially financed by the NRP within the framework of calls for family and apartment buildings, and from mid-2023 onwards, the source of funding will be the Modernisation Fund. By the end of 2024, almost 5,600 projects worth CZK 258.5 million had been approved to support rainwater management systems. Once again, projects for the accumulation of rainwater for garden irrigation predominate, with a total volume of accumulation tanks of approximately 43,000 m³. In November 2021, a call for proposals was announced through the NP ENV (funded by the NRP) aimed at supporting effective rainwater management in built-up areas of municipalities and intended for specified public entities and other legal entities. The funds were primarily used to cover projects submitted to the OPE 2014–2020 (see below for OP), for which there were no EU funds left. By the end of 2024, 336 projects of this type had been approved under this call for a total of CZK 1,186.7 million.

The New Green Savings programme also supports **the construction of green roofs** on family and apartment buildings. From mid-2023, when the programme will be covered by the Modernisation Fund, the construction of green roofs must be linked to another measure (building insulation, construction of a new house or replacement of an energy source). Between 2018 and 2024, 1,155 applications were approved and paid out for CZK 72.7 million.

Rainwater management measures are also supported **under the OP Environment**. In the 2014–2020 programming period, this involved support under Priority Axis 1, ‘Improving water quality and reducing flood risk’, supported area 1.3 ‘Ensuring flood protection of built-up areas and rainwater management’, specifically in activity 1.3.2 ‘Rainwater management in built-up areas’ (known as **‘Rainwater for municipalities’**). The total allocation for supported area 1.3 was approximately CZK 2.8 billion, and relevant calls for proposals were regularly announced for activities related to rainwater management in built-up areas. In 2020, the 144th call, known as the “big Rainwater”, was announced with a total allocation of CZK 1.0 billion from EU funds, followed in 2021 by the 159th call with an allocation of CZK 0.5 billion from EU funds. By the end of 2024, over 300 projects had been approved for activity 1.3.2, with a total of CZK 1.1 billion in EU funds, the implementation of which should retain approximately 32,000 m³ of rainwater within the built-up areas of municipalities. The issue is also addressed by the follow-up OPE 2021–2027, where CZK 1.8 billion is available under measure 1.3.4, designed, among other things, to slow down runoff, for infiltration, retention and accumulation of rainwater, as well as for the use of rainwater and grey water and the implementation of green roofs. For most of the activities under this measure, a continuous call for proposals ran from September 2022 to October 2023, during which 120 projects with a total budget of approximately CZK 1.1 billion were approved. In 2023, a special call No. 36 was also announced, targeting only the activity “Construction of technology for the accumulation, treatment and distribution of grey and rainwater in buildings for flushing and other relevant uses” with a total allocation of CZK 200 million from EU funds.

Similar support, but focused on comprehensive blue and green infrastructure projects in settlements, is also provided by the Ministry of Regional Development within **the IROP**, specifically under specific objective 2.2 Green Infrastructure. The Ministry of the Environment is the substantive manager and guarantor of the criteria relating to rainwater management and blue-green infrastructure systems. It is fully based on the criteria used for sub-projects of rainwater management and blue-green infrastructure, which are supported in the long term by the OP Environment and thus guarantee a high-quality project.

Support for the implementation of water-saving measures is also focused on the business sector, for example within the framework of operational programmes administered by the Ministry of Industry and Trade, specifically **the OP EIC** and **OP TAC**. With the contribution of the Real Estate programme from OP EIC, small and medium-sized enterprises were able to implement water-saving measures (i.e. rainwater harvesting and utilisation, water recycling, grey water utilisation, etc.) as part of comprehensive projects to revitalise buildings for business and directly connected infrastructure. The total allocation of the relevant calls amounted to CZK 2 billion. Similar support within the Sustainable Water Management activity, intended for all types of businesses, is also offered by OP TAC through a relevant call with an allocation of CZK 1.2 billion. Further support is also available from the NRP (component 2.7 Circular Economy, Recycling and Industrial Water), specifically through the calls for proposals Water Treatment and Circular Economy with a total allocation of CZK 1 billion.

As part of the TACR research project “More economical use of water in industry and energy in the Czech Republic”, a certified methodology for a so-called **water audit** (similar to an energy audit) was developed in 2021, which will help beneficiaries to determine, from a technical and economic point of view, where water is used, what its consumption is in relation to the topography of the site, where to save water, how to behave economically, etc. The submission of a completed “water audit” is a prerequisite for applying for support for the implementation of measures aimed at combating drought within the NRP and OP TAC. The sustainability of the “water audit” subsidy can be demonstrated, among other things, by obtaining the “Responsible Water Management” label (RWM), which is awarded by the Ministry of the Environment. By obtaining the label, companies can declare that they use water in a sustainable and environmentally friendly manner. Since September 2022, when the programme was launched, three companies have obtained the RWM label⁴¹.

Quality of greenery in cities

The urban environment, population and biodiversity are among the categories that are significantly affected by climate change. Factors that can influence the immediate effects of climate change include **green spaces** (especially tall vegetation) and water bodies in cities and their quality (the extent of ecosystem services provided). Greenery in settlements and water bodies significantly increase the degree of adaptation of urban systems and populations, especially to extreme temperatures. Greenery in settlements and water bodies are important quiet zones with natural shade, improve the microclimate of the area, increase evapotranspiration, increase biodiversity in the area, reduce surface runoff, noise and dust, and thus improve the health conditions of the population and the overall quality of life in cities. The spatial accumulation of greenery and water areas in settlements, or the uniformity of their spatial distribution and their interconnection, plays an important role in the adaptation of the settlement environment. At the same time, the factors of area, spatial distribution and quality of green spaces and water bodies significantly counteract urban overheating (the so-called heat island effect) and reduce the negative impacts of the built-up urban environment.

The assessment of the quality of greenery in cities is based on information on **the proportion of greenery in settlements and water areas in the urban areas** of all 61 Czech cities with more than 20,000 inhabitants (i.e. including regional capitals), based on the classification of remote sensing data. The proportion of green and water areas (forest land, protected areas, floodplains – polders, wetlands, meadows and pastures, urban parks with greenery, roofs covered with greenery (so-called green roofs), ecoducts, watercourses and their riparian vegetation, and water areas)

⁴¹ For more information on the RWM programme, see <https://mzp.gov.cz/cz/agenda/voda/odpovedne-hospodareni-s-vodou>.

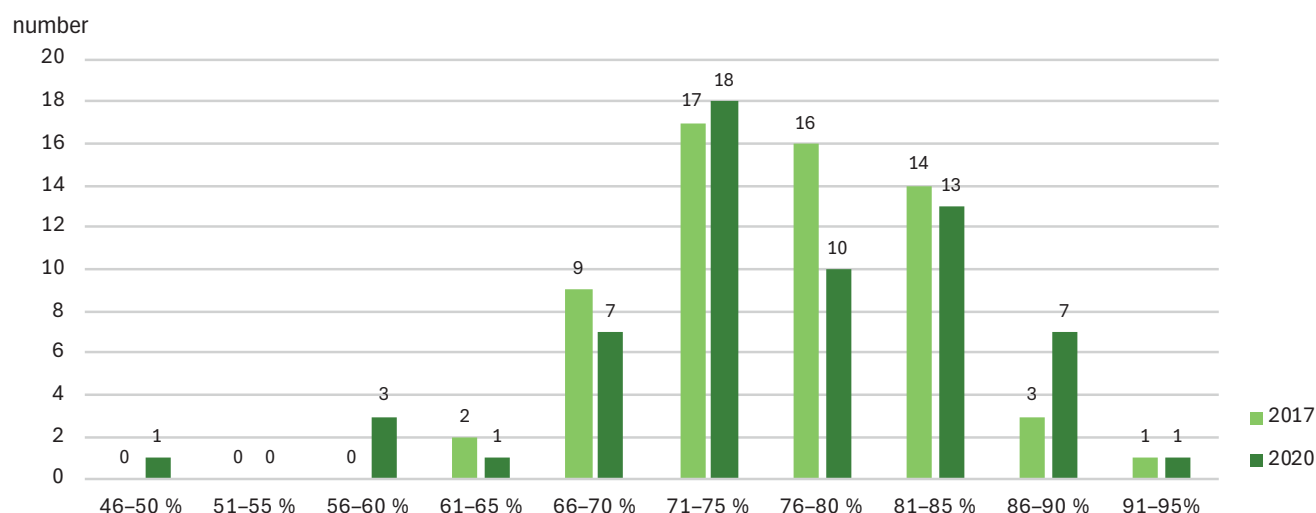
ranged from 45.7% (Haviřov) to 91.9% (Trutnov) of the total urban area in 2020⁴², with an average share of 76.0%. Compared to the last measurement for 2017, there were significant changes, especially in the category of 76–80% share of greenery and water areas in the total area of urban territory, where there was a decrease in the number of cities, mainly in favour of the “higher” category of 86–90%.

Despite the generally high share of total urban greenery in urban areas, it must be noted that a significant part of this share is **low greenery** (e.g. low-cut lawns, rubbish dumps, etc.), whose potential for providing ecosystem functions and increasing adaptation capacity is low compared to high greenery. Low greenery accounts for an average of 59.1% of the urban area, i.e. 78.0% of the total green area in settlements. The lowest share of low greenery in the total area is identified in Karlovy Vary (25.7%), while the highest is in Přerov (75.6%). In contrast, **tall greenery (trees)** occupies on average only 13.3% of the urban area, i.e. 19.8% of the total green area in settlements, which corresponds to the numerical representation, where more than 60% (i.e. 37) of the monitored cities had a share of tall greenery of only 1–20% of the total urban area.

Water areas are also an important element in the urban microclimate that deserves greater attention. The highest share of water areas and wetlands in the urban areas of the monitored cities in 2020 was identified in Hodonín (7.4%), thanks to the local wetlands and ponds and the flow of the (Old) Morava River. The second highest proportion of water areas in 2020⁴³ was identified in Cheb (6.7%) in connection with the presence of water reservoirs and the flow of the Ohře River. The lowest proportion of water areas was recorded in Kladno (0.01%) and Vsetín (0.02%).

Graph 39

Number of Czech cities with over 20,000 inhabitants according to the proportion of greenery in settlements and water areas in the total area of these cities [number], 2017, 2020



Data for 2021–2024 are not available at the time of publication.

Data source: CENIA, Sentinel-2, CZSO

⁴² Data for 2021–2024 are not available at the time of publication.

⁴³ Data for 2021–2024 are not available at the time of publication.

Financial support is provided on an ongoing basis for the establishment, development and sustainable maintenance of urban greenery systems in urbanised environments (e.g. the application of nature-based approaches and the restoration of small water features in settlements, the implementation of green roofs and rainwater management), particularly within the framework of NP ENV grant calls (priority area 5: Environment in towns and municipalities), IROP (area Green infrastructure of towns and municipalities) and NRP (component 2.9 Support for biodiversity and combating drought). Of course, we cannot forget the OPE, specifically specific objective 1.3 Adaptation to climate change and its activities: e.g. Support for nature-based measures in the landscape and settlements (Establishment and restoration of public green spaces in settlements) or Preparation of studies and plans (Study of the urban green space system). A more precise definition and evaluation of green areas in settlements is also addressed, among other things, by the DivLand project – Centre for Landscape and Biodiversity within the Programme of Applied Research, Experimental Development and Innovation in the Field of the Environment – Environment for Life. One of the project's activities focuses on the urban landscape, specifically the evaluation of green infrastructure. As part of this activity, detailed mapping of the development, condition and accessibility of urban greenery is being carried out in several model cities through field surveys and the use of greenery assessment methods using remote sensing, which should be followed in the coming years by regular mapping in more than 660 settlements in the Czech Republic.

Detailed visualisations and data

<https://www.envirometr.cz/data>

2 Climate-neutral and circular economy

2.1 Transition to climate neutrality

Key messages

- Greenhouse gas emissions in Czechia fell by 47.0% between 1990 and 2023⁴⁴. Czechia is on track to meet its target of a 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels.
- In the land use, land use change and forestry (LULUCF) sector, the emissions balance was significantly negative in 2023 (-3.6 Mt CO₂ eq.) due to the decline in the bark beetle calamity. The development of the LULUCF emissions balance in Czechia is thus on a favourable trajectory to meet the 2030 carbon storage target set by Directive 2023/839.
- Emissions in the EU Emissions Trading System (EU ETS) are falling significantly, and Czechia is thus contributing to the EU27's target of a 62.0% reduction in emissions by 2030. However, the decline in emissions outside the EU ETS, within the scope of the Effort Sharing Regulation (ESR), is slow and non-linear in Czechia, with the exception of the last year, 2023, when emissions in the ESR were only 11.5% below the 2005 reference year level. The scenario with existing measures indicates that by 2030, emissions will be close to the target set by the amended European legislation, which is a 26% reduction in ESR emissions by 2030 compared to 2005.
- The structure of the energy mix for electricity generation is evolving towards low-emission and zero-emission sources. Since 2023, electricity generation from nuclear power has exceeded electricity generation from brown and black coal. In 2024, nuclear energy accounted for 40.2% of electricity generation.
- Foreign trade in electricity continues to be export-oriented, but the value of the negative balance of foreign trade in electricity is declining. The share of the balance in electricity consumption reached -11.5% in 2024, approaching the corridor set by the SEP.
- The consumption of solid fossil fuels in households has been declining significantly in recent years, reflecting the impact of the replacement of household heating technologies supported by subsidy programmes. The number of households heated by electricity and heat pumps is growing.
- Energy consumption in transport continues to grow, with more than 90% of the energy consumed in transport coming from the combustion of fossil fuels. The growth in the number of low-emission and zero-emission vehicles in the vehicle fleet has been very dynamic in recent years, but it has only been going on for a short time and has had little impact on the carbon intensity of transport so far.
- Final energy consumption in Czechia fell significantly by 6.2% in 2023, following a volatile and generally stagnant trend in final consumption in previous years. Energy consumption fell particularly in industry and in households, where the decline in the energy intensity of buildings, supported by subsidy programmes, is beginning to take effect.
- In 2024, 16.7% of total electricity production came from renewable sources, with electricity production from renewable sources increasing year-on-year, particularly from photovoltaics and hydro-electric power plants.
- The share of RES in final energy consumption reached 18.6% in 2023, and despite the gradual growth in RES consumption, the updated NECP target of 30% RES by 2030 is still a long way off.
- The share of RES in energy consumption in transport is very low (5.7% in 2023), and Czechia is not yet meeting the targets for RES use in transport set by EU legislation.

⁴⁴ Data for 2024 are not available at the time of publication.

2.1 Transition to climate neutrality

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Greenhouse gas emissions	Reduction of greenhouse gas emissions (including LULUCF) by at least 55% by 2030 compared to 1990 ⁴⁵			Aggregate emissions, including LULUCF, to be reduced by 47% between 1990 and 2023	
	62% reduction in emissions from stationary sources in the EU ETS between 2005 and 2030 ⁴⁶			Decrease in verified emissions in the EU ETS by 50.8% between 2005 and 2024	
	26% reduction in emissions covered by the ESR Regulation by 2030 compared to 2005 ⁴⁷			11.5% reduction in emissions covered by the ESR Regulation between 2005 and 2023	
	Achieve LULUCF removals of 1,228 tonnes of CO ₂ eq. by 2030 ⁴⁸			Balance of emissions and reductions in LULUCF 3,568.4 kt CO ₂ eq. in 2023	
Electricity and heat production	Target structure of electricity production by 2040: nuclear fuel 46–58%, renewable and secondary sources 18–25%, natural gas 5–15%, brown and black coal 11–21%			In 2024, nuclear fuel 40.2%, coal 35.9%, renewable sources 16.7%, natural gas 4.8%	
	Gradual decline in electricity exports and maintaining the balance within +/-10% of domestic consumption			The share of the balance in consumption in 2024 was 11.5%, with the negative balance falling by 27.5% year-on-year. Exports fell by 2.8%.	

⁴⁵ European target – European Climate Law (Regulation (EU) 2021/1119

⁴⁶ Common EU target according to Directive (EU) 2023/959 of the European Parliament and of the Council

⁴⁷ Regulation (EU) 2023/857

⁴⁸ Regulation (EU) 2023/839 of the European Parliament and of the Council

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current statusv	Target achievement
Household heating by fuel	Reducing the use of fossil fuels for heating and energy savings			Decrease in household energy consumption by 10.6% in 2023 compared to 2022, decrease in coal combustion by 34.7% year-on-year	
Energy and fuel consumption in transport	Decrease in fossil fuel combustion in transport			Growth in energy consumption in transport by 89.9% in the period 2000–2023. More than 90% of the energy consumed in transport comes from fossil sources.	
	Fulfilment of NAP CM targets for vehicle fleet			The NAP CM targets for 2025 for the number of low-emission and zero-emission vehicles are likely to be met (with the exception of electric buses and hydrogen vehicles), while the fulfilment of the targets for 2030 is uncertain	
Energy intensity of the economy	Achieving the average energy intensity of GDP creation in the EU27 by 2030			The energy intensity of the Czech economy in 2023 will be 38.4% higher than the EU27 average	
Energy efficiency	By 2030, do not exceed PES consumption of 1,206 PJ and final energy consumption of 846 PJ			PES consumption of 1598 PJ and final energy consumption of 952.5 PJ in 2023	
Energy import dependency	Import energy dependency not to exceed 65% by 2030 and 70% by 2040			Energy import dependency of 41.6% in 2023	
Use of renewable energy sources	Achieving a 30% share of RES in final energy consumption by 2030			18.6% of final energy consumption from RES in 2023	
Renewable energy consumption in transport	Share of RES in final energy consumption in transport 29% by 2030 or a 14.5% reduction in fuel emission intensity compared to 2005			Share of RES in transport 5.65% in 2023	

Current measures supporting the achievement of the target

- Following the adoption of the Fit for 55 legislative package, two amendments to Act No. 383/2012 Coll. were prepared, transposing the revision of Directive 2003/87/EC with new emission trading rules for the period 2021–2030. During 2024, discussions were completed on an amendment to the Act, which primarily directs all revenues from the sale of emission allowances to climate change-related purposes and introduces new rules for monitoring and reporting emissions in the new EU ETS2 system for road transport, buildings and other emissions outside the EU ETS1.
- In accordance with EU legislation and to support the fulfilment of decarbonisation targets in the field of energy and climate, the government approved an update to the Czech Republic's National Energy and Climate Plan in December 2024, and the Czech Republic's Climate Protection Policy was also updated.
- In 2023, Directive (EU) 2023/1791 of the European Parliament and of the Council on energy efficiency came into force, followed in 2024 by Directive (EU) 2024/1275 on the energy performance of buildings.
- In the transport sector, the purchase of low-emission and zero-emission vehicles is supported and the development of infrastructure for alternative fuels continues, including support for low-emission public transport, including suburban rail transport. The purchase of low-emission vehicles for public transport is supported by the IROP from the European Regional Development Fund (ERDF). The NGS programme supports electromobility for households and apartment buildings through subsidies for the establishment of non-public charging stations.
- The updated National Action Plan for Clean Mobility, which meets the requirements of the Alternative Fuels Infrastructure Directive (AFIR), was approved by the Czech Government on 28 August 2024. It contains new targets for alternative fuel vehicles and public charging/refuelling infrastructure.
- The development of renewable energy sources is being accelerated. A comprehensive amendment to the Energy and Construction Act has been approved, simplifying the RES permitting process (known as Lex OZE 1), as well as an amendment to the Energy Act (known as Lex OZE 2), which introduces the basic principles of community energy (electricity sharing, energy communities, active customers).

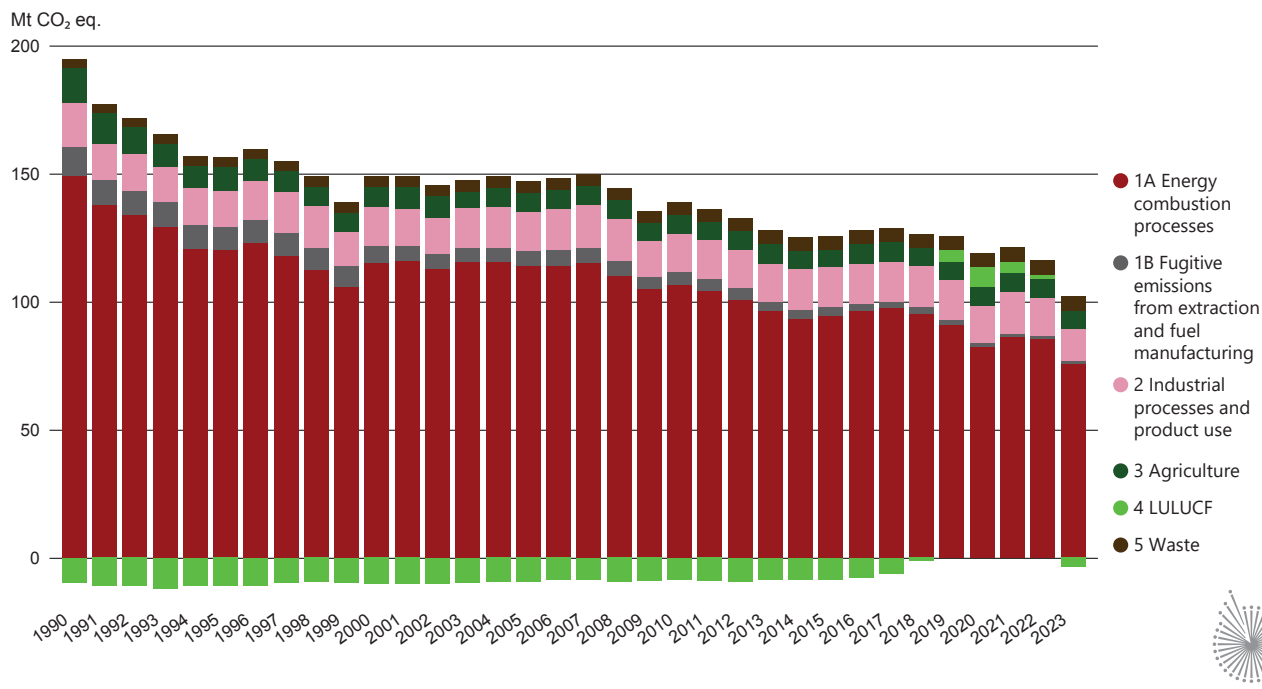
Greenhouse gas emissions

Greenhouse gas emissions in Czechia (including the LULUCF sector and indirect CO₂ emissions) fell by 47.0% to 98.9 Mt CO₂ eq. (Graph 40), and by 15.1% (17.5 Mt CO₂ eq.) in the year-on-year comparison between 2022 and 2023⁴⁹. This was the most significant decline in emissions in a single year since 2000.

In **the long term**, emissions trends are characterised by a significant decline in the early 1990s as a result of economic restructuring. Emissions then fluctuated in line with developments in economic performance, industrial production and GDP structure, with **the effect of decarbonisation measures** becoming clearly apparent at the end of the period. Another significant factor in the development of total emissions at the end of the period was **the LULUCF sector** (land use, land use change and forestry), in which the bark beetle calamity in forests, which peaked in 2020, caused a significantly positive balance of emissions and removals. In 2023, when the bark beetle calamity subsided, the balance of emissions and removals in LULUCF was again negative, amounting to –3.6 Mt CO₂ eq. Thanks to this favourable development, **Czechia is currently meeting** and is on track to meet the target set by Directive 2023/839 to achieve a level of carbon storage in biomass and soil of 1,228 thousand tonnes of CO₂ eq. by 2030.

⁴⁹ Data for 2024 are not available at the time of publication. The emissions inventory for the UNFCCC is always available in April for the previous 24 months, i.e. in 2025, the last reported year is 2023.

Graph 40

Aggregate greenhouse gas emissions in the Czech Republic by sector [Mt CO₂ eq.], 1990–2023

Data for 2024 are not available due to the emission inventory processing schedule.

Data source: CHMI

Based on current greenhouse gas emission trends and the latest projections, **Czechia is on track to meet the target of a 55% reduction in greenhouse gas emissions** by 2030 compared to the 1990 reference level, which is set out in the European Green Deal and established by European legislation (European Climate Law) for the EU27 as a whole. According to the latest reporting (March 2025) on emission policies, measures and projections, prepared in accordance with Article 18 of Regulation (EU) 2018/1999⁵⁰, the Czech Republic's total emissions, including LULUCF, should reach 59.8 Mt CO₂ eq. in 2030 according to the WEM scenario (with existing measures), which corresponds to a 68.6% reduction compared to the reference year 1990. Projections according to the WAM scenario (with additional measures in sectors 1 – Energy and 5 – Waste) assume an even more significant decrease in emissions to 54.1 Mt CO₂ eq., i.e. by 71.6%. However, current projections do not yet indicate that climate neutrality will be achieved by 2050, with projected emissions for that year amounting to 37.0 Mt CO₂ eq. according to the WEM scenario and 12.5 Mt CO₂ eq. according to the WAM scenario.

The downward trend in emissions is significantly influenced by **the decline in emissions from combustion processes** (combustion of carbon fuels), which continue to account for approximately three-quarters of total greenhouse gas emissions in Czechia (73.9% in 2023). Between 1990 and 2023, emissions from combustion processes fell by 49.0%, and in the last years assessed, i.e. since 2019, by 16.7%. In **the energy industry**, which is the sector with the largest share of total emissions (34.8%), emissions did not start to decline until after 2010 (Graph 41). This decline is significant in the context of the change in the energy mix and the growth in electricity production from zero-emission sources; since 2019, emissions from the energy industry have fallen by more than a quarter (27.5%).

Emissions from **local heating of households and commercial buildings** (by 22.7% in the last five years assessed) and from fuel combustion in the manufacturing industry are also falling. The only category of combustion processes from which emissions continue to grow is **transport**, which in 2023 produced about one-fifth (19.4%) of total greenhouse gas emissions in Czechia. Emissions from transport have increased by 76.5% since 1990 and by 4.7% in the last five years monitored (2019–2023), with the preliminary inventory for 2024 indicating continued growth in emissions.

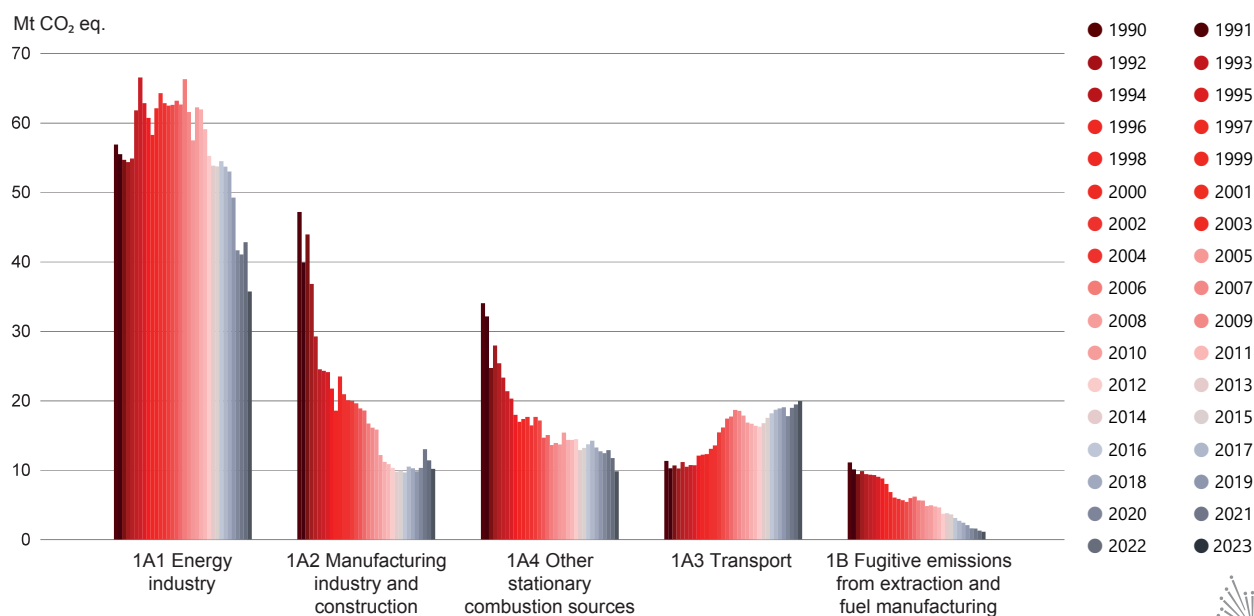
⁵⁰ Integrated reporting on greenhouse gas policies and measures and on projections in the Czech Republic, 2025.

Despite ongoing decarbonisation measures in transport and the gradual increase in the share of low-emission and zero-emission vehicles in the fleet, the growth in energy consumption in transport continues to be saturated by the growth in the consumption of fossil fuels.

Emissions from **agriculture** have stagnated in recent years, **emissions from waste** continue to grow slowly, but the development of total emissions is only marginally affected by waste management due to its small share of total emissions (5.4% in 2023). Of total aggregate emissions (excluding LULUCF), CO₂ emissions accounted for 81.6% in 2023, CH₄ emissions for 11.1%, N₂O for 3.7% and F-gas emissions for 3.6%. Nitrous oxide emissions come mainly from agriculture (71.2% in 2023), specifically from the use of nitrogen fertilisers and, to a lesser extent, from livestock production. Methane emissions are produced mainly in waste management (46.5%) and agriculture (35.2%).

Graph 41

Greenhouse gas emission trends in individual sectors of category 1 – Energy [Mt CO₂ eq.], 1990–2023



Data for 2024 are not available due to the emission inventory processing schedule.



Data source: CHMI

Greenhouse gas emissions from stationary installations covered by **the European Emissions Trading System (EU ETS)** fell by 50.8% between 2005 and 2024, from 82.5 to 40.6 Mt CO₂ eq. between 2005 and 2024, and decreased by 13.2% between 2022 and 2023. Czechia is thus contributing to the fulfilment of the pan-European target, which, according to current legislation, is set at a 62% reduction in EU-ETS emissions in the EU27 by 2030 compared to the 2005 reference level. According to the emission projections reported under EU legislation⁵¹, emissions in the EU ETS are expected to fall to 18.5 Mt CO₂ eq. under the scenario with existing measures (WEM), i.e. by 84.0% compared to the reference year. The WEM and WAM scenarios do not differ significantly in the case of the EU ETS. In the structure of emissions from EU ETS installations, combustion processes have the highest long-term share (80.3% in 2024). Other significant categories of activities within the EU ETS are iron and steel production (6.6% of emissions in 2024) and cement and lime production (7.1%).

⁵¹ https://opendata.chmi.cz/air_quality/products/GHG_emissions/projections/documents/Projections_GHG_2025_CZ.pdf

Emissions outside the EU ETS, whose reduction is regulated by the Effort Sharing Regulation (ESR), fell in Czechia between 2005 and 2023 from 63.1 to 55.8 Mt CO₂ eq., i.e. by 11.5 %. Year-on-year, emissions in the ESR fell by 4.8 Mt CO₂ eq. in 2023, i.e. by 8.0%. The main sources of emissions in this category are households, transport and other small stationary and area sources of emissions (agriculture, waste, etc.), which are mostly difficult to regulate.

According to the latest amendment to Regulation (EU) 2023/857, all EU Member States are to contribute to a 40% reduction in EU emissions in the ESR by 2030 compared to 2005 levels; for Czechia, the target has been increased to 26%. However, the decline in emissions covered by the ESR has been significantly slower and less linear than the decline in emissions in the EU ETS, and according to the latest projections (see the above-mentioned report), the achievement of the ESR target is uncertain. According to the WEM scenario (with current measures), emissions in the ESR should be 47.1 Mt CO₂ eq. in 2030, which is 25.4% below the reference year and on the verge of meeting the target. The scenario with additional measures (WAM) is significantly more optimistic, according to which, if measures in the area of household heating and transport are strengthened, emissions in the ESR would fall to 41.3 Mt CO₂ eq. by 2030, which represents a 34.6% decrease compared to the reference year and fulfilment of the set target.

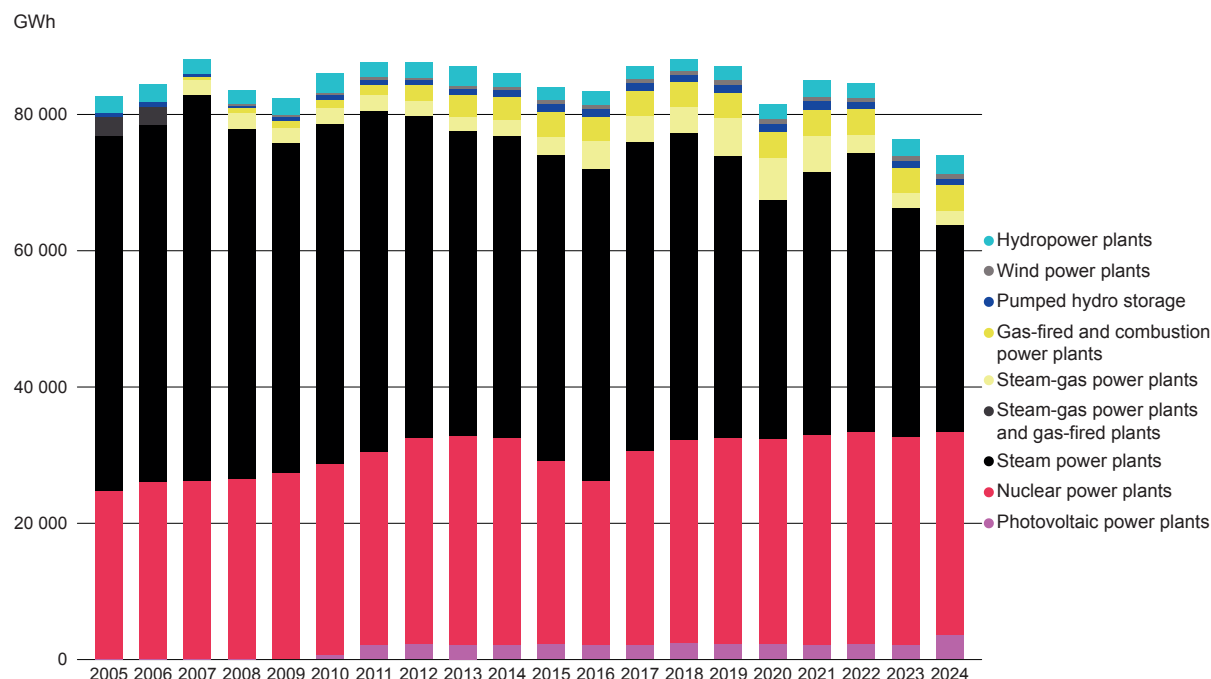
Electricity and heat production and consumption, household heating

The mix of sources used in electricity and heat production is influenced by the availability of domestic energy resources, the situation in foreign fuel trade, and current energy policy, which regulates the conditions for their use. The level of electricity and heat production is then determined by current demand and consumption on the domestic and foreign markets.

Gross electricity production reached 73,882 GWh in 2024, down 3.1% year-on-year (Graph 42). In terms of power plant technology, most electricity in 2024 was generated in steam power plants, which burn solid fossil fuels as well as biomass, biogas, natural gas and other fuels, producing 30,480 GWh of electricity, i.e. 41.3% of total electricity generated. The second most important category is nuclear power plants, which produced 40.2% of electricity. Other types of power plants generate electricity on a smaller scale, including gas and combustion power plants (5.1%), photovoltaic (4.9%), hydro (3.6%), combined cycle (2.8%), pumped storage hydro (1.2%) and wind power plants (1.0%). Year-on-year, electricity production from steam power plants fell by 9.6% due to the decline in lignite production. On the contrary, production from power plants using renewable energy sources increased. Production from photovoltaic power plants increased by 24.1% in 2024, with favourable weather conditions contributing to photovoltaic production in addition to growth in installed capacity. Production in hydroelectric power plants increased by 13.2% year-on-year due to higher river flows in 2024 compared to the previous year.

Graph 42

Electricity production by power plant technology in the Czech Republic [GWh], 2005–2024



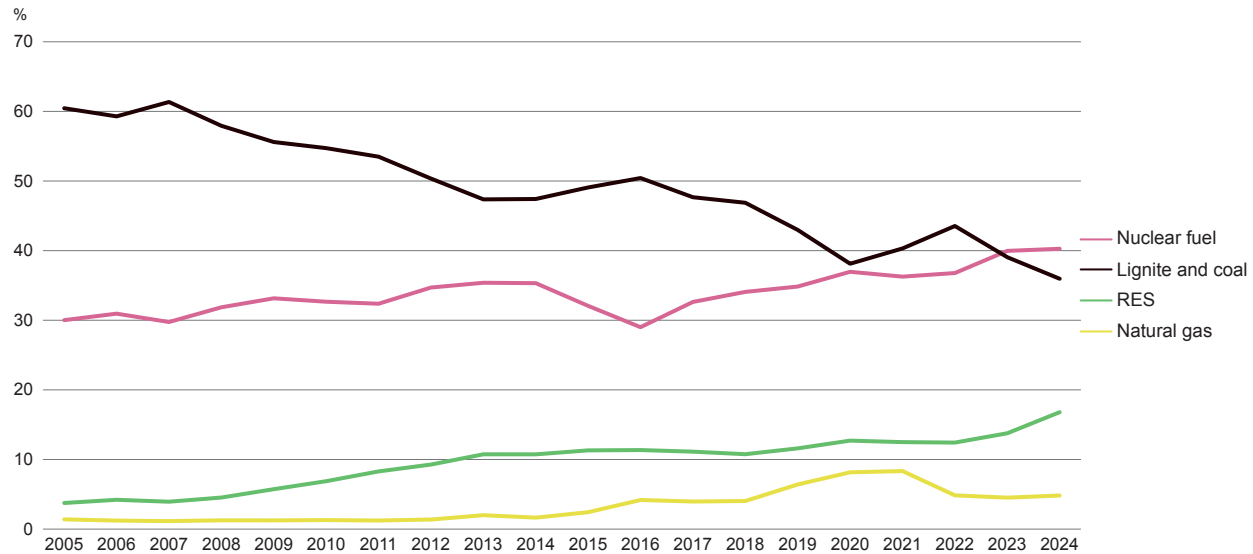
Data source: ERO

In terms of fuels, nuclear fuel generated the most electricity in Czechia in 2024 (29.7 TWh, i.e. 40.2%, Graph 43). Electricity generation from nuclear fuel has exceeded electricity generation from coal since 2023; in 2024, 26.5 TWh of electricity was generated from brown and black coal, i.e. 35.9% of total generation. Renewable energy sources accounted for 16.7% of electricity generation (year-on-year growth of 3 p.p.), while natural gas accounted for 4.8%.

The target structure of electricity generation by fuel is set out in the applicable strategic documents, with the SEP setting target corridors for 2040. In 2024, the share of electricity generation in nuclear power plants approached the target corridor (46–58%) and the target is likely to be met with a margin. Electricity production in nuclear power plants has been stable in the long term (in terms of installed capacity), but the decline in production from fossil fuels is leading to an increase in the share of nuclear sources. The share of coal is gradually decreasing (from 60.4% in 2000 to 36% in 2024). Currently, the share of electricity production from coal is above the target corridor (11–21%), but given the current trend and the gradual decarbonisation of the economy, it is likely that this target corridor will be achieved by 2040. The share of electricity generation from renewable sources is growing (by 13 percentage points in the period 2005–2023) and the current value of 16.7% is already close to the target corridor of 18–25% by 2040, which will be achieved with room to spare. The target range for electricity generation from natural gas (4.8%), which is currently below the target range (5–15%), is also being met.

Graph 43

Share of electricity production by fuel type in the Czech Republic [%], 2005–2024



Target corridors for single sources

nuclear 46–58%

renewables and secondary sources 18–25%

natural gas 5–15%

lignite and coal 11–21%



Data source: ERO

Exports continue to exceed imports in **foreign trade in electricity**. In 2024, 22,009 GWh of electricity was exported (a year-on-year decline in exports of 2.8%), while imports amounted to 15,350 GWh (a year-on-year increase of 14.0%). The foreign trade balance in electricity was therefore negative, amounting to –6,659 GWh. Compared to the previous year, the negative balance was 27.5% lower, mainly due to higher electricity imports, and the balance fell for the second year in a row. With total electricity production of 73,882 GWh in 2024, exports accounted for 29.8% of production. One of the objectives of the current State Energy Policy of the Czech Republic is to gradually reduce electricity exports and maintain the balance within +/-10% of domestic consumption by 2040. In 2024, domestic net electricity consumption amounted to 57,976 GWh, with the balance accounting for 11.5% of consumption. The target set by the SEC **has not yet been met**, but trends in foreign trade in electricity and energy consumption are favourable for its achievement in the coming years.

Electricity consumption in Czechia fluctuates without any significant trend. In 2024, total net electricity consumption amounted to 57,976 GWh, which is 0.6% less than in 2023. Economic sectors and households consumed a total of 55,924 GWh of electricity.

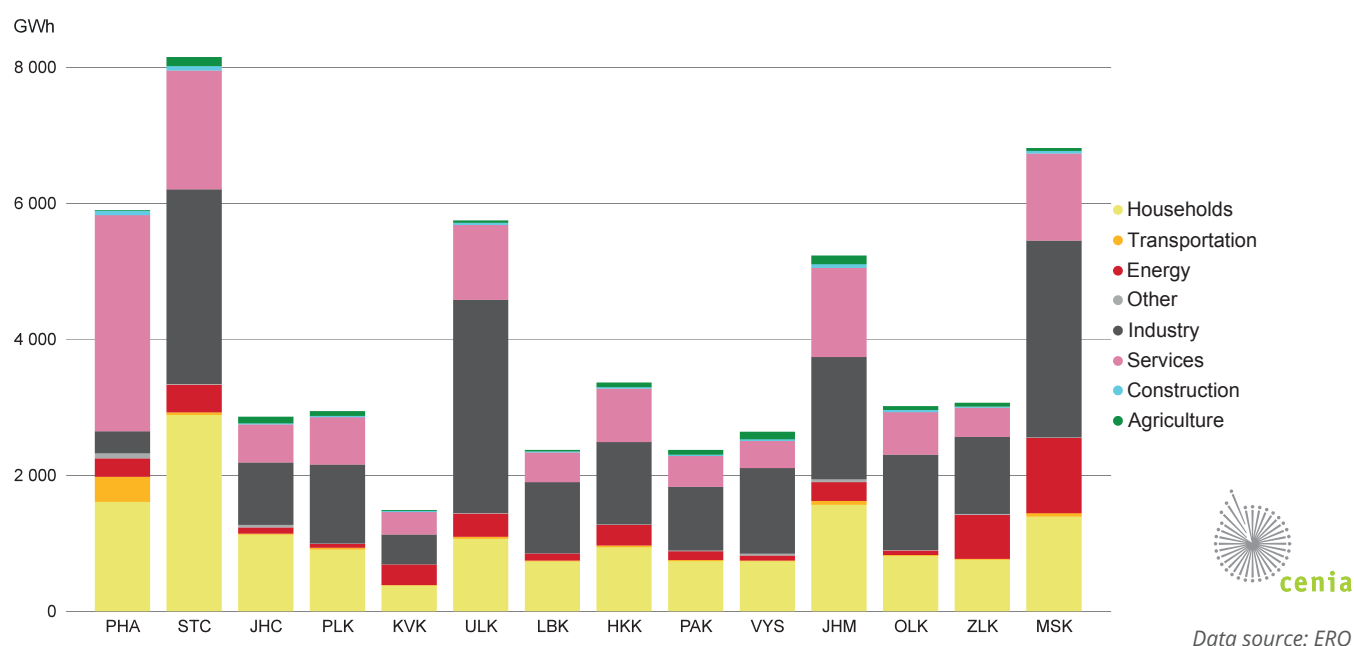
Industry consumes the most electricity in Czechia, accounting for 36.7% of total electricity consumption in 2024. Among the regions of Czechia, the industrially focused regions of Ústí nad Labem (54.6%) and Moravia-Silesia (42.5%) had the largest share of industry in total electricity consumption (Graph 44).

