



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

## SUMMARY

# 2020



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Ministry of the Environment  
of the Czech Republic

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Czech Environmental Information Agency

Moskevská 1523/63, 101 00 Prague 10

info@cenia.cz, <http://www.cenia.cz>

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Climate change manifestations in the Czech Republic, the transition to climate neutrality, and the adaptation of settlements to climate change are some of the topics addressed in the new Report on the Environment of the Czech Republic 2020 (hereinafter the “Report”). Beginning with the current issue, the content concept and structure are linked to the State Environmental Policy of the Czech Republic 2030 with a view to 2050. The purpose of the Report therefore includes – in addition to an annual assessment of the state of the environment and economy-related impacts – the continuous monitoring of achieving objectives and priorities of the State Environmental Policy. The main areas of the State Environmental Policy are framed by other contextual topics important for the state and development of the environment.

The conclusions of the Report show that the year 2020 was both significantly impacted by the COVID-19 pandemic and was also unusual in environment-related terms. The downturn in economic activity, the restrictions of the mobility of the population and goods, and the change in household consumption patterns caused a reduction in anthropogenic pressures on the environment. Air quality continues to improve in the Czech Republic, and the country is meeting its current climate protection commitments. Coal-based power generation continues to fall, while power generation from renewable energy sources increased.

Climate change is an important factor that has been reflected in the state of the environment in recent years. The year 2020 was very warm and the average annual temperature in the Czech Republic is rising at a rate of 0.35°C per decade, however precipitation in this year was higher than in preceding two years. Nevertheless, soil and hydrological drought conditions persisted in part of the territory. One major direct impact of climate change is the **bad health condition of forests**, which are vulnerable to climate change manifestations due to long-term economic use inconsistent with natural processes. Logging related to the bark beetle calamity has resulted in large clearings, and the forests have become a source of greenhouse gas emissions. Nevertheless, there is currently **extensive regeneration of forests with a predominance of deciduous trees** in the affected areas.

Agricultural land is vulnerable to manifestations of climate change such as erosion and drought resulting from intensive farming based around the application of mineral fertilisers and plant-protection products, oversized fields and high levels of ploughing. In addition, **there has been a long-term loss of agricultural land** in favour of built-up areas. The impacts of intensive farming on the landscape and the impacts of climate change on biodiversity are increasing. **Many species are disappearing from the Czech Republic, or their ranges are changing.**

Another impact of the COVID-19 pandemic is the most significant **decline in total water abstraction** for the last five years. **Waste water treatment from point sources is continuously improving**, reflected in significant decrease in total phosphorus and ammoniacal nitrogen in flowing waters. Pesticides that enter the water from intensively farmed agricultural land are a significant problem in terms of the quality of surface and groundwater.

Air quality continues to improve. The Czech Republic already met its emission ceilings set for 2020, including for emissions of suspended PM<sub>2.5</sub> particulate matter, in 2019. Although limit values for air pollutants are still being exceeded regionally, **the proportion of the country's territory and the share of the population affected by above-limit concentrations decreased** again in 2020. Meteorological (especially dispersion) conditions contributed towards air quality improvements over the last three years, however the impacts of the introduction of modern technologies in manufacturing, the modernisation of the composition of combustion equipment in households supported through boiler subsidies, and the gradual renewal and modernisation of the road vehicle fleet were also evident. No smog situation was announced in 2020.

**Greenhouse gas emissions** from large stationary combustion sources are decreasing, however, except for 2020 greenhouse gas emissions from transport are growing and the growth in emissions from waste is continuing. Greenhouse gas emissions from the land use, land-use change and forestry (LULUCF) sector are significantly increasing as a consequence of poor forest health.

The favourable development of air quality and emissions of pollutants and greenhouse gases is supported through the development of the energy and industry sectors. However, transport remains a significant burden on the environment and the climate system.

In the energy sector we are seeing a **decline in the domestic extraction of brown coal**, while more electricity was generated from nuclear sources than from brown coal for the first time in history in 2020. **Electricity generation from renewable energy sources is also increasing**, and already met the targets set for 2020 in 2013. Total electricity generation in 2020 was the lowest for the last 18 years, a consequence of reduced domestic and foreign demand due to the measures related to the COVID-19 pandemic. Both primary and final energy source consumption met the targets set for 2020 in 2019.

**Transport remains dependent on fossil energy sources** and is therefore carbon intensive, in spite of growth in the use of alternative fuels and propulsion. In addition, with the exception of 2020, energy consumption in transport has been growing, road transport is the largest energy consumer in the transport sector.

**The material intensity of the economy is decreasing**, meaning the economy requires less raw and other materials to create each unit of GDP. This is also associated with a reduction in the environmental burden related to material mining and consumption.