Households are another significant consumer of electricity, accounting for 28.0% of total electricity consumption in 2024. Electricity consumption in households varies between regions mainly according to the population of the region, so it is more appropriate to compare specific consumption per capita. The highest electricity consumption per person in households was recorded in the Central Bohemian Region (1.93 MWh.person⁻¹.year⁻¹), Hradec Králové (1.67 MWh.person⁻¹.year⁻¹) and Liberec (1.60 MWh.person⁻¹.year⁻¹) regions, while the best situation was in the capital city of Prague (1.10 MWh.person⁻¹.year⁻¹). The average electricity consumption in households in Czechia was 1.39 MWh.person⁻¹.year⁻¹). Electricity consumption in households is influenced by the method of heating, insulation of buildings and the use of electricity-intensive appliances. In absolute terms, the highest household electricity consumption was in the Central Bohemian Region (2,885.1 GWh), which accounted for 18.5% of household electricity consumption in the whole of Czechia in 2024.

In 2023, **services** accounted for 23.8% of total electricity consumption, with the highest consumption in the capital city of Prague (3,179 GWh, i.e. 53.9% of total electricity consumption in the region). The services sector also includes trade, education and healthcare. **Electric traction in transport** consumed 697 GWh of electricity, i.e. 1.2% of total consumption, with the highest consumption in the capital city of Prague (367.3 GWh, i.e. 6.3% of electricity consumption in the region).

Graph 44

Electricity consumption in regions by sector [GWh], 2024



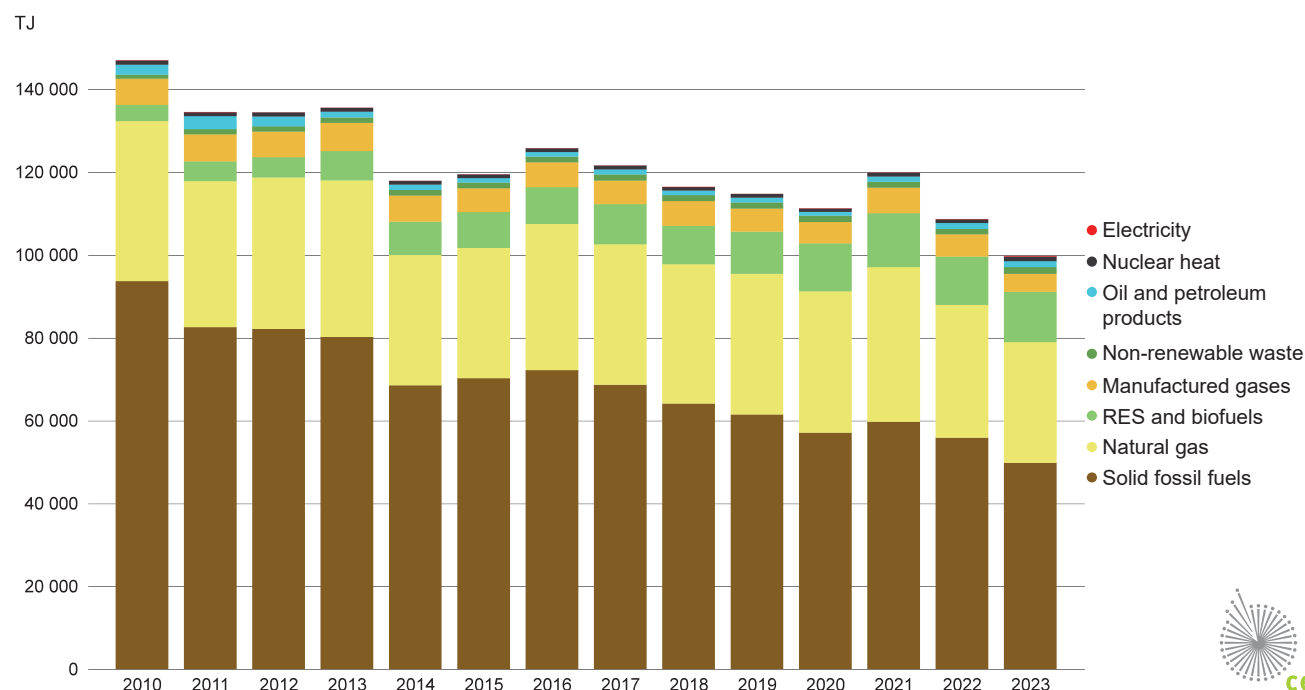
Heat production in district heating systems, including heat production in large domestic boiler rooms, is gradually declining, due to the decreasing energy intensity of buildings, energy savings and warmer heating seasons. In 2023⁵², 99.7 PJ of heat was produced, representing a year-on-year decline in heat production of 8.2% (Graph 45). Over the last five years monitored (2019–2023), heat production fell by 13.1%.

⁵² Data for 2024 are not available at the time of publication.

In the structure of heat production by fuel, solid fossil fuels continue to account for the highest share (49.9% in 2023). However, the share of solid fossil fuels in heat production is gradually declining, from 63.7% in 2010 to 51.4% in 2022. Another significant source of heat is natural gas, with a 29.2% share of total heat production in 2023. After 2021, heat production from natural gas is slowly declining in connection with rising natural gas prices and an overall decline in demand for heat. On the contrary, heat production from renewable sources is growing significantly, having roughly tripled since 2010 to 12.2 PJ, with renewable sources accounting for 12.2% of heat production in 2023.

Graph 45

Gross heat production in district heating by fuel type in the Czech Republic [PJ], 2010–2023



Data for 2024 are not available due to the schedule for their collection and processing.

Data source: MIT

The method of heating households varies significantly between individual regions and municipalities within the Czech Republic. In cities and urban agglomerations close to industrial and energy facilities from which residual heat can be utilised, district heating is used to a greater extent, whereas in smaller municipalities, especially in remote locations, individual heating of individual houses or flats is more common.

In 2023, there were 4,312,727 households or permanently occupied dwellings registered in the Czech Republic⁵³. The largest share (36.3%) of these are heated **by natural gas** (Graph 46), followed by **district heating** (35.0%). The highest number of households heated by natural gas, which is a fossil fuel but a significantly more environmentally friendly alternative to solid fuels, was found in the South Moravian Region (246,300), where 52.1% of all permanently occupied households are heated by natural gas. More than 40% of households are heated **by natural gas** in the Zlín, Olomouc and Pardubice regions, while the lowest share of households using this method of heating was in the South Bohemian Region, where 62,800 households heated by gas correspond to 24.3% of the total number of households.

⁵³ Data for 2024 are not available at the time of publication.

In regions with larger agglomerations near power plants, where combined heat and power generation, heating plants and other industrial operations can be used, district heating is generally used. The largest share of households supplied with district heating is in the capital city of Prague (308,900 in 2023, i.e. 52.9%), followed by the Ústí nad Labem and Karlovy Vary regions, where approximately 49% of households are supplied with thermal energy from steam power plants, and the Moravian-Silesian Region, where approximately 49% of households are also connected to district heating. Due to the Temelín Nuclear Power Plant, a relatively high number of households are also connected to district heating in the South Bohemian Region (84,500, i.e. 32.7%). In contrast, the lowest rates of household connection to district heating are in the Vysočina, Central Bohemia and Liberec regions, which must rely to a large extent on individual heating of individual houses or residential units.

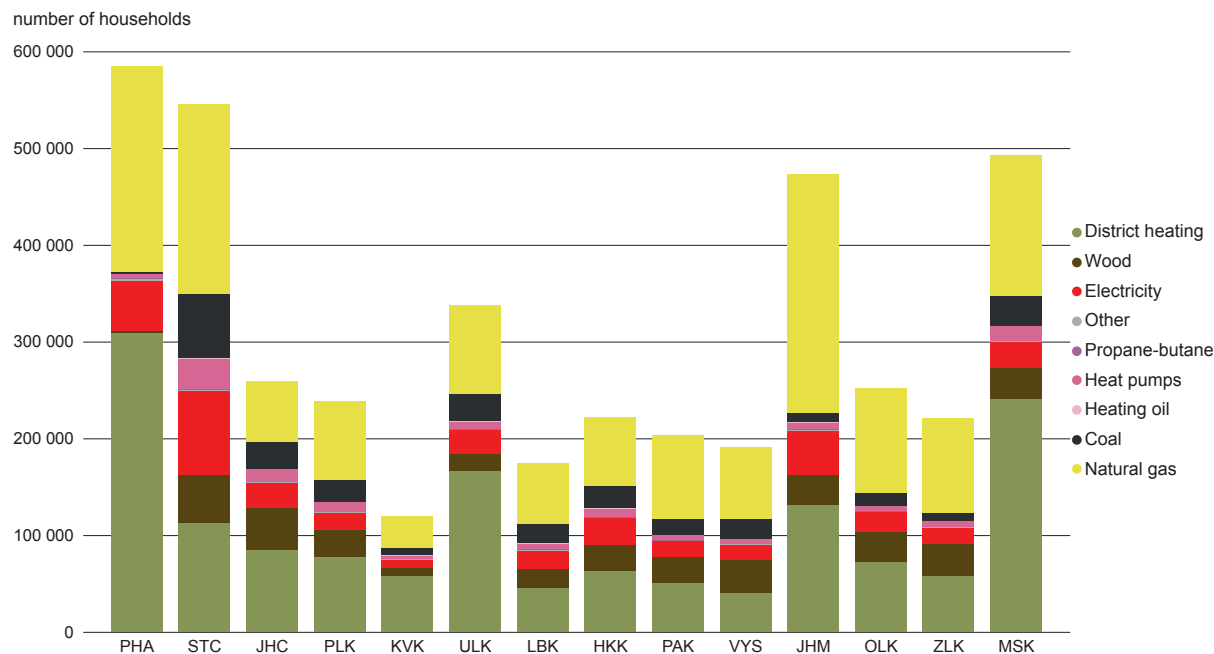
According to the latest data, 6.8% of all households in Czechia were heated with **coal fuels** and 8.9% with wood. The highest share of households heated with coal was in the Central Bohemian Region (66,100 households, i.e. 12.1%), followed by the Liberec Region (11.2%) and the Vysočina Region (10.5%). Wood is most commonly used for heating in households in the Vysočina Region (18.4%) and the South Bohemian Region (16.8%).

Electricity, which is a favourable type of heating in terms of air pollution, is used to heat 9.4% of households, with the highest proportion in the Central Bohemian Region (15.7%) and the Hradec Králové Region (12.7% of households). **Heat pumps** currently heat only 3.0% of all households, with this environmentally friendly type of heating being most widespread in the Central Bohemian Region (5.6%) and the South Bohemian Region (5.1%).

The ratio **of heating methods in households** changes only slowly over time, influenced mainly by the construction of new houses and flats and the modernisation of heating technologies in family houses. Clear trends in the last five years for which data is available (2019–2023) include an increase in the number of households heated by electricity (by approximately 71,000 households, i.e. 21.3% over five years, and 1.6% year-on-year in 2023) and a significant **increase in the number of flats heated by heat pumps**, which almost tripled between 2019 and 2023 to 129,800 households and increased by 18.5% year-on-year, which is a favourable finding from the perspective of building decarbonisation. Around 2020, the number of households heated with wood also increased due to high natural gas prices. Currently, the number of households using this fuel for heating is stagnating, with 383,000 households in 2023. On the contrary, the number of households heated with coal is declining (by 20.1% in the period 2019–2023 to 295,300 households). Other heating methods (district heating, gas) are stagnating or fluctuating.

Graph 46

Heating methods in permanently occupied dwellings in regions [number of households], 2023



Data for 2024 are not available at the time of publication. The heating method of households is determined from the 2021 Census of Population, Houses and Flats.



Data source: CHMI

In 2023, **households** consumed a total of 271.6 PJ of energy for heating⁵⁴, which was 10.6% less heat than in the previous year. In the longer term, heat production for household heating fluctuates according to the temperature conditions of the heating seasons, with a clear downward trend in the period 2021–2023 (a decrease of 18.4% over three years). Although this development in energy consumption for heating was supported by warmer heating seasons, it is also an indication of improving energy efficiency in buildings.

In terms of fuel consumption for heating (Graph 47), households in 2023 produced most heat from biomass, which mainly includes firewood, wood briquettes and pellets (29.6%), and natural gas (22.9%). The consumption of biomass and natural gas, which is used not only for heating but also for cooking and hot water, fluctuates from year to year depending on the conditions of the heating season. In 2023, it fell by 10.6% year-on-year. In the case of electricity, the year-on-year decline in consumption was only 1.4%, reflecting an increase in the number of households heated by electricity. However, electricity consumption includes not only heating but also consumption for the operation of domestic electrical appliances, even in households that are heated by other means.

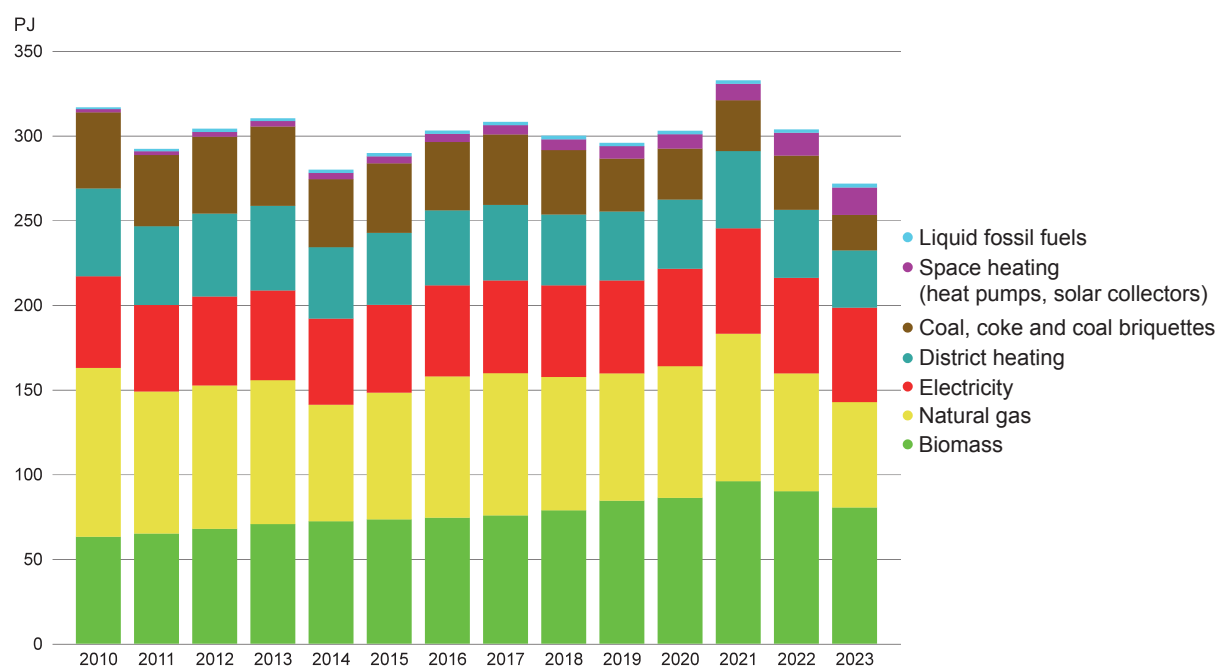
The use of ambient heat (heat pumps) for household heating **is increasing significantly**. In the last five years monitored (2019–2023), ambient energy consumption roughly doubled to 16.2 PJ, which represented 6.0% of the total energy consumed in households in 2023 (year-on-year growth of 1.5 p.p.). In 2023, **the district heating system** supplied only 12.5% of energy to households, even though approximately 35% of households (approximately 1.5 million households) are heated in this way. This is because district heating is more often used to heat larger apartment buildings, where less heat is needed to heat a single household than to heat a household in a family home. The supply of energy from district heating for household heating has fallen by 16.7% since 2019, mainly due to the insulation of houses and warmer winters.

⁵⁴ Data for 2024 are not available at the time of publication.

The consumption of solid fossil fuels in households has been declining significantly, especially in recent years, reflecting the impact of the replacement of household heating technologies supported by subsidy programmes and the ban on the operation of solid fuel boilers in emission classes 1 and 2. In 2023, households consumed 20.9 PJ of energy from coal combustion, which was 34.7% less than in the previous year. Coal accounted for 7.7% of total household energy consumption, the lowest share since 2010.

Graph 47

Fuel consumption in households in the Czech Republic [PJ], 2000–2023



Data for 2024 are not available at the time of publication.



Data source: MIT

Energy consumption in transport

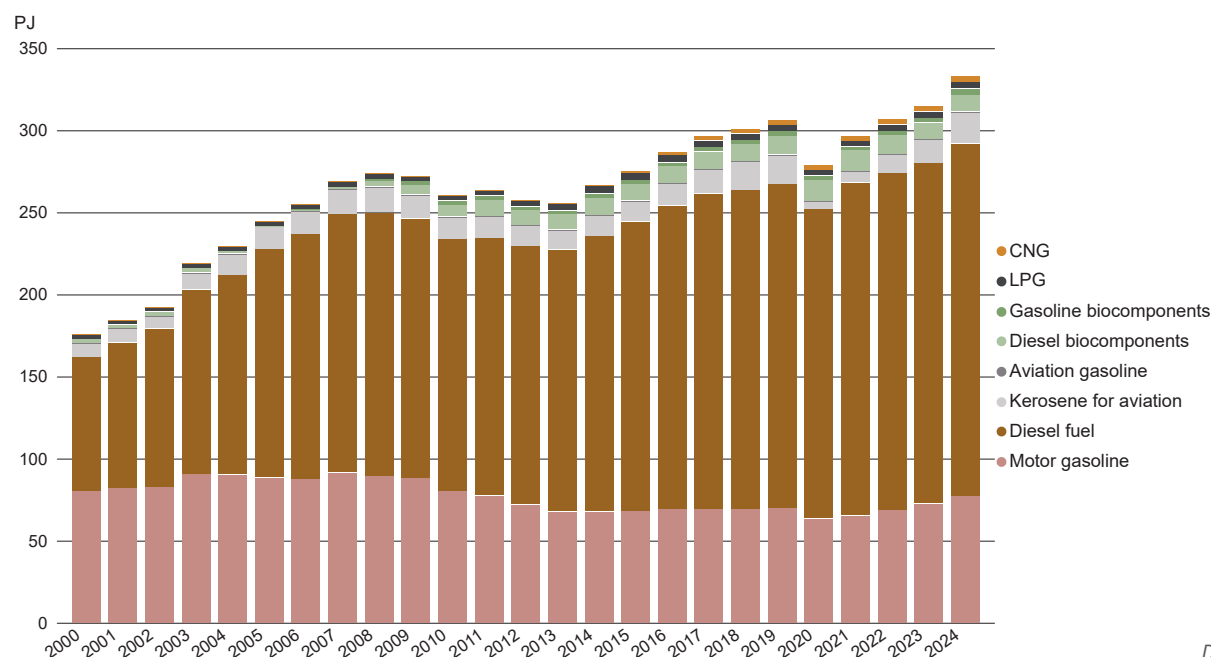
Energy consumption in transport continues to **grow**. Since 2020, when the impact of the COVID-19 pandemic on transport was evident, energy consumption in transport has increased by 19.2%, and in 2024 by 5.4% year-on-year to 327.6 PJ, which is almost double the energy consumption in transport in 2000 (Graph 48). Energy in transport in Czechia is largely obtained by burning **fossil fuels**, which accounted for 96% of total energy consumption in transport in 2024 (excluding electricity consumption by electric modes of transport).

Of the individual fuels, **diesel consumption** accounts for the largest share of total energy consumption in transport (65.2% in 2024), which is used in both passenger and freight transport, including individual transport, and whose consumption continues to grow (by 3.1% year-on-year in 2024). Petrol accounted for 22.8% of energy consumption in transport. Petrol consumption also continues to grow (increasing by 21.7% in the period 2020–2024 by 5.7% year-on-year in 2024). This growth in consumption is mainly related to the increasing performance of individual car transport during this period and the high number of registered petrol-powered passenger cars (3.8 million in 2024, i.e. more than half of the total 6.6 million registered passenger cars). The consumption of alternative fossil fuels (LPG and CNG) is stagnating and together accounts for approximately 2% of total energy consumption in transport.

According to ERO data, 697 GWh of electricity (approximately 2.5 PJ) was consumed by electric modes of transport in 2024, which was 1.2% of total electricity consumption. The ERO data include consumption by public transport (trains, trams, metros, trolleybuses, electric buses) and public chargers, but do not take into account domestic wallboxes (consumption is included in household electricity consumption). Electric mobility thus currently contributes little to the decarbonisation of transport.

Graph 48

Energy consumption in transport by fuel in the Czech Republic [PJ], 2000–2024



Data source: TRC

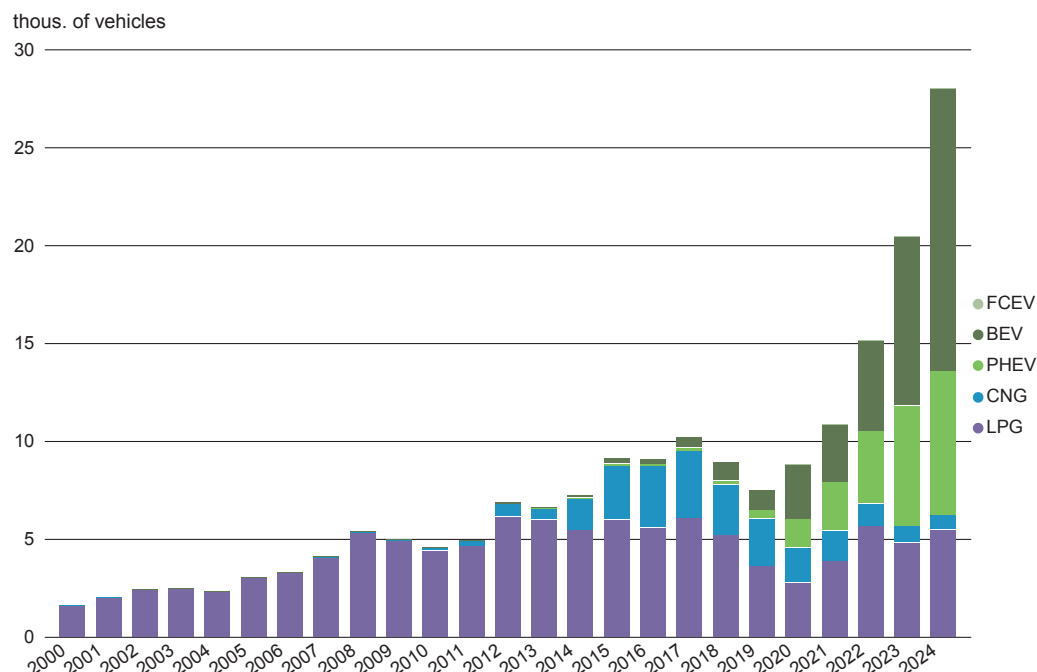
The largest consumer of energy in transport and the least energy-efficient mode of transport is **private car transport**, which accounted for 58% of total energy consumption in transport from fuel combustion in 2024. Road freight transport accounted for about one-third of total energy consumption in transport (31.9%). All types of road transport together accounted for 93.2% of energy consumption.

Reducing the environmental impact of transport and gradually **decarbonising transport** as part of the transition to climate neutrality should ensure the growth in the use of zero-emission and low-emission vehicles, including their infrastructure, in line with the objectives of the updated **National Action Plan for Clean Mobility**.

In 2024, 28,000 zero-emission and low-emission vehicles in category M1 (passenger cars) were registered, representing a year-on-year increase of approximately one third (Graph 49). There were 14,402 **battery electric vehicles** (BEVs) in category M1 registered, and 7,252 **plug-in hybrids**. Registrations of passenger BEVs have almost doubled every year since 2022 (growth of 221% in the period 2022–2024). The relative growth of electromobility in Czechia in recent years is unique even within the EU27, but it should be emphasised that it is starting from a very low base. The growth in the number of PHEV registrations is slower; in 2024, PHEV registrations accounted for roughly half the number of BEV registrations. The use of hydrogen in individual transport is still completely marginal; in 2024, only one M1 category fuel cell electric vehicle (FCEV) was registered, with a total of 28 in the register.

Graph 49

Registrations of low-emission and zero-emission passenger cars (M1 category vehicles) by fuel and drive category and year of last registration in the Czech Republic [thousands of vehicles], 2000–2024



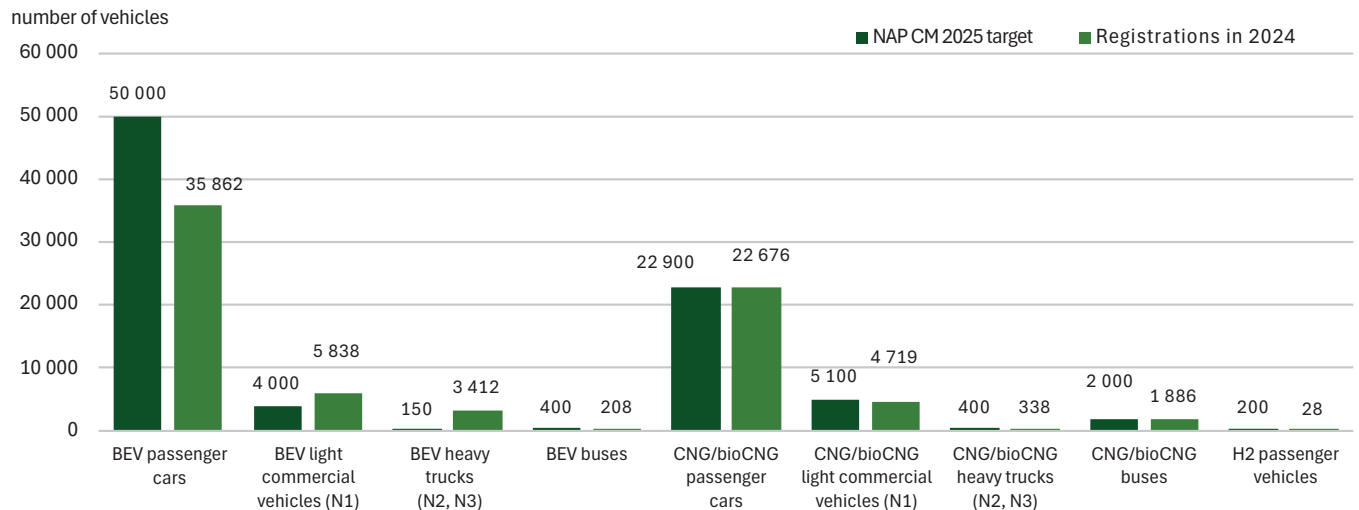
BEV – battery electric, PHEV – plug-in hybrid, FCEV – fuel cell electric (hydrogen), CNG – compressed natural gas, LPG – liquefied petroleum gas

A total of 35,862 battery electric vehicles (BEVs) in category M1 were registered at the end of 2024. Given the current rate of BEV registrations, it is likely that the updated NAP CM target (50,000 registered vehicles by 2025) will be met (Graph 50). Achieving the target of 250,000 registered M1 category BEVs by 2030 still seems very ambitious, but it is possible if the sharp growth in registrations continues. For other categories of low-emission and zero-emission vehicles, the NAP CM target for the number of registrations in 2025 has already been met (BEV light commercial vehicles, CNG passenger cars) or is likely to be met, with the exception of BEV buses and hydrogen vehicles of all categories.

At the regional level, the highest numbers of registered low-emission and zero-emission vehicles are in the Capital City of Prague and the Central Bohemian Region (Graph 51). At the end of 2024, a total of 47.3% of passenger BEVs in the whole of the Czech Republic were registered in these regions. The lowest numbers of BEV and PHEV registrations so far are in the Karlovy Vary Region (527 BEV and 389 PHEV), followed by the Liberec Region and the Vysočina Region.

Graph 50

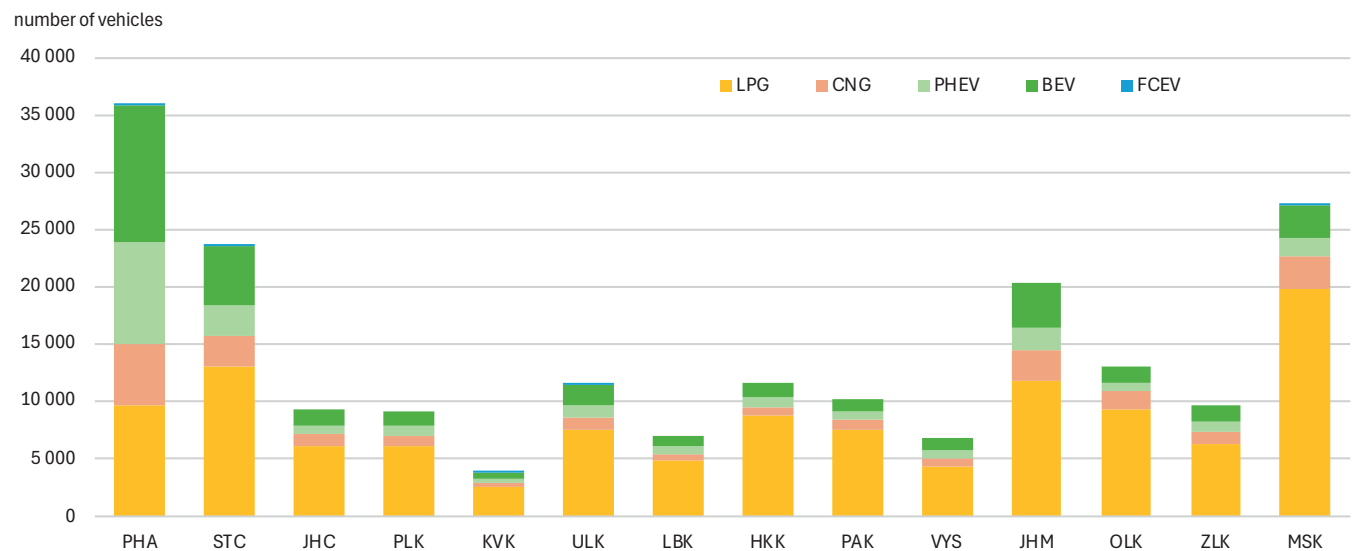
Total number of registered low-emission and zero-emission vehicles in each category compared to the NAP CM targets for 2025 [number of vehicles], 2024



Data source: TRC

Graph 51

Total number of registrations of low-emission and zero-emission vehicles in category M1 (passenger cars) in regions at the end of 2024 [number of vehicles]



BEV – battery electric, PHEV – plug-in hybrid, FCEV – fuel cell electric (hydrogen), CNG – compressed natural gas, LPG – liquefied petroleum gas

Data source: TRC

Energy efficiency

The **energy efficiency** indicator monitors energy consumption and savings. In terms of energy efficiency, the update to the National Energy and Climate Plan (NECP), approved by the government in December 2024, set targets for the maximum amount of primary energy sources (PES) of 1,206 PJ by 2030 and for maximum final energy consumption of 846 PJ in 2030.

Primary energy consumption is one of the basic indicators of a country's energy balance. It is the sum of domestic and imported energy sources, expressed in energy units. The aim of the current State Energy Policy of the Czech Republic (SEP) is to achieve a diversified mix of PES by 2040 with a target structure in the following ranges: nuclear fuel 25–33%, solid fuels 11–17%, gaseous fuels 18–25%, liquid fuels 14–17%, renewable and secondary sources 17–22%.

The consumption of primary energy sources fluctuates with a slight downward trend. In 2023, the PES value was 1,598.2 PJ, which was 8.1% less than in the previous year 2022. The year-on-year decline in PES in 2023 was the most significant since 2010. **Solid fossil fuels** (brown and black coal) accounted for the largest share of the energy mix (28.3%) in Czechia in 2023, with mining having a long tradition in the country thanks to its rich reserves. In line with efforts to decarbonise the energy sector, this share is declining in the long term (in 2019, the share was 33.5%) and solid fossil fuels are gradually being replaced by more environmentally friendly sources. Achieving the SEP target corridor is still a long way off, but likely by 2040.

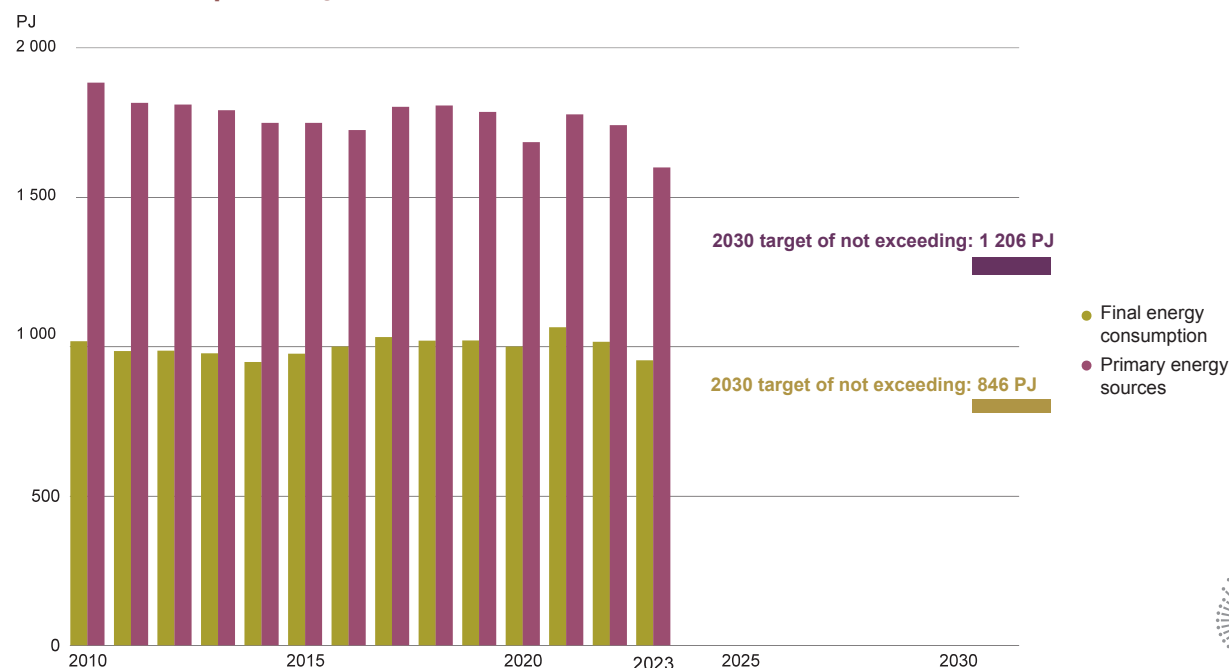
Oil and petroleum products accounted for 24.3% of total PES consumption in 2023. The SEP aims to reduce their share to between 14% and 17%, but the trend in the share of liquid fuels is moving in the opposite direction, with their share in the energy mix growing slightly, mainly as a result of increased consumption of petroleum fuels in transport. **Natural gas** consumption fluctuates; in 2020, its share in the PES mix reached the target corridor (18–25%), but in 2023, due to a decline in natural gas consumption, its share fell to 15.1%, slightly below the target corridor.

Nuclear energy accounted for 19.8% of the energy mix in 2023. The current SEP anticipates an increase in the share of nuclear energy in the PES to 25–33% by 2040. On this basis, a National Action Plan for the Development of Nuclear Energy in the Czech Republic was drawn up, which outlines the further development of these sources in Czechia, including the construction of new nuclear units to increase existing capacity. The share of **renewable energy sources and biofuels** in the PES structure in 2023 was 13.5%. This category is showing a significant upward trend and it can be assumed that the target corridor will be achieved by 2040.

Final energy consumption in 2023 fell significantly year-on-year by 62.5 PJ (6.2%) to 952.5 PJ (Graph 52). The year-on-year decline in final energy consumption was caused by a decrease in final energy consumption in industry (by 9.9%) and households (by 10.6%), while energy consumption in transport increased year-on-year. Final energy consumption has been volatile and the trend has not yet been towards achieving the energy efficiency target set in the draft update of the NECP, which is 846 PJ in 2030. However, if the rate of decline in final energy consumption that occurred in 2023 continues, the target would be achieved. However, there is considerable uncertainty surrounding the achievement of the target. The SEEPIA project's model scenarios⁵⁵, created using the TIMES energy-economic model, show possible trajectories for the development of final energy consumption. The WEM scenario (with existing measures) indicates a value of 1,026.9 PJ in 2030, while the WAM scenario (with additional measures) assumes 1,001.8 PJ. These scenarios are not predictions, but an analytical tool for strategic decision-making.

Graph 52

PES consumption and final energy consumption compared to the 2020 and 2030 targets in the Czech Republic [PJ], 2010–2023



Data for 2024 are not available at the time of publication.

 **cenia**
Data source: MIT

Energy intensity of the economy tracks the amount of energy that the economy needs to generate a unit of economic output. We express it as PES consumption per unit of gross domestic product. Unlike the energy efficiency indicator, it does not track the absolute total of energy consumed, but rather the efficiency of energy use in the economy. Given that energy consumption (and production) is associated with a number of environmental pressures, and also in the interests of energy security, there is a long-term effort to reduce energy intensity in all areas of human activity.

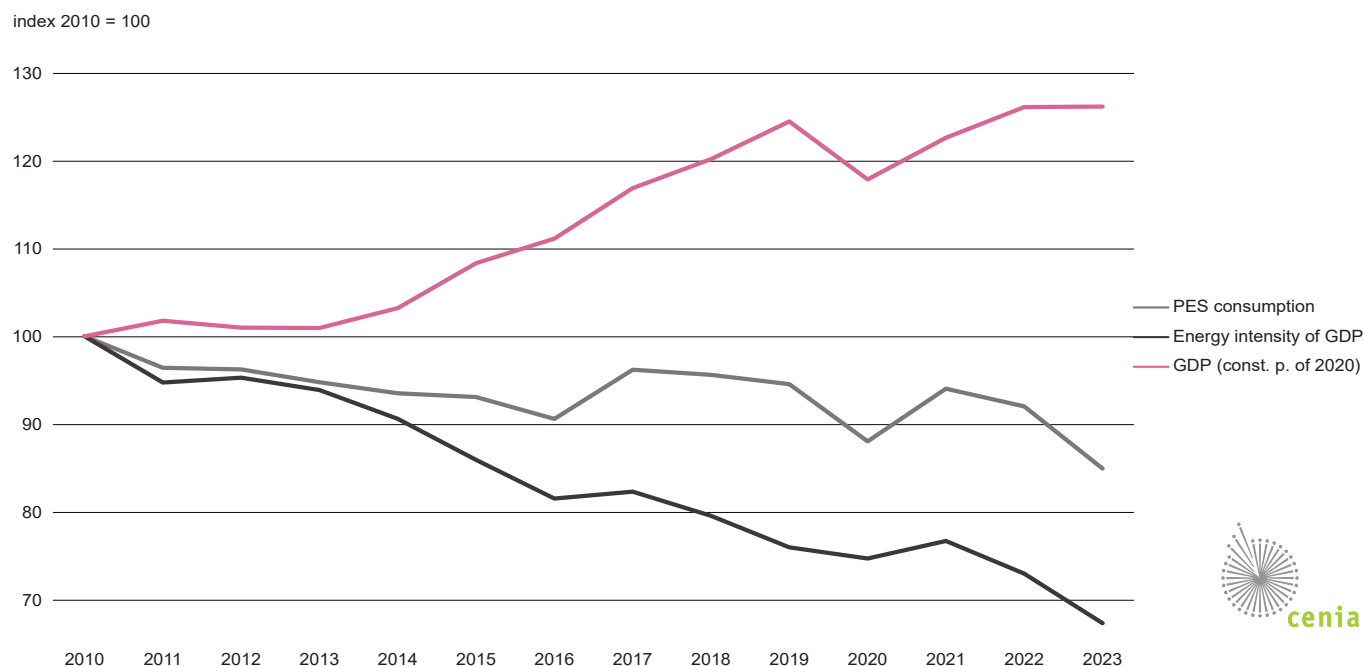
⁵⁵ <https://seepia.cz/>

The energy intensity of the Czech economy **is steadily declining** (Graph 53), falling by 32.7% between 2010 and 2023. In a year-on-year comparison with 2023, the energy intensity of all sectors declined, most significantly in industry, by 19.3%. Transport has the highest and slowest declining energy intensity, which, in addition to high energy consumption in transport, is also influenced by the fact that energy consumption in transport also includes individual car transport, which does not make any direct contribution to economic performance.

In **an international context**, the energy intensity of the Czech Republic (4.25 TJ.mil. EUR⁻¹) is still 38.4% higher (in 2023) than the average energy intensity of the EU27 countries, but it is gradually approaching the EU27 average. According to the NECP update, the Czech Republic's energy intensity should fall to the EU average, but this target **has not yet been met**. The Czech Republic's higher energy intensity is due to the structure of GDP, with a higher share of industry and above-average energy intensity of transport and households.

Graph 53

Energy intensity of GDP in the Czech Republic [index, 2010 = 100], 2010–2023



Data for 2024 are not available at the time of publication.

Data source: CZSO, MIT

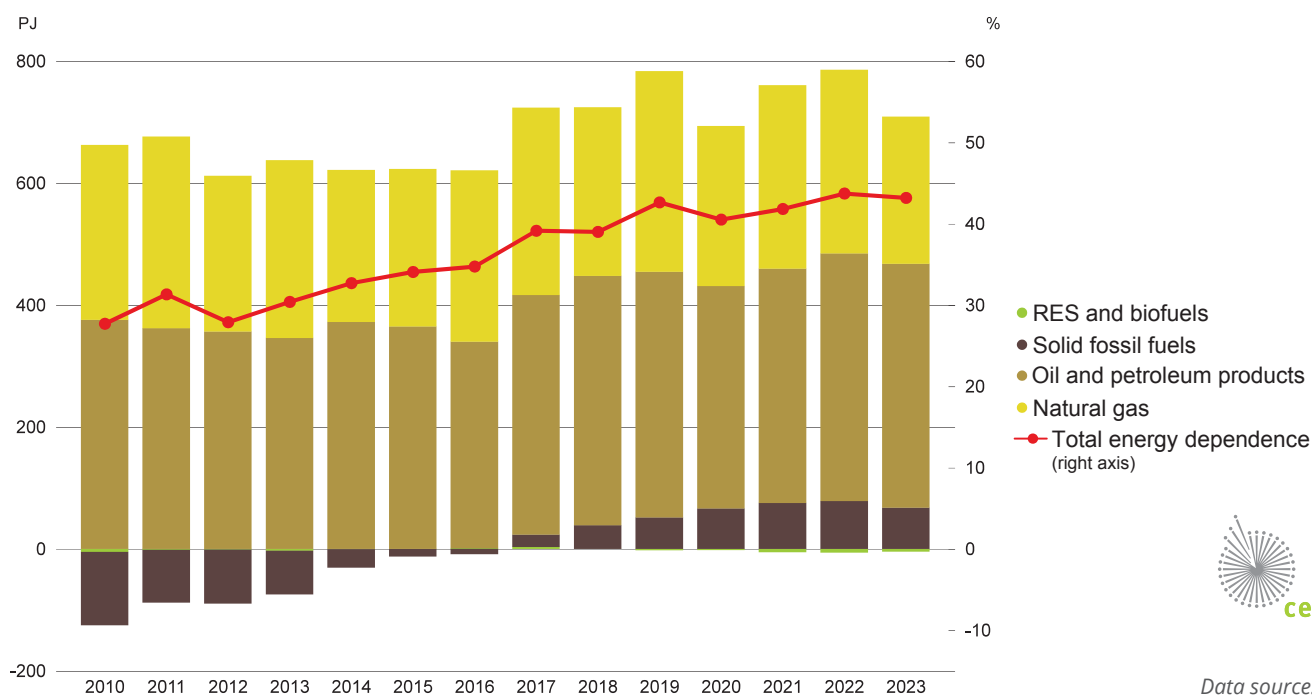
Energy import dependency

The energy security of a country is also determined by **its import energy dependency**, which shows the extent to which the economy is forced to import energy resources in order to meet its energy needs. The Czechia has set a target of not exceeding 65% import energy dependency by 2030 and 70% by 2040⁵⁶. Between 2010 and 2023, the Czech Republic's energy import dependency (the ratio of imports to exports of primary energy sources) rose from 25.5% in 2010 to 41.6% in 2023 (Graph 54). Czechia is almost entirely dependent on imports of oil and natural gas (import and export balance of 402.5 PJ and 241.0 PJ in 2023, respectively), after 2017, a positive import and export balance (predominantly imports) can also be observed for solid fossil fuels in connection with the decline in domestic coal mining.

Compared to the EU27 countries, Czechia is among the countries with lower energy dependence (eighth lowest). The fulfilment of the target corridors for energy dependence by 2030 is likely given the decline in energy consumption and the gradual decarbonisation of the economy.

Graph 54

Balance of exports and imports of individual fuels, Czechia's energy import dependency [PJ, %], 2010–2023



Data source: MIT

Data for 2024 are not available at the time of publication.

⁵⁶ These values include nuclear fuel as an imported source, but for the purposes of calculating the indicator, it is considered a domestic source, mainly due to the possibility of holding relatively high stocks.

Renewable energy sources

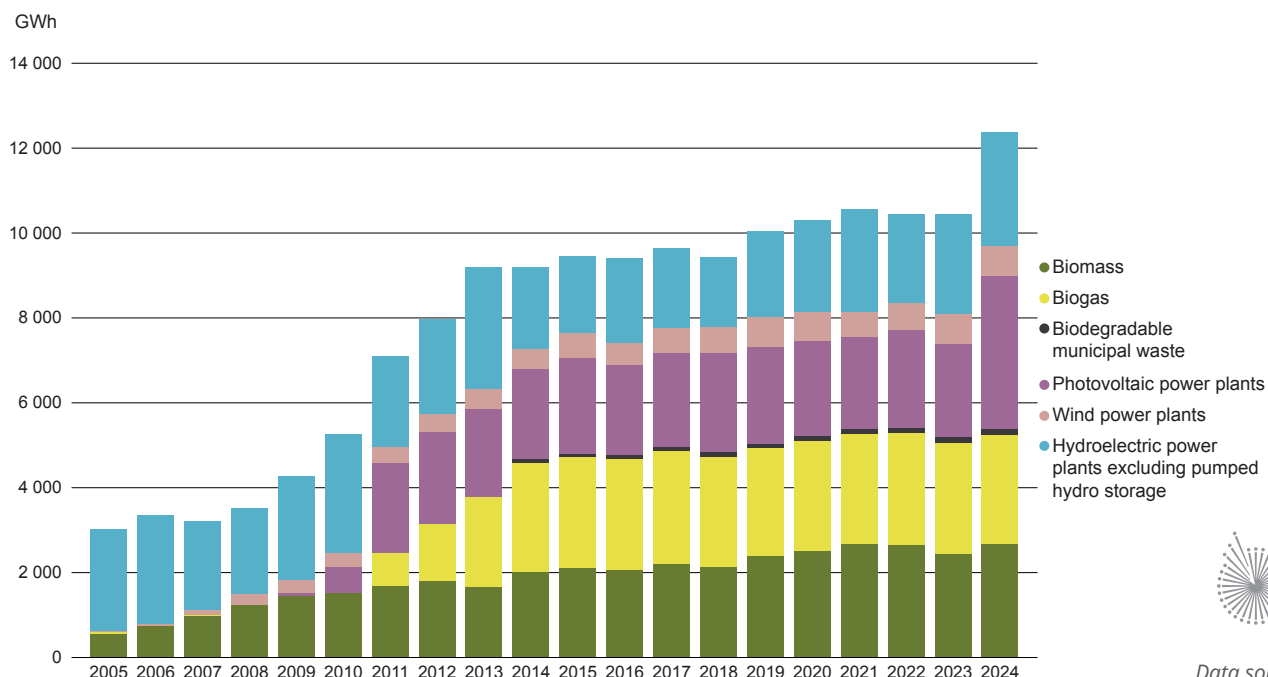
The use of renewable energy sources is beneficial in terms of energy security, decarbonisation of the economy and the move towards climate neutrality. However, it is limited by local natural conditions (relief, climate) and the economic viability of individual types of RES.

Electricity production from renewable sources grew rapidly between 2008 and 2013, when these sources received significant financial support. Since 2014, the growth rate of electricity production from RES has slowed down, but in 2024, year-on-year production from RES increased significantly by 10.9% to 12,355 GWh of electricity (Graph 55), which represented 16.7% of total gross electricity production. The largest year-on-year increase was in the production of photovoltaic power plants (by 24.1%), with photovoltaics accounting for 29.1% of the total electricity produced from RES. Production from hydroelectric power plants (excluding pumped storage plants, which are not considered RES) also increased, by 13.2%, which can be linked to higher average flows in watercourses.

In 2024, **biomass** accounted for 21.6% and **biogas** for 20.7% of total energy produced from renewable sources. Electricity production from **wind power plants** accounted for only 5.8% of electricity from renewable sources, with wind power production stagnating.

Graph 55

Electricity production from RES in the Czech Republic [GWh], 2003–2024

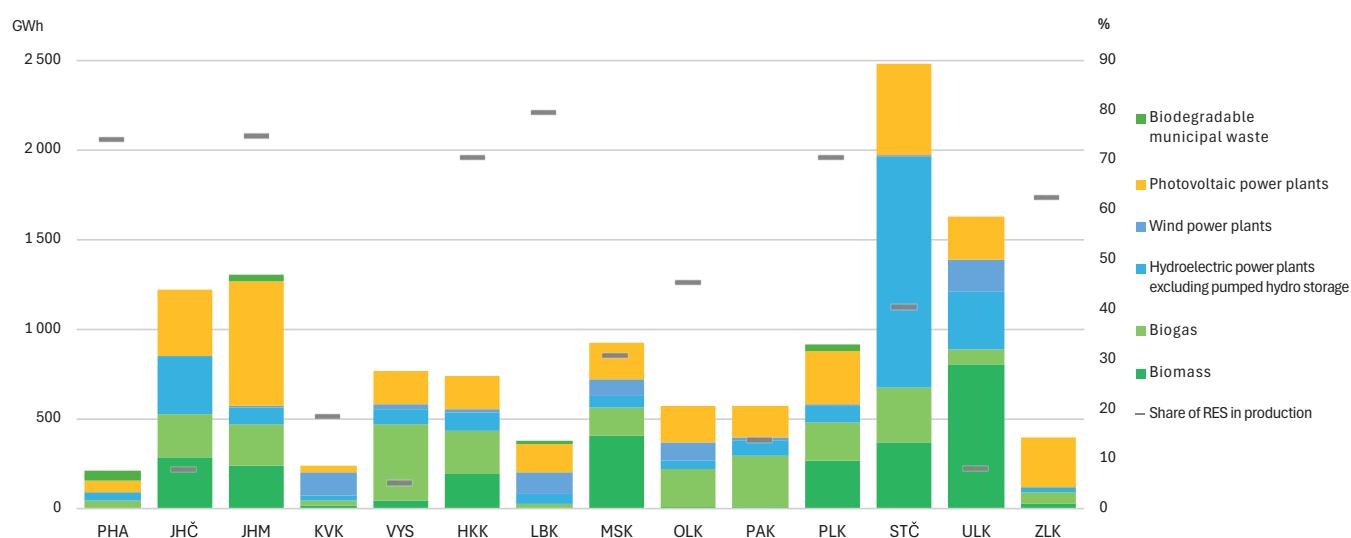


Of the regions of Czechia, the Central Bohemian Region has the highest production of electricity from RES (2,480.5 GWh in 2024), due to electricity production in the Vltava cascade hydroelectric power plants (52.0% of electricity from RES in the region), and to a lesser extent in photovoltaic power plants and biomass steam power plants (Graph 56). The highest electricity production from biomass is in the Ústí nad Labem Region (801.4 GWh, i.e. 49.3% of electricity from RES in the region), which is burned in local steam power plants. The most electricity from photovoltaics was produced in the South Moravian Region (692.1 GWh, i.e. 52.8% of electricity from RES in the region), which has favourable climatic conditions for electricity production in photovoltaic power plants.

The least electricity from RES was produced in the capital city of Prague. Given that the region has no other sources of electricity, the share of RES in total electricity production was higher than 70%. The situation is similar in the Liberec Region. The lowest share of RES in total electricity production is in regions with large coal-fired or nuclear power plants (the Vysočina, South Bohemian and Ústí regions).

Graph 56

Gross electricity production from RES in regions and the share of electricity production from RES in total gross electricity production [GWh, %], 2024



Data source: ERO

Two **binding targets** have been set for **energy from renewable sources** in Czechia. The target of the updated National Energy and Climate Plan is to achieve a 30% share of RES in gross final energy consumption by 2030. Another target, set by the State Energy Policy (SEP), is to achieve a share of RES in electricity generation of between 18% and 25% by 2040. Due to the growth in electricity production from RES, the share reached 16.7% in 2024 and is thus already almost within the corridor set for 2040.

According to SHARES data⁵⁷, **the share of RES in final energy consumption** was 18.6% in 2023, an increase of 0.5 percentage points year-on-year. Although the share of RES in final energy consumption in Czechia is growing steadily, this growth is very slow and unless the growth dynamics of RES energy use increase, the 2030 target will not be achieved. The SEEPIA project model scenarios⁵⁸ suggest that the share of renewable energy sources in final consumption could reach 24.0% in 2030 if current policies are maintained (WEM scenario) and up to 30.1% if additional measures aimed at deeper decarbonisation are implemented (WAM scenario).

Heat production from renewable sources (in large sources, i.e. district heating and large domestic boiler rooms) showed an upward trend in the period 2010–2023⁵⁹. In 2023, it increased by 4.0% year-on-year to 12,156 TJ, and the share of RES in heat production reached 12.2%. Biomass has the largest share in heat production from RES, accounting for 79.2% in 2023. Other sources of heat include waste (heat from waste incinerators, 14.0%), biogas (6.1%) and heat pumps (0.6%).

⁵⁷ SHARES (Short Assessment of Renewable Energy Sources) methodology, see Directive 2009/28/EC and Directive (EU) 2018/2001 (RED II). SHARES data for 2024 are not available.

⁵⁸ <https://seepia.cz/>

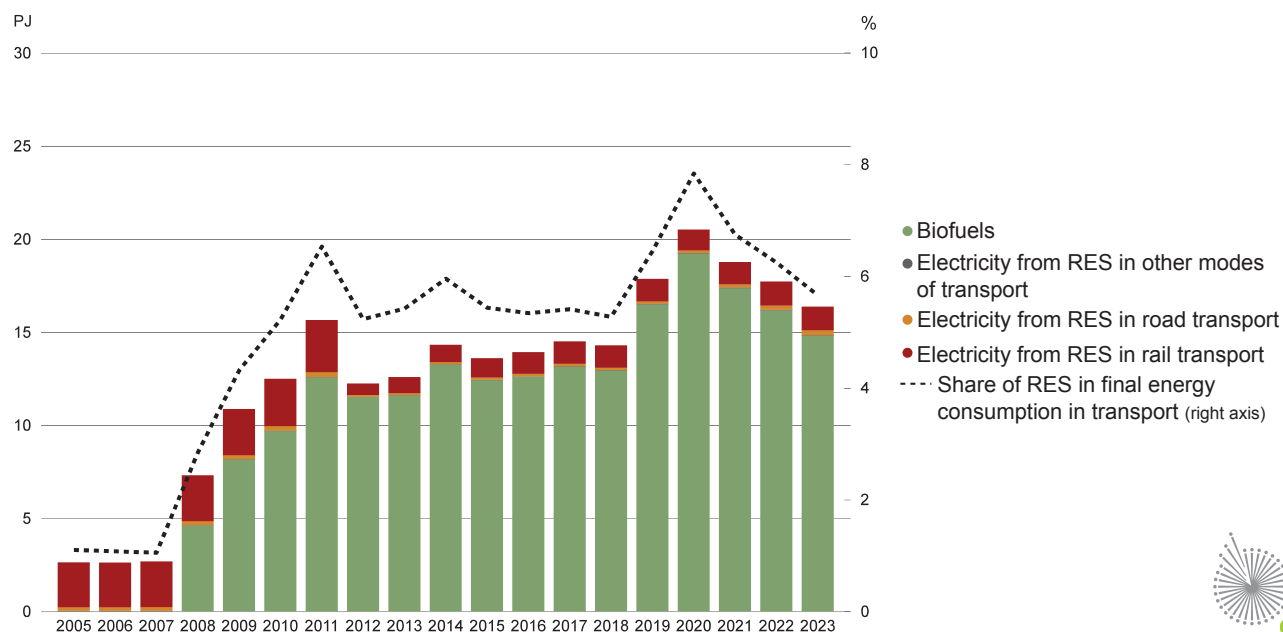
⁵⁹ Data for 2024 are not available at the time of publication.

The growth in the use **of RES in transport** is essential for reducing transport's dependence on fossil fuels, for decarbonising transport and thus for reducing greenhouse gas emissions from transport. Binding targets for the share of RES in final energy consumption in transport were set for 2020 by Directive 2009/28/EC. This directive was replaced by Directive 2018/2001/EC (RED II), according to which the share of RES in transport is to increase to 14% by 2030. In October 2023, the amended Directive 2023/2413/EC (RED III) came into force, increasing the target share of RES to 29% and introducing an alternative target of reducing fuel emission intensity by 14.5% compared to the baseline set by according to the methodology of the directive, i.e. when using fossil fuels. The RED III Directive sets a new target for the share of advanced fuels and renewable fuels of non-biological origin (RNFBO), which should reach 5.5% by 2030, with the share of RNFBO alone being at least 1%.

According to SHARES data, **energy consumption from RES** in 2023 amounted to 16.4 PJ, which represented 5.65% of final energy consumption in transport (Graph 57). Biofuels accounted for the largest share of energy consumption from RES in transport in that year (90.4%), while electricity consumption in rail transport accounted for 7.7% and road transport for only 1.7%.

It is difficult to track **trends in renewable energy consumption** in transport and its share of total final energy consumption in transport due to changes in the calculation methodology resulting from the amendment to the directive on the promotion of renewable energy sources. Specifically, this concerns the method of determining the energy mix for calculating electricity consumption from RES in electric modes of transport (the RED II Directive uses the national mix instead of the previously used EU27 average), as well as the method of accounting for biofuels and so-called multipliers, which favour certain fuels and modes of transport in the calculation. The decline in the time series between 2020 and 2021 is thus largely due to methodology, not changes in the use of RES in transport.

In reality, **the use of RES in transport** can be described **as stagnant**, and from 2021 onwards even slightly declining, with the use of biofuels in transport falling by 14.8% in the period 2021–2023. As a result of this development, the share of RES in 2023 fell by 0.6 percentage points year-on-year to 5.7%, and the target set by the RED II Directive (29% of energy from RES) and the update of the NECP is therefore not currently being met and **is unlikely to be met by 2030**. However, model calculations carried out as part of the SEEPIA project for the NECP update predict significant growth in the share of RES in transport in the future. According to the WEM scenario (with existing measures), the share should reach 13.7% of final energy consumption in transport in 2030, while the WAM scenario with additional measures assumes a more significant increase in the use of RES in transport to 18.1% of final energy consumption in transport in 2030.

Graph 57**Energy consumption from RES in transport in Czechia and the share of RES in final energy consumption in transport [PJ, %], 2005–2023**

Data for 2024 are not available at the time of publication.

Data source: MIT

**Detailed visualisations and data**

<https://www.envirometr.cz/data>

2 Climate-neutral and circular economy

2.2 Transition to a circular economy

Key messages

- The material intensity of the economy is decreasing, thereby reducing pressure on the environment. Between 2000 and 2023⁶⁰, the decreased by 50.8%.
- Total waste production in 2023⁶¹ decreased by 3.0% year-on-year to 38.0 million tonnes (in the case of municipal waste, production remained at 5.8 million tonnes).
- In 2023, packaging waste production fell slightly year-on-year to 1,368,200 tonnes, but a growing trend can be observed in the medium term. In terms of the material composition of packaging waste, paper and cardboard packaging is the most common (42.6% in 2023), followed at a considerable distance by plastics (20.5%) and glass (16.3%).
- Waste management is dominated by waste recovery, especially material recovery, whose share is growing in both the medium and short term and amounted to 83.8% in 2023.
- Despite the positive developments in municipal waste management, a large proportion (42.4%) of municipal waste is still landfilled.
- An environmentally friendly approach to waste and packaging production is guaranteed by the eco-labelling of products and services. After a long-term decline, the number of licences for the Czech EFP and EFS eco-labels has stagnated, while the number of EU Ecolabel licences is growing. In 2024, there were a total of 31 valid licences in Czechia with 72 products certified by the EFP/EFS eco-label, while in the case of the EU Ecolabel, there were 43 licences for 5,236 certified products.

⁶⁰ Data for 2024 was not available at the time of publication.

⁶¹ Data for 2024 were not available at the time of publication.

2.2 Transition to a circular economy

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2024)	Target achievement
Material intensity of the economy	The material intensity of the economy is decreasing			Decrease in material intensity of the economy by 50.8% in the period 2000–2023	
Waste production	Maximum prevention of waste generation			Total waste production in 2023* amounted to 38.0 million tonnes (a year-on-year decrease of 3.0%). Municipal waste production was 5.8 million tonnes (year-on-year stagnation).	
Eco-labelling**					
Total number of valid EFP or EFS eco-labelling licences	100 valid EFP or EFS eco-labelling licences by 2030			31 valid licences with 72 products certified with the EFP/EFS eco-label	
Total number of valid EU Ecolabel licences	25 valid EU Ecolabel licences by 2030 ⁶²			43 licences for 5,236 products certified with the EU Ecolabel	
Waste management structure	The waste management hierarchy is being followed			Material recovery prevails, with an 83.8% share in 2023*. The share of landfilling is not decreasing significantly and stands at 13.1%.	

⁶² Target value of the indicator according to the SEP 2030.

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status (2024)	Target achievement
Municipal waste management	Increase the share of municipal waste recycling to at least 65% and reduce the share of municipal waste landfilling to a maximum of 10% by 2035 ⁶³			Despite favourable developments in municipal waste management, a large proportion (42.4%) of municipal waste is still landfilled.	

* Value in 2023. Data for 2024 were not available at the time of publication.

** Due to differing trends in the time series on which the indicator is based, the assessment of sub-indicators (elementary indicators) is provided.

Current measures supporting the achievement of the target

- Following on from the Strategic Framework for the Circular Economy of the Czech Republic 2040, the Action Plan for the Circular Economy 2022–2027 was approved.
- A new Waste Management Plan for the Czech Republic for the period 2025–2035 has been approved.
- Act No. 243/2022 Coll. prohibits the placing on the market of a number of single-use plastic products.
- The Ministry of the Environment has drawn up a strategy for expanding extended producer responsibility systems in Czechia.
- An amendment to the Packaging Act was prepared, allowing for the introduction of a deposit system for plastic beverage bottles and metal beverage containers (especially cans).
- The development of waste management infrastructure is supported, contributing to higher demand for products made from recycled materials and, at the same time, to the use of plastic waste generated in Czechia through individual calls for proposals under the OP Environment 2021–2027 and the preferential treatment of recycled products in so-called 'green' tenders.
- The Ministry of the Environment, in cooperation with the State Environmental Fund of the Czech Republic, has prepared a system of bonuses within the OPE 2021–2027 for projects that involve the purchase of products made from secondary raw materials.
- The development of technologies aimed at reducing material intensity was supported by the TREND programme (Ministry of Industry and Trade), which supported a total of 525 projects in its first eight competitions. OPST 2021–2027 supports innovative and pilot circular economy projects leading to a reduction in material intensity.
- A long-term research project is underway: Centre for Environmental Research: Waste and Circular Economy and Environmental Safety (CEVOOH). The main beneficiary and leader of the project consortium is CENIA.

⁶³ Target value of the indicator according to the Waste Management Plan for the Czech Republic.

Material intensity of the economy

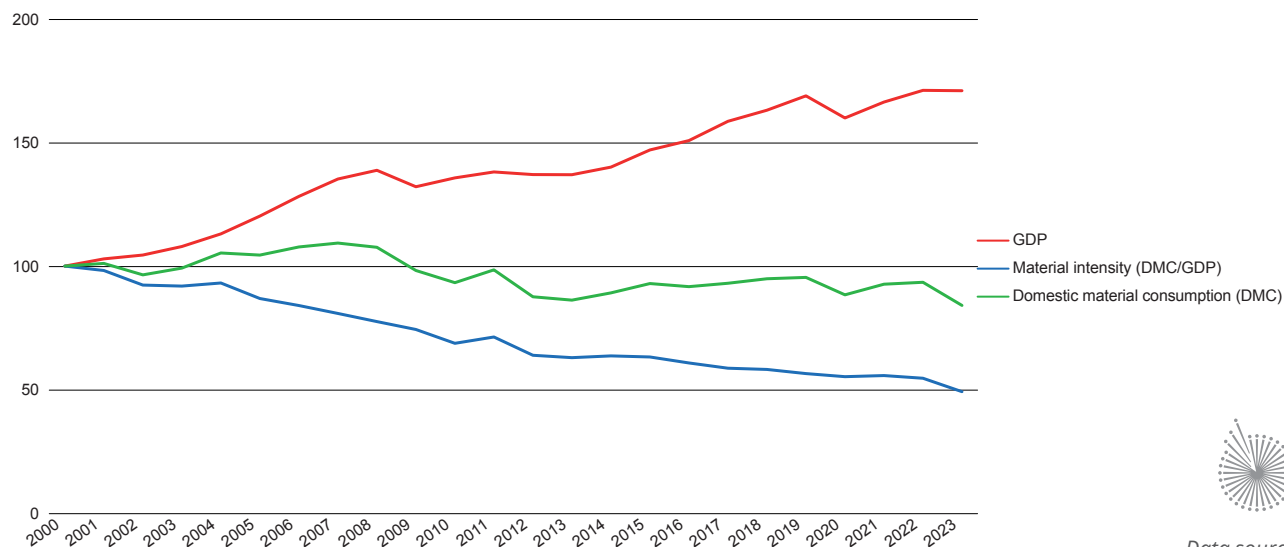
The **material intensity of the economy** in 2023⁶⁴ decreased significantly by 10.0% year-on-year to 24.3 kg.1000 CZK⁻¹ and was 50.8% lower than in 2000 (Graph 58). Declining material intensity indicates a reduction in the economy's demand for natural resources and material consumption as a result of the growing efficiency of converting material inputs into economic output. The situation in 2023 represents relative decoupling, with domestic material consumption falling significantly by 10.0% to 151.3 million tonnes amid year-on-year stagnation in economic output.

In most years of the period 2000–2023, material intensity showed a pattern of **relative decoupling**, with the environmental burden represented by material consumption (DMC) per unit of GDP declining, but in absolute terms, DMC follows the trend of the economy (i.e. it rises when the economy grows and falls when it declines). This is a consequence of the structure of GDP creation in Czechia, with a high share of industry, and also of the fact that economic growth during the period under review was significantly influenced by the manufacturing industry and its more material-intensive sectors. **Absolute decoupling**, where the environmental burden in absolute terms decreases despite economic growth, which is optimal from an environmental perspective, was rare during the period under review. It occurred in five years of the period under review, most recently in 2016.

Graph 58

Development of material intensity of the economy, domestic material consumption and GDP in the Czech Republic [index, 2000 = 100], 2000–2023

index (2000 = 100)



Data source: CZSO

GDP in constant 2020 prices.

Data for 2024 are not available at the time of publication.

Factors contributing to the decline in material intensity after 2000 include the reduction in the share of solid fossil fuels in the energy mix for electricity and heat production, the growth in the use of renewable energy sources, and the reduction in the energy and material intensity of industry. Declining material intensity makes it possible to limit the negative impacts on the landscape associated with the extraction of mineral resources and to reduce the waste flows of the economy related to the use of materials and raw materials, including air emissions and waste production. The growing efficiency of biomass cultivation and use reduces the pressure of agriculture on water quality and ecosystems.

⁶⁴ Data for 2024 are not available at the time of publication.

Given the nature of its economy, Czechia has slightly above-average **material flow intensity indicators**, and thus also specific environmental pressures per capita and per unit of GDP associated with the extraction and consumption of materials, compared to other EU27 countries. **Domestic material consumption per capita** in Czechia in 2023⁶⁵ was 15.0 t.capita⁻¹, which is 8.5% above the EU27 average. The material intensity of the Czech economy in 2023 was 0.43 tonnes.(1,000 PPS)⁻¹, which is 20.0% above the average material intensity of EU27 countries. The highest material intensity is found in economically weaker countries with high levels of extraction and consumption of raw materials and other materials (e.g. Romania, Bulgaria), while the Czech Republic ranks among the best in Central Europe in terms of material intensity among countries with a similar economic profile.

Waste prevention

Currently, the key trend in waste management is the transition to a **circular economy**, where material flows are closed in long-term cycles and emphasis is placed on waste prevention, product reuse, recycling and conversion to energy instead of mineral extraction and landfilling.

The main factors influencing waste production and management include, above all, economic development, where there is generally an almost linear relationship between economic development and waste production. This is also related to the economic situation of the population – different socio-economic groups have different consumption habits and thus a different impact on waste management; higher incomes are associated with more intensive consumption behaviour and thus with greater amounts of waste. Czechia is a traditional industrial country with significant amounts of industrial and electronic waste, which requires subsequent professional processing and recycling. Other factors include demographic characteristics; regardless of the age structure of the population, there is a correlation between waste production and population growth. Whether the rate of population and waste growth will be linear depends on the availability of waste management infrastructure and on the behaviour, education and attitudes of the population towards waste management⁶⁶.

Total waste production (the sum of total production of other and hazardous waste) between 2009 and 2023⁶⁷ increased by 17.8%, but between 2022 and 2023 it decreased by 3.0% to 38,009.1 thousand tonnes (Graph 59). In 2023, the decline in production from 2022 was confirmed, mitigating the medium-term upward trend. Waste production can be reduced by preventing its generation, which is in line with the principles of the circular economy. Another important indicator is total waste production per capita, which amounted to 3,494.1 kg.capita⁻¹ in 2023, a year-on-year decrease of 6.1%. The total production **of other waste** accounts for a significant proportion (95.8% in 2023) of **total waste production**. This is mainly influenced by the production of construction and demolition waste. Between 2009 and 2023, the total production of other waste increased by 21.0%, but fell by 3.0% year-on-year between 2022 and 2023 to 36,431.4 thousand tonnes. Given the dominant position of this waste group in total waste production, a similar trend can be observed here as in total waste production, i.e. a moderation of the medium-term upward trend. **Hazardous waste** accounted for 4.2% of total waste production in 2023. This share has fallen from 6.7% since 2009. Between 2009 and 2023, total hazardous waste production fell by 27.0% and by 1.4% year-on-year between 2022 and 2023 to a total of 1,577.7 thousand tonnes. Total hazardous waste production per capita in 2023 was 145.0 kg.capita⁻¹. It is possible to prevent the generation of this waste by reducing the content of hazardous substances in products.

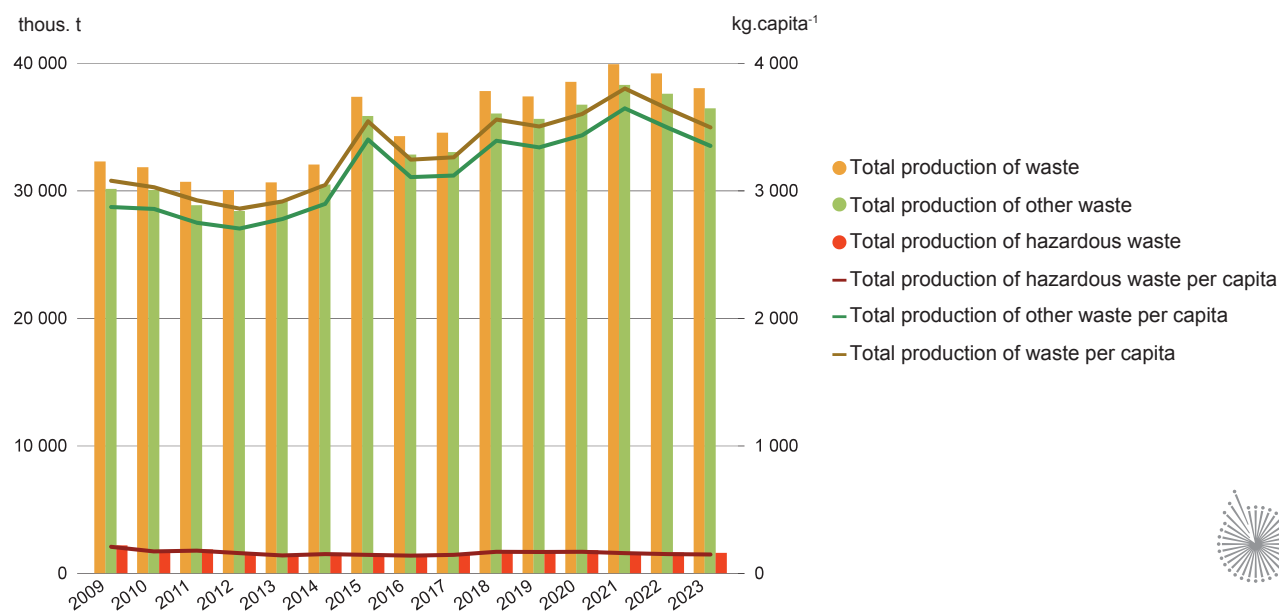
⁶⁵ Data for 2024 are not available at the time of publication.

⁶⁶ Taken from the Czech Republic Waste Management Plan for 2025–2035 (Analytical section).

⁶⁷ Data for 2024 was not available at the time of publication.

Graph 59

Total production of waste, other waste and hazardous waste in the Czech Republic [thousand tonnes], total production of waste, other waste and hazardous waste per capita in Czechia [kg.capita⁻¹], 2009–2023

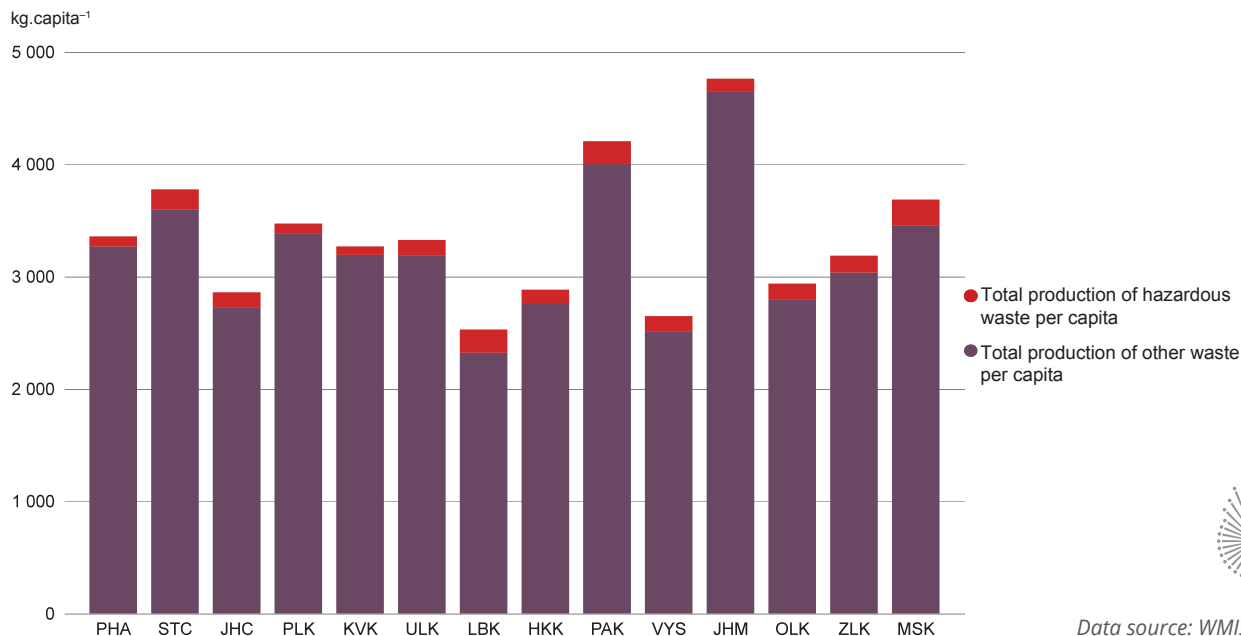


Data source: WMIS MoE, CZSO

The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. The Czech Statistical Office is the source of data on the population of Czechia (average). Data for 2024 were not available at the time of publication.

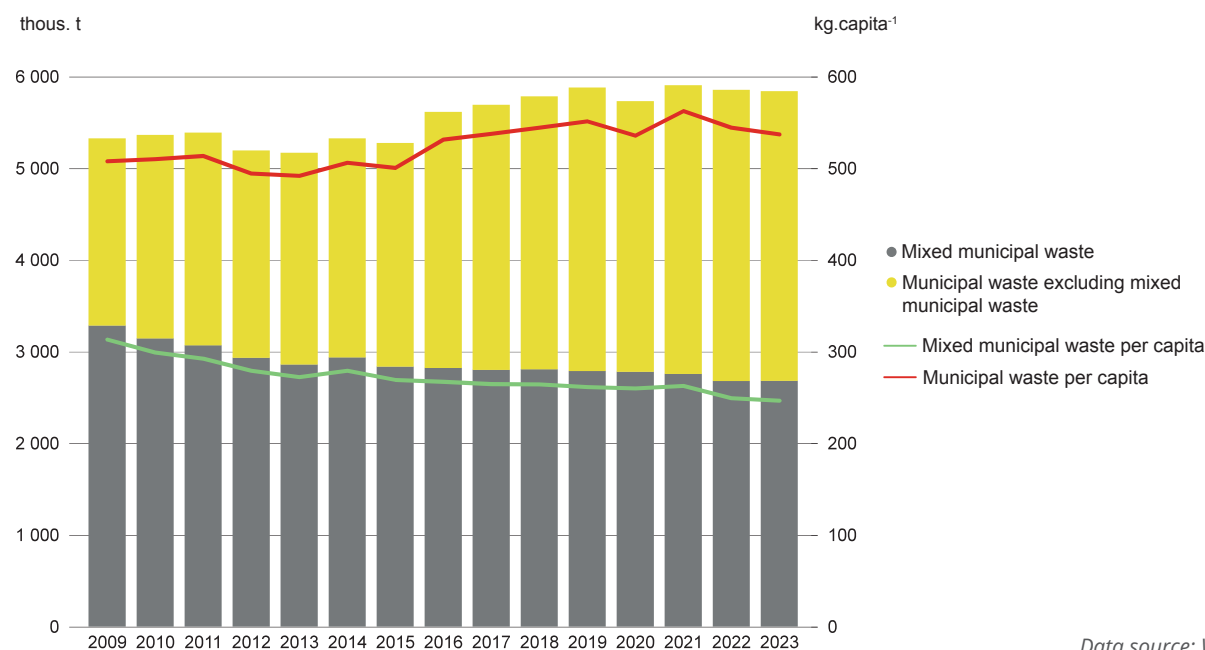
When **comparing total waste production per capita across regions⁶⁸**, it is necessary to take into account the current state of industry, construction and demolition activities, remediation of old environmental burdens, the introduction and use of the best available techniques, and the demographic characteristics of the region. In 2023, the highest total waste production per capita was reported in the South Moravian Region (4,762.3 kg.capita⁻¹), the Pardubice Region (4,205.8 kg.capita⁻¹) and the Central Bohemian Region (3,775.5 kg.capita⁻¹), see Graph 60. For comparison, in 2022, total waste production per capita was highest in the South Moravian Region (4,368.3 kg.capita⁻¹), the Moravian-Silesian Region (4,289.4 kg.capita⁻¹) and Ústí nad Labem (4,014.9 kg.capita⁻¹).

⁶⁸ Total production of other and hazardous waste per capita.

Graph 60**Total production of other and hazardous waste per capita in regions [kg.capita⁻¹], 2023**

The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. The Czech Statistical Office is the source of data on the population of the Czech Republic (average). Data for 2024 were not available at the time of publication.

Municipal waste production in 2023 reached 5,840.2 thousand tonnes (Graph 61) and remained at virtually the same level as in 2022. In the medium term since 2009, however, municipal waste production has increased by 9.7% and, per capita, reached 536.9 kg.capita⁻¹ in 2023. On a positive note, there has been a slight decrease in **mixed municipal waste production** in the medium term. Between 2009 and 2023, mixed municipal waste production decreased by 18.4%, remaining almost unchanged year-on-year at 2,680.8 thousand tonnes. Mixed municipal waste production per capita in 2023 was 246.4 kg.capita⁻¹.

Graph 61**Municipal waste production in the Czech Republic [thousand tonnes], municipal and mixed municipal waste production per capita in the Czech Republic [kg.capita⁻¹], 2009–2023**

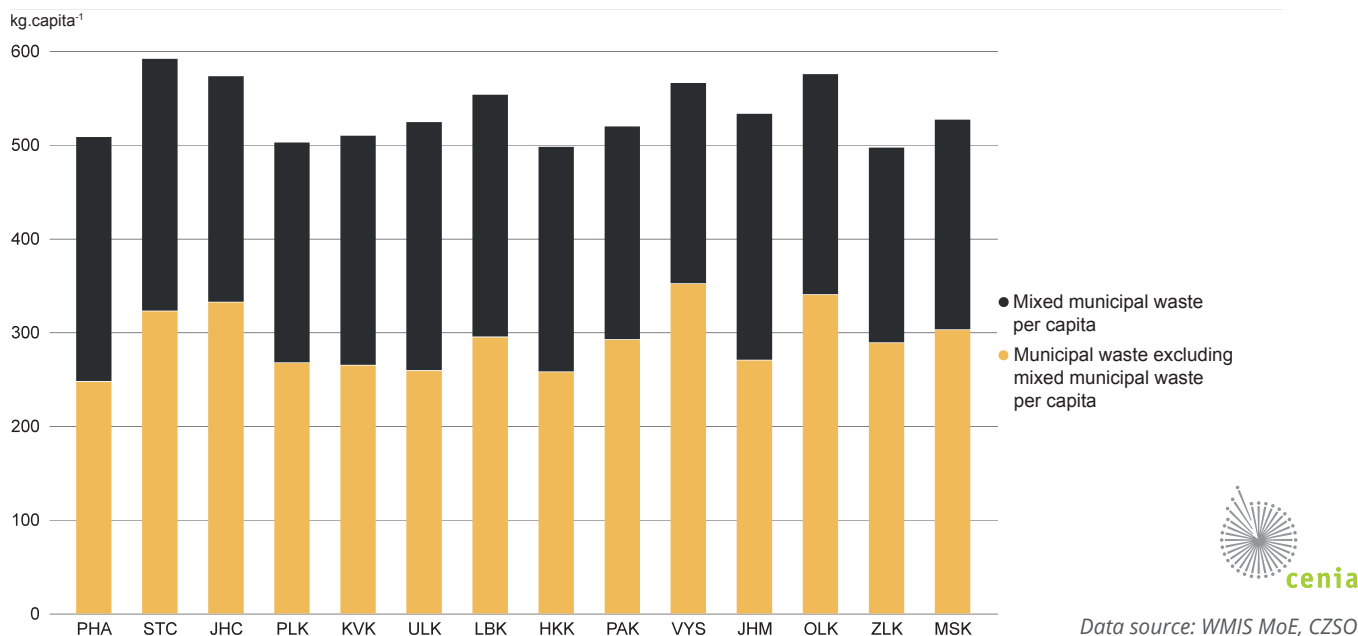
Data source: WMIS MoE, CZSO

The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. The Czech Statistical Office is the source of data on the population of Czechia (average). Data for 2024 were not available at the time of publication.

In terms of per capita production, the highest **municipal waste production** in 2023 was in the Central Bohemian Region (591.6 kg.capita⁻¹) and the Olomouc Region (575.3 kg.capita⁻¹). The Central Bohemian Region (Graph 62) also had the highest production of mixed municipal waste per capita (269.4 kg.capita⁻¹). Conversely, the lowest production of municipal waste was in the Zlín Region (497.0 kg.capita⁻¹) and the Hradec Králové Region (497.8 kg.capita⁻¹). This production is influenced by various factors, including the structure of the population. The reason for the higher production of municipal waste is also the significant concentration of service facilities, whose waste, in addition to household waste, is also included in the production of municipal waste, but also the degree of waste sorting and the high concentration of population.

Graph 62

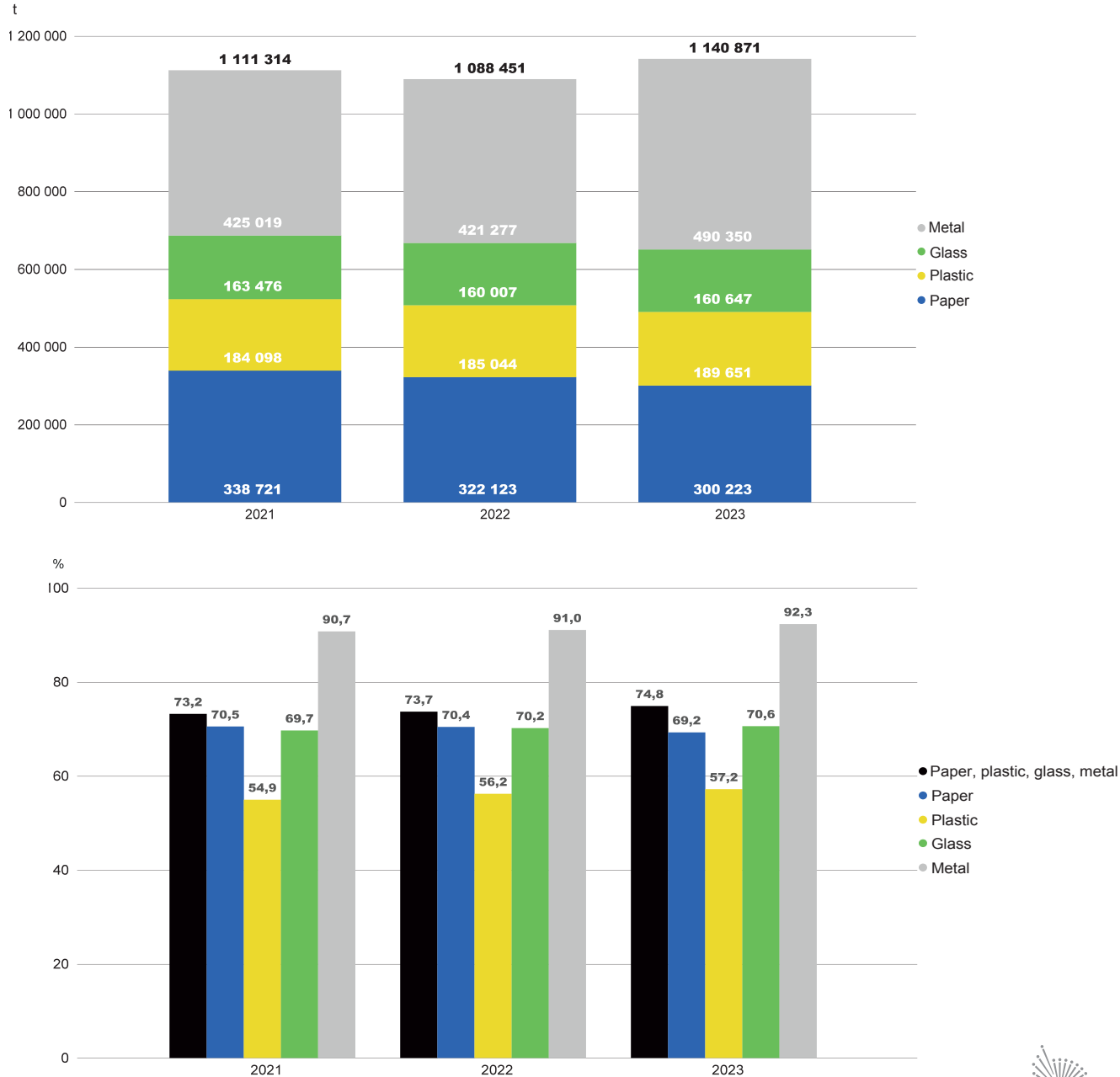
Municipal waste production per capita and mixed municipal waste production per capita in regions [kg.capita⁻¹], 2023



The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. The Czech Statistical Office (CZSO) is the source of data on the population of the Czech Republic (average). Data for 2024 were not available at the time of publication.

One of the most characteristic manifestations of a consumer society is the increase in **packaging waste production**. Between 2009 and 2023, packaging waste production increased by 53.0%. In 2023, 1,368.2 thousand tonnes of packaging waste were produced in Czechia, a slight decrease of 2.6% compared to 2022. However, despite the decline in the last two years, a significant upward trend can be observed in the medium term. In terms of the material structure of packaging waste, paper and cardboard packaging is the most common (42.6% in 2023), followed at a considerable distance by plastics (20.5%) and glass (16.3%).

In view of the above-mentioned increase in packaging waste production, it is necessary to promote **waste sorting (separation)** systems, in which the waste produced is separated for further use. In 2023, a total of 1.1 million tonnes of waste was sorted in municipalities, of which 490,000 tonnes was metal, 300,000 tonnes was paper, 190,000 tonnes was plastic and 161,000 tonnes was glass (Graph 63). The overall efficiency of separation in Czechia is gradually increasing and in 2023 it was 74.9%, with the highest rates in the Zlín (79.6%) and Moravian-Silesian (78.8%) regions and the Olomouc region (78.5%). Conversely, the lowest sorting efficiency for these waste categories was reported in the Capital City of Prague (67.3%) and the Ústí nad Labem Region (68.7%).

Graph 63**Separation of paper, plastic, glass and metal from municipalities [t/year], separation efficiency in the Czech Republic [%], 2021–2023**

Data for 2024 were not available at the time of publication.

Data source: WMIS MoE



A sustainable approach to waste and packaging production is one of the principles that guarantees the eco-labelling of products and services. **Eco-labelling** is the labelling of products and services that are demonstrably more environmentally friendly and safer for consumer health throughout their entire life cycle. Their quality must remain at a very high level, and their useful properties are tested by accredited laboratories. Ecolabels are awarded after comprehensive verification of the entire product life cycle. Certified products or services can be recognised by a simple and easy-to-remember symbol, the ecolabel logo.

The **EU Ecolabel** is the official European Union label for environmental excellence. Purely Czech, independent labels in this regard are the **Environmentally Friendly Product (EFP)** and **Environmentally Friendly Service (EFS)**, which are guaranteed by the Ministry of the Environment. It is up to the applicant to decide whether they want to certify their product with a national label, an EU label, or both.

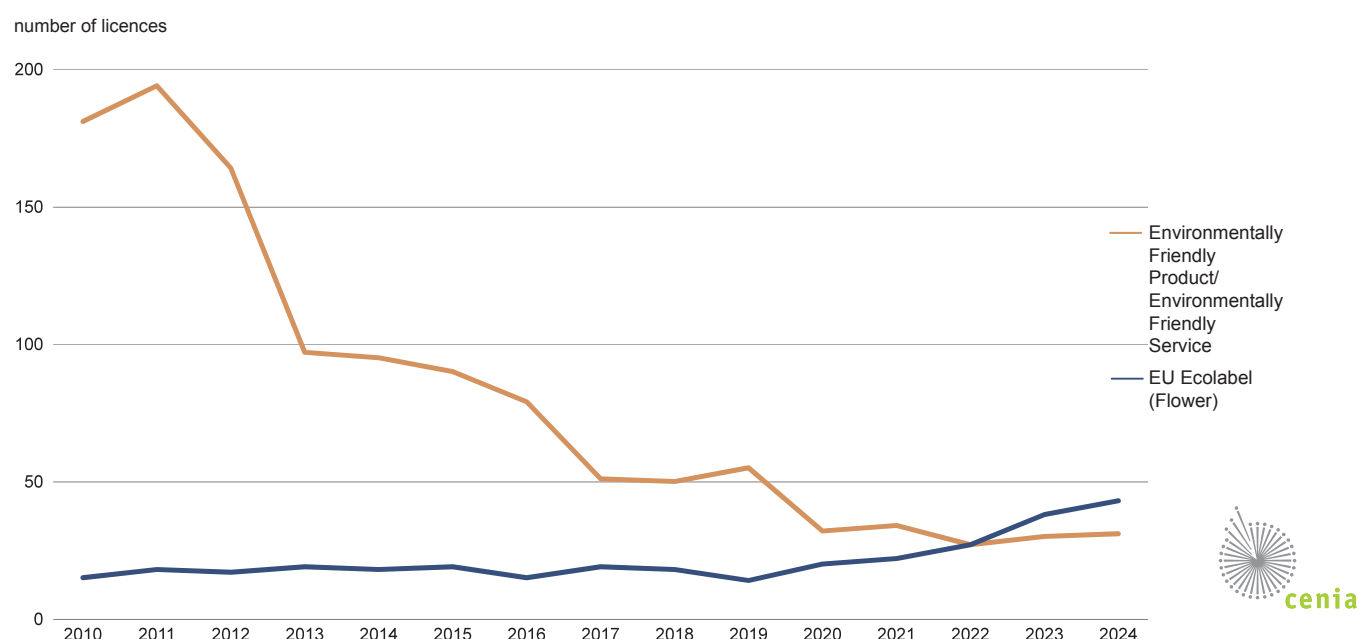
In 2024, there were a total of **31 valid licences** in Czechia with 72 products certified by the EFP/EFS eco-label, while in the case of the EU Ecolabel, there were **43 licences** for 5,236 certified products. Compared to 2023, there is a growing trend in the number of EU Ecolabel licences, while the number of EFP/EFS licences is rather stagnating (Graph 64). It is clear that if current trends continue, the EFP/EFS eco-label will not achieve its target for 2030 (100 valid licences), unlike the EU Ecolabel, where the target of 25 valid licences has already been achieved. In order to increase consumer demand for eco-labelled products and manufacturers' interest in eco-labels, the promotion of eco-labelling continued in 2024. In cooperation with the Czech Quality programme, for example, online webinars were held for all those interested in eco-labels, competitions for certified products were held on social networks, and television reports on successful eco-label holders were broadcast.

The criteria for eco-label certification are continuously updated in line with the latest knowledge and available technologies so that eco-labels remain a symbol of environmental excellence and stimulate ecological innovation. As a result, only 10-20% of environmentally friendly products achieve eco-labels. At the end of 2023, new criteria were issued for absorbent hygiene products and reusable menstrual cups, with significantly stricter environmental limits and requirements, yet two Czech manufacturers have already modified their production processes and obtained the eco-label according to this set of criteria. The largest number of valid EFP/EFS and EU Ecolabel licences continues to be in the categories of furniture, paper, cosmetics and drugstore products, but the categories of tourist accommodation and lubricants are also showing a growing trend.

In an international context, it is possible to compare the number of licences, or products and services certified by the EU Ecolabel, in individual European countries. As of September 2024, there were a total of 2,983 valid licences for 98,977 certified products and services across the EU27. Czechia ranked 8th in terms of the number of certified products and services among all EU27 countries.

Graph 64

Valid EFP/EFS and EU Ecolabel (or EU Flower) eco-labels in the Czech Republic [number], 2010–2024



Data source: MoE

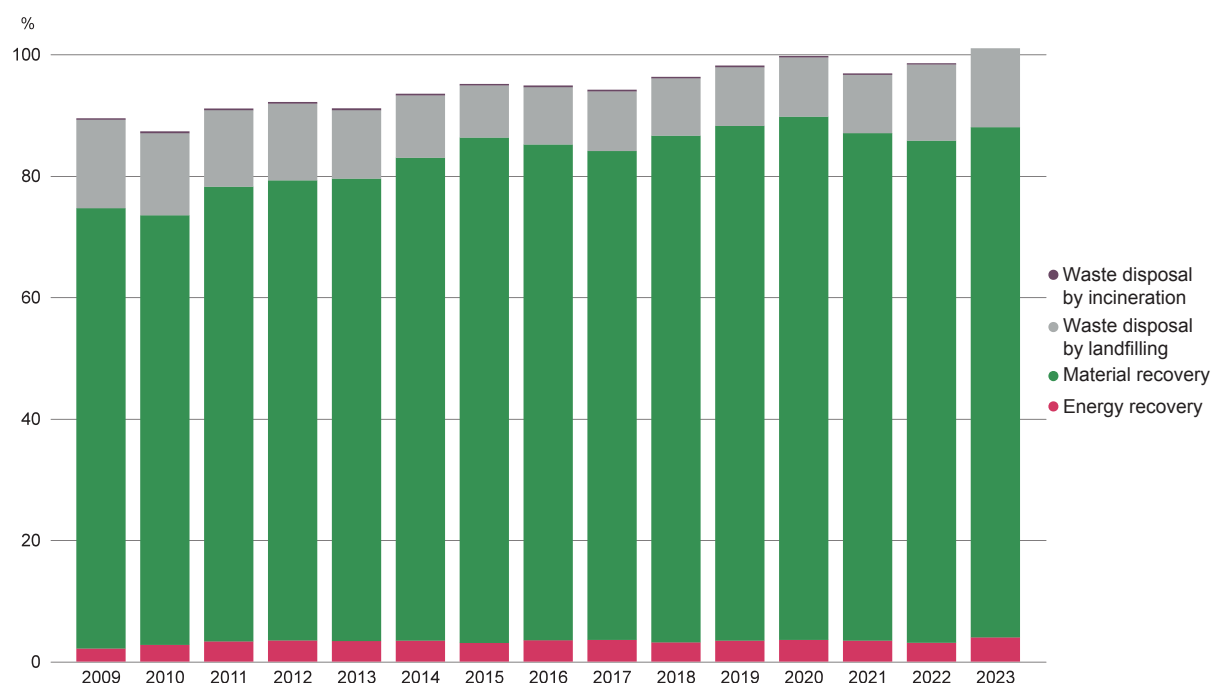
Compliance with the waste management hierarchy

Waste management is dominated by waste utilisation, especially material utilisation, whose share is growing in both the medium and short term (Graph 65). Between 2009 and 2023⁶⁹, the share of waste **utilised** for **material** recovery increased from 72.5% to 83.8% (i.e. to 27,099.6 thousand tonnes). Only a small part of total waste production is **used for energy**. Between 2009 and 2023, the share of waste used for energy increased from 2.2% to 3.6% (i.e. to 1,402.2 thousand tonnes).

The most common method of waste disposal is storage at or below ground level, i.e. **landfilling**. This remains a significant problem in Czechia. Since 2009, the share of landfilling has fallen from 14.6% to 13.1% in 2023, which is not a significant decrease. In 2023, the amount of waste disposed of by landfilling was 4,446.4 thousand tonnes. Another method of waste disposal is **incineration**. Every year, approximately 0.2% of the waste produced is disposed of by incineration, which is a negligible proportion (i.e. 66.4 thousand tonnes in 2023).

Graph 65

Share of selected waste management methods in waste production in the Czech Republic [%], 2009–2023



The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. Data for 2024 were not available at the time of publication.

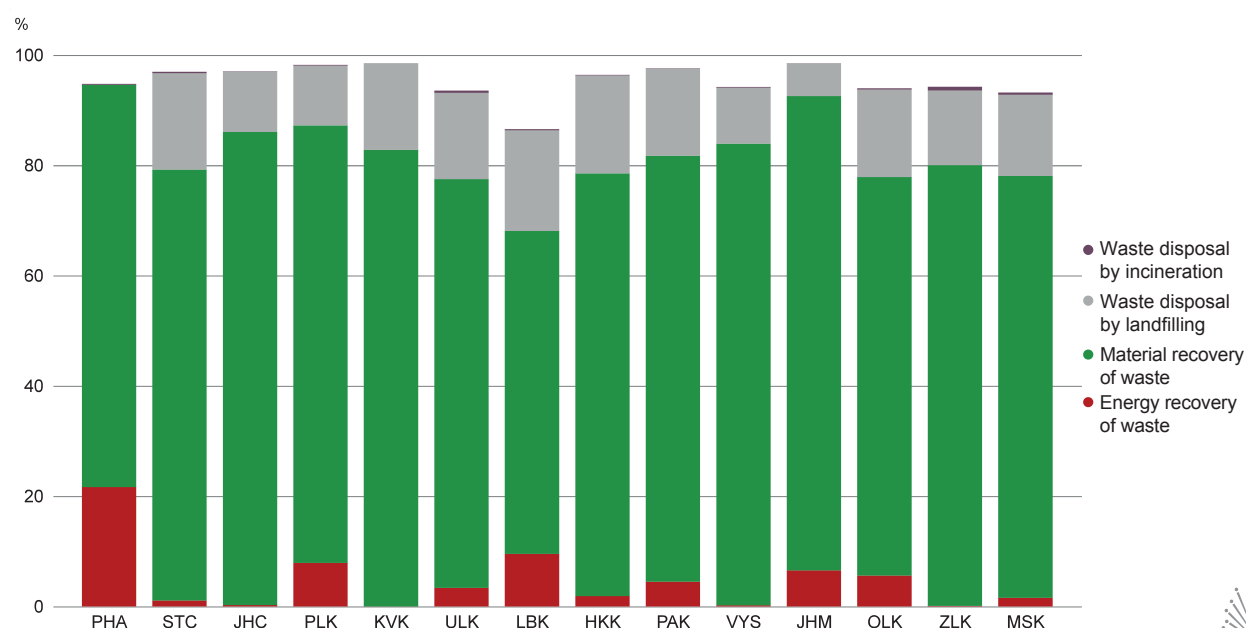
Data source: WMIS MoE

⁶⁹ Data for 2024 was not available at the time of publication.

From a **regional perspective and in comparison with overall waste management** in all regions, material recovery clearly predominates in overall waste management (ranging from 58.6% in the Liberec Region to 86.0% in the South Moravian Region, Graph 66). It is also worth mentioning the significant share of energy recovery in the Capital City of Prague (21.6%), at the expense of an almost zero share of landfilling in this region. In other regions, the share of landfilling in total waste management ranged from 5.9% in the South Moravian Region to 18.3% in the Liberec Region.

Graph 66

Share of selected waste management methods in total waste management in regions [%], 2023



The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. Data for 2024 were not available at the time of publication.



Data source: WMIS MoE

The aim is to further reduce the share of landfilling in total waste production in favour of material and energy recovery, i.e. in accordance with the applicable waste management hierarchy. It is important to use the right (especially legislative⁷⁰) tools for this gradual change, which can significantly help the transition to a circular economy.

Municipal waste⁷¹ is a specific group of waste, which is also reflected in the ways it is managed. Unlike other groups of waste, in this case, disposal **by landfilling** predominates. However, since 2009, the share of landfilled municipal waste in municipal waste production has fallen from 64.0% to 42.4% in 2023. Compared to 2022, the decrease was 3 percentage points (Graph 67).

⁷⁰ In connection with the transition to a circular economy, active legislative support for material recycling is necessary, as the preparation and transition to systems supporting the circular economy are very time-consuming and problematic without this support (as cases from other countries show).

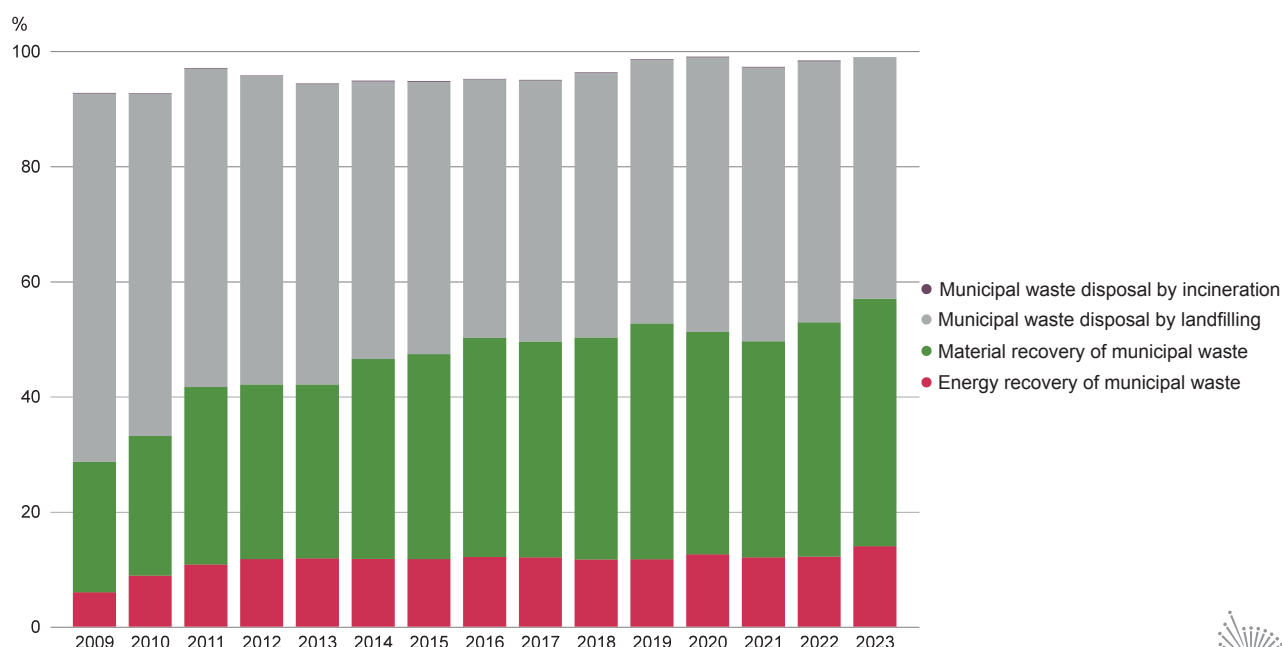
⁷¹ Due to a change in methodology, waste with catalogue numbers 20 02 02 (soil and stones) and 20 03 06 (sewer cleaning waste) has not been included in municipal waste management and total municipal waste production since 2020.

The shift away from landfilling has led to an increase in the share of municipal waste **used for material recovery**, which rose from 22.7% in 2009 to 43.1% in 2023, an increase of 2.4 percentage points compared to 2022. This share is on an upward trend in the medium term. At the same time, compared to 2009, there has also been an increase in the importance **of energy recovery from** municipal waste from 6.0% to 14.1% in 2023, a year-on-year increase of 1.9 percentage points between 2022 and 2023.

The situation is different for **incineration** (unlike energy recovery from municipal waste, municipal waste is only disposed of by incineration and is not used in any way), which accounts for a negligible amount of municipal waste (0.01% in 2023).

Graph 67

Share of selected municipal waste management methods in municipal waste production in the Czech Republic [%], 2009–2023

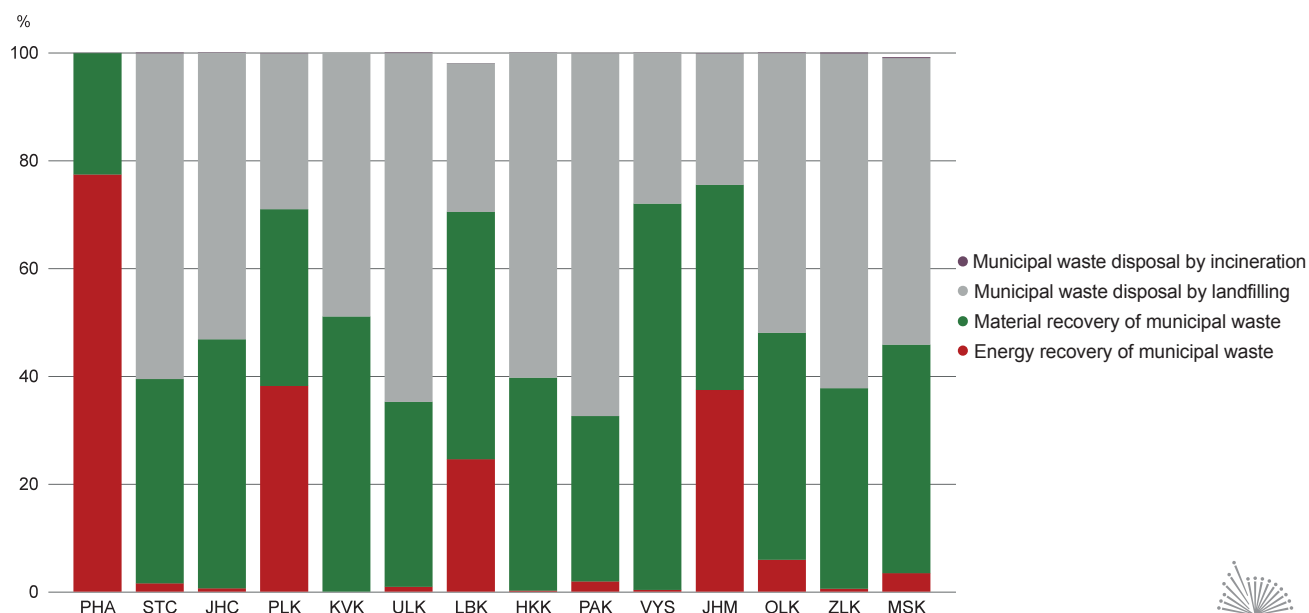


The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. Data for 2024 were not available at the time of publication.

Data source: WMIS MoE



Municipal waste management in individual regions is relatively variable, with landfilling accounting for the largest share of total waste management in most regions – the highest in the Pardubice Region (67.3%) and the Ústí Region (64.7%), and the lowest in Prague (0%) and the South Moravian Region (24.4%). It is worth noting the significant share of recycling, or material recovery of municipal waste, in the Vysočina Region (71.6%) and the dominant share of energy recovery in the Capital City of Prague (77.4%) thanks to the processing of municipal waste at the Malešice waste-to-energy plant (Graph 68). The presence of waste-to-energy plant is also evident in other regions with a more significant share of energy recovery from municipal waste (Plzeň, South Moravian and Liberec regions).

Graph 68**Share of selected methods of municipal waste management in total municipal waste management in regions [%], 2023**

The data were determined according to the methodology of the Waste Management Indicator System valid for the given year. Data for 2024 were not available at the time of publication.

Data source: WMIS MoE

Nevertheless, the situation in the area of municipal waste management in Czechia is not satisfactory, with municipal waste landfilling above the EU27 average and recycling below average. The aim is to reduce the share of landfilling in total municipal waste production more rapidly and, at the same time, to increase its material and energy recovery, in accordance with the applicable waste management hierarchy and the principles of the circular economy linked to the need to meet the European circular economy targets⁷². If the current trend continues, it will be difficult to achieve the targets for municipal waste recycling for 2025, 2030 and 2035 and for municipal waste landfilling for 2035.

Detailed visualisations and data

<https://www.envirometr.cz/data>

⁷² The targets for municipal waste are set out in Act No. 541/2020 Coll. on waste.

3 Nature and Landscape

3.1 Ecological stability of the landscape and sustainable land management

Key messages

- Land is being built on over the long term, which prevents its future use for agriculture or forestry. Between 2000 and 2024, the area of built-up land increased by 4.2%, while agricultural land decreased by 2.1%. Since 2018, the intensity of agricultural land take has been declining. While the area of agricultural land decreased by 1.15% between 2003 and 2013, the decrease between 2013 and 2023 was 0.61%.
- The most serious form of soil degradation in our country is erosion, to which Czechia is vulnerable due to intensive farming relying on mineral fertilisers. The loss of soil productivity due to erosion in Czechia is estimated at 0.14% per year, which corresponds to a direct loss of CZK 265.5 million per year.
- The consumption of active substances contained in plant protection products gradually decreased by 19.1% between 2000 and 2024, amounting to 3,481.0 tonnes of active substances in 2024 (0.98 kg of active substances per 1 ha of agricultural land). Nevertheless, preventive values for organic pollutants in agricultural soil are still being exceeded.
- The trend in mineral fertiliser consumption for the period 2000–2024 is fluctuating but generally increasing. While a decline has been observed since 2016, mineral fertiliser consumption increased by a total of 45.3% for the period 2000–2024. In 2024, the consumption of nutrients in mineral fertilisers increased by 36.2% compared to 2023, to 110.3 kg.ha⁻¹ of agricultural land. The temporary decrease in consumption in 2023 was mainly due to nitrogen fertilisers, for economic reasons and limited domestic production and imports.
- Organic farming is developing in Czechia primarily thanks to support for farmers. The share of organically farmed land in 2024 was 17.1%, but current developments do not suggest that the target of 22% by 2027 will be met. In Czechia, organic farming is particularly developed in cattle breeding. A significant proportion of organically farmed land has long been in the Karlovy Vary Region (59.7%), where livestock grazing predominates due to its mountainous nature.
- In the long term, it has not been possible to improve the health of forest stands. Timber harvesting intensity is decreasing in connection with the decline of the bark beetle calamity, and extensive forest restoration is taking place in the affected areas. In 2024, the share of natural regeneration in total forest restoration reached a record 29.7%. Conifers predominate in artificial forest regeneration, accounting for 55.3% of the total, including fir. Spruce has long been the most commonly planted tree species. In the long term, however, there has been an increase in the proportion of deciduous stands in the species composition of forests.

3.1 Ecological stability of the landscape and sustainable landscape management

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Area of impervious surfaces	Water retention in the landscape is increasing			Area of built-up land: index (2000=100) reached 104.22	
Pollution of agricultural land	Soil degradation is decreasing			Preventive value exceeded on arable land for: PCB: 2.9% of samples, PAH: 5.7% of samples, DDT: 9.1% of samples	
Erosion of agricultural land	Soil degradation is decreasing			510 erosion events	
Consumption of fertilisers and plant protection products	Soil degradation is decreasing			Consumption of active substances contained in plant protection products: 3,745.2 thousand kg of active substances. Consumption of mineral fertilisers: 110.3 kg of pure nutrients. ha ⁻¹ .	
Area of agricultural land	Slowing down the loss of agricultural land to 0.25% of agricultural land for the period 2020–2030 ⁷³			Decrease in agricultural land of 0.56% in 2014–2024	
Reclamation after mineral extraction	Soil degradation is decreasing			534.3 km ² of land not yet reclaimed	
Organic farming	Achieve a 22% share of organic areas in total agricultural land by 2027			17.1 %	

⁷³ Target value of the indicator according to SEP.

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Average size of soil blocks	Non-productive functions and ecosystem services of the landscape are enhanced			5,3 ha	
Forest health				In defoliation classes 2–4 77.0% conifers and 41.4% deciduous trees (60 years and older); 9.7% conifers and 27.8% deciduous trees (up to 59 years old)	
Sustainable forest management				PEFC 66.46%, FSC 4.98%; Selective cutting 3.47%; Area of clearings 55,900 ha	
Species composition of forests				30.5% deciduous trees	

Current measures supporting the achievement of the objective

- Financial support is provided for projects to restore wetlands, pools, small reservoirs and floodplains, care for valuable biotopes, plant greenery, improve the spatial and species composition of forests, and revitalise watercourses and make them passable for fish migration. Methodological and informational support for these measures is provided on an ongoing basis by the Ministry of the Environment in cooperation with the Agency for Nature Conservation and Landscape Protection of the Czech Republic.
- Land consolidation is an important tool for improving the structure of the agricultural landscape, implementing landscape features and increasing its natural retention capacity. By the end of 2024, comprehensive and simple land consolidation had been carried out on 42.3% of the agricultural land fund (more than 1.77 million hectares).
- An amendment to the Act on the Protection of Agricultural Land Fund (ALF) has made it possible to implement landscape features on agricultural land without the need to remove it from the ALF, adjusted remedial measures in the event of erosion, and strengthened the role of owners so that the consent of the owner of the land is now required for the removal of land from the ALF.
- Financial support is provided for the establishment and restoration of landscape features, including the planting of trees, the care of important landscape features and elements of the territorial system of ecological stability (TSES).
- Structural changes in Czech agriculture are partly addressed through eligibility criteria for financial support for farmers. When approving the Strategic Plan for the Common Agricultural Policy, a commitment was enshrined in the conditions for good agricultural soil condition standards to adjust the definition of erosion-prone land according to the parameters set out in the Decree on the Protection of Agricultural Land against Erosion (No. 240/2021 Coll.). From 2023, the area of a single crop is limited to 30 ha and up to 10 ha on soil at high risk of erosion.

⁷⁴ Target value of the indicator according to SEP.

- Support for organic farming (OF) will continue after 2023 under the SP CAP for the period 2023–2027. This plan follows on from the previous “Organic Farming” subsidy programme from the Rural Development Programme 2014–2022. Support is also provided for the introduction of organic food into public catering in order to increase its sales on the local market.
- The application of nature-friendly forest management methods and the ongoing revision of the recommended target species composition in forests is ensured by updating the regional forest development plans.
- Support for traditional and sustainable forest management practices and the adaptation of forest ecosystems to climate change is provided through financial contributions for ecological and nature-friendly technologies.

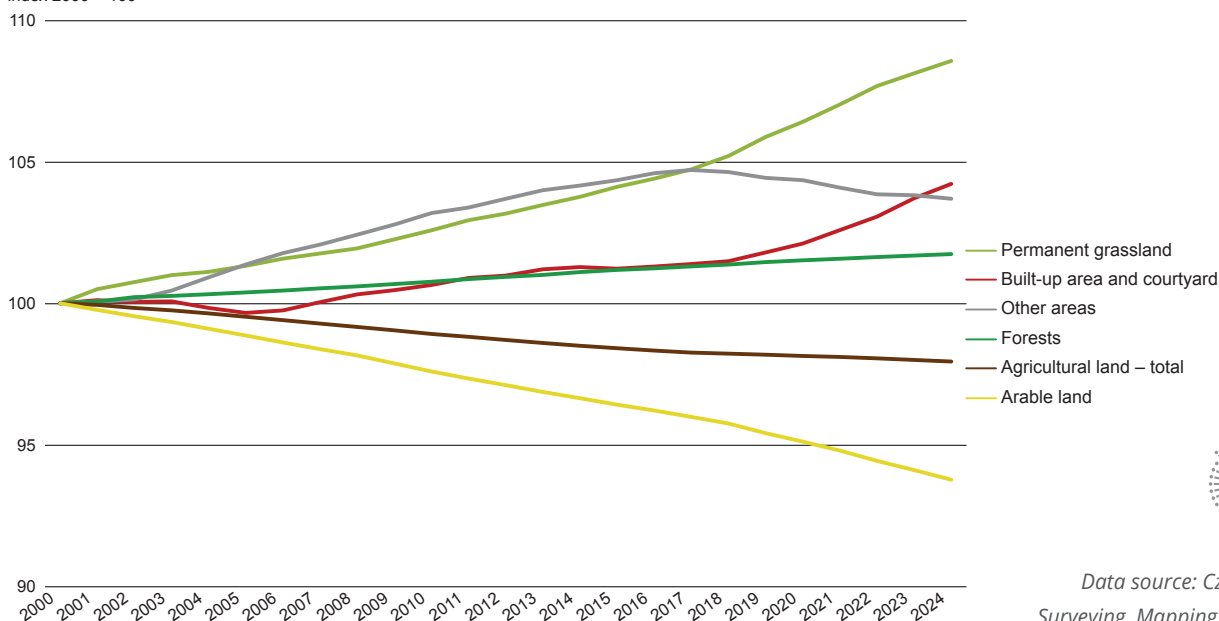
Land use

Clear long-term trends in land use in Czechia include **a decline in agricultural land and an increase in built-up areas** (Graph 69). Between 2000 and 2024, the area of built-up land increased by 4.2%, while agricultural land decreased by 2.1%. In 2023⁷⁵, a total of 778.6 ha of land was permanently removed from the agricultural land fund (ALF), mostly for housing construction (231.0 ha) and for production and storage (117.5 ha). Since 2018, the intensity of agricultural land take has been declining. While the area of the ALF decreased by 1.15% between 2003 and 2013, the decrease between 2013 and 2023 was 0.61%. The target value of the indicator according to the SEP 2030 for the period 2020–2030 is 0.25%. The current trend is therefore significantly below the planned level, and the loss of agricultural land due to land take continues to be too rapid. Built-up land loses its productive function, which prevents its future use for agriculture or forestry. In addition, impermeable surfaces prevent rainwater from infiltrating the soil and lose their ability to regulate the microclimate. New residential and transport infrastructure also has a negative impact on species diversity, as it increases landscape fragmentation and generates additional traffic, which creates noise and pollution. Intensive land use leads to landscape homogenisation and the loss and degradation of natural habitats and species biotopes (see Chapter 3.2).

Graph 69

Land use [index, 2000 = 100], 2000–2024

index 2000 = 100



Data source: Czech Office for
Surveying, Mapping and Cadastre

⁷⁵ Data for 2024 are not available at the time of publication.

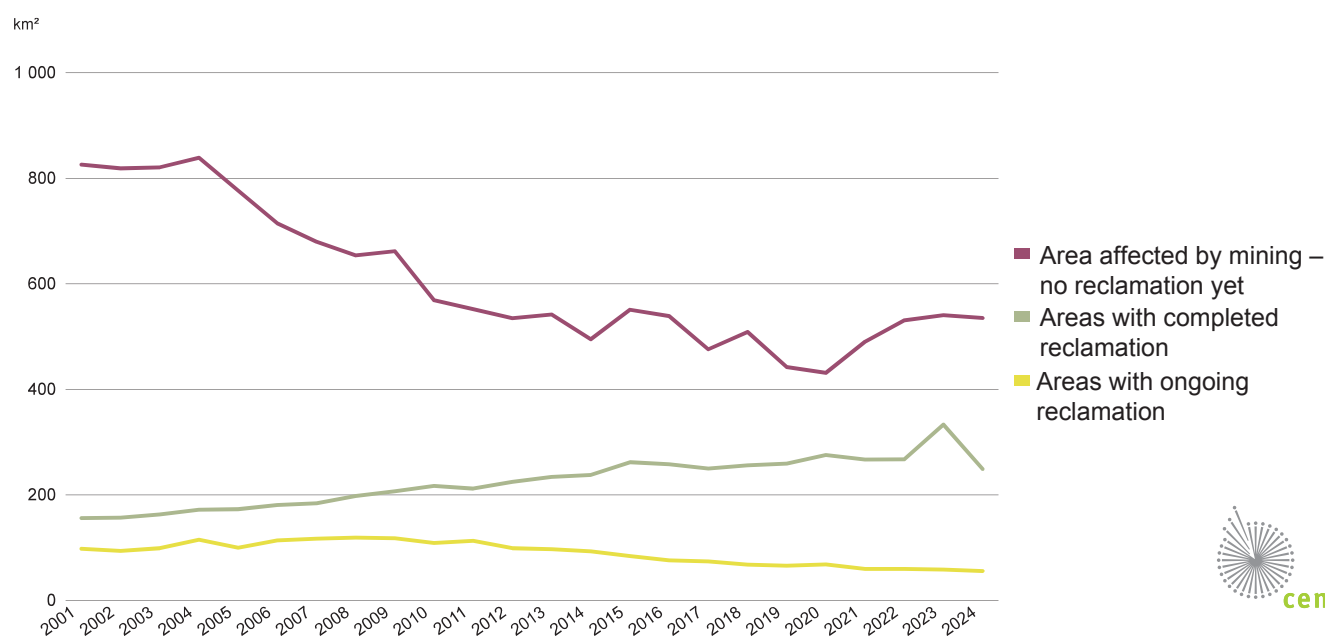
Mining

Land use for **mineral extraction** can cause significant soil degradation, as it involves the displacement of large volumes of rock in the mined deposits. The largest volumes extracted in Czechia are construction materials, with building stone and gravel being the most important commodities. In terms of energy resources, the mining of brown and black coal is significant. Brown coal is mined on the surface in the North Bohemian and Sokolov basins. Black coal is currently mined in the Upper Silesian basin using underground methods. However, mining has declined significantly in recent years due to the downturn in the industry.

Act No. 44/1988 Coll., on the protection and use of mineral resources (the Mining Act), requires mining companies **to reclaim areas affected by mining** and to create financial reserves for this reclamation. The area affected by mining has been declining in the long term since 2001, but has increased slightly in recent years due to an increase in the mining of construction and energy raw materials (Graph 70). In 2024, there were a total of 534.3 km² of areas that had not yet been reclaimed. Natural succession is increasingly being used in reclamation, resulting in areas of high natural value within a short period of time. Hydric reclamation of areas affected by mining also has a positive impact on the environment, as it retains water in the landscape, thus creating sources of drinking water or welcome landscape features to which wetland biotopes are linked.

Graph 70

Reclamation after mineral extraction [km²], 2001–2024



Soil condition

The most serious form of soil degradation in our country is **erosion**, to which Czechia is vulnerable due to intensive farming relying on mineral fertilisers. The loss of soil productivity due to erosion in Czechia is estimated at 0.14% per year, which corresponds to a direct loss of CZK 265.5 million per year⁷⁶. The decline in fertility can also be observed in the decrease in value according to the rated soil ecological units. In 2024, there was a year-on-year decrease in the average price of land by 2.7% in the surveyed cadastral areas. In addition to soil loss, the washing away of soil particles also causes surface water pollution and silting of water reservoirs. Furthermore, climate change is increasing the risk of erosion events due to the occurrence of localised high-intensity rainfall after periods of drought, which increases the vulnerability of soil to erosion.

Water erosion, expressed as long-term potential washout (G)⁷⁷ higher than 2.1 t.ha⁻¹.year⁻¹ i.e. above the lower limit of moderately endangered soil), 52.9% of agricultural land (ALF) is endangered, with 18.2% being extremely endangered (G higher than 10.1 t.ha⁻¹.year⁻¹). In the long term, the areas bordering the Moravian valleys and the hills and highlands of the Czech Republic are most at risk. **Wind erosion**⁷⁸ potentially threatens 29.4% of agricultural land, of which 3.5% is the most threatened land, located mainly in southern Moravia and the Elbe River Basin.

According to erosion monitoring, most **erosion events** occur in the Vysočina Region (Fig. 14), most often on areas with maize (44.0% of all recorded erosion events)⁷⁹. However, effective soil protection technologies must be implemented regardless of the type of crop. The majority of erosion events occur on parts of soil blocks without applied soil protection technologies, and especially on soils without cover with crop vegetation that has not yet taken root. The data highlight the urgent need to introduce generally effective measures to increase soil roughness and soil cover, rooting and soil aggregate stability at the time of sowing the main crop.

⁷⁶ Data for 2010: Panagos P., Standardi G., Borrelli P., Lugato E., Montanarella L., Bosello F. Cost of agricultural productivity loss due to soil erosion in the European Union: From direct cost evaluation approaches to the use of macroeconomic models. *Land Degrad Dev.* 2018; 29: 471–484. <https://doi.org/10.1002/ldr.2879>.

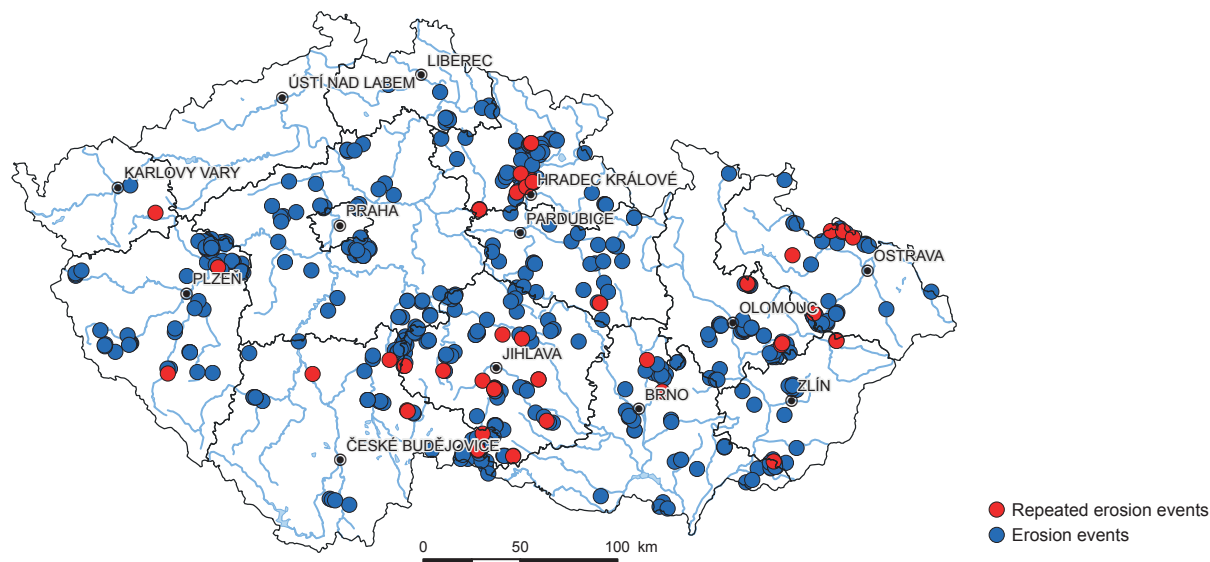
⁷⁷ The calculation of average long-term soil loss G is based on the Universal Soil Loss Equation (USLE): $G = R \times K \times L \times S \times C \times P$ [t.ha⁻¹.year⁻¹]. The following factors are included as inputs to the equation: a regionalised factor of the erosive efficiency of torrential rain on arable land according to LPIS (R), a soil erodibility factor (K), a slope length factor (L), slope gradient factor (S), vegetation protection factor determined according to climate regions (C), and erosion control effectiveness factor (P). Potential vulnerability expressed as long-term average washout is calculated on the basis of long-term regionalised factors and therefore does not change significantly over the years.

⁷⁸ The methodology for determining the potential vulnerability of soil to wind erosion was used. Data on climatic regions (sum of daily temperatures above 10 °C, average moisture security during the growing season, probability of dry growing seasons, average annual temperatures, annual precipitation) and data on the main soil units (genetic soil type, soil-forming substrate, grain size, skeletal content, degree of hydromorphism) were used. The final assessment is expressed as the product of the climate region factor and the main soil unit factor.

⁷⁹ An overview of recorded erosion events is available on the agricultural soil erosion monitoring web portal: <https://me.vumop.cz/app/>.

Fig. 14

Recorded erosion events, 2024



Data source: Research Institute for Soil and Water Conservation, public research institution

According to the latest available model data, 90.3% of the territory of the EU27 and the United Kingdom is at risk of water erosion⁸⁰. The most vulnerable soils are mainly in southern Europe (Italy, Slovenia, Greece). Wind erosion, which is estimated to threaten approximately 9.6% of the territory of the EU27 and the United Kingdom, poses the greatest threat to sandy soils characteristic of the glacial deposits of northern countries (Denmark, Germany, the Netherlands, Scandinavia and the Baltic Sea region). **Losses related to soil degradation in the EU** are estimated at more than EUR 50 billion per year. In addition, climate change is expected to increase the vulnerability of soils to water erosion in the future due to the increasing extremity of precipitation and changes in land use. Soil loss due to water erosion is expected to increase by 13–22.5% in the EU and the United Kingdom by 2050 compared to the baseline year 2016⁸¹. In 2015⁸², the share of degraded land in the total land area was 6% in Czechia⁸³, which was below the average compared to other European countries.

⁸⁰ Panagos, P., Borrelli, P., Poesen, J., Ballabio, C., Lugato, E., Meusburger, K., Montanarella, L., Alewell, C. The new assessment of soil loss by water erosion in Europe. *Environmental science & policy*, 2015; 54: 438–447. <https://doi.org/10.1016/j.envsci.2015.08.012>.

⁸¹ Panos Panagos, Cristiano Ballabio, Mihaly Himics, Simone Scarpa, Francis Matthews, Mariia Bogonos, Jean Poesen, Pasquale Borrelli: Projections of Soil Loss by Water Erosion in Europe by 2050, *Environmental Science & Policy*, 124 (2021), 380–92. Available at: <https://doi.org/10.1016/j.envsci.2021.07.012>.

⁸² Data for 2016–2023 are not available at the time of publication.

⁸³ This is a calculation within the international indicator for Sustainable Development Goal 15.3.1, for which data on land cover, soil productivity and soil carbon stocks were used. Available from: <https://landportal.org/node/52267>.

Among the phenomena causing soil degradation is **soil compaction**, which negatively affects both the productive and non-productive properties of the soil. Compacted soil has a limited ability to absorb precipitation, which increases surface runoff and the risk of erosion. It also disrupts the water, air and temperature regimes, which suppresses natural soil processes and leads to a reduction in organic matter content. The potential vulnerability of the lower soil layers to compaction is partly determined by the type of soil – so-called genetic compaction, which is typical for soils with a higher clay content. Of the total area of soil threatened by compaction, genetic compaction accounts for only 30%, while compaction caused by intensive farming accounts for 70%. In agricultural soils, high potential vulnerability of the lower layers to compaction was assessed in 16.1% of the agricultural land area. Soils with lower and medium to low **infiltration capacity**⁸⁴ together account for 38.7% (data for 2023⁸⁵). Dual soil groups (medium/low and lower medium/low infiltration capacity) account for a total of 1.5% of agricultural soils.

A key characteristic of soil ecosystems that defines their ability to perform productive functions and their resilience is **the organic matter content** in the soil. In the Czech Republic, 55.8% of agricultural land has an organic matter content⁸⁶ in the low to lower-medium category. The low humus content in the soil is influenced by intensive agricultural management with a predominance of mineral fertilisers and low use of manure and compost. Erosion also contributes significantly to dehumidification.

The quality of agricultural soil is negatively affected by the content **of hazardous substances in the soil**⁸⁷, which enter the soil and sediments through anthropogenic activities. The presence of hazardous elements and substances in the soil is not necessarily related to agricultural activity, and if it is, it is mainly a consequence of the application of plant protection products, sludge from sewage treatment plants or sediments from water reservoirs and watercourses.

Based on the results of determining the content of hazardous elements in soil using aqua regia extraction, the most problematic contents in the period 1998–2024 were **cadmium**, with 12.2% of samples exceeding the limit for all soils (i.e. for light and other soil types, which include sandy loam, loam, clay loam and clay soils), followed by **arsenic** (10.4%) and **zinc** (9.1%).

In terms of **organic pollutants**⁸⁸, the highest proportion of samples exceeding preventive values in recent years was measured for the sum of 12 PAHs. PAHs are also produced by natural processes, but they are currently found in higher concentrations in the environment as a result of human activity, primarily due to the incomplete combustion of carbon fuels. They have a high bioaccumulation capacity and, depending on their structure, some of them have carcinogenic effects. In 2023⁸⁹, the limit was exceeded at two selected observation areas of arable land (Fig. 15). The DDT content was exceeded in arable land at three locations. The limit for PCB content in arable land was exceeded at one monitoring area.

⁸⁴ Soil categorisation based on saturated hydraulic conductivity, impermeable layer depth and groundwater level, combined with the hydrogeological characteristics of soil-forming substrates, is used to assess the potential infiltration capacity of soils.

⁸⁵ Data for 2024 are not available at the time of publication.

⁸⁶ The system of rated soil ecological units was used for the evaluation, and soil probe data on organic matter content (oxidisable carbon content – Cox and humus content) were grouped under the taxonomically corresponding main soil units of the system, i.e. the 2nd and 3rd digits of the rated soil ecological units' code.

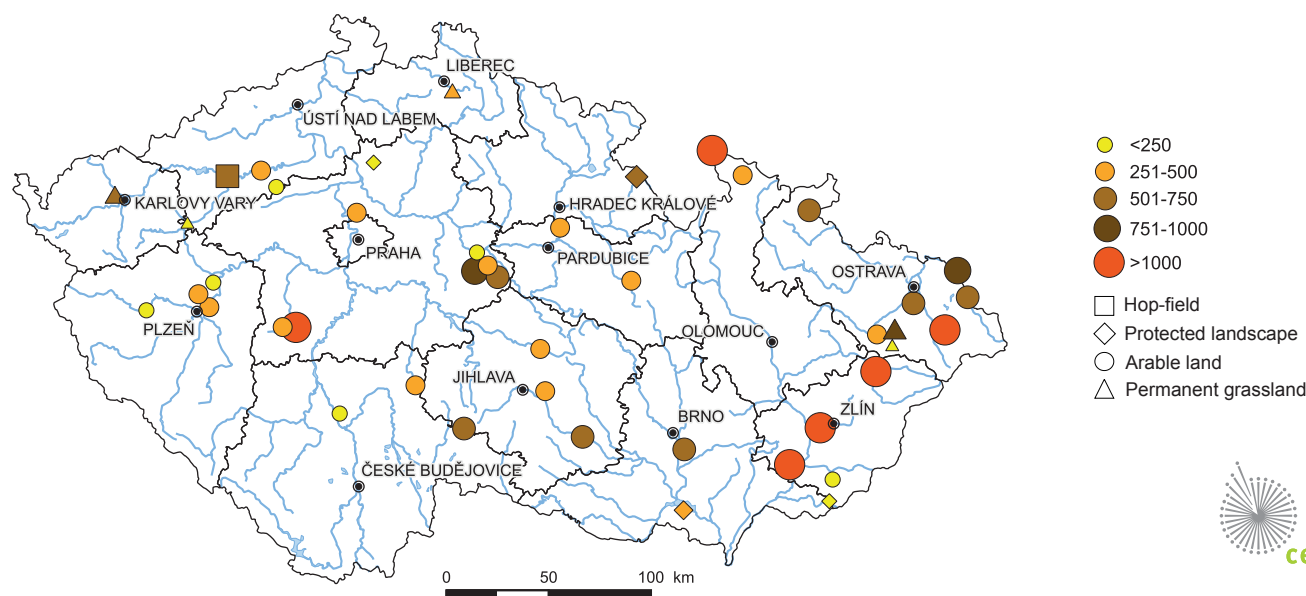
⁸⁷ As part of the monitoring of the content of hazardous elements and substances in the soil (baseline soil monitoring – BSM), both inorganic pollutants or hazardous elements (e.g. As, Cd, Ni, Pb, Zn, etc.) and persistent organic pollutants (POPs) are monitored. These include, in particular, 12 polycyclic aromatic hydrocarbons (12 PAHs), polychlorinated biphenyls (PCBs) and organochlorine pesticides (HCH, HCB, DDT group substances). The basic BSM network was established in 1992. The system currently comprises 214 monitoring sites.

⁸⁸ Organic pollutants are determined annually at the same 40 selected BSM monitoring sites and 5 sites in protected areas (Krkonos National Park, Kokořínsko, Pálava, Bílé Karpaty, Orlické hory) from the topsoil horizon.

⁸⁹ Data for 2024 are not available at the time of publication.

Fig. 15

Content of the sum of 12 PAHs in the topsoil of agricultural land (within the BSM) in the Czech Republic [$\mu\text{g.kg}^{-1}$ dry matter], 2024



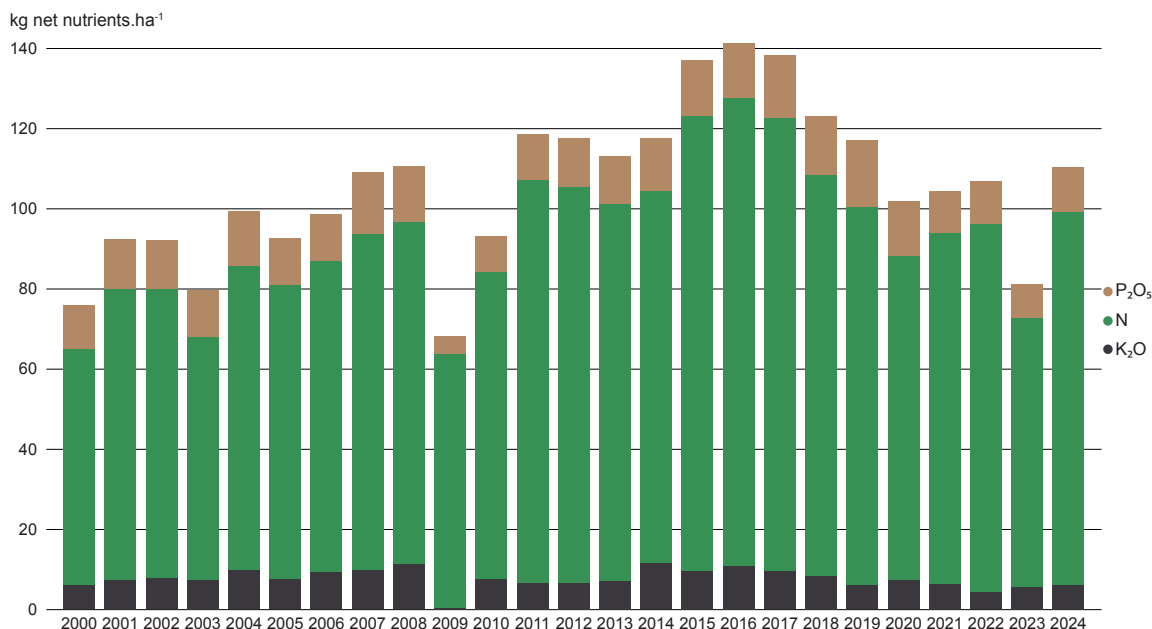
Determined on the basis of samples from 40 selected monitoring areas and 5 areas in protected territories. The preventive value for the sum of 12 PAHs according to Decree No. 153/2016 Coll. is $1,000 \mu\text{g.kg}^{-1}$ dry matter.

Sustainable agricultural management

Conventional intensive agriculture has a number of environmental impacts and is partly responsible for biodiversity loss. To ensure crop yields and maintain food security, modern agriculture relies on large amounts of chemical pesticides and fertilisers, which contribute to soil degradation, cause a decline in the biodiversity of soil microorganisms and negatively affect the quality of surface and groundwater.

The trend in **mineral fertiliser** consumption for the period 2000–2024 is fluctuating but generally increasing. While a decline has been observed since 2016, mineral fertiliser consumption increased by a total of 45.3% over the period 2000–2024. In 2024, the consumption of nutrients in mineral fertilisers increased by 36.2% compared to 2023, to 110.3 kg.ha^{-1} of agricultural land (Graph 71). The exceptionally low consumption, especially of nitrogen fertilisers, in 2023 was a consequence of the unfavourable economic situation and limited domestic production and imports. In terms of the consumption of mineral fertilisers and plant protection products, the Czech Republic's position is favourable compared to other EU27 countries, i.e. below the European average.

Graph 71

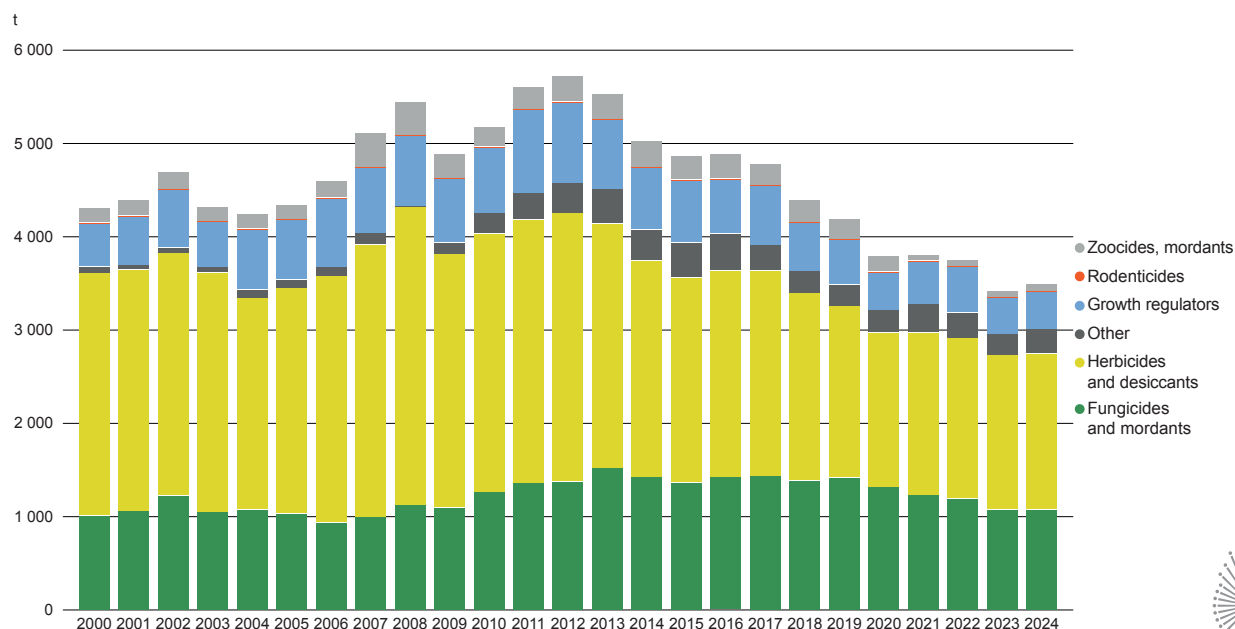
Consumption of mineral fertilisers in the Czech Republic [kg of pure nutrients.ha⁻¹], 2000–2024

The consumption of farmyard manure has remained relatively stable since 2014. The total input of pure nutrients from **farmyard** manure (manure, slurry, etc.) and **organic fertilisers** (especially digestate from biogas plants) in 2024 was 67.8 kg.ha⁻¹. The high consumption of fertilisers in recent years is related, among other things, to efforts to offset the negative effects of drought on crops.

In 2020, the European Commission presented two targets for reducing pesticide use in its “Farm to Fork” strategy: a 50% reduction in the use and risk of chemical pesticides and a 50% reduction in the use of hazardous pesticides. In the Czech Republic, the consumption of active substances contained in **plant protection products** (PPPs) fell by 19.1% between 2000 and 2024, amounting to 3,481.0 tonnes of active substances in 2024 (Graph 72). This means that 0.98 kg of active substances contained in PPPs and plant protection adjuvants were consumed per hectare of agricultural land. Although the current trend of reducing pesticide consumption in Czechia is slower, Czechia’s relatively low consumption within the EU contributes to the achievement of these targets.

Graph 72

Consumption of active substances contained in plant protection products and other products according to their purpose of use in the Czech Republic [tonnes of active substances], 2000–2024



* Other – adjuvants, repellents, mineral oils, etc.

Data source: CISTA

One way to improve and maintain soil fertility and ecological functions is **organic farming**. Its aim is to close the nutrient cycle as much as possible and to farm in harmony with nature. Organic farming avoids mineral fertilisers and synthetic pesticides, diverse cropping practices with catch crops maintain and support soil organisms and soil fertility, and species-appropriate animal husbandry contributes to their welfare and ensures acceptance by the general public.

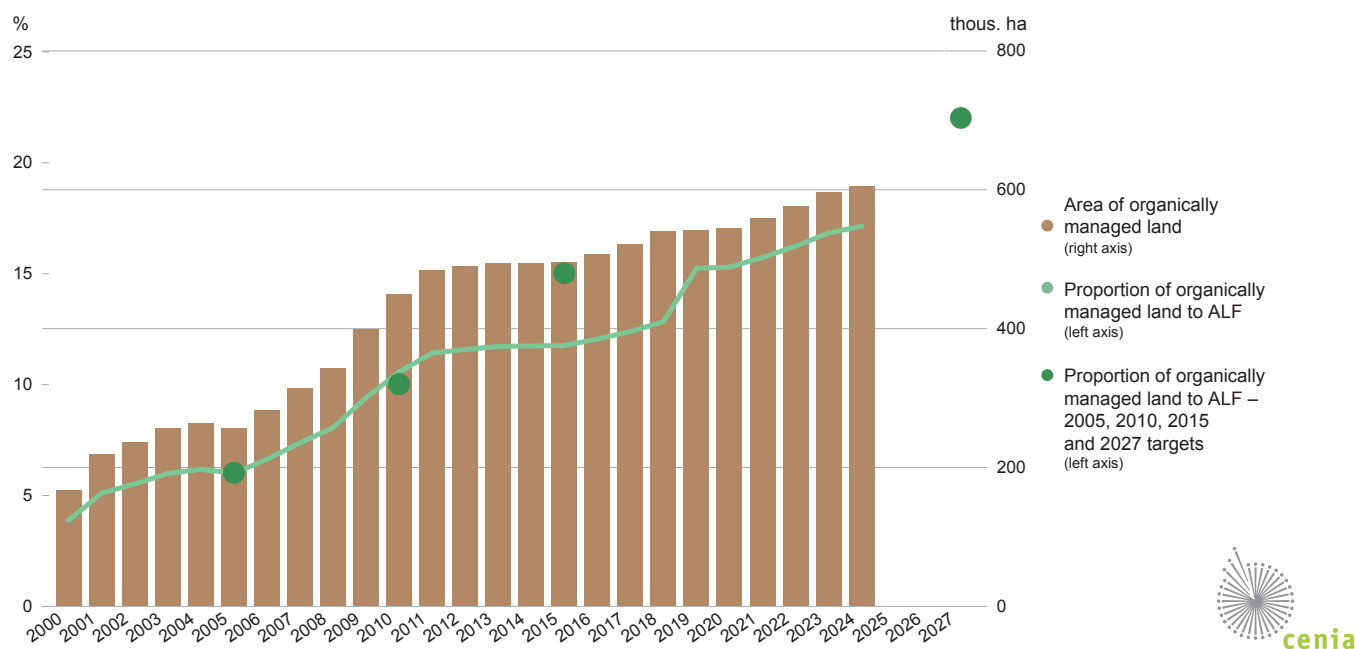
Since 1990, organic farming in Czechia has developed primarily thanks to support for farmers and consumer demand. Significant growth occurred between 2005 and 2011, supported by subsidies after EU accession. The number of **organic farms** stagnated between 2011 and 2014 due to restrictions on new entries into the programme, with a revival since 2015. The share of **organically farmed land** in the agricultural land fund (ALF) registered in the public land register (LPIS) in 2024 was 17.1%, which is significantly above the EU average (10.8% in 2023)⁹⁰. Although the area of organic farming is growing, the current trend is not on track to meet the 22% target in 2027⁹¹ (Graph 73).

⁹⁰ European Environment Agency: <https://www.eea.europa.eu/en/analysis/indicators/agricultural-area-used-for-organic>.

⁹¹ Czech Republic Action Plan for the Development of Organic Farming 2021–2027.

Graph 73

Area and share of organically farmed land in agricultural land [thousand ha, %], 2000–2024



Until 2018 (inclusive), the share of organically farmed land in total agricultural land in the Agricultural Land Fund (ALF) was calculated; from 2019 onwards, it is the share of organically farmed land in relation to the total ALF land registered in the LPIS. The targets are based on the relevant Czech Republic Action Plan for the Development of Organic Farming.

Data source: Institute of Agricultural Economics and Information, MoE

In the Czech Republic, organic farming is particularly well developed in livestock breeding. The structure of organically farmed land is thus skewed in favour of **permanent grassland**, which in 2024 accounted for 78.9% of the land used for organic farming. A significant proportion of organically farmed land has long been found in the Karlovy Vary Region (59.7% in 2024) and the Liberec Region (35.1%), where livestock grazing on permanent grassland predominates due to their mountainous nature. On the contrary, the share of organically farmed agricultural land has long been low in the Central Bohemian Region (6.2%), the Vysočina Region (6.9%), the South Moravian Region (7.1%) and the Pardubice Region (8.1%). The share is very low in the Prague Region (1.3%), which is due to the urban character of this region. The largest number of organic farms is located in the South Bohemian Region (838 organic farms), while the smallest number is in Prague (14 organic farms).

Although the share of arable land in organic farming is gradually increasing, maintaining the current trend is not expected to achieve the national target of at least 30% of **arable land** being organically farmed by 2027⁹². Although permanent grassland plays an important role in the landscape and is used for organic livestock farming, it is necessary to increase the share of other categories in the future, especially arable land and orchards, mainly due to the increase in organic food production and sustainable management and use of agricultural land.

⁹² Czech Republic Action Plan for the Development of Organic Farming 2021–2027.

Despite growing consumption of organic food, **the organic food market** remains small, accounting for only 1.6% of total consumption in 2023⁹³. Due to a lack of processing capacity, part of Czech organic production continues to be processed as conventional or exported abroad as raw material. The development of domestic processing and distribution networks is hampered in particular by low consumer demand for organic food, which is negatively affected by increased living costs and declining purchasing power of the population.

The structure of Czech agriculture within the EU is characterised by large-scale production with a predominance of hired labour and land, low production diversification and a high degree of arable land (70.8% of agricultural land in the LPIS in 2024). Some of the largest fields in Europe are located here⁹⁴, which is the result of the collectivisation and intensification of agriculture that took place from the late 1940s and especially in the 1950s⁹⁵. Although these characteristics have increased productivity and efficiency in recent years, large-scale agriculture has had a significant impact on natural habitats, soil and water quality. While in 1948 the average size of soil blocks was 0.23 ha, in 2024 the average size of soil blocks⁹⁶ was 5.2 ha. There are 3,417 largest soil blocks measuring 60 ha and more, covering an area of 287,900 ha (8.2%). However, the average size of soil blocks is decreasing. The representation of soil blocks depends on the type of agricultural and settlement structure in individual regions. The largest soil blocks are located in the Karlovy Vary Region (average 7.5 ha) and the smallest in the Liberec Region (average 3.6 ha).

Landscape features that contribute to the preservation of biodiversity, play an important role in erosion control and help shape the character of the landscape are also an important part of the agricultural landscape. In 2024, ecologically significant features, landscape orchards, wooded areas and areas with fast-growing trees covering a total area of 11,500 ha (0.3% of agricultural land) were registered in the LPIS, and these are gradually being expanded. Land consolidation is a powerful tool for implementing landscape features⁹⁷, with comprehensive consolidation carried out on 42.3% of agricultural land in 2024.

There is also an ongoing effort to convert arable land in areas with natural constraints⁹⁸ into grassland and to support extensive livestock farming. **Grassland conversion** is supported by state subsidy policy and the application of Common Agricultural Policy principles and is focused on areas with a higher risk of soil erosion, areas prone to frequent washouts and areas of high soil permeability (infiltration areas), where it helps to reduce the entry of nitrates into groundwater and surface water.

State of forests

Forest land has long covered about one-third of the Czech Republic's territory and continues to expand slightly. **Forest ecosystems** are therefore an important element of the entire landscape, and forestry is a significant economic sector. Stable forest ecosystems support biodiversity, regulate the water regime of the landscape, protect the soil from erosion, improve air quality and provide recreational and aesthetic functions. In addition, as a renewable source of material, wood has significant potential in the transition to sustainable production and consumption systems.

⁹³ Data for 2024 are not available at the time of publication.

⁹⁴ Lesiv, Myroslava, et al. Estimating the global distribution of field size using crowdsourcing. *Global change biology*. 2019. 174–186. <https://doi.org/10.1111/gcb.14492>.

⁹⁵ Lerman, Zvi. Agriculture in transition economies: from common heritage to divergence. *Agricultural economics*. 2001. 95–114. <https://doi.org/10.1111/j.1574-0862.2001.tb00057.x>.

⁹⁶ Soil block represents a contiguous area of agriculturally managed land with a minimum area of 0.01 ha, the boundaries of which can be identified in the field and on which a natural or legal person carries out agricultural activities in their own name and on their own responsibility, and on which one type of agricultural crop is grown, as specified by Government Regulation No. 307/2014 Coll. on the determination of details of land use records according to user relationships, or on which there is an ecologically significant element.

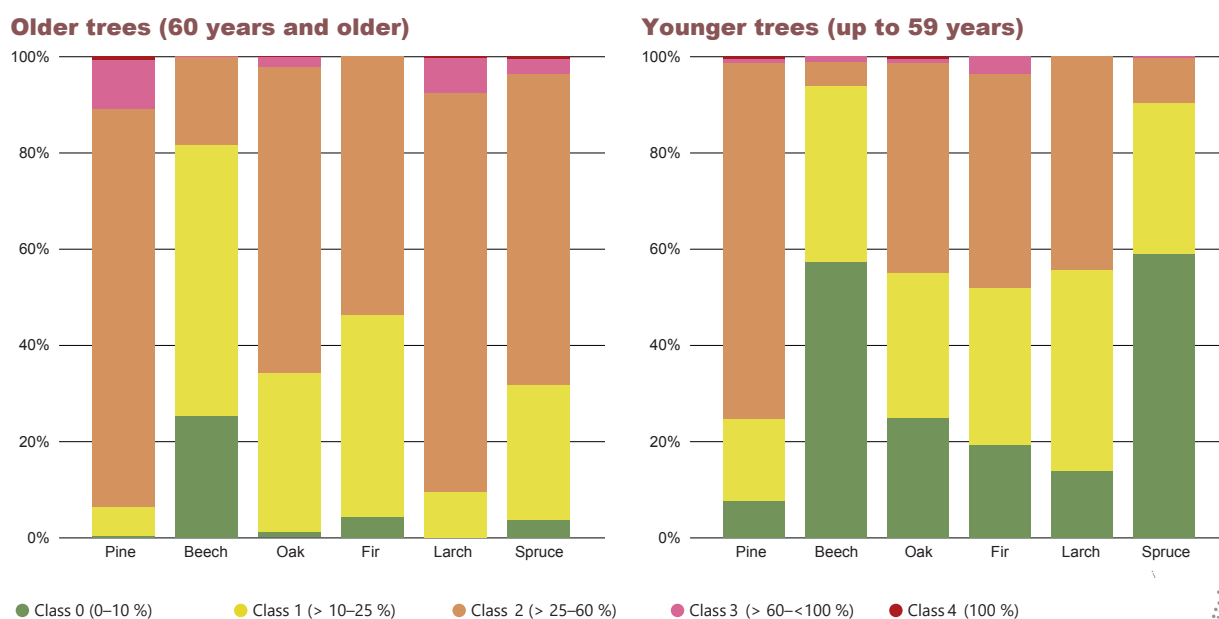
⁹⁷ More at: <https://spu.gov.cz/pozemkove-upravy>.

⁹⁸ More at: https://agriculture.ec.europa.eu/common-agricultural-policy/income-support/additional-schemes/anc-payment_cs.

The ability of forests to fulfil their functions can be assessed according to **their health status**, expressed as the degree **of defoliation**⁹⁹. In 2024, 77.0% of conifers and 41.4% of deciduous trees were classified in defoliation classes 2–4 in the case of older stands (60 years and older), and 9.7% of conifers and 27.8% of deciduous trees in the case of younger stands (up to 59 years). Of the tree species, pine shows the highest level of defoliation in both older and younger stands (Graph 74). Older stands of larch, spruce and oak are also in poor health (more than 50% of individuals in defoliation classes 2–4)¹⁰⁰. In 2023, 29.5% of conifers and 33.3% of deciduous trees in Europe were in defoliation classes 2–4¹⁰¹. The above-mentioned factors causing defoliation are thus the reason why the Czech Republic ranks among the countries with the highest defoliation rates in Europe.

Graph 74

Defoliation of basic tree species by class [%], 2024



The assessment of the health status of coniferous and deciduous stands using the level of defoliation is divided into two categories according to age – older (60 years and older) and younger (up to 59 years). Defoliation values are divided into five basic classes (0–4), of which classes 2–4 characterise significant damage to trees.

Data source: FGMRI

⁹⁹ Relative loss of the assimilation apparatus in the tree crown compared to a healthy tree growing in the same stand and habitat conditions.

¹⁰⁰ Data for 2024 are not available at the time of publication.

¹⁰¹ Michel A, Hagenmüller K, Kirchner T, Prescher A-K, Schwärzel K, Wohlgemuth L, editors (2024) *Forest Condition in Europe: The 2024 Assessment*. ICP Forests Technical Report under the UNECE Convention on Long-range Transboundary Air Pollution (Air Convention). Eberswalde: Thünen Institute. 96 p. <https://doi.org/10.3220/ICPTR1732702585000>

The lower level of defoliation in younger stands is due to the fact that younger stands have greater vitality and the ability to withstand adverse environmental conditions. In addition, older stands were burdened by sulphur (SO_x) and nitrogen (NO_x) emissions during the 1970s and 1980s. In addition to their direct impact on the assimilation organs of trees (leaves), these pollutants affected **the acidification of forest soils** and the availability of nutrients (especially basic cations Ca, Mg, Na, K) in their sorption complex, which most forest soils in Czechia are relatively poor in due to natural conditions. The available data show acidification and a decrease in the content of basic elements in forest soils, mainly in the upper mineral horizons, in various parts of Czechia¹⁰². According to data obtained using spatial models¹⁰³, 97.2% of forest soils in the upper mineral layer (0–30 cm) and 89.1% of forest soils in the lower mineral layer (30–80 cm) fall into the categories of high and extreme risk of acidification.

Since 1989, **the pollution situation** has improved significantly thanks to the installation of equipment, changes in the fuel base and the application of emission limits on air pollution sources. However, forest stands respond to changes with a considerable delay, and even though the intensity of air pollution is demonstrably lower, it has not been possible to reduce nitrogen deposition in particular in the long term. In addition to site conditions and the amount of acid deposition, **the method of management**, including tree species composition and logging intensity, also influences acidification and the overall nutrient balance of forest ecosystems. Coniferous stands are more vulnerable to acidification due to the slow decomposition of their litter, which is associated with the production of low-molecular-weight organic acids, and also due to the higher concentration of pollution in under-canopy precipitation due to dry deposition on needles. For the long-term sustainability of forest management, it is essential that nutrient losses resulting from biomass removal (timber harvesting) do not exceed nutrient replacement through natural processes (weathering, atmospheric deposition).

The high degree of defoliation and the fluctuating trend in the representation of defoliation classes mean that, in **the long term**, the health of forest stands remains unsatisfactory. Currently, the health of forest stands is negatively affected mainly by the effects of **climate change**, such as drought, strong winds and a longer growing season. In recent years, spruce forests have also been affected by the lingering spread of the spruce bark beetle, which was caused by a combination of climatic conditions and the low ecological stability of forest stands, which are largely made up of spruce monocultures.

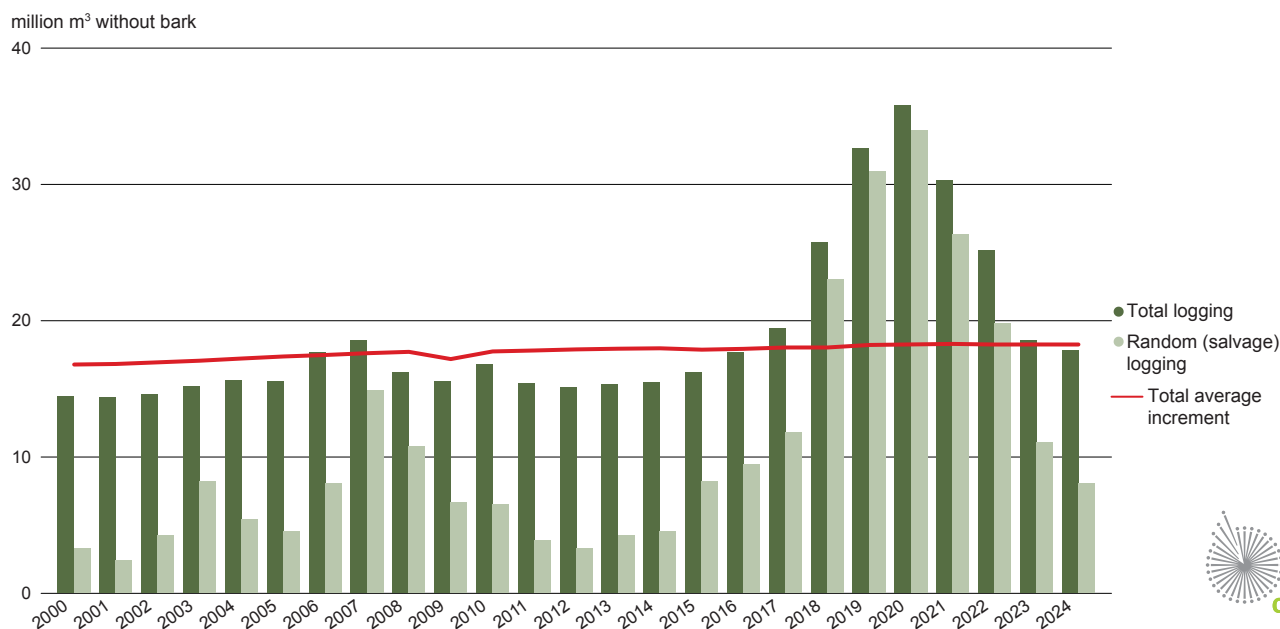
The largest **bark beetle calamity** in the Czech Republic to date, which began in 2015 in northern Moravia in the Jeseníky Mountains and gradually spread to other areas, peaked in 2020, when the volume of timber harvesting reached a historic maximum of 35.8 million m^3 of wood without bark. Since then, logging has been declining annually, reaching approximately the 2016 level in 2024. The total volume of recorded **timber harvesting** reached 17.8 million m^3 of wood without bark, and the share of **incidental** (calamity) harvesting in the total decreased to 45.0% (Graph 75). The most affected areas were the Vysočina, Olomouc and Moravian-Silesian regions in the Jeseníky Mountains. Other significantly affected areas included the vicinity of Dačice in the South Bohemian Region, Děčín in the Ústí nad Labem Region and part of the Beskydy Mountains.

¹⁰² Šrámek V., Jurkovská L., Fadrhonsová V., Hellebrandová-Neudertová K., 2013: *Chemistry of forest soils in the Czech Republic according to typological categories – results of forest soil monitoring within the BIOSOIL project*. Forestry Research Reports, 58: 314. Available at: <https://www.vulhm.cz/files/uploads/2019/01/324.pdf>.

¹⁰³ Komprdová K. et al., 2021: *Chemical properties of the upper mineral layers of forest soils and the threat to forest soils from acidification and nutritional degradation, set of maps*. Research Institute of Forestry and Game Management, v.v.i. Available from: https://www.vulhm.cz/files/uploads/2022/01/Chemické%20vlastnosti%20%20svrchních%20mineralních%20vrstev%20lesních%20pud%20a%20ohrožení%20lesních%20pud%20acidifikací%20a%20nutricní%20degradaci_b.pdf.

Graph 75

Comparison of actual timber harvests with total average increment in the Czech Republic [million m³ without bark], 2000–2024



The total average increment (TAI) expresses the production capacity of forest habitats and is a decisive indicator in assessing the principle of balance and sustainability of harvesting possibilities.

Data source: CZSO, CFI

In addition to its impact on ecosystems and economic losses, massive tree felling also affects the overall **carbon balance of forests**. While Czech forests sequestered carbon in the previous period, since 2018 this balance has shifted from negative to positive values, and forests have thus become a source of greenhouse gases. With the gradual stabilisation of the bark beetle calamity, there was also a record recovery of forests in the affected areas, which led to the carbon balance for the LULUCF sector becoming negative again in 2023 (-3.6 Mt CO₂ eq.). Restoring the full carbon sequestration capacity of forest ecosystems remains a priority for the coming period. However, long-term carbon storage in the soil occurs mainly in natural forest ecosystems. In the long term, it is therefore important to support this function by introducing nature-based management methods.

Sustainable forest management

Most (73.7%) of the forest ecosystems in Czechia are **commercial forests**, whose main purpose is sustainable management ensuring the provision of all ecosystem services, including the production of wood as a renewable raw material. Increasing the resilience of these forests to the effects of climate change and improving their production and non-production functions can be achieved by using nature-friendly management methods and maintaining a diverse forest structure.

Nature-friendly management methods can be considered those that make maximum use of the creative forces of nature to achieve forestry management objectives, respect site conditions, and implement management measures in accordance with natural processes and the condition of the stands. According to data from forest management plans (FMPs)¹⁰⁴, **clear-cutting methods** (understory, selective cutting, clear cutting) are used almost exclusively.

The result of the long-term application of predominantly clear-cutting methods is a significant predominance of forest stands with **a simple structure** (81.1% of forests)¹⁰⁵ at the level of the lowest units of spatial division of the forest (stand groups). At the same time, however, there has been a gradual reduction in the size of intentional regeneration elements to a current average of approximately 0.35 ha, resulting in group-based area and age differentiation even in these forest stands. In terms of forest shapes, **tall forests** clearly predominate (approx. 97.2% of stands), which are characterised by a long rotation period. However, there are efforts to increase the proportion of medium and low forests with very short rotation periods and forests with a richer structure, which is positive in terms of forest stand resilience and biodiversity support.

Many species of forest organisms are threatened by a lack **of dead wood** left in forests to decay naturally. The amount of dead wood in Czechia is lower than in natural conditions, but it has been increasing in the long term. In the period 2011–2015, there was a slight increase in its average volume to 17.2 m³.ha⁻¹, and in the following period 2016–2020, it rose to 20.0 m³.ha⁻¹.

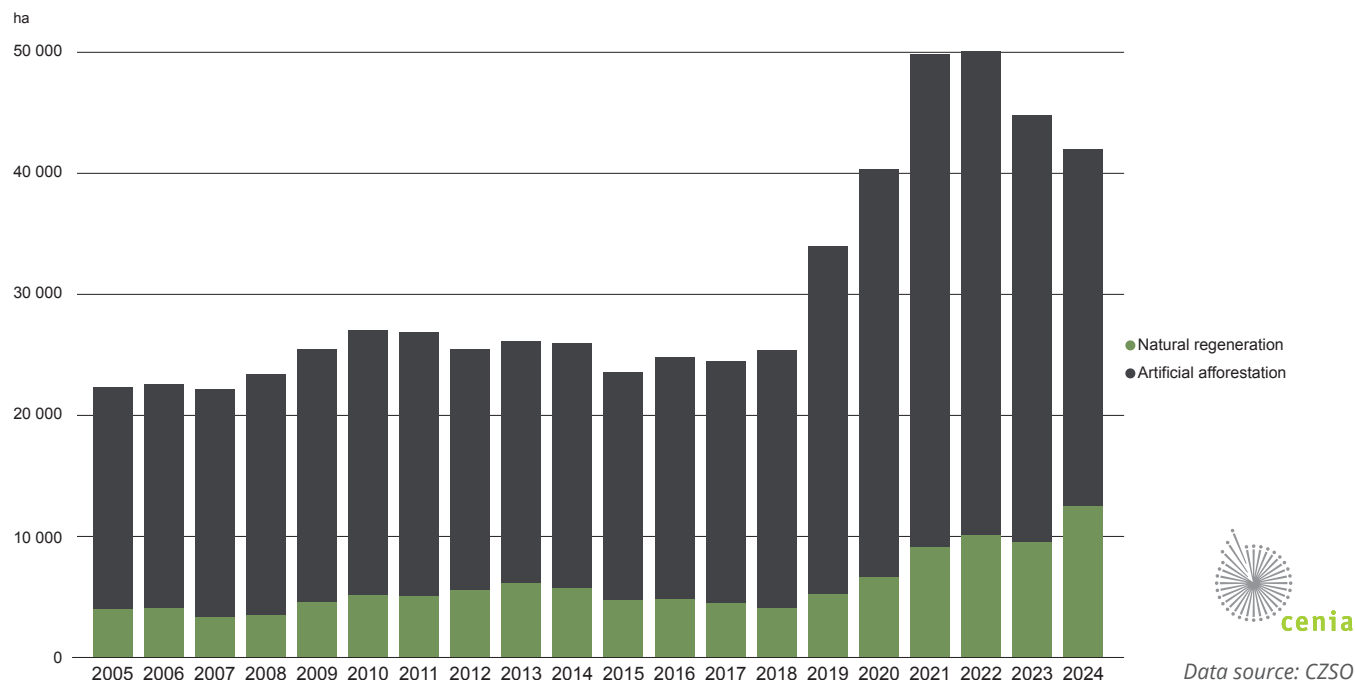
One of the key principles of nature-friendly forest management is the use **of natural regeneration** in genetically suitable stands. As a result of record timber harvesting in recent years, mainly due to the bark beetle calamity, there has been a significant increase in the total area of forest regeneration. Although most of the regeneration continues to be **artificial afforestation**, the area of natural regeneration and its share of total regeneration have been growing in the long term. In 2024, the share of natural regeneration in total forest regeneration reached a record 29.7%, which represents a positive shift towards more sustainable management (Graph 76). Greater use of natural regeneration and appropriate management methods has the potential to significantly reduce costs and the need for planting material and human resources, which are in short supply during a calamity, while at the same time achieving higher forest production value.

¹⁰⁴ The data from the draft section of the Forest Management Plan are influenced by the owner's economic intentions and may not correspond to the actual representation of individual management methods.

¹⁰⁵ Kučera M., Adolt R., editors: *National Forest Inventory in the Czech Republic – Results of the Second Cycle 2011–2015* [online]. First edition. Brandyš nad Labem: Institute for Forest Management Brandyš nad Labem, 2019 [cited 29 June 2021]. ISBN 978-80-88184-24-9. Available at: <https://nli.gov.cz/ke-stazeni/narodni-inventarizace-lesu/>.

Graph 76

Afforestation and natural forest regeneration [ha], 2005–2024



In order to support natural and artificial forest regeneration, it is necessary to take a whole range of management measures, both forestry and hunting. In terms of game management measures, it is particularly important to adhere to the plan **for the breeding and hunting of cloven-hoofed game**, especially in view of the continuing extensive damage caused by this game through browsing on established forest cultures and natural regeneration, as well as on agricultural crops and land. In the long term, the numbers of all monitored game species are increasing, especially fallow deer, whose numbers more than doubled between 2000 and 2024. Roe deer have long been the most numerous game species. Based on data from the National Forest Inventory (NIL)¹⁰⁶, the minimum demonstrable amount **of damage caused by game** can be estimated at CZK 1,163 million per year. The reason for the high numbers of game is the intensive use of the landscape by humans, especially agriculture, which creates suitable cover and food conditions, and reduced natural regulation of game, or its complete absence. Damage caused by game can also be reduced by establishing small fields and browsing areas. In terms of forestry measures, it is worth mentioning consistent forest protection and timely stand tending in relation to tree species. The costs of protecting forest stands against wildlife currently amount to approximately CZK 1,451 million per year.

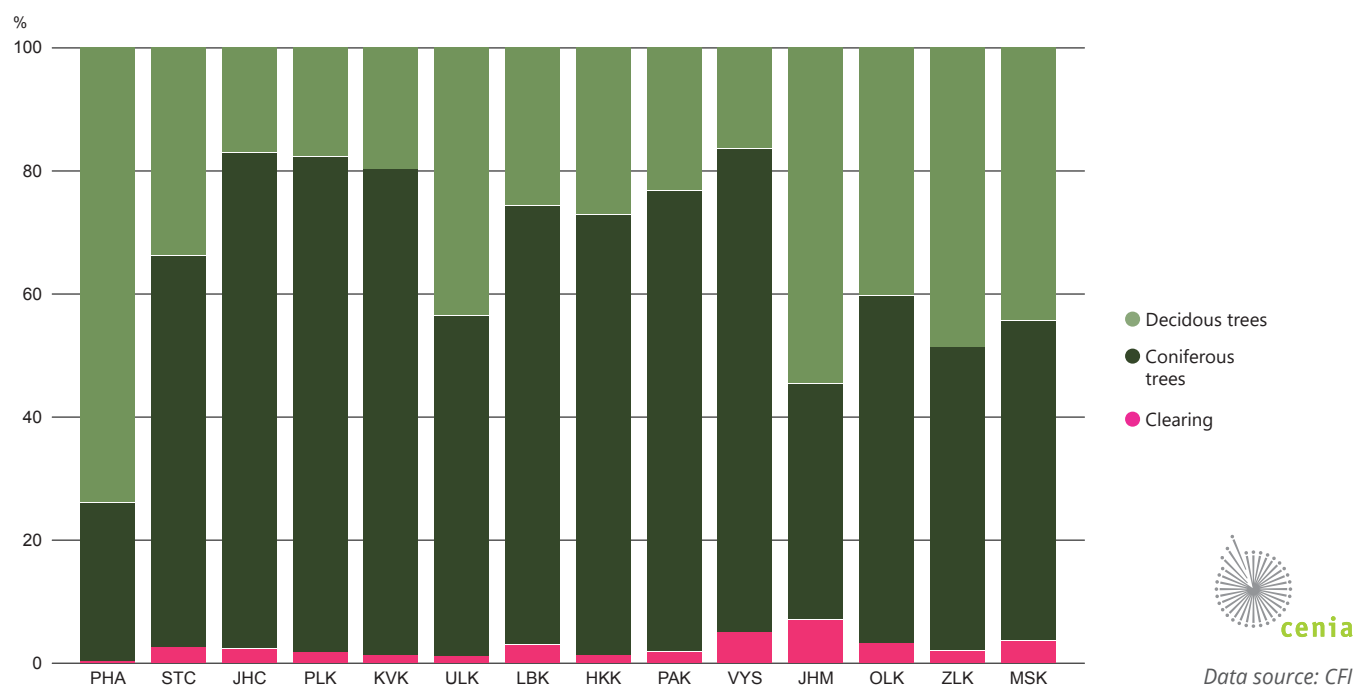
In recent decades, there has been a noticeable shift in species composition towards a more natural (and stable) forest structure, reflected in the more frequent **planting of deciduous trees** at the expense of conifers. In 2024, 16,300 ha were afforested with conifers (55.3%) and 13,200 ha with deciduous trees (44.7%) through planting and sowing (i.e. artificially). The most commonly used tree species was spruce (10,400 ha), followed by beech (4,800 ha) and oak (4,500 ha).

¹⁰⁶ FGMRI: Determination of the minimum demonstrable amount of damage caused by game to forest stands in the Czech Republic. Available online: https://www.vulhm.cz/files/uploads/2024/07/Skody_na_lese_VULHM.pdf.

The current **species composition of forests** differs significantly from the reconstructed natural and recommended composition¹⁰⁷, mainly as a result of the widespread planting of spruce and pine monocultures in the past. Monocultures of conifers of the same age, often of unsuitable ecotypes, reduce biodiversity and are significantly more susceptible to damage from biotic and abiotic factors. The total **share of deciduous stands** in the forest area is gradually increasing, rising from 22.3% in 2000 to 30.5% in 2024, with the recommended composition anticipating an increase in the proportion of deciduous trees to 35.6%. The largest share of conifers in the forest area is in the Plzeň Region and the South Bohemian Region (both 80.6%), followed by the Vysočina Region (78.6%) and the Karlovy Vary Region (79.0%; Graph 77). Conversely, the largest share of deciduous trees in the forest area is in the Prague Region (74.1%) and the South Moravian Region (54.8%). In addition to these regions, the proportion of deciduous trees in the forest area reaches the recommended value of 35.6% in the Zlín Region (48.8%), Moravian-Silesian Region (44.5%), Ústí Region (43.7%) and Olomouc Region (40.4%). In all other regions, there is a slight trend towards gradually approaching the recommended state with a higher proportion of deciduous trees.

Graph 77

Species composition of forests in regions [%], 2024



A tool for introducing responsible forest management and informing consumers about the origin and environmental consequences of timber harvesting is **the certification of forest land** by international certification organisations, which developed in Czechia mainly after 2000. Currently, **PEFC** (Programme for the Endorsement of Forest Certification Schemes) and **FSC** (Forest Stewardship Council) certificates are available. In 2024, 66.4% of forest land was certified according to PEFC and 5.0% according to FSC, whose standards place higher demands on certain aspects of sustainable management.

Detailed visualisations and data

<https://www.envirometr.cz/data>

¹⁰⁷ The reconstructed natural composition is close to the climax composition before human influence on the forest. The recommended species composition of forests is a compromise between the current and natural tree composition, taking into account economic interests, non-productive functions of forests and knowledge related to adaptation to climate change.

3 Nature and Landscape

3.2 Biological diversity

Key messages

- Since 1982, the abundance of all common bird species in Czechia has declined by approximately 11% overall, with the most significant decline occurring in the last five to ten years. The largest decline was recorded in bird species of the agricultural landscape, whose abundance decreased by 45.0% between 1982 and 2024 due to the high intensity of agriculture. Bird populations are also affected by climate change.
- Most of the species of animals (59.8%), plants (75.4%) and natural habitats (79.6%) of European importance in Czechia are in an unfavourable or poor condition.
- Landscape fragmentation by transport is increasing and efforts to effectively open up the river network continue to fail.
- Partial successes can be observed in populations of endangered species thanks to management in protected areas.
- Active species protection tools are being implemented for 17 animal species and 13 plant species.
- In the long term, the number of specimens of protected species traded under the CITES Convention is increasing. The most traded group of animals are birds (especially parrots), followed by reptiles and amphibians.

3.2 Biological diversity

Assessment of trends and status of indicators and fulfilment of set targets

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Landscape fragmentation	The condition of natural habitats is improving and species protection is ensured			Average effective mesh size 37 km ²	
Passability of the river network	Passability of 161 transverse structures by 2027 ¹⁰⁸			21 structures made passable	
Status of species and habitats of European importance	The status of natural habitats is improving and species protection is ensured			59.8% of animal species, 75.4% of plant species and 79.6% of natural habitats are in an unfavourable or inadequate state	
Status of bird species				Growing or stable population status 49.8% of wild bird populations (1980–2018)	
Common bird species				Decline in the abundance of all common bird species by 11% between 1982 and 2024	
Specially protected areas and Natura 2000 sites				21.9 %	
Active species protection tools	Protection and care of the most valuable parts of nature and the landscape is ensured			17 animal species and 13 plant species	

¹⁰⁸ Concept for improving the passability of the Czech river network

¹⁰⁹ The Czech Republic's contribution to the objectives of the EU Biodiversity Strategy

SEP 2030 indicator	Target	Long-term trend (15 years and more)	Short-term trend (5 years)	Current status	Target achievement
Non-native species in Czechia	The negative impact of invasive non-native species is limited			1,576 non-native and 75 invasive plant species, 595 non-native and 113 invasive animal species	
International trade in endangered species protected by the CITES convention	Protection of wild animals in human care is ensured			104 confiscated live specimens	

Current measures supporting the achievement of the objective

- The planned amendment to the Nature and Landscape Protection Act in the area of species protection regulates rights and obligations in relation to wild animals, including in cases where care needs to be provided.
- In 2024, preparations continued for the declaration of the Křivoklátsko National Park, the declaration of the Soutok Protected Landscape Area was discussed, and preliminary negotiations and the acquisition of expert documentation for the planned declaration of the Krušné hory Protected Landscape Area took place. At the same time, an amendment to the government regulation establishing the national list of sites of European importance was approved, and a government regulation defining the new Western Krušné hory Bird Area was also approved.
- The adoption of the updated Concept of Active Species Protection Tools in the Czech Republic 2023–2032, including new lists of candidate species, was key to the implementation of rescue programmes for selected endangered species.
- Individual rescue and conservation programmes are gradually being developed, e.g. for the stone crayfish and the Eurasian lynx. Amendments to the Nature Conservation Act will improve the status of active species protection tools by providing a clearer legal basis for them.
- The preparation of principles for the regulation of non-native species is ongoing. In 2023, principles were adopted for the tree of heaven and giant hogweed, and in 2024, principles were adopted for the silk tree and Himalayan balsam. Work is continuing on the preparation of principles for the regulation of other invasive non-native species.
- Financial support is provided for the modernisation and development of rescue stations and CITES rescue centres for endangered animal species.

The state of natural habitats, species and landscapes

All biodiversity indicators point to a global **decline in biodiversity**, and the pressures causing this decline are intensifying. However, preserving biodiversity and the benefits that nature provides to humans is essential for achieving sustainable development and human well-being. For example, food production depends on biodiversity and a range of ecosystem services that support agricultural productivity. Nature is also key to meeting climate protection goals. Approximately one-third of the net reduction in greenhouse gas emissions needed to meet the Paris Agreement targets could come from nature-based solutions¹¹⁰. The main drivers of global biodiversity loss are changes in land and water use (e.g. deforestation), overexploitation of organisms (e.g. marine fisheries), climate change, pollution of ecosystems and the spread of invasive species.

Changes in land use and overall changes in ecosystems reflect trends in bird population development¹¹¹. Between 1982 and 2024, the abundance of all **common bird species**¹¹² in Czechia declined by approximately 11% overall, with the most significant decline occurring in the last five to ten years (Graph 78).

The abundance **of birds in agricultural landscapes** declined by almost half (45.0%) during this period, with a massive decline in field birds beginning even before monitoring started in 1982. The main causes of the dramatic decline in the abundance of birds in the agricultural landscape are primarily the high intensity of agriculture¹¹³ and insufficient measures to support biodiversity¹¹⁴. For example, the grey partridge, lapwing, meadow pipit and meadow pipit have declined to a fraction of their original numbers during the monitoring period and have recently remained at this significantly reduced level.

The abundance **of forest bird species** declined slightly until around 2000, followed by a period of stability and a decline in recent years, with the 2024 value 21.7% lower than in 1982. At the same time, forest habitat specialists are mostly declining in numbers (e.g. red-breasted flycatcher, wood warbler, common redstart) and are being replaced by widespread species with broad ecological valence, such as blackbird, song thrush, robin, blackcap, great tit and blue tit. Biodiversity is thus declining overall at the local and regional levels.

¹¹⁰ IPBES. (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Zenodo. Available online: <https://doi.org/10.5281/zenodo.6417333>.

¹¹¹ Vermouzek, Z., Jechumtál Skálová A. (2025): *Indicator of common bird species and indicator of forest bird species for 2024*. Czech Agency for Nature Conservation and Landscape Protection. Unpublished. 16 p.

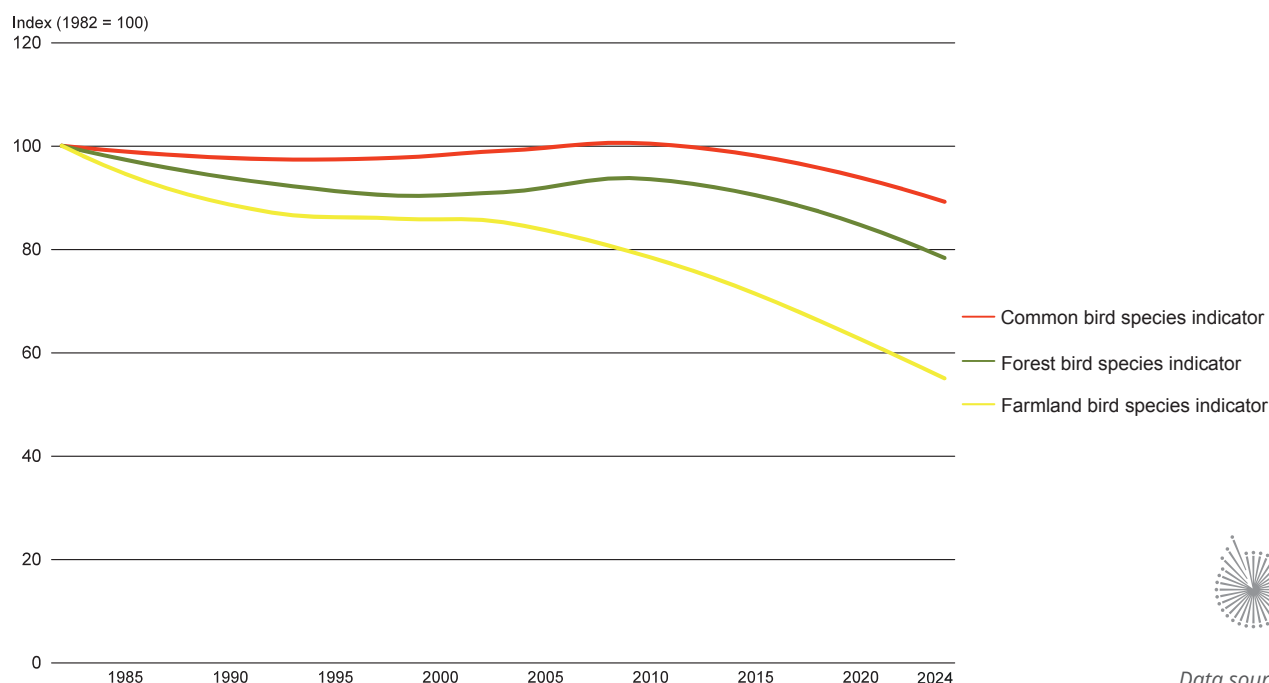
¹¹² The indicator is based on data from the Unified Bird Census Programme in the Czech Republic, which is a long-term programme for monitoring nesting bird populations in the Czech Republic and provides data on changes in the abundance of bird species and their occurrence and abundance in different types of environments. The JPSP is organised by the Czech Ornithological Society. For the purposes of calculating the indicator for common bird species, 42 species were selected, whose populations (together with the population of the rock pigeon, *Columba livia f. fera*, which was excluded from the analysis) together represent 95% of all birds nesting in the Czech Republic.

¹¹³ Reif J. & Vermouzek Z. (2018): *Collapse of farmland bird populations in an Eastern European country following its EU accession*. *Conservation Letters* 2018, doi: 10.1111/conl.12585.

¹¹⁴ Vermouzek Z. & Zámečník V., 2018: *Agricultural landscape bird indicator for 2018*. Study for the Ministry of Agriculture of the Czech Republic. Czech Ornithological Society, unpublished, 64 pp.

Graph 78

Indicators for all common bird species, forest bird species and farmland bird species [index, 1982 = 100], 1982–2024



Data source: Czech
Ornithological Society

Trends in bird populations reflect changes in the landscape and its use, as well as overall changes in ecosystems. To a lesser but increasing extent, the effects of **climate change** have been evident since around the mid-1990s. As a result, northern species (brown hawk moth, green bush cricket, woodlark) are disappearing from Central Europe, while thermophilic species (turtle dove, nightingale, golden oriole), which have so far been concentrated in southern Europe, are increasing slightly. In connection with this, a further decline in bird populations can be expected in our country, as according to models of the future spread of individual species in response to climate change, the area with the greatest species diversity, of which Czechia has been a part until now, will shift northeastwards¹¹⁵.

The European Union protects more than 460 species of wild birds in all stages of their life cycle under **the EU Birds Directive**. According to the latest assessment (for the period 2013–2018), Czechia has 49.8% of wild bird populations have a growing or stable population size in terms of long-term change (i.e. 1980–2018)¹¹⁶ and 44.3% of populations have a growing or stable population size in terms of short-term change (2007–2018). The other half of bird populations show a long-term decline (23.5%), uncertain (1.8%) and unknown (24.4%) status. The status of bird populations depends to a large extent on **the status of their habitats**. The nesting range of 74% of wild bird populations is stable or growing (i.e. increasing in size) in the long term, and 72% in the short term.

¹¹⁵ Huntley B., Green R. E., Collingham Y. C. & Willis S. G. (2007): *A Climatic Atlas of European Breeding Birds*. Lynx Edicions, Barcelona.

¹¹⁶ Data for 2019–2024 are not available at the time of publication due to the indicator being reported in six-year cycles.

The overall condition of Czech nature also reflects **the condition of species of animals and plants of European importance**. Based on results from 2013–2018¹¹⁷, 59.8% (131) of animal species and 75.4% (46) of plant species were in an unfavourable or inadequate condition. At the same time, despite the gradual improvement **in the status of European-significant natural habitat types**, 79.6% of natural habitats were still assessed as being in an unfavourable or bad condition. Within the EU27 and the United Kingdom¹¹⁸, Czechia is average. In Czechia, 30.3% of species of European importance were in a favourable condition, while in the EU as a whole the figure was 31.4%¹¹⁹. At EU level, 23.8% of assessed habitats were in a favourable condition, compared to 19.4% in Czechia.

A number of factors contribute to the unfavourable status of natural habitats and species, one of the most significant being the change in society's approach to landscape management and use. On the one hand, this is reflected in the intensification of land use, which leads to the homogenisation of the landscape and the loss and degradation of natural habitats and species biotopes (as evidenced, among other things, by the unfavourable status of forest natural habitats and associated species, farmland birds, amphibians, etc.) and on the other hand in the abandonment of farming and the threat to natural habitats and species biotopes of succession (particularly threatened are formerly extensively farmed non-forest natural habitats and species associated with them). Other factors include landscape fragmentation (especially by transport infrastructure and transverse structures in watercourses) and the loss of naturally valuable areas (especially through development), but the impact of nutrient loading on the landscape, climate change and the spread of non-native invasive species cannot be overlooked either.

The ecological stability of the landscape can be assessed according to the number of natural habitats. In 2024, **natural habitats** accounted for an average of 15.8% of the cadastral area. Areas with the greatest disruption to natural structures are found in the most agriculturally used areas and in metropolitan areas, while natural and near-natural landscapes are found mainly in border areas and are associated with designated protected areas. The highest proportion of natural habitats in the cadastral area is found in the Karlovy Vary Region (33.2%), the Liberec Region (28.2%) and the Zlín Region (28.0%). Conversely, the lowest proportion is found in the Capital City of Prague (6.5%) and the Vysočina Region (6.9%).

Landscape fragmentation caused by transport leads to the loss of the original qualities of habitats and their connectivity, which is important for animal migration. The results of the analysis of the average effective mesh size¹²⁰ for the period 2016–2022¹²¹ show that there is an overall increase in fragmentation, mainly due to the gradual construction of the motorway and road network and the expansion of built-up areas. Nevertheless, the degree of fragmentation has decreased in a number of places. This was mainly due to the transfer of some public roads to the category of non-public roads. The most fragmented areas include the surroundings of large settlements (central and eastern Bohemia, Liberec, Plzeň, Ostrava, the surroundings of Brno, Olomouc and Ústí n. Labem) and areas along major transport routes. In contrast, the least fragmented areas are the peripheral areas of marginal mountain ranges, areas of current and former military training grounds, larger forest complexes, or areas with sparser settlement and transport infrastructure.

Transport routes represent a significant and often insurmountable obstacle for many species of animals. The barrier effect of new transport routes is largely mitigated by compensatory measures (ecoducts, underpasses, etc.) for **animal migration**.

¹¹⁷ Data for 2019–2024 are not available at the time of publication due to the indicator being reported in six-year cycles.

¹¹⁸ The United Kingdom was included in the assessment for the period 2013–2018.

¹¹⁹ This is the average value for the countries listed. Expert assessments at European level indicate an even lower proportion, with 28% of species in good condition. For more information, see: <https://www.eea.europa.eu/en/analysis/indicators/conservation-status-of-species-under>

¹²⁰ Effective Mesh Size (EMS) expresses the imaginary probability of two randomly located points in the landscape meeting. The higher the EMS values, the lower the degree of landscape fragmentation (and vice versa). For regular grid units located within larger unfragmented areas, this is practically the area of unfragmented areas.

¹²¹ Data for 2024 are not available at the time of publication.

The fragmentation of watercourses and the associated restriction or prevention of free migration, often combined with other anthropogenic pressures (hunting, fisheries management, pollution, climate change, hydroelectric power plants, regulation and modification of river beds, etc.), have led to a significant decline in the populations of most rheophilic fish species and the partial to complete disappearance of specialised diadromous fish species. According to data from watercourse administrators, there are more than 6,600 transverse structures higher than 1 m on watercourses in the Czech Republic, and thanks to projects focused on mapping transverse barriers, more than 20,000 migration barriers have been mapped on watercourses important for migration. Within the framework of the Concept for the Passability of the River Network (2009; updated in 2020), a total of 161 transverse structures are proposed for passability, of which 21 have been made passable. Thus, 13% of the commitment has been fulfilled over the last 16 years.

It is still not possible **to systematically** and hierarchically **open up the river network** in Czechia by implementing the planned measures. In practice, fish passes are still mostly built “alternatively” in other parts of watercourses than would be most effective, and especially in watercourses where the restoration of migration permeability is of rather regional to local importance, which cannot be considered optimal. The launch of other measures, such as the removal of transverse barriers, which are comprehensive measures, can be considered very positive. Other factors causing the fragmentation of watercourses include backwater and water accumulation, inappropriate watercourse modifications (flood control measures), water abstraction and pollution.

Protection and care of the most valuable parts of nature and the landscape

Specially protected species are listed in Decree No. 395/1992 Coll. as amended¹²², a decree of the MoE implementing certain provisions of Czech National Council Act No. 114/1992 Coll. on the protection of nature and the landscape. However, there are many more species that deserve attention, and these are listed in the so-called red lists, which are continuously updated (the latest edition of the Czech red lists was published in 2017, but there is also an updated digital database of red lists¹²³).

According to **the red lists**, 908 species of vascular plants and over 1,000 species of fungi, lichens and bryophytes, as well as 163 species of vertebrates (16 species of amphibians, 7 species of reptiles, 25 species of lampreys and fish, 100 species of birds and 15 species of mammals) and over 3,300 species of invertebrates. A large number of endangered plant and animal species occur in the border areas of Czechia, where there are a number of protected areas, and in the Pannonian region (southern Moravia).

A large proportion **of endangered species** according to the red lists can be found among reptiles, amphibians, fish and lampreys, birds, butterflies and longhorn beetles, which points to the main problems in the Czech landscape, namely the large number of unsuitably modified watercourses, the inadequate, albeit improving, water quality in many places, and the overall uniformity of many parts of the Czech landscape. Fish populations are also affected by predation by fish-eating predators.

The fire-bellied toad is the only amphibian species that has been reclassified in the new Red List to a lower category than in the previous assessment. Thanks to appropriate management, its populations have begun to thrive again. Since 2012, targeted management and administration of suitable sites has been underway in the Podyjí National Park – changes in pond management, targeted reduction of fish stocks, and the creation and restoration of pools and small wetlands, which are strengthening the population of the fire-bellied toad. Data available from monitoring shows an increase in population numbers, as well as the successful spread of the species to new or restored sites.

¹²² More at: [https://portal.nature.cz/web/cz/zvlaste-chranene-druhy#/.](https://portal.nature.cz/web/cz/zvlaste-chranene-druhy#/)

¹²³ More at: [https://portal.nature.cz/cervene-seznamy#/.](https://portal.nature.cz/cervene-seznamy#/)

The populations of native plant and animal species and individual valuable communities in Czechia are threatened by the spread of geographically **non-native species**, especially **invasive** species. The highest number of invasive species occurs along watercourses and roads, which facilitate their spread. An increased number of invasive species is also recorded in human settlements and their surroundings. From a geographical point of view, a high number of invasive species occur in the North Pannonian subprovince (the territory of South Moravia), where there is also a higher number of endangered plant and animal species.

The occurrence and spread of invasive species in Czechia is reviewed and evaluated once every ten years. Data on the occurrence of non-native species are collected at the national level in the NCA Findings Database. Among other things, the data is used to plan interventions against invasive species in selected sensitive areas. Noteworthy are significant projects aimed at the eradication of giant hogweed in the Karlovy Vary Region (since 2013) and the northern raccoon in the Doupov Mountains (2019–2024).

Of the total number of 1,576 **non-native plant species** that occur or have been recorded in the Czech Republic in 2022¹²⁴, 75 species are considered **invasive**¹²⁵. Widely spread invasive plant taxa include knotweed, glandular impatiens, multifoliate lupine, giant hogweed and black locust.

One of the places where efforts are being made to stop the spread of **black locust** is the Podyjí National Park. Of the original area of approximately 180 hectares of black locust, approximately 50 hectares (roughly the size of 17 football pitches) have been treated so far. Individual plants and stands are being destroyed by manual injection. Acacia is being treated according to a strategy focused on the priority treatment of small isolated foci and stands growing in areas with preserved vegetation.

Of the total number of 595 **non-native animal species**, 113 species were considered **invasive** in 2022¹²⁶. Widely spread invasive animal species include the American mink, northern raccoon, sika deer, eastern minnow, silver carp, striped crayfish, signal crayfish and Spanish slug. In 2023, the Asian hornet, which is included in the EU list of invasive alien species, was recorded in Czechia for the first time.

The EU Biodiversity Strategy to 2030 includes the goal of ensuring the territorial **protection of at least 30% of the EU's territory** (and 10% of the EU's territory under strict protection). Czechia has a limited number of valuable large areas suitable for potential nature conservation, which has led to the creation of many small protected areas (median size < 9 hectares) that suffer from isolation (Fig. 16).

The **Natura 2000** network is almost complete in Czechia, so its contribution to meeting the objectives of ensuring territorial and strict protection will be minimal. However, there are plans to create new specially protected areas of national importance.

Overall, **the area of protected areas** (21.9% in 2024) should be increased by 1.1% of previously unprotected areas by 2030. Further efforts will focus on improving the connectivity of the network of protected areas by strengthening the protection of natural areas that are currently protected by other means (e.g. significant landscape features, territorial system of ecological stability, temporarily protected areas, nature parks, water source protection zones). These areas, which can be listed in the World Database of Protected Areas as **other effective territorial protection measures** when adequate protection is ensured, will account for a further 5.3% of the commitment. Overall, it is proposed to protect 28.33% of the country's territory by 2030. The increase in the proportion of strictly protected areas should be ensured by declaring new specially protected areas and strengthening the protection of natural values in Zone II of protected landscape areas.

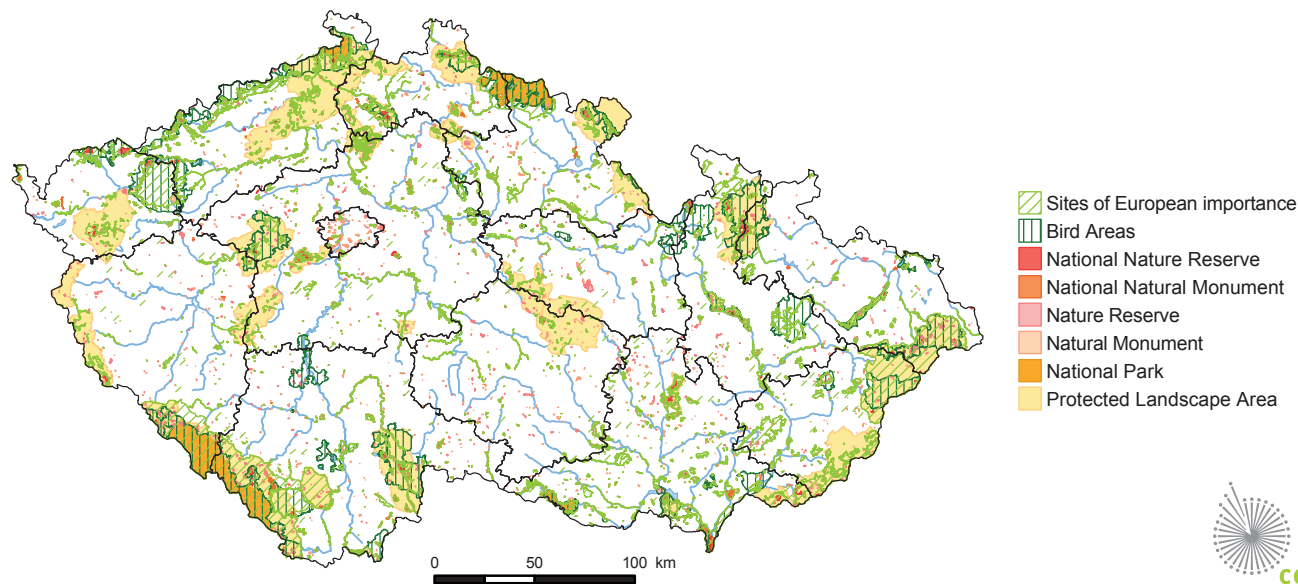
¹²⁴ Data for 2023 and 2024 are not available at the time of publication.

¹²⁵ Pyšek, P.; Sádlo, J.; Chrtěk, J. Jr. et al. (2022). *Catalogue of alien plants of the Czech Republic (3rd edition): species richness, status, distributions, habitats, regional invasion levels, introduction pathways and impacts*. Preslia, 94, pp. 447–577.

¹²⁶ Data for 2023 and 2024 are not available at the time of publication.

Fig. 16

Specially protected areas and Natura 2000 sites in the Czech Republic, 2024



Data source: NCA

The NCA project “Plan for the TSES in Protected Landscape Areas”, which is gradually reviewing the delimitation of plans for TSES in 20 protected landscape areas, adding new ones and targeting the expansion of selected components of the TSES delimited according to the biotope approach.

The natural zones of national parks and other protected areas, where natural processes are prioritised and human intervention is limited, are of great importance for biodiversity. In the Šumava National Park, for example, these zones enable the survival of two rare forest beetle species – the great capricorn beetle and the mountain longhorn beetle. An increase in numbers has been recorded, for example, in the Šumava population of **capercaillie**, which responded positively to the reduction of artificial interventions in Zone 1 of the national park after the windstorm caused by Hurricane Kyrill.

A species with significantly positive range and population trends is **the peregrine falcon**, whose European population collapsed in the 1950s due to the use of various pesticides in agriculture, especially DDT. Falcons returned to the Czech countryside 30 years later, and currently more than 100 pairs nest in Czechia, thanks in part to the protection of natural nesting sites and the installation of nesting boxes on tall buildings. Similarly, the seemingly unpopular measure of **restricting access and activities** in selected areas of the Bohemian Switzerland National Park, which is one of the most important nesting sites for peregrine falcons, has enabled successful nesting and rearing of young and has significantly contributed to the protection of this species.

Active species protection tools¹²⁷ are an important tool for the protection of the most endangered species. In 2023, the Concept of Active Species Protection Tools in the Czech Republic 2023–2032 was approved, which defines the categories of active species protection tools (rescue programmes, care programmes and regional action plans) and describes the criteria for selecting plant and animal species for their preparation. In 2024, active species protection tools were implemented for 17 animal species and 13 plant species.

Thanks to the rescue programme, for example, **the Czech sand pink** has been saved, whose remaining population (numbering around 200 individuals in the 1990s) has grown more than fortyfold and continues to expand.

¹²⁷ Information on active species protection tools is available at: <https://www.zachranneprogramy.cz/>.

The regional action plan for **the rock butterfly** in the České středohoří Mountains, which was approved at a time when numbers of this species were critically low at the last site (Raná) in the České středohoří Mountains, has been successful. To date, it has been possible to significantly increase the numbers of rock butterflies at Raná and, through a combination of measures, to restore their abundant occurrence at other sites.

Care for national parks

National parks are one of the most valuable parts of our country's natural heritage, and their legislative protection reflects this. All use of these areas is therefore subject to the preservation of natural ecosystems corresponding to the natural conditions of the given habitat and the achievement of their natural biological diversity.

The long-term goal of national park protection is to preserve or gradually restore natural ecosystems, including ensuring the undisturbed course of natural processes in their natural dynamics in the predominant area of national parks, and to preserve or gradually improve the condition of ecosystems whose existence is conditioned by human activity that are important in terms of biological diversity, in the remaining area of national parks. The protection of national parks thus focuses primarily on the preservation, support and development of both natural processes and ecosystems and their components, the maintenance of which depends on continuous human care. Both of these approaches are always specifically chosen with regard to the type of ecosystem, including its components, and contribute to the preservation, restoration and development of biological diversity.

The form and nature of active care in national parks varies depending on the nature conservation zones, which determine the possible extent of intervention or care for the natural environment. Each zone has its own specific regime, which reflects its conservation objective and the nature of the ecosystems represented therein.

The aim of the nature zone is to allow natural processes to proceed undisturbed in the ecosystems represented. Therefore, only a limited number of activities are carried out here as part of active ecosystem management, in particular the removal of invasive and geographically non-native species, measures to support specially protected species, and safety interventions along tourist trails. All these activities are carried out with the utmost respect for the preservation of the natural character of the area, and in 2024, a total of CZK 2,188,500 was spent on them by all national park administrations over a total area of 29,871 ha. The total funds spent by individual national park administrations on active management in the natural zone in 2024, including a breakdown into forest and non-forest ecosystems, are shown in Table 3.

The aim of the near-natural zone is to achieve a state of represented ecosystems corresponding to natural ecosystems. In the near-natural zone, active care for forest ecosystems is based on the same measures as in the natural zone, and is further extended to include restoration management aimed at supporting the structural differentiation and stability of forest ecosystems, interventions to support natural processes and increase the diversity and volume of woody biomass in stands, and measures against the spread of bark beetles that do not impair the naturalness of forest ecosystems. In the area of active care for non-forest ecosystems, in addition to measures identical to those in the natural zone, interventions are also carried out to support the natural ecological stability and biological diversity of these habitats. In 2024, national park administrations spent a total of CZK 95,079,900 on active management in this zone, covering a total area of 27,862 ha. The total funds spent by individual national park administrations on active management in the near-natural zone in 2024, including a breakdown into forest and non-forest ecosystems, are shown in Table 3.

The aim of the concentrated nature conservation zone is to preserve or gradually improve the condition of ecosystems that are important in terms of biological diversity and whose existence is dependent on permanent human activity, or to restore near-natural ecosystems. The zone of concentrated nature conservation thus encompasses both long-term objectives of national park protection, and with this in mind, a whole range of measures and interventions are used in active conservation. In forest ecosystems, this involves not only the implementation of measures carried out in natural and near-natural zones, but also the implementation of restoration management to improve their condition and interventions to benefit their species, age and spatial structure. Furthermore, measures are implemented to prevent the spread of bark beetles, and where natural regeneration is not ensured, artificial regeneration

is also carried out, including measures for its protection. In some cases, specific interventions are also introduced in forest stands to support selected species and habitats, such as coppice and middle forests. Active management of non-forest ecosystems in this zone includes both measures implemented in the natural and semi-natural zone and interventions aimed at the management and maintenance of characteristic grassland vegetation and the associated species diversity (e.g. mowing, grazing, reduction of self-seeded trees) and measures to restore grassland communities and improve the condition of degraded or otherwise affected non-forest ecosystems (e.g. support for wetlands and small water bodies). In 2024, a total of CZK 204,568.5 thousand was spent by national park administrations on active management in this zone, covering a total area of 60,252 ha. The total funds spent by individual national park administrations on active management in the concentrated nature conservation zone in 2024, including a breakdown into forest and non-forest ecosystems, are shown in Table 3.

In the cultural landscape zone, if there are objects of national park protection, active care is focused on similar measures as in the concentrated nature care zone. In 2024, a total of CZK 2,576,100 was spent on active management in this zone by all national park administrations, covering a total area of 1,033 ha. The total funds spent by individual national park administrations on active care in the cultural landscape zone in 2024, including a breakdown into forest and non-forest ecosystems, are shown in Table 3.

Tab. 3

Funds spent on fulfilling long-term conservation objectives according to NP zoning, 2024

Nature protection zone NP	Total area of nature conservation zone in NPs (ha)				Active management by NP administrations	Total funds spent by NP administrations on active management in 2024 (CZK)*			
	Krkonoše NP	Šumava NP	Bohemian Switzerland NP	Podyjí NP		Krkonoše NP	Šumava NP	Bohemian Switzerland NP	Podyjí NP
natural	7 329	18 978	1 237	2 328	care for forest ecosystems	21 689	395 746	1 043 016	695 601
					care for non-forest ecosystems	–	32 479	–	–
close to nature	8 097	16 837	1 498	1 430	care for forest ecosystems	22 752 001	65 951 575	3 278 721	2 911 768
					care for non-forest ecosystems	–	185 857	–	–
concentrated nature conservation	20 730	31 836	5 169	2 517	care for forest ecosystems	70 651 076	94 856 809	13 358 151	5 137 549
					care for non-forest ecosystems	11 658 960	5 255 815	339 159	3 310 973
cultural landscape	196	808	24	5	care for forest ecosystems	–	2 408 069	–	–
					care for non-forest ecosystems	–	138 637	29 403	–

* These are the direct costs of NP administration for the activities concerned.

Data source: National park administrations, MoE

In addition to the above activities, active management of national park areas also includes measures that cannot be directly assigned to specific protection zones, as these activities overlap across the entire national park or its buffer zone, regardless of the specific boundaries of individual zones. These include, for example, activities related to the care of small watercourses and water areas, including measures to restore and revitalise the water regime. They also include interventions aimed at eliminating invasive alien species, caring for wild animals, and activities in the field of

seed production and nursery management, which serve to provide reproductive material for the restoration of selected ecosystems in the national park. These activities represent a significant part of the active management of national park areas, with a total of CZK 43,841,600 spent on these activities in 2024 by all national park administrations. The total funds spent in 2024 by individual national park administrations on active care, which cannot be broken down by individual protection zones, are listed by type of measure in Table 4.

Tab. 4

**Funds spent on active management in the managed area by the NP administration
(groups of typical activities), 2024**

Groups of typical activities in the implementation of active care in the managed area by the NP administration	Total funds spent by the NP administration on active care in the managed area in 2024 (CZK)*			
	Krkonoše NP	Šumava NP	Bohemian Switzerland NP	Podyjí NP
care for small watercourses and water areas, including revitalization of the water regime	8 908 847	11 324 878	342 143	147 629
elimination of invasive species	34 175	3 184 307	302 130	22 780
care for wild animals that are game	9 175 813	4 857 810	866 637	866 078
seed production and nursery gardening	894 232	2 562 298	116 117	235 759

* These are the direct costs of the NP administration for the activities concerned, which cannot be broken down by zoning due to the overlap of these activities across NP zones (if the NP has a protection zone, the data also applies to this area).

Data source: National park administrations, MoE

The above activities, which describe in more detail the measures implemented as part of active management by individual national park administrations, broken down by individual protection zones or for the entire national park territory, or its protection zone, and the funds spent on them in 2024, ensure the fulfilment of both the long-term objectives of national park protection and the functions of their protection zones, which arise from the applicable legislation.

The mission of national parks is to fulfil the long-term objectives of national park protection and also to enable the use of national park areas for sustainable development, education, research and nature-friendly tourism in ways that do not conflict with the long-term objectives of national park protection. In addition to active nature conservation, which contributes to the fulfilment of the long-term objectives of national park protection, national park administrations also carry out other activities related to the mission of national parks. These include, in particular, activities related to the regulation of visitor numbers and the development of visitor infrastructure, specifically the maintenance and renewal of tourist facilities such as boardwalks, shelters and bridges, as well as the development of information and navigation elements in the field and the optimisation of the network of tourist trails, including the modification of their surface and other parameters. These activities not only increase the comfort of visitors and local residents, but above all contribute to the protection of national park areas, as they eliminate or minimise the negative impacts associated with visitor numbers in these areas. The mission of national parks also includes awareness-raising and educational activities carried out by individual national park administrations, as well as the use of national park areas for research and monitoring purposes. In 2024, a total of CZK 88,276,600 was spent on activities related to visitor infrastructure and visitor management for all national park administrations. A total of CZK 21,607,100 was spent on scientific research and monitoring activities carried out by individual national park administrations in 2024, and a total of 1,131 public events focused on awareness and education were organised by national park administrations in 2024. The activities of national park administrations described above and the funds spent on them in 2024, which are detailed in Table 5, ensure the fulfilment of the mission of national parks under current legislation.

Tab. 5

Funds spent on ensuring the fulfilment of the mission of national parks under current legislation, 2024

Indicators linked to the mission of the national park for 2024	National park administration							
	Krkonosé NP		Šumava NP		Bohemian Switzerland NP		Podyjí NP	
number of public events (educational, awareness-raising, promotional, etc.) organized or co-organized by the NP administration (number of events)	721		239		145		26	
funds spent on visitor infrastructure and visitor management implemented by the NP administration within the NP (CZK)	50 603 027		26 236 624		8 054 414		3 382 583	
Number of monitoring and scientific research activities in the NP territory and funds spent on them								
a) implemented by the NP administration (number/CZK)*	28	4 168 870	50	11 188 162	21	5 362 835	15	887 250
b) implemented by external entities (number)	62		53		9		35	

* Including activities carried out by another entity on behalf of the NP administration; the funds spent on them include only the direct costs of these activities (i.e. mainly the costs of services).

Data source: National park administrations, MoE

Ultimately, national parks not only fulfil the role of areas of exceptional natural value, which they support and develop through considerable financial resources, but also serve an educational, scientific and cultural-social function. Therefore, their existence and protection is essential not only for nature conservation, but also for the quality of life of society as a whole.

Protection of wild animals and plants in human care

The exploitation of wildlife for international trade is the second most serious cause of species decline after habitat destruction¹²⁸. Imports, exports and the number of specimens seized in **international trade in endangered species protected by CITES** show a steadily increasing trend. The main exporting regions are mostly developing countries, for which the export of live wildlife often represents a significant economic resource.

The most **imported** group of **live animals** to the Czech Republic are reptiles, followed by corals (Graph 79). Mammals, birds, amphibians, etc. are imported in numbers of at most several dozen or less than a hundred individuals per year. Imported specimens are mostly from the wild (especially corals and, to a lesser extent, reptiles) and less often from captive breeding. Of **the non-living animal specimens**, crocodile skin watch straps are the most imported into the Czech Republic (hundreds to thousands per year).

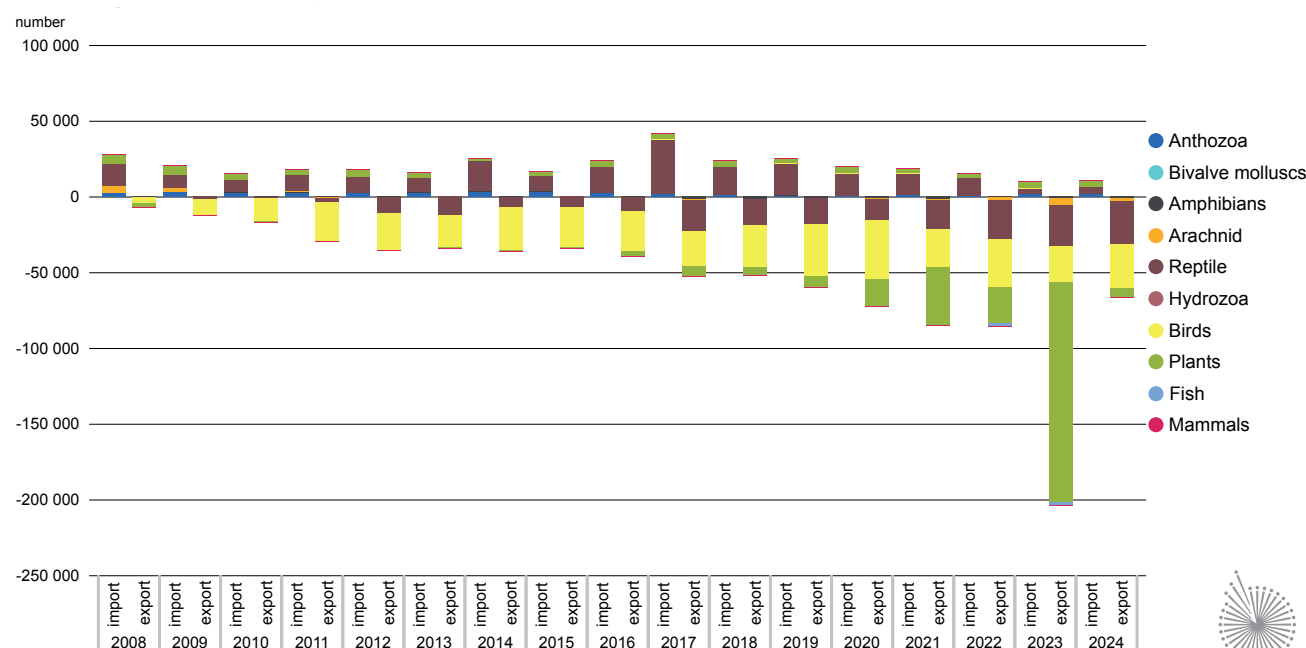
Imported live plant specimens include artificially grown orchids and representatives of the Euphorbiaceae and Asclepiadaceae families. Of **the non-living plant specimens**, we mainly import extracts from burdock for use in traditional Chinese medicine.

¹²⁸ More at: www.mzp.cz/cites and https://sysnet.shinyapps.io/CITES_public/.

Birds (mainly parrots, but also birds of prey for falconry) are the most **exported group of animals**, followed by reptiles and amphibians. Mammals, fish and invertebrates are exported in numbers of tens or hundreds of individuals per year at most, but in recent years there has been a significant increase in the export of primates from the Czech Republic to third countries, which is already significantly higher than the European average for exports in recent years, even though these are animals bred in human care. It will be necessary to respond to these current trends by amending Act No. 100/2004 Coll. on trade in endangered species of animals and plants.

Graph 79

International trade in endangered species protected by CITES in Czechia [number of cleared specimens], 2008–2024



Data source: NCA

Plants (mainly cacti) dominate among live specimens **seized in illegal trade**, with hundreds of specimens confiscated. Invertebrates (33 in 2024) and reptiles (27 in 2024) dominate among non-live specimens. In recent years, there has been an increase in the amount of traditional Asian medicine confiscated that contains specimens of endangered species, especially plants (664 pieces in 2024) and, among animals, mainly mammals (e.g. bear bile, musk from the musk deer) or reptiles (e.g. extracts from python or cobra fat).

A separate problem area remains the breeding of animal species requiring special care, where there are repeated cases of violations of the Animal Protection Act, the Act on the Conditions for the Operation of Zoos and other regulations. Particularly problematic is the illegal breeding of large carnivores, where, despite considerable expenditure, the state has limited possibilities for effective law enforcement, especially when it comes to the need for rapid removal of large numbers of illegally held animals, which is limited by insufficient capacity in CITES rescue centres.

Detailed visualisations and data

<https://www.envirometr.cz/data>

Financing environmental protection

Key messages

- Expenditure from central sources (i.e. mainly from the state budget and state funds) fell by 39.2% year-on-year in 2024 to a total of CZK 98.9 billion (i.e. by 0.89 percentage points to 1.23% of GDP). The main reason for the significant year-on-year fluctuations in the last two years is increased support for thermal insulation and energy saving programmes, primarily financed from the National Recovery Plan or the Modernisation Fund.
- Air and climate protection remained a priority area of support in 2024, with the continued implementation of programmes aimed at supporting thermal insulation, energy savings and changes in heating technologies (e.g. the New Green Savings programme and the so-called boiler subsidies). Other areas supported were water protection, biodiversity and landscape protection, and the transition to a circular economy.
- Under the OP Environment 2021–2027, with a total allocation of CZK 75.9 billion in total eligible expenditure (TEE), 77 calls for proposals were announced from the beginning of the programming period until the end of 2024, and support totalling CZK 55.5 billion in TEE was approved.
- Compared to other EU27 countries, investments in environmental protection in Czechia have been above average for a long time.

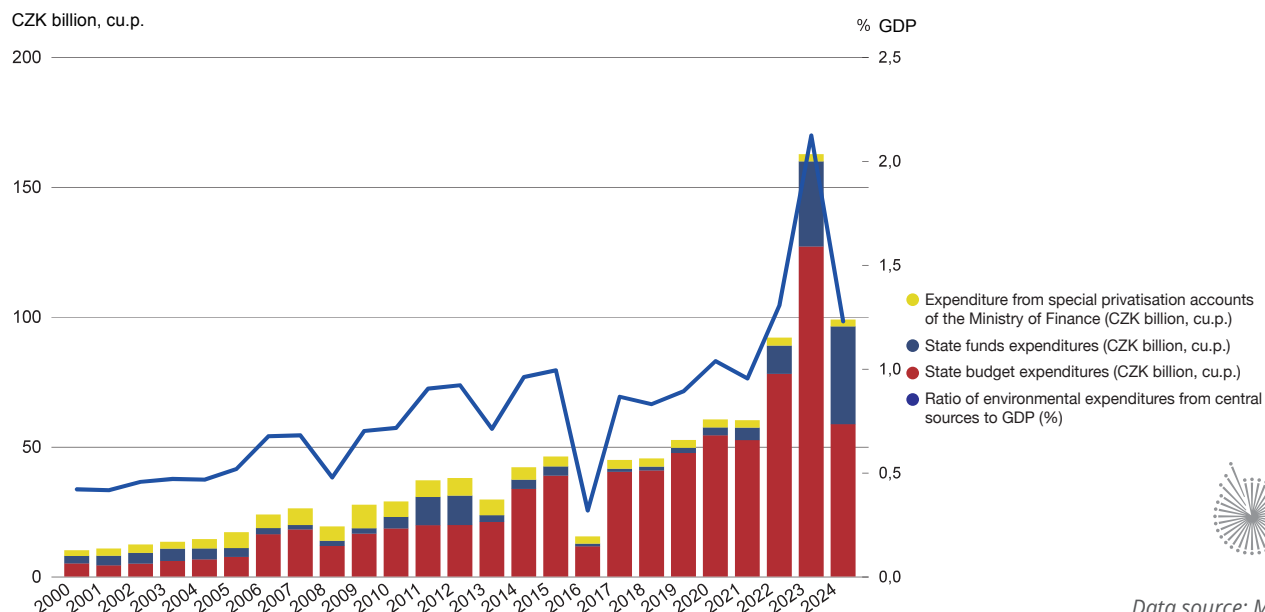
Financing environmental protection

Public expenditure on environmental protection

Financing environmental protection is a basic prerequisite for improving the state of individual components of the environment and is also an expression of the public need for environmental protection at both the central and regional levels. This need can be quantified not only by the volume of funds spent from the economic entities' own resources, but also by the amount of financial support from public sources or budgets. Public sources of expenditure on environmental protection include national sources, i.e. the state budget and state funds (central sources) and regional and municipal budgets, as well as related funds from European and international sources¹²⁹.

Environmental protection expenditure from central sources fell by 39.2% year-on-year in 2024 to a total of CZK 98.9 billion (i.e. by 0.89 percentage points to 1.23% of GDP). The sum of funds provided from **the state budget**, as the main central source of expenditure, fell by 53.9% year-on-year to CZK 58.6 billion in 2024 (Graph 80). On the contrary, **expenditure from state funds**, among which the State Environmental Fund of the Czech Republic plays a key role, increased by 15.1% to CZK 37.7 billion. However, it should be noted that the previous year, 2023, was exceptional in terms of public expenditure due to increased support for thermal insulation and energy saving programmes, primarily financed from the Modernisation Fund and the National Recovery Plan. In addition to the state budget and state funds, a specific category of central sources of environmental protection funding includes the resources of the defunct National Property Fund of the Czech Republic, which are administered by the Ministry of Finance within **special privatisation accounts** and from which CZK 2.6 billion was spent in 2024. These expenditures are directed towards the removal of old environmental damage caused before privatisation and by the activities of companies to date, or towards the remediation of environmental damage caused by mineral extraction and the revitalisation of the affected areas.

¹²⁹ Information on public expenditure is based on the budget structure of the Ministry of Finance, which also monitors funds provided primarily for the creation and protection of the environment on a long-term basis. Given that financial transfers (e.g. from the state budget, state funds, etc.) can also be a source of expenditure for regional budgets, some of this expenditure duplicates expenditure from central sources or European funds. For this reason, expenditures from central sources, regional budgets and European or international sources are assessed separately and cannot therefore be summarised.

Graph 80**Public expenditure on environmental protection from central sources in the Czech Republic [CZK billion, cu.p., % of GDP], 2000–2024**

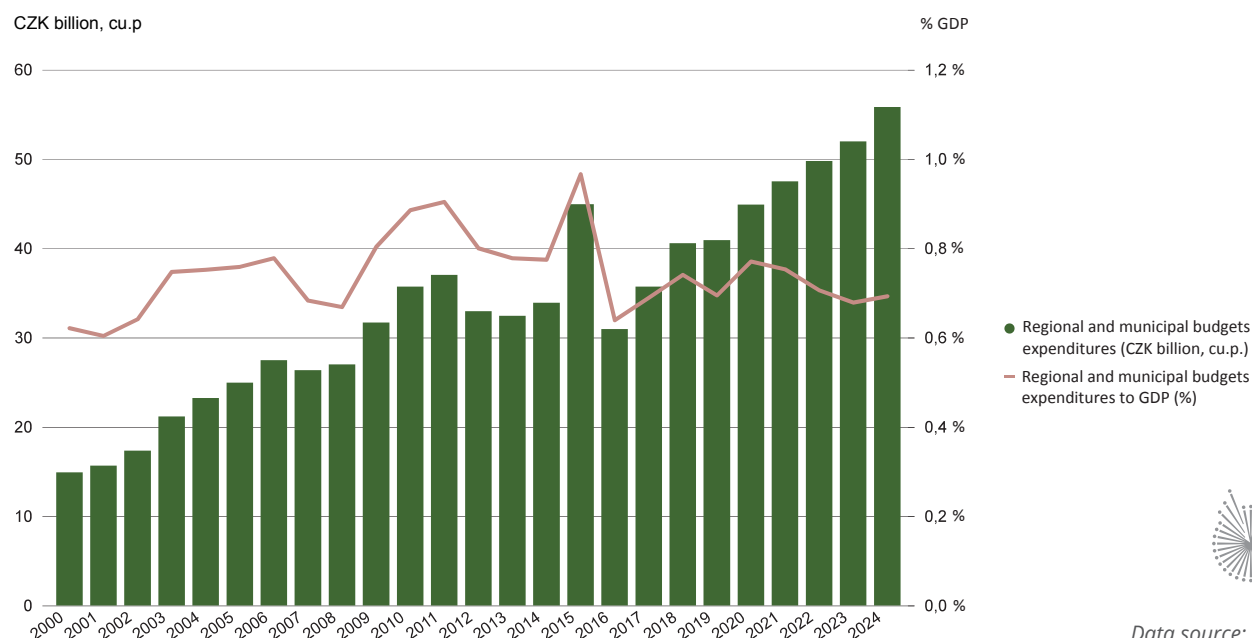
Expenditure from municipal and regional budgets on environmental protection, which is intended to finance ongoing activities based on the competence of municipalities or regions, increased by 7.4% year-on-year in 2024 to a total of CZK 55.8 billion. However, the slight increase in these expenditures led to stagnation in their share of GDP, or rather to a slight increase of 0.01 percentage points to 0.69% of GDP (Graph 81).

In terms of programme focus, the largest amount of financial support from public sources in 2024 was again directed towards air and climate protection, where the implementation of programmes aimed at supporting thermal insulation, energy savings and changes in heating technologies in connection with reducing air pollution from local heating systems using solid fuels and reducing greenhouse gas emissions. This area includes, for example, the so-called boiler subsidies paid to support the replacement of boilers (see below for more details) and **the New Green Savings Programme (NGS)**¹³⁰. In 2024, almost 70,000 applications were paid out under the NGS programme, totalling CZK 19.7 billion, including the **NGS Light** programme, which was launched in January 2023 for senior citizens and low-income households who own family homes.

¹³⁰ Since 2021, NGS financing has been provided from the National Recovery Plan and, after its allocation has been exhausted, from the HOUSEnerg programme within the Modernisation Fund.

Graph 81

Public expenditure on environmental protection from regional budgets in the Czech Republic [CZK billion, cu.p., % of GDP], 2000–2024



Other priority areas of support included water protection and biodiversity and landscape protection. In this area, most of the funds were spent on supporting protected areas of nature and protecting species and habitats (e.g. through the Landscape Care Programme). Within the territorial budgets, attention was paid in particular to the appearance of municipalities and public green spaces. Last but not least, waste and circular economy were also among the priority areas of public support. The priority was to support waste prevention, collection and transport, high-quality sorting, waste re-sorting and material recycling.

In addition to national environmental protection subsidy programmes, which are mainly administered by the State Environmental Fund of the Czech Republic, public expenditure on environmental protection has also been boosted since 2004 thanks to **direct EU support and the possibility of co-financing projects from other foreign sources**. Currently, these include, in particular, the Financial Mechanisms of the European Economic Area and Norway, the LIFE and Interreg programmes, and the Swiss-Czech Cooperation Programme. The most significant European fund in terms of subsidies is the OPE, which is the main source of EU funding for environmental protection, followed by the PRV (or SP CAP), whose objectives include the preservation and improvement of natural ecosystems dependent on agriculture.

The total allocation for **the OP Environment 2014–2020** (including reallocations) is EUR 2.8 billion (CZK 71.0 billion) in EU funds, or EUR 3.3 billion (CZK 83.2 billion) in TEE. In view of the end of eligibility of expenditure on 31 December 2023, the last calls for proposals under the programme were announced in 2023. Since the beginning of the programming period, the OP Environment managing authority has announced 172 calls (including one call for financial instruments), and 15,613 applications for support amounting to approximately EUR 7.5 billion (CZK 189.5 billion) in public expenditure have been registered in the OP Environment. A total of 9,725 projects worth EUR 4.2 billion (CZK 105.0 billion) in TEE should be completed. Of this amount, approximately EUR 3.9 billion (CZK 97.8 billion) in TEE has been financed to beneficiaries since the beginning of the programming period. Some projects will still be completed by beneficiaries in 2025 at their own expense.

The OP Environment 2014–2020 also financed **so-called boiler subsidies**, in which three calls for proposals were announced for individual regions with a total allocation of approximately EUR 428.6 million (CZK 10.4 billion) in TEE, or EU funds. This financial allocation from the OP Environment was further increased by CZK 1.5 billion from the NGS programme funds. In all three calls, 102,400 solid fuel boiler replacements were approved, with a total volume of EUR 489 million (CZK 11.9 billion). Boiler subsidies continued in the OPE 2021–2027, where they were focused on supporting low-income households. In 2022–2023, two calls were announced with a total allocation of CZK 6.7 billion, under which 24,200 solid fuel boiler replacements were approved by the end of 2024, with a total volume of EUR 138.4 million (CZK 3.5 billion) were approved by the end of 2024, and 16,000 applications for EUR 95.8 million (CZK 2.4 billion) were reimbursed. Support for low-income households continues after the OPE allocation has been exhausted from the NGS Light programme.

On 18 July 2022, the EC approved **the OP Environment 2021–2027** with a total allocation of EUR 2.5 billion (CZK 63.3 billion) in EU funds and EUR 3.0 billion (CZK 75.9 billion) in TEE (including reallocations). From the beginning of the programming period until 31 December 2024, the OPE Managing Authority announced 77 calls with an allocation corresponding to 93% of the programme allocation, and 5,090 applications for support amounting to approximately EUR 4.7 billion (CZK 119.1 billion) TEE were registered. During the period under review, applicants were also able to submit applications for support under calls announced by the NCA and SEF, administered under the Project Schemes of Specific Objectives 1.3, 1.4 and 1.6. Since the beginning of the programming period, 2,266 legal acts have been issued in the amount of EUR 2.2 billion (CZK 55.5 billion) TEE, and the funds accounted for in payment requests amounted to approximately EUR 632.9 million (CZK 15.8 billion) TEE.

In 2021, the implementation of **the Modernisation Fund**, an investment instrument of the European Investment Bank and the European Commission, was launched. This fund focuses on supporting green projects that will significantly reduce the Czech Republic's dependence on coal combustion and accelerate the transition to clean energy sources. The aim of the investments is to contribute to reducing greenhouse gas emissions through energy savings and the development of renewable energy sources. The allocation of the fund depends on the prices of emission allowances and is estimated at CZK 383 billion by 2030. Subsidies are distributed across eight programmes for a wide range of energy-saving measures, from the modernisation of technologies in industry and energy, the construction of photovoltaic and wind power plants, energy savings in buildings, to the modernisation of public lighting and the purchase of electric buses. In total, calls for proposals worth CZK 150.7 billion have already been announced in the Modernisation Fund, of which seven calls for proposals worth CZK 18.3 billion in 2021, eight calls in 2022 with a total allocation of CZK 40.5 billion, 16 calls in 2023 worth CZK 48.2 billion, and eight calls in 2024 worth CZK 43.7 billion. Within the framework of all announced calls (including NGS and NGS Light), 98,255 projects were approved in 2024 with a total subsidy of CZK 75.7 billion, and 116,203 projects worth CZK 31.6 billion were paid out in 2024 from already (and previously) approved applications.

Another significant source of international funding is **the National Recovery Plan (NRP)**, which is a plan of reforms and investments by the Czech Republic to mitigate the impact of the COVID-19 pandemic and restart the economy using funds from the Recovery and Resilience Facility under the EU's Next Generation EU recovery plan. The Ministry of the Environment is the owner or co-owner of eight sub-components combining activities in the field of the environment with a total volume of funds of CZK 29.0 billion. The first two calls for NRP activities were announced by the Ministry of the Environment through the State Environmental Fund of the Czech Republic under the NGS programme in 2021. In addition to these calls, other calls are being implemented under the NRP within the NP ENV, e.g. for energy savings in public buildings, water management in municipalities, support for the purchase of (electric H2) and non-public charging infrastructure, support for the construction of recycling infrastructure in the area of biodegradable waste, environmental education programmes on climate change, and the adaptation of aquatic, non-forest and forest ecosystems to climate change. A total of CZK 10.3 billion was allocated to NRP calls under the NP ENV. From the start of the application period until the end of 2024, a total of 3,939 applications were submitted under the NP ENV, with a total subsidy request of CZK 13.2 billion. In 2024, a total of 1,763 positive decisions by the Minister on the provision of subsidies were issued in response to NRP calls under the NP ENV, and a total of CZK 3.7 billion was paid out for projects.

In addition to the SEF, some of the components of the NRP falling under the Ministry of the Environment are implemented directly by the Ministry and the NCA through the National Recovery Plan – Support for the Restoration of Natural Landscape Functions programme. By 31 December 2024, 14 calls for proposals had been announced under the programme, with an allocation of CZK 1.4 billion. Under these calls, 2,189 applications were submitted by the end of 2024, with a total volume of CZK 754 million.

In 2023, the implementation **of the Just Transition Operational Programme** continued. This programme provides targeted support to the most affected regions (coal-mining regions) to mitigate the socio-economic (decline in coal mining, economic transformation, etc.) and environmental impacts of the transition. In the Czech Republic, support from the programme, with a total allocation of approximately CZK 41 billion, is being drawn by the Karlovy Vary, Ústí nad Labem and Moravian-Silesian regions, as these are the regions most affected by the shift away from coal. By the end of 2024, 69 calls for proposals had already been announced with an allocation of CZK 35.6 billion, representing approximately 87% of the total programme allocation, and 465 applications had been approved with an EU contribution of CZK 23.5 billion.

The **Ministry of Agriculture** also implemented support measures that contribute to improving the environment, in particular through **the Rural Development Programme (RDP)** and **the Strategic Plan for the Common Agricultural Policy (SP CAP)**. The activities supported under the current RDP mainly included agri-environment-climate measures, organic farming measures, forestry-environmental and climate services and forest protection, payments under the Natura 2000 network and payments for less-favoured areas. In 2023, approximately CZK 6.4 billion was paid out from the RDP for these measures, and in 2024 approximately CZK 0.9 billion (total support for the entire RDP programming period amounted to CZK 65.6 billion). Support for rural development, including the above measures, continues under **the SP CAP** for the period 2023–2027, where CZK 8.9 billion was paid out in 2024, mainly for interventions in areas with natural or other constraints, AECM and organic farming.

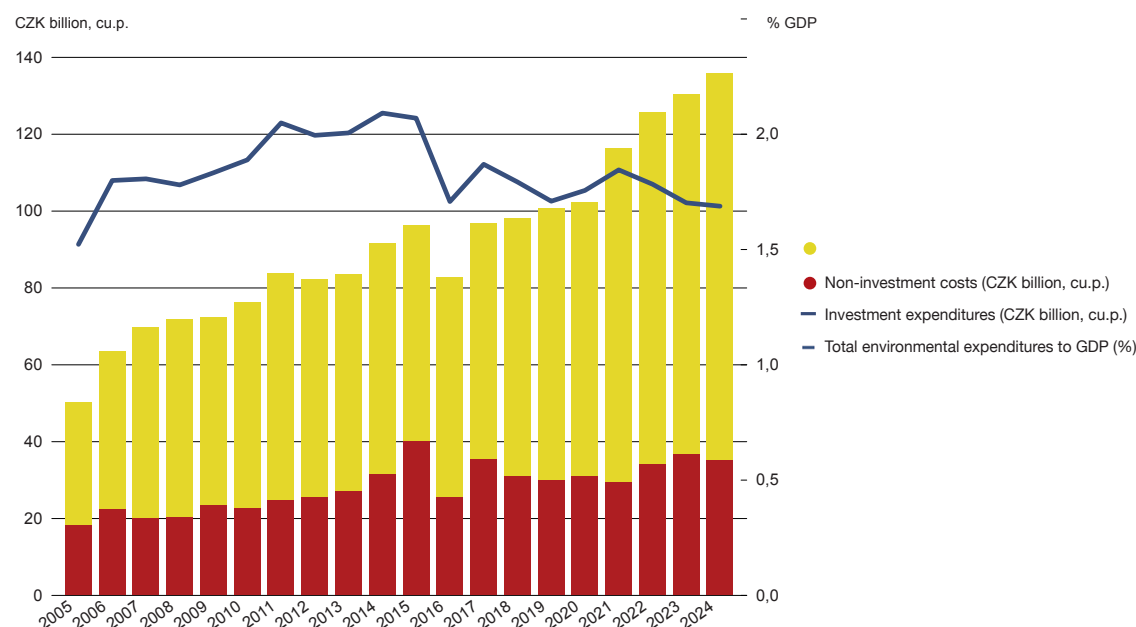
In the **MIT** portfolio, it is also worth mentioning the operational programmes that focus, among other things, on supporting energy savings and reducing emissions and the circular economy, in particular **OP TAC 2021–2027**, whose priorities include “Shift to a low-carbon economy” and “More efficient use of resources”, under which 840 projects were supported for CZK 18.7 billion in public expenditure. In the case of **the Ministry of Regional Development**, it is important to mention **the IROP**, in particular the specific objective of “Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution”, under which 170 projects worth CZK 5.9 billion have been supported in the current programming period.

Investments and non-investment costs for environmental protection

An alternative view of environmental protection financing is offered by a statistical survey conducted by the Czech Statistical Office, which focuses on the issue of investments and non-investment costs for environmental protection incurred by both the public and private sectors. In 2024, investments and non-investment costs for environmental protection increased by CZK 5.6 billion year-on-year, i.e. by 4.3% to a total of CZK 135.8 billion in current prices (Graph 82). **The share of investments and non-investment costs in GDP** fell slightly year-on-year to 1.69% of GDP due to relatively faster GDP growth.

Graph 82

Total expenditure on environmental protection in the Czech Republic [CZK billion, cu.p., % of GDP], 2005–2024



Data source: CZSO

Investments in 2024 fell by CZK 1.5 billion, i.e. by 4.0% to a total of CZK 35.2 billion, and, as in the past, expenditure on integrated facilities (i.e. for pollution prevention) prevailed at CZK 21.7 billion over expenditure on end-of-pipe facilities (i.e. for pollution removal), which amounted to CZK 13.5 billion. It is therefore possible to note a long-term high level of investment, where an integrated approach to environmental protection based on the principle of introducing and using BAT and other innovations is applied. The aim of this approach is the gradual modernisation of the production and operating facilities of environmental polluters, which leads in particular to the elimination of the negative impacts caused by their activities.

In terms of the programme focus of investments, the largest investment expenditure in 2024 was spent on wastewater management (CZK 11.6 billion, e.g. on the reconstruction and construction of sewers and wastewater treatment plants), followed by air and climate protection (CZK 9.1 billion, e.g. for reducing industrial emissions) and waste and circular economy (CZK 6.6 billion, e.g. for waste prevention, collection and transport, high-quality sorting, waste sorting and material recycling). **According to the classification of economic activities of the investing entity (CZ-NACE)**, the largest share of total investment in 2024 was in public administration and defence, compulsory social security (31.7% of total investment) and water supply, including activities related to wastewater, waste and remediation (22.6% of total investment), followed by manufacturing (17.5% of total investment) and the energy sector, i.e. the production and distribution of electricity, gas, heat and air conditioning (17.0% of total investment).

In the case of **non-investment costs, or current expenditure**, a long-term upward trend can be observed. This was confirmed in 2024, when these costs increased by CZK 7.0 billion year-on-year, i.e. by 7.5% to CZK 100.7 billion, and thus continued to constitute a significant part of the environmental protection expenditure monitored by the Czech Statistical Office, alongside investments. As in previous years, in 2024, in terms of programme focus, most current expenditure was incurred in the area of waste and circular economy management (CZK 66.2 billion) and wastewater management (CZK 19.9 billion). Other cost-intensive areas in the long term are air and climate protection (CZK 6.8 billion in 2024) and soil protection and remediation, including groundwater and surface water protection (CZK 3.8 billion).

In an international comparison of environmental protection financing, it is possible to compare investments that are above average in Czechia compared to the EU27 average, i.e. in the public and business (industrial) sectors in the long term. In 2022, these investments ranged from 0.1% of GDP in cu.p. (Ireland) to 0.8% of GDP in cu.p. (Slovenia), Czechia reached a level of 0.6% of GDP in cu.p. The reason for increased investment in Czechia and other new Member States is primarily the need to meet stricter conditions and requirements set by relevant European legislation. The level of investment is also supported by the possibility of drawing on EU funds or other foreign subsidy programmes.

Environmentally harmful subsidies and subsidies for fossil fuels

The issue of the above-mentioned financial subsidies is also linked to the need to eliminate environmentally harmful subsidies and support, for example by eliminating subsidies for the use of fossil fuels in the form of tax exemptions and replacing them with less environmentally harmful forms of support.

In this context, it is necessary to ensure an effective and digitised framework for basic monitoring of public expenditure flows, support and the links between the tax system and the environment, and to provide a tool for the state's mandatory reporting obligations. Mandatory reporting within the EU is enshrined in the EU's 8th Environment Action Programme (8th EAP) and in the Regulation on the Governance of the Energy Union and Climate Action. In order to achieve the objectives of the 8th EAP and climate protection targets, it is envisaged that environmentally harmful subsidies, in particular subsidies for fossil fuels, will be phased out at EU, national, regional and local level, inter alia through:

- a binding EU framework for monitoring Member States' progress in phasing out fossil fuel subsidies based on an agreed methodology and reporting on this progress, setting a deadline for phasing out fossil fuel subsidies in line with the ambition to keep global warming below 1.5 °C;
 - i.e. NECP reporting: Member States shall include in their integrated national reports on energy and climate progress information on the implementation of national targets for the phasing out of energy subsidies, in particular fossil fuel subsidies;
- methodologies for identifying other environmentally harmful subsidies, as established by the Commission in consultation with Member States; based on these methodologies, Member States will identify other environmentally harmful subsidies and report them regularly to the Commission so that it can report on the level and type of these subsidies in the Union and on the progress made in phasing them out.

Subsidies for fossil fuels in Czechia reached almost CZK 60 billion in 2023¹³¹, while the sum of the items monitored jumped by almost CZK 25 billion compared to a total of CZK 35 billion in 2022. However, this increase was caused by increased temporary items, which in 2022 and 2023 were primarily intended to help businesses and households cope with high electricity prices during the energy crisis caused by Russia's aggression in Ukraine and thus prevent significant social and economic damage. Temporary subsidies accounted for 85% of total fossil fuel subsidies in 2022 and 92% in 2023. Excluding these extraordinary subsidies, long-term subsidies decreased by approximately CZK 600 million year-on-year, representing a decline of approximately 12%. The vast majority of this support consists of refunds for so-called green diesel in agriculture, i.e. approximately CZK 2.4 billion per year, and various exemptions from tax on natural gas and certain other gases and tax on solid fuels – approximately CZK 2.7 billion in 2022 and CZK 2.3 billion in 2023.

¹³¹ Data for 2024 are not available at the time of publication due to the methodology and frequency of monitoring.

The total amount of environmentally harmful subsidies (excluding energy subsidies) in Czechia also reached almost CZK 60 billion in 2023. The largest volume, more than half, represents lost revenue from EU ETS emission allowances provided as free allocation to companies in the manufacturing and energy industries. An estimated one-third of the total amount represents lost value-added tax revenues based on exemptions in the area of international transport, especially air transport, and ancillary services related to aviation. Approximately CZK 4.5 billion in lost revenue was related to water consumption – approximately two-thirds of this amount is attributable to the preferential treatment of drinking water consumption with a reduced VAT rate, which in some cases where this alternative is possible may act as an incentive to consume drinking water instead of industrial water. The remaining amount is attributable to exemptions from payments for watercourse and river basin management. A similar amount, i.e. CZK 1.5 billion, is accounted for by items resulting from exemptions from landfill fees and compensation for indirect costs for sectors identified as being at significant risk of carbon leakage due to the inclusion of greenhouse gas emission costs in electricity prices (EU ETS). There are also smaller items such as the exemption from the air pollution charge (approximately CZK 100 million) or items relating to the link between revenues and expenditures and the non-charging of mineral extraction (a total of approximately CZK 65 million).

It should be emphasised that the vast majority of the volume of quantified environmentally harmful subsidies and subsidies for fossil fuels is an inherent part of EU legislation (EU ETS – approx. 53%) or is harmonised at EU level (especially in the case of VAT on transport – approx. 27%), and there is therefore no direct way to phase them out at national level. At the national level, however, the Czechia has committed to adjusting certain taxes and fees or subsidies provided so that they better reflect the negative impacts of individual activities. In addition to temporary support for fossil fuels, the Czechia has committed to phasing out coal by 2033. A common problem in quantifying fossil fuel and environmentally harmful subsidies remains the lack of comparability between individual EU Member States, which is caused by the methodological failure to grasp a uniform benchmark for taxation or the pricing of negative externalities. This issue and its solution are being developed, for example, within the OECD – the so-called Effective Carbon Rates¹³² for greenhouse gases.

Detailed visualisations and data

<https://www.envirometr.cz/data>

¹³² OECD (2023), *Effective Carbon Rates 2023: Pricing Greenhouse Gas Emissions through Taxes and Emissions Trading*, OECD Series on Carbon Pricing and Energy Taxation, OECD Publishing, Paris, <https://doi.org/10.1787/b84d5b36-en>.

Opinions and attitudes of the Czech public

Key messages

- The Czech public's awareness of climate change, greenhouse gas emissions, energy and related policies and measures is problematic. Nevertheless, in 2024, the majority (76%) of the Czech public considered climate change to be a serious problem.
- At the same time, the majority of the Czech public agrees on the basic political goals in the area of climate protection. For example, 75% of respondents agree that greenhouse gas emissions must be reduced to a minimum and the remaining emissions must be offset, for example by increasing forested areas, in order for the EU economy to become climate neutral by 2050.
- Although science has long provided clear evidence of human influence on global climate change and there is consensus on the need for mitigation measures, public debate is influenced by misinformation, which increases the level of perceived uncertainty and polarisation in society.

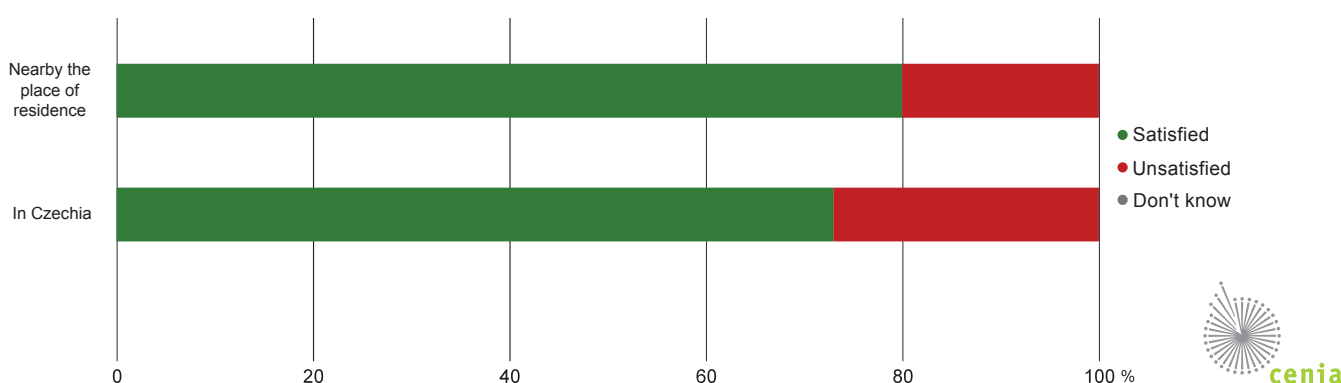
Opinions and attitudes of the Czech public

Regular representative surveys of public opinion on Czech society's relationship to the environment

Long-term trends show that the public rates the environment in their place of residence more highly than the overall environment in Czechia. At least 70% of respondents express **satisfaction with the environment in their place of residence** (except for 2004 and 2010; Graph 83). Satisfaction with **the overall state** of the environment in Czechia has been gradually increasing since monitoring began in 2002, with slight deviations.

Graph 83

Satisfaction with the environment in the Czech Republic and in the place of residence [%], 2024



Question asked: How satisfied are you with the environment in our country in general and in your place of residence?

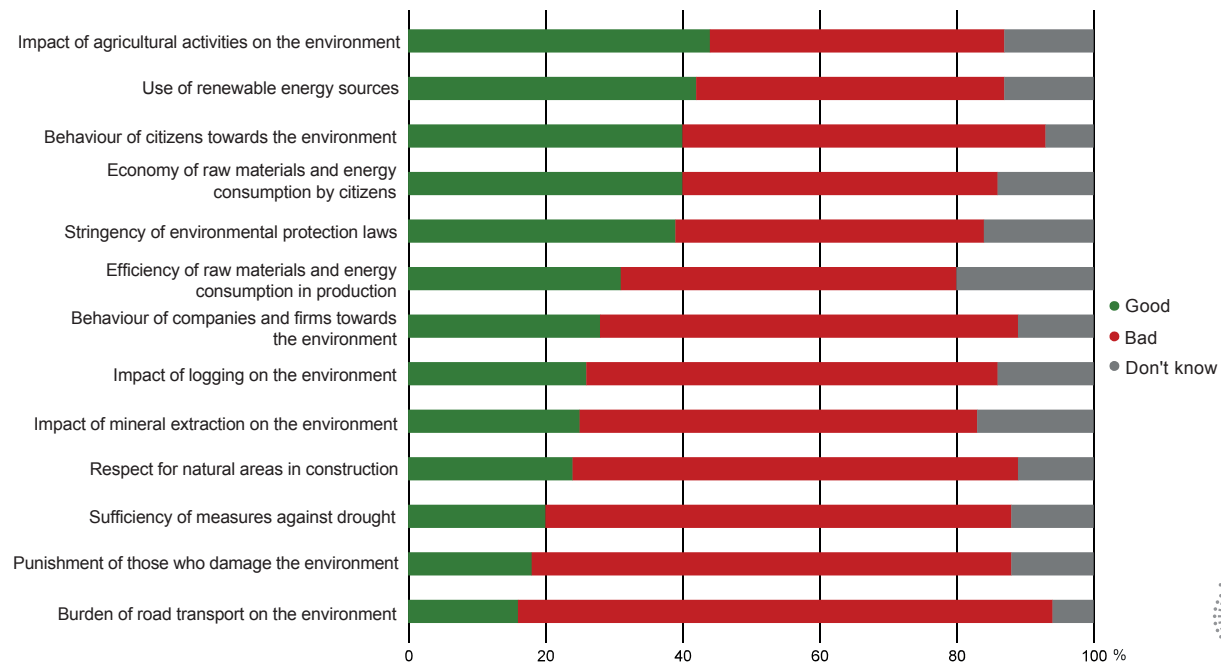
Data source: Public Opinion Research Center of the Institute of Sociology of the Czech Academy of Sciences

The results of the 2022 survey¹³³ show that in the area of the environment, society is most **critical of the impact of road transport on the environment** (78% of respondents said that the situation is bad) and the insufficient punishment of those who damage the environment (70% of respondents said that the situation is bad). Roughly two-thirds of respondents consider measures against drought to be insufficient (68% of respondents) and measures to protect natural areas during construction to be insufficiently environmentally friendly (64% of respondents said the situation is bad; Graph 84).

¹³³ The survey was not conducted in 2023 and 2024.

Graph 84

Assessment of activities affecting the environment [%], 2022



Question asked: What is your opinion on the situation in Czechia with regard to: a) punishment of those who damage the environment, b) behaviour of businesses and companies towards the environment, c) behaviour of citizens towards the environment, d) impact of mineral extraction on the environment, e) impact of timber extraction on the environment, f) efficiency of raw material and energy consumption in Czech production, g) the efficient use of raw materials and energy by citizens, h) the conservation of natural areas during construction, i) the strictness of environmental protection laws, j) the impact of road transport on the environment, k) the impact of agricultural activities on the environment, l) the use of renewable energy sources, m) the adequacy of measures against drought? The survey was not conducted in 2023 and 2024.

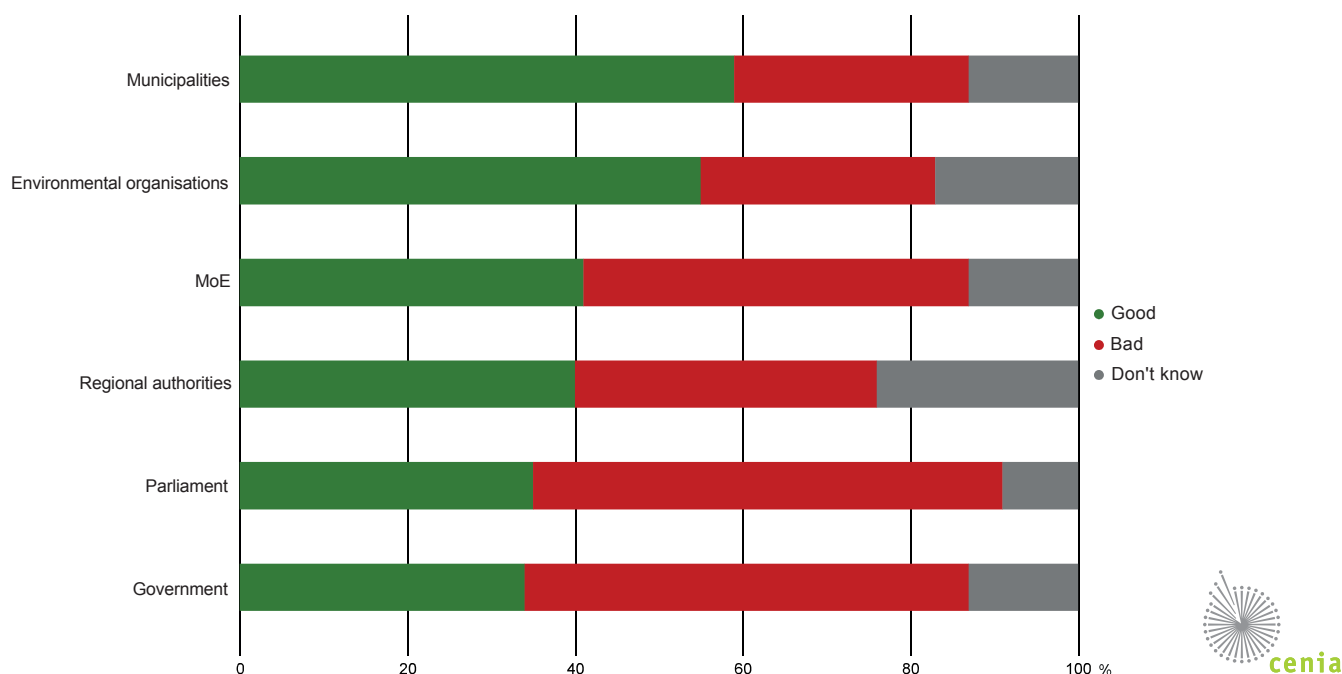
Data source: Public Opinion Research Center of the Institute of Sociology of the Czech Academy of Sciences

In the evaluation of activities aimed at environmental protection in 2022¹³⁴, the activities of **municipal authorities** (59% of responses) and **environmental organisations** (55% of responses) received the highest ratings. On the contrary, negative ratings in the area of environmental protection were expressed in the case of **the activities of parliament** (59% of responses) and also **the government** (53% of responses; Graph 85). Compared to 2020, when the same survey was conducted, improved ratings were recorded mainly in the case of **regional authorities** (an increase in positive ratings by 7 percentage points) and **municipal authorities** (an increase in positive ratings by 3 percentage points).

¹³⁴ The survey was not conducted in 2023 and 2024.

Graph 85

Assessment of the activities of institutions in environmental protection [%], 2022



Question asked: When it comes to environmental protection, how do you rate the activities of the government, the Ministry of the Environment, parliament, regional authorities, municipal authorities and environmental organisations? The survey was not conducted in 2023 and 2024.

Data source: Public Opinion Research Center of the Institute of Sociology of the Czech Academy of Sciences

According to the Eurobarometer survey on attitudes towards the environment¹³⁵, 66% of respondents in Czechia agree that **environmental** issues **have a direct impact on their daily lives and health** (78% in the EU27). This figure has not changed since the last survey in 2019. Czechs consider support **for the circular economy** and **nature restoration** to be the most effective ways of addressing environmental problems (both options were identified as a priority by 60% of respondents). Nature restoration is perceived as a significant priority in Czechia, as evidenced by a comparison with the EU average, where only 49% of the population prefers this approach. Within the circular economy, Czechs support reducing waste by properly **sorting waste for recycling and using reusable packaging**. Roughly half (51%) of respondents in Czechia expressed a willingness to pay more for sustainable products that are easier to repair, recyclable and/or produced in an environmentally sustainable manner (59% in the EU27).

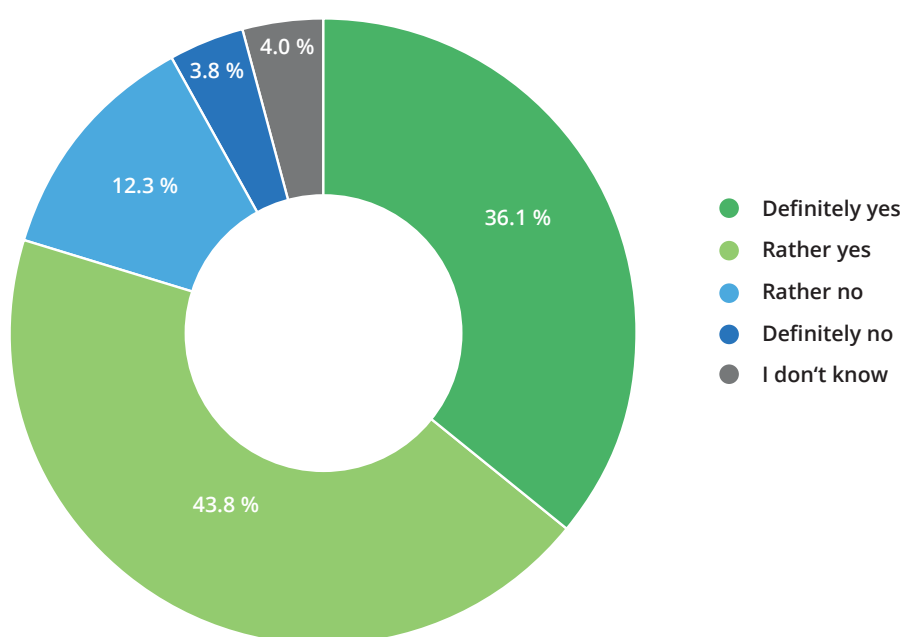
¹³⁵ More at: <https://europa.eu/eurobarometer/surveys/detail/3173>.

Czech public opinion on climate change

Public opinion polls have long shown that the Czech public **agrees on the basic facts** of climate change. According to a 2024 survey¹³⁶, 92% of respondents said that the climate is definitely or probably changing, and 80% said that human activity is responsible for this change (Graph 86). However, the Czech public's **awareness** of climate change, greenhouse gas emissions and energy production in the Czech Republic has room for improvement. For example, only 7% of respondents know that the Czech Republic produces more greenhouse gas emissions per capita than India, China or the United Kingdom¹³⁷.

Graph 86

Perception of climate change [%], 2024



Question asked: Do you think that global climate change in the last century is mainly caused by humans and human civilisation?

Data source: Acceptability of environmental protection policies, SEEPIA

Despite relatively low awareness, according to the Eurobarometer survey¹³⁸, the majority (77%) of the Czech public considered climate change to be **a serious problem** in 2023. However, compared to the 2021 survey, the proportion of respondents considering climate change to be **a very serious problem** fell significantly (by 16 percentage points). This is a significantly lower proportion in the context of a Europe-wide assessment, as respondents in the EU27 as a whole considered climate change to be a very serious problem in more than three-quarters of cases (77%). It is also important **to note that** the majority of the Czech population **agrees** on the basic political goals in the area of climate protection. For example, 51% of the Czech public supports the EU economy becoming **climate neutral** by 2050 (Graph 87).

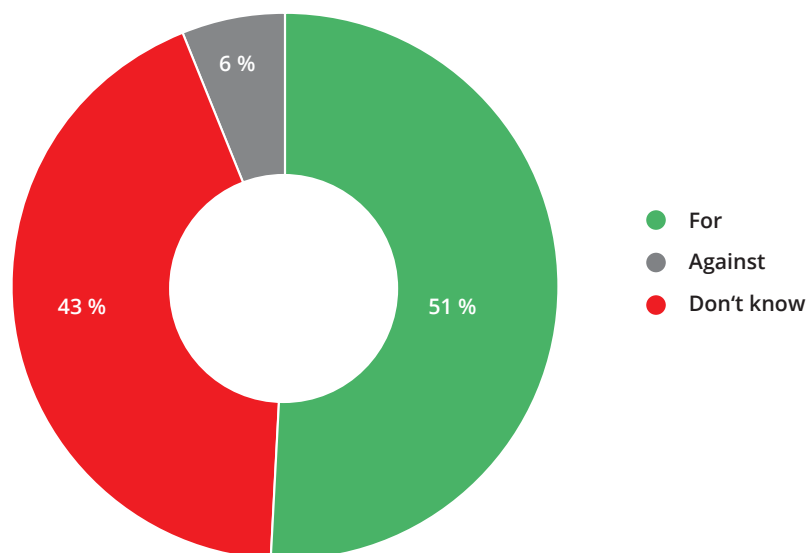
¹³⁶ SEEPIA (2024). Results of the survey Acceptability of environmental protection policies. Czechs and the environment – interactive web database. Available online: <https://data.seepia.cz/>.

¹³⁷ Krajhanzl, J. et al. (2021): Czech Climate 2021. Map of Czech public opinion on climate change. Department of Environmental Studies, Faculty of Social Studies, Masaryk University, in cooperation with Green Dock, z.s.

¹³⁸ More at: <https://europa.eu/eurobarometer/surveys/detail/2954>.

Graph 87

Assessment of the decarbonisation of the economy [%], 2023



Question asked: The EU has a goal of becoming climate neutral by 2050, i.e. to be an economy with zero net greenhouse gas emissions. To what extent do you support or not support the EU's goal of becoming climate neutral by 2050?

Data source: Eurobarometer 565

Certain specific initiatives or **measures** to meet climate change targets enjoy much lower public support. One example is **the European Green Deal**, which 36% of the population considers too ambitious¹³⁹. Approximately the same proportion of the population (34%) knows nothing or almost nothing about the Green Deal, and half knows only a little. Awareness has remained almost unchanged since 2022¹⁴⁰. The vast majority know nothing or almost nothing (87%) or only a little (11%) about the "Fit for 55" legislative package.

In terms of **measures**, water conservation (e.g., the construction of small reservoirs and ponds is supported by 86%) and the introduction of a circular economy enjoy particularly strong **support**. Most subsidies, e.g., for thermal insulation, also enjoy **high support**¹⁴¹.

The majority of the Czech public would increase the share of **hydro, solar and wind energy** in the national energy mix (71% to 67%). Around half of those surveyed are in favour of increasing the share of **nuclear energy** (54%). A large proportion of respondents were unable to decide on the future of natural gas, whether to reduce or increase its share in the energy mix (38% undecided). On the contrary, the share of **coal and oil** use should be reduced (57%). Although **renewable sources** generally enjoy high support, the construction of wind farms meets with resistance from municipalities. Forty per cent of respondents would rather or definitely agree to the construction of a new wind farm 500 metres from the last house in the municipality. However, this share increases or decreases depending on how the financial compensation provided is used. The majority of respondents would agree if it were used to reduce the energy bills of the municipality's residents (61%). The least popular option is to provide funds to the municipality without specifying their purpose (25%).

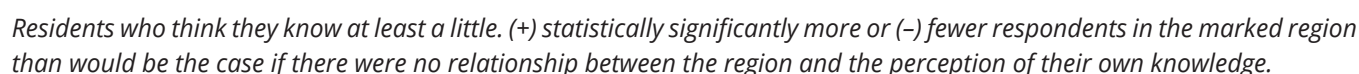
¹³⁹ SEEPIA (2024). Results of the survey Acceptability of environmental protection policies. Czechs and the environment – interactive web database. Available online: <https://data.seepia.cz/>.

¹⁴⁰ STEM & Institut 2050. Czech (non-)transformation 2022. Available online: <https://institut2050.cz/wp-content/uploads/2022/09/CZtransformace220920.pdf>.

¹⁴¹ SEEPIA (2024). Results of the survey Acceptability of environmental protection policies. Czechs and the environment – interactive web database. Available online: <https://data.seepia.cz/>.

There are no significant differences between regions in terms of their perception of their own knowledge of the European Green Deal or the Czech Republic's national energy and climate plan, but there are differences in awareness of the "Fit for 55" package. Statistically significantly more respondents in Prague (19%) think they know at least something about the package. The situation is similar in the Plzeň Region (19%). On the contrary, there are fewer such residents in the Central Bohemian Region (9%), where significantly more people declare that they know nothing or very little about the package (Fig. 17).

Subjectively perceived knowledge of the Fit for 55 package [% of residents], 2024

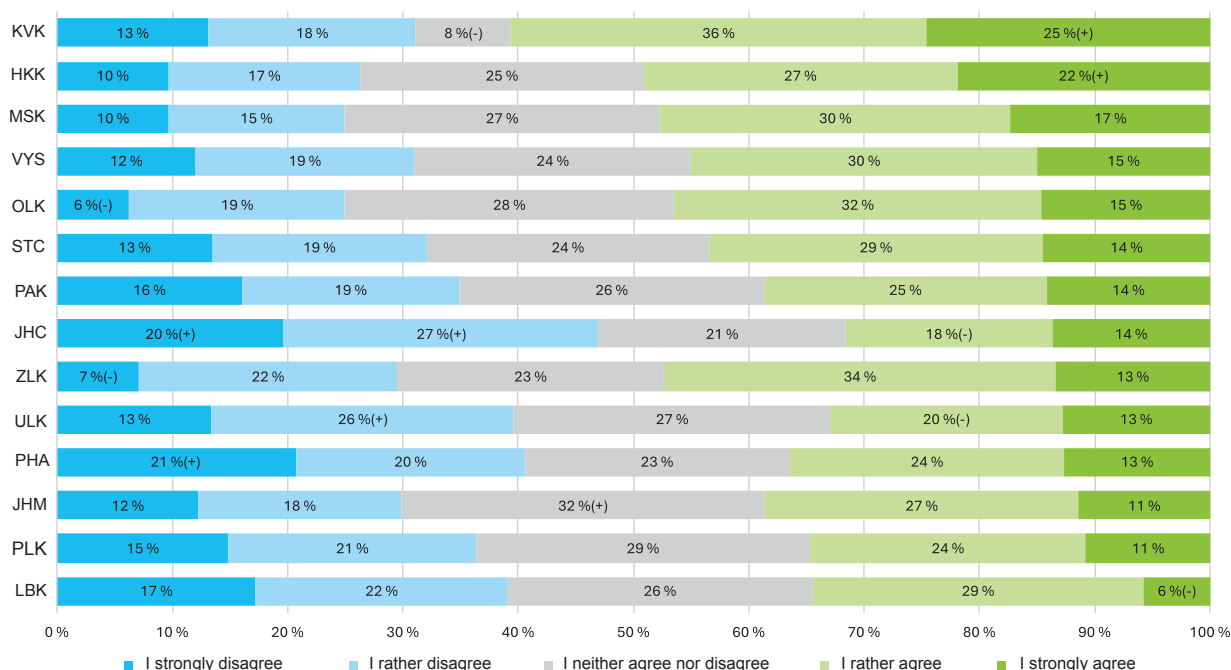


Opinions on the construction of solar power plants vary across regions only in cases where the plant would be built on a lake formed by former coal mines. Residents of the Hradec Králové and Karlovy Vary regions tend to agree with construction in such locations. In the Karlovy Vary region, the majority of residents (61%) would agree with construction. On the contrary, residents of Prague, the South Bohemian Region and the Ústí Region are significantly more opposed to the construction of a solar power plant in such a location (Graph 88). In the Ústí Region, 39% of respondents strongly disagree or rather disagree with this construction. The reason may be that this region is considering the implementation of floating photovoltaic power plants on flooded water areas of former brown coal mines. Preferences for the construction of a new wind power plant do not differ significantly between regions. Nor does the level of agreement with its construction differ if financial compensation were to be provided to the municipality without specifying its purpose, provided to the municipality to be used for infrastructure (sewerage, nursery school, greenery, etc.), provided to the municipality to be used for transport, including on-demand transport, used to reduce energy bills for residents of the municipality, or provided directly to each resident with permanent residence in the municipality.

179

Graph 88

Level of agreement with the construction of a new solar power plant on a lake on the site of former coal mines [%], 2024

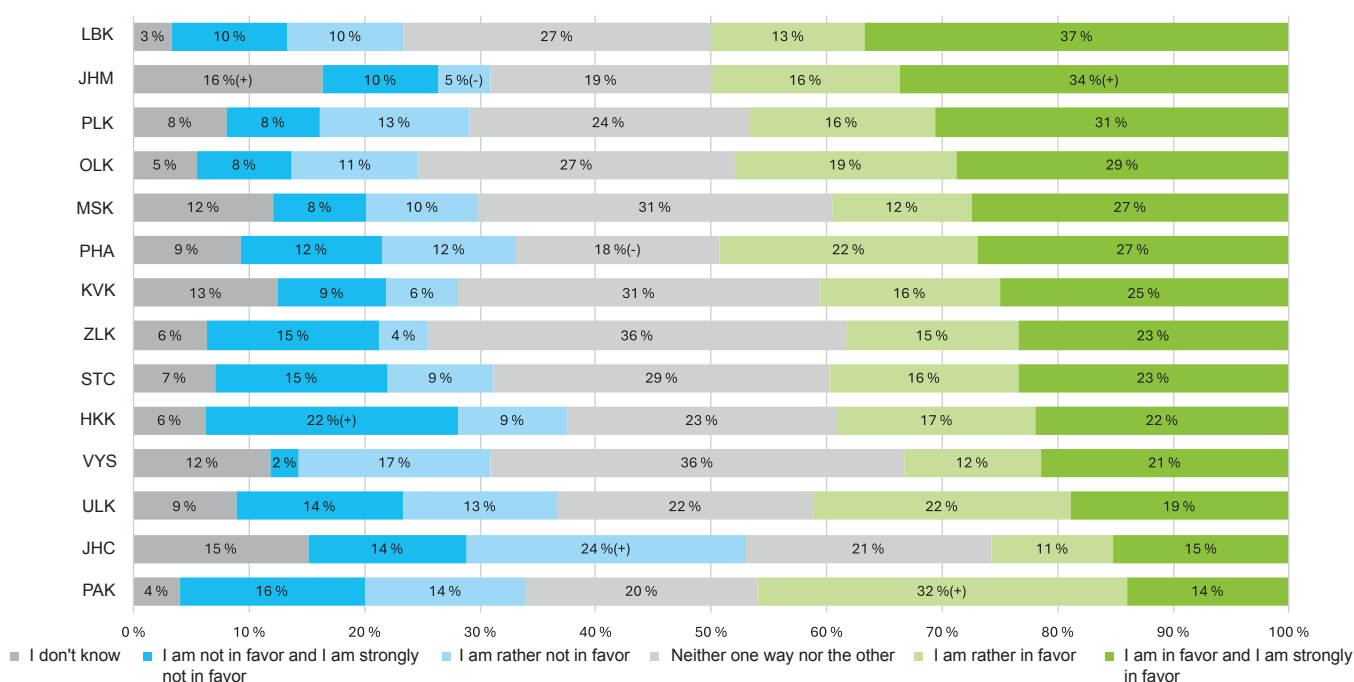


(+) statistically significantly more or (-) fewer respondents in the indicated category than would be the case if there were no relationship between the region and approval of the construction.

Data source: Acceptability of environmental protection policies, SEPIA

Graph 89

Level of support for the landfill ban [%], 2024



(+) statistically significantly more or (-) fewer respondents in the indicated category than would be the case if there were no relationship between the region and support for the landfill ban.

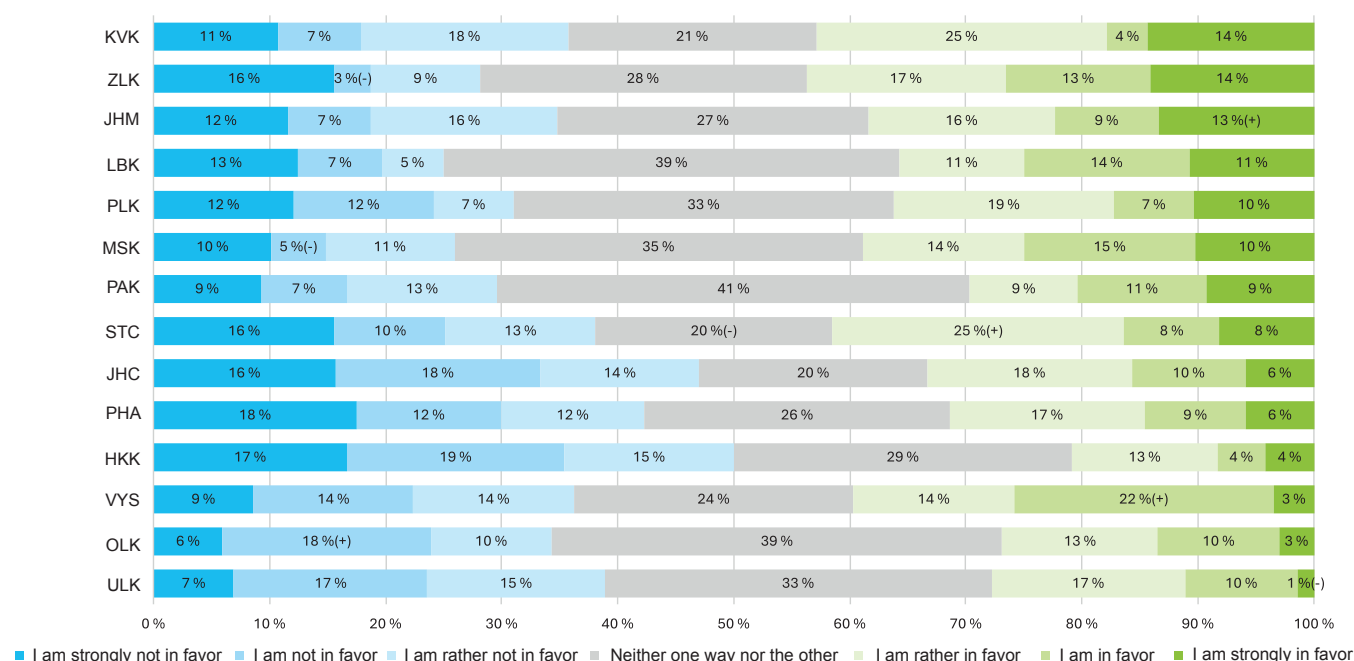
Data source: Acceptability of environmental protection policies, SEPIA

As regards circular economy measures, only the level of support for a ban on landfilling depends on the region in which the respondent lives. In the Hradec Králové Region, a larger proportion of people (22%) definitely do not support it than in the South Moravian Region (10%), where, on the contrary, significantly more people definitely support this measure (34%). Residents of the Pardubice Region tend to support the landfill ban (Graph 89).

Higher subsidies or financial contributions for organic food production are statistically significantly more supported by residents of the South Moravian Region, the Vysočina Region and the Central Bohemian Region (Graph 90). This measure enjoys the least support in the Hradec Králové Region (51% do not support it), the South Bohemian Region (48% do not support it) and Prague (42%).

Graph 90

Level of support for higher subsidies/financial contributions for organic food production [%], 2024



(+) statistically significantly more or (-) fewer respondents in the designated category than would be the case if there were no relationship between the region and the support of higher subsidies.

Data source: Acceptability of environmental protection policies, SEEPIA

Misinformation and perceptions of climate change

Although science has long provided clear evidence of human influence on global climate change and there is consensus on the need for mitigation measures¹⁴³, public debate is influenced by misinformation, which increases the level of perceived uncertainty and polarisation in society.

Research shows that understanding of climate change and opinions on its causes are influenced not only by information, but also by political attitudes, socio-economic context, media environment and psychological factors¹⁴⁴. However, the spread of disinformation narratives that exploit **anti-elitist attitudes** and **conspiracy thinking** also plays an important role¹⁴⁵. These narratives often portray climate protection measures as a tool of the elites (scientists, institutions, the EU) aimed against the interests of ordinary people.

The following disinformation narratives often appear in the Czech environment:

- Denial of the existence of climate change or human influence on it, questioning the scientific consensus and the effectiveness of climate measures.
- Marginalising or denying the impacts of climate change, emphasising the claim that climate measures will lead to industrial collapse and widespread poverty.
- Portraying climate policies as an imposed “dictate from Brussels” or manifestations of a corrupt West. In particular, the policies of the “Green Deal for Europe” are often presented as harmful, corrupt and threatening to national sovereignty.
- Conspiracy theories that climate change is a fabrication of global elites who exploit it to manipulate and control society or for financial gain.

These narratives undermine public trust and reduce support for climate protection measures. The professional literature therefore recommends using approaches such as **pre-bunking** (early warning of manipulative techniques) and **debunking** (refuting false information), together with an emphasis on clear and empathetic communication with different groups of the population.

Detailed visualisations and data

<https://www.envirometr.cz/data>

¹⁴³ <https://www.ipcc.ch/report/ar6/syr/resources/spm-headline-statements>

¹⁴⁴ Lewandowsky, S. (2021). Climate change disinformation and how to combat it. *Annual review of public health*, 42(1), 1–21. <https://doi.org/10.1146/annurev-publhealth-090419-102409>

¹⁴⁵ Presl, D. (2021): Climate change and disinformation in the Czech information space. *Association for International Affairs*. Available online: https://www.amo.cz/wp-content/uploads/2021/11/AMO_Zmena_klimatu_a_dezinformace-1-1.pdf.

Planetary boundaries

A satellite image of Earth at night, showing the illuminated landmasses of Europe and Africa against the dark background of space. The city lights are visible as bright yellow and white clusters, particularly concentrated in Western Europe and North Africa. The curvature of the Earth is visible at the top of the frame.

Key messages

- Our society and economy depend on a healthy planet. However, the world has exceeded 6 of the 9 planetary boundaries defining a safe space for humanity.
- The objectives of the EU's 8th Environment Action Programme require that by 2050, EU citizens live in a well-being economy that is also within the safe space of our planet's limits.
- Through its supply chains, Czechia is putting pressure on the environment worldwide. The transition to less environmentally harmful products and services and the reduction of growing consumption levels are necessary to reduce our consumption footprint and impacts to sustainable levels.

Planetary boundaries

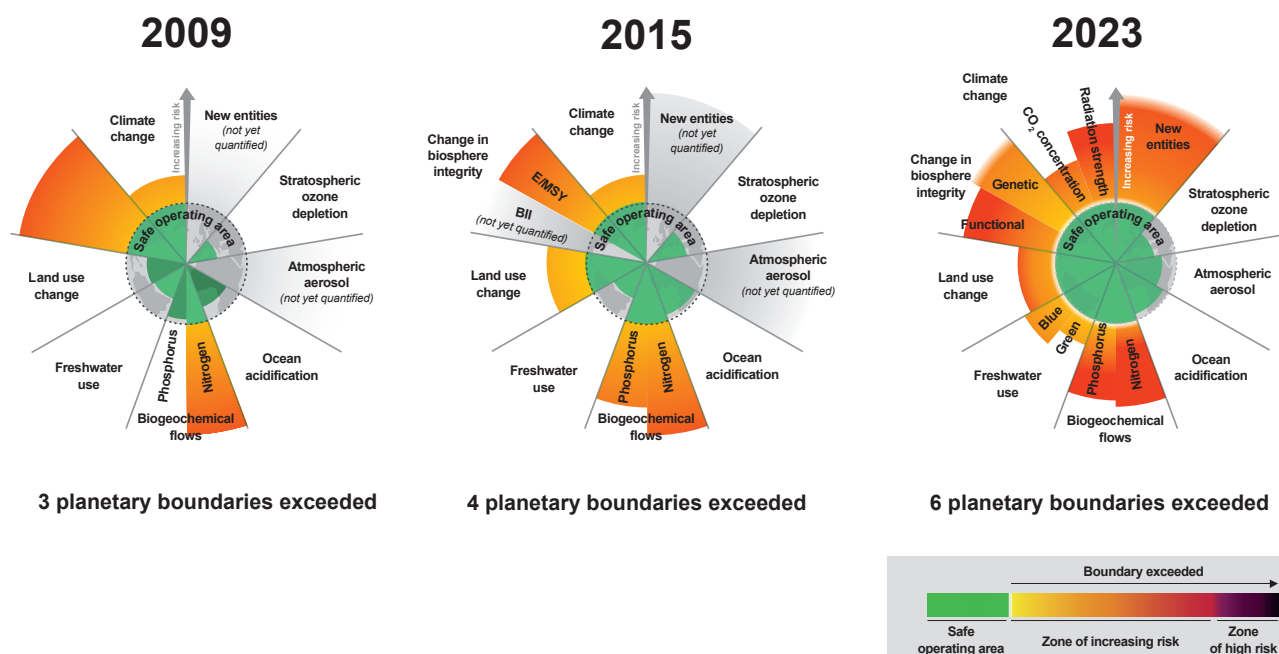
The concept of planetary boundaries

The concept of planetary boundaries¹⁴⁶ aims to define a **“safe operating space for humanity”** based on the evolution of nine complex, interconnected phenomena: climate change, biodiversity loss, biogeochemical flows (phosphorus and nitrogen cycles), soil system change, freshwater use, ocean acidification, stratospheric ozone depletion, atmospheric aerosol loading, and the introduction of new entities into the biosphere (Fig. 18).

It is currently estimated that humanity has already exceeded 6 of the 9 planetary boundaries, namely changes in the integrity of the biosphere; climate change; land use change and biogeochemical flows, and now also new entities, whose boundaries have been newly quantified, and changes in water use. Furthermore, for all planetary boundaries that have been identified as exceeded in the past (change in the integrity of the biosphere; climate change; land use change and biogeochemical flows), the level of exceedance has increased. Ocean acidification is also approaching its planetary boundary. On the other hand, there has been an improvement in the case of stratospheric ozone, whose depletion has been halted and the ozone layer is recovering. This is the result of measures taken under the ratified Montreal Protocol of 1987.

Fig. 18

Visualisation of the concept of planetary boundaries



Data source: adapted from Steffen, W. et al., 2015; Richardson, K. et al., 2023

¹⁴⁶ Richardson, K. et al., 2023: Earth beyond six of nine planetary boundaries. *Science Advances*, Vol. 9, Issue 37, doi: 10.1126/sciadv.adh2458.

Living well within the limits of our planet

Since its inception, the planetary boundaries framework has significantly influenced the international debate on global sustainability, and considerable effort has been made to translate it to the national level in order to increase its **policy** relevance. The EU's 8th Environment Action Programme (8th EAP) has reinforced the planetary boundaries perspective, and its objectives require that by 2050, EU citizens live in a welfare-based economy that is also within the safe space of our planet's limits. To achieve this goal, the EU must accelerate its transition to a regenerative growth model "to give back more to the planet than it takes out", as stated in the 2020 EU Action Plan for the Circular Economy.

Translating global limits into national policy targets requires addressing the biophysical, socio-economic and ethical dimensions of individual processes and involves a series of decisions on how to quantify them. Given that **EU countries** are highly dependent on resources such as water, land use, biomass or other materials extracted or used outside their territory to satisfy their relatively high levels of consumption, **aggregate consumption footprint indicators** can be used to assess these impacts. The consumption footprint expresses the environmental and climate impacts of the consumption of goods and services by EU citizens, regardless of where these goods and services are produced. The consumption footprint can be reduced by limiting the total amount of goods and services consumed or by consuming goods with a lower environmental impact.

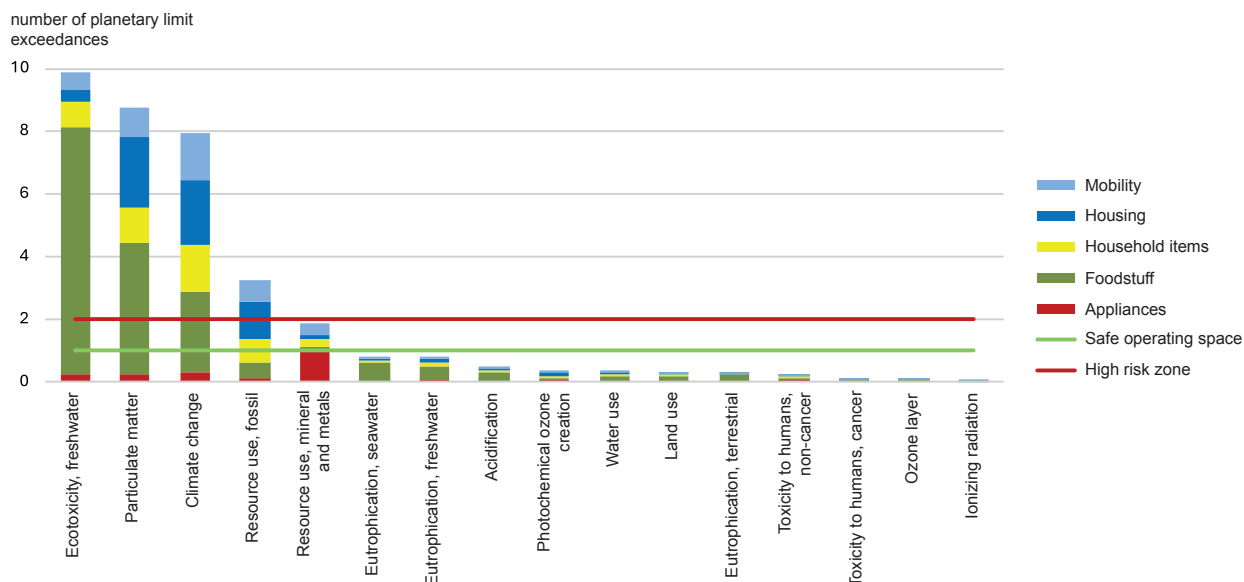
Overall, the environmental impacts of EU consumption are considered high, with **the per capita ecological footprint in Czechia** being below average within the EU27¹⁴⁷. Between 2010 and 2023¹⁴⁸, it increased by 6.2% in Czechia. Food consumption (45.7%), housing (21.0%) and mobility (16.1%) have the highest environmental impact in Czechia. In terms of planetary boundaries, consumption has the greatest global impact on water resources, particulate matter emissions and climate change (Graph 91).

¹⁴⁷ European Commission, 2023: Consumption Footprint Platform — EPLCA¹, European Commission. Available online: <https://eplca.jrc.ec.europa.eu/ConsumptionFootprintPlatform.html>.

¹⁴⁸ Data for 2024 are not available at the time of publication.

Graph 91

Assessment of the degree to which planetary boundaries are exceeded using the Czech Republic's consumption footprint indicator [number of planetary boundaries exceeded], 20233



The consumption footprint indicator assesses environmental impacts in 16 different categories, including climate change and resource depletion, which can be aggregated into a single score based on a normalisation and weighting system. To assess planetary boundary overshoot, these categories are assigned to nine ecological processes identified within the planetary boundaries. Data for 2024 are not available at the time of publication.

Data source: European Platform for Life Cycle Assessment (EPLCA)

Current trends suggest that the EU is not on track to meet its target of significantly reducing its consumption footprint by 2030. A combination of limiting overall consumption and switching to products with a lower environmental impact could help reduce the consumption footprint. There is also significant potential in promoting services and circular business models, such as sharing or products provided as a service (e.g. renting instead of owning), which generally have a lower environmental impact than traditional consumption of goods.

Detailed visualisations and data

<https://www.enviometr.cz/data>

Methodology for assessing status, trends and achieving the objectives

Each chapter at the level of the SEP 2030 strategic objectives includes an assessment of the status and trend of the relevant indicators of the Czech Republic's Environmental Report. The trend assessment methodology is based on statistical analysis using the linear regression method.

Trend time horizon

Trend	Time period
Short term	last 5 years
Long term	last 15 years and more ¹⁴⁹

The evaluation is carried out on three levels:

1) Trend at the level of individual variables

The trend for individual variables of a given indicator (e.g. NO_x emissions) is assessed on the basis of linear regression parameters (linear regression equation $Y = ax + c$, $R^2 = \{0, 1\}$).

The time series is converted to an index (percentage) series, where the evaluated beginning of the trend is 100 (e.g. long-term trend of NO_x emissions in 1990 = 100). The values a and R^2 are calculated for individual variables.

The value a is the slope of the linear trend, which expresses how the variable decreases or increases from the beginning of the measurement. It is a dimensionless number comparable across all other variables because it does not depend on absolute values (the index series removes the influence of units and the actual size of the numbers) and describes the trend curve from the parameters of linear regression. The value a indicates the change in % per year.

R^2 is the reliability value (determination, $R^2 = \{0, 1\}$). R^2 expresses the extent to which the regression line represents the actual data.

The resulting values are converted in a table of verbal evaluation and used in the text of the evaluation of individual variables, i.e. the result of the calculation is a numerical value as a basis for verbal evaluation in the text.

Index a value (linear trend slope)	Verbal evaluation in the text
0 to +/- 0.5 % per year	Stagnating trend
+/- 0.5 to +/- 1 % per year	Slightly increasing/decreasing trend, gradual trend
+/- 1 to +/- 3 % per year	Rising/falling trend
+/- 3 to +/- 10 % per year	Significantly increasing/decreasing trend
more than +/- 10 % per year	Very significant upward/downward trend

¹⁴⁹ For time series in the long-term trend, a minimum of 15 years is required, but no more than 1990.

2) Trend indicators

The trend of individual indicators is assessed on the basis of determining the trend of individual variables from which the indicator is compiled. The overall trend is assessed on the basis of aggregating the assessment of indicators composed of time series of individual variables. For individual indicators, the variables included in the assessment of the overall trend, the selected aggregation method and other parameters for trend assessment are listed in specific indicator sheets available on the portal <https://www.enviometr.cz>, which are based on the CENIA methodology used and tested in the Environmental Reports 2020–2022. A fluctuating trend is determined for the overall trend when more than half of the individual variables have a coefficient of determination lower than 0.5. The trend cannot be evaluated if there is no time series for the given time period.

Graphical representation of the trend					
	Positive growing trend		Stagnation		Negative increasing trend
	Positive declining trend		Fluctuating trend		Negative downward trend
	Trend cannot be determined or is not practical to evaluate				

3) Assessment of target achievement

The assessment is carried out against measurable targets set by national and European legislation and strategic documents. The criteria for determining the individual categories of target achievement are set out in the indicator sheets available on the Envirometer portal¹⁵⁰. Official reports and the projections contained therein (e.g. for greenhouse gas emissions) or model outputs from projects (e.g. SEEPIA, modelling for updating the NECP) are used to evaluate the fulfilment of targets in the future. Only if these data are unavailable is linear trend extrapolation used.

Graphical representation of the indicator status assessment (fulfilment of target)						
	Development is moving towards the achievement of the target		Achievement of the target is uncertain		Achievement of the target is unlikely	 Cannot be assessed

¹⁵⁰ https://www.enviometr.cz/sites/enviometr/files/2025-01/Indik%C3%A1torov%C3%A9%20listy_Zo%C5%BDP%202023.pdf

List of abbreviations

AECM	agri-environmental and climate measures
ALF	agricultural land fund
AOT40	accumulated exposure above the threshold concentration of 40 ppb
B[a]P	benzo[a]pyrene
BEV	battery electric vehicle
BOD₅	five-day ical oxygen demand
BSM	basal soil monitoring
CAUMD	Commission for the Assessment of Urban Mobility Documents
CEI	Czech Environmental Inspectorate
CENIA	Czech Environmental Information Agency
CFI	Czech Forestry Institute
CGS	Czech Geological Survey
CISTA	Central Institute for Supervising and Testing in Agriculture
CLP	EU Regulation on the classification, labelling and packaging of chemical substances
CN	cyanide functional group
CNG	compressed natural gas
COD_{Cr}	chemical oxygen demand with potassium dichromate
COD_{Mn}	chemical oxygen demand with potassium permanganate
CSR	Contaminated Sites Register
cu.p.	current prices
CZ-NACE	classification of economic activities (Nomenclature générale des Activités économiques dans les Communautés Européennes)
CZSO	Czech Statistical Office
DDT	dichlorodiphenyltrichloroethane
DMC	domestic material consumption
DNA	deoxyribonucleic acid
EC	exceedance curve
EEA	European Environment Agency
EFP	environmentally friendly product
EFS	environmentally friendly service
EQS AA	environmental quality standard – annual average
ERO	Energy Regulatory Office of the Czech Republic
ESD	legislative provision for effort sharing valid until 2020, when it was replaced by the ESR (Effort Sharing Decision)
ESG	environmental, social and governance
ESR	regulation on effort sharing for reducing greenhouse gas emissions outside the EU ETS, e.g. from transport (Effort Sharing Regulation)
ETBE	ethyl tert-butyl ether
EU	European Union
EU ETS	European Union Emission Trading Scheme
EU27	member states of the European Union (excluding the United Kingdom)
Eurostat	European Statistical Office
FAL	flood activity level

FGMRI	Forestry and Game Management Research Institute, public research institution
FSC	Forest Stewardship Council certification system
GDP	gross domestic product
HA	high annoyance
HAMR	Hydrology, Agronomy, Meteorology and Retention
HCB	hexachlorobenzene
HGR	hydrogeological region
HCH	hexachlorocyclohexane
HSD	high sleep disturbance due to noise
CHMI	Czech Hydrometeorological Institute
IL	emission limit
IPR	Integrated Pollution Register
IROP	Integrated Regional Operational Programme
IWSS	integrated warning service system
LA21	local Agenda 21
LAG	local action group
LPIS	public land register (Land Parcel Identification System)
LULUCF	land use, land-use change and forestry
LV	limit value
MIT	Ministry of Industry and Trade
MoA	Ministry of Agriculture
MoE	Ministry of the Environment
MoF	Ministry of Finance
NAP CM	National Action Plan for Clean Mobility
NCA	Nature Conservation Agency of the Czech Republic
NECP	National Energy and Climate Plan of the Czech Republic
NERP	National Emission Reduction Plan of the Czech Republic
NFR	Nomenclature for Reporting
NGO	non-governmental non-profit organisation
NGS	New Green Savings
NICS	National Inventory of Contaminated Sites
NMVOC	non-methane volatile organic compounds
NP	national park
NP ENV	National Environment Programme
NRL	National Reference Laboratory for Environmental Noise
NRP	National Recovery Plan
OP EIC	Operational Programme Enterprise and Innovation for Competitiveness
OP TAC	Operational Programme Technology and Applications for Competitiveness
OPE	Operational Programme Environment
p.p.	percentage point
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PCDD/PCDF	polychlorinated dioxins and furans
PE	population equivalent
PEFC	certification system Programme for the Endorsement of Forest Certification Schemes
PES	primary energy source
PFAS	per- and polyfluoroalkyl substances
PFOS	perfluorooctane sulfonate
PHEV	plug-in hybrid electric vehicle

PM	particulate matter
POPs	persistent organic pollutants
PPS	purchasing power standard
RDP	Rural Development Programme
REACH	EU Regulation on the restriction of toxic chemicals (Registration, Evaluation, Authorisation and Restriction of Chemicals)
RES	renewable energy sources
RWM	responsible water management
SECAP	Sustainable Energy and Climate Action Plan
SEEPiA	Centre for Socio-Economic Research on the Impacts of Environmental Policies
SEF	State Environmental Fund of the Czech Republic
SEP	State Energy Policy
SEP 2030	State Environmental Policy
SHARES	methodology for assessing renewable energy sources (Short Assessment of Renewable Energy Sources)
SNM	strategic noise mapping
SP CAP	Strategic Plan for the Common Agricultural Policy
SUMF	Sustainable Urban Mobility Framework
SUMP	Sustainable Urban Mobility Plan
TACR	Technology Agency of the Czech Republic
TEE	total eligible expenditure
TOC	total organic carbon
TRC	Transport Research Centre, public research institution
TSES	territorial system of ecological stability
UN	United Nations
USLE	Universal Soil Loss Equation
UWC	usable water capacity
VAM	voluntary associations of municipalities
VOC	volatile organic compounds
WAM	scenario with additional measures
WEI	water exploitation index
WEM	scenario with existing measures
WHO	World Health Organisation
WMIS	Waste Management Information System
WRI	T. G. Masaryk Water Research Institute, public research institution
WWTP	wastewater treatment plant

Abbreviations of regions of the Czech Republic

PHA	Prague
STC	Central Bohemian Region
JHC	South Bohemian Region
PLK	Plzeň Region
KVK	Karlovy Vary Region
ULK	Ústí nad Labem Region
LBK	Liberec Region
HKK	Hradec Králové Region
PAK	Pardubice Region
VYS	Vysočina Region
JHM	South Moravian Region
OLK	Olomouc Region
ZLK	Zlín Region
MSK	Moravian-Silesian Region



2024

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