**Waste generation is not decreasing**, nevertheless **material recovery still dominates overall waste treatment**. Its share is increasing in accordance with circular economy principles and the current waste treatment hierarchy. In the case of municipal waste, landfilling still dominates in spite of significant efforts.

**The preparation and implementation of settlement adaptation strategies is under way**, yet is progressing slowly. Rainwater management and the issue of improving settlement adaptation capacities through support for the development of public greenery have begun to be addressed only relatively recently. The majority of cities with over 40,000 inhabitants already have approved sustainable urban mobility plans or strategic sustainable urban mobility frameworks.

**The year 2020 experienced a continuation of the growth in public expenditure on environmental protection** supported through the successful drawing of funds from European sources through operational programmes, in particular from the Operational Programme Environment, and the Rural Development Programme. Examples of the successful financing of environmental protection measures include the implementation of the New Green Savings and Dešťovka (Rainwater) Programmes and the already mentioned boiler subsidies.

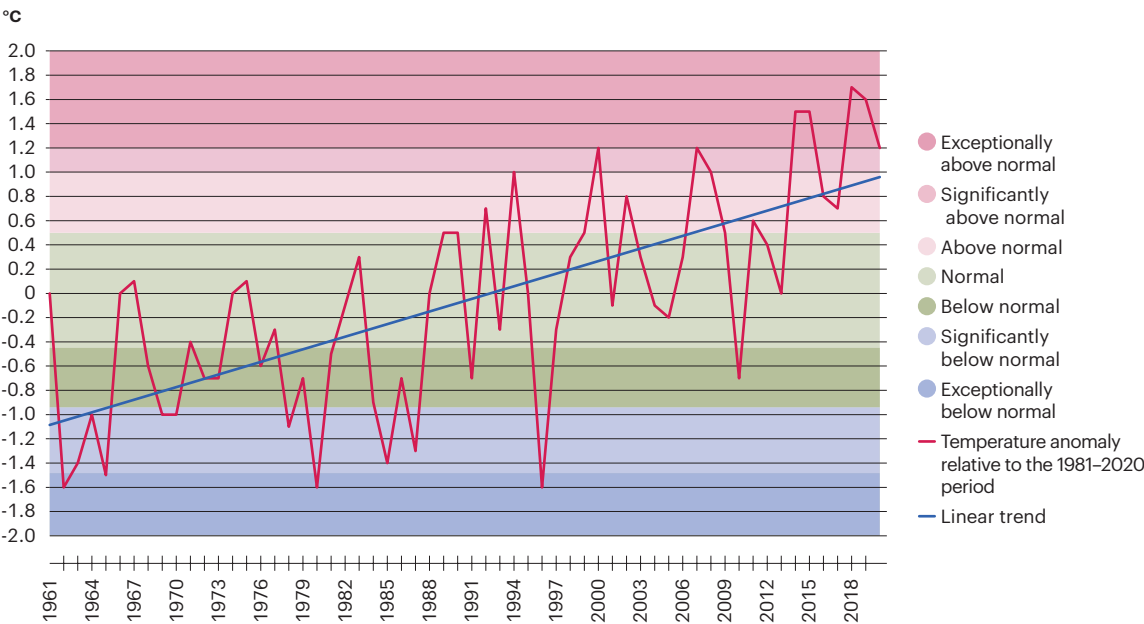
The Report for 2020 is published in a detailed electronic form on the CENIA and Ministry of the Environment of the Czech Republic websites together with the Statistical Environmental Yearbook of the Czech Republic 2020 and Reports on the Environment in the Regions of the Czech Republic 2020.

# Climate change in the Czech Republic

- The average annual temperature in the Czech Republic is growing at a rate of 0.35°C per decade. The year 2020 was significantly above normal in terms of temperature.
- Precipitation was above normal in 2020, reaching 112% of the 1981–2010 normal.
- The annual number of tropical days with temperatures above 30°C has more than doubled over the past 30 years to an average of 12 per year, highlighting the growing temperature extremes in the summer season.
- In the Poohří region, parts of Central Bohemia and South Moravia, soil moisture values fell below 10% of available water capacity in 2020, indicating significant soil drought. These are areas where soil drought has also occurred in past years. However, the soil drought did not have an across-the-board character as in previous years, as it did not occur at all in higher altitudes and in most of Moravia and Silesia thanks to higher precipitation, and it also lasted for a shorter time in the affected areas.
- The dry winter of 2019 and the precipitation deficit in the spring of 2020 were reflected in subnormal states of flow rates in the monitored profiles and in a significantly to extremely subnormal level of groundwater levels in most of the territory, while on the other hand heavy precipitation in June and October caused flooding.

Chart 1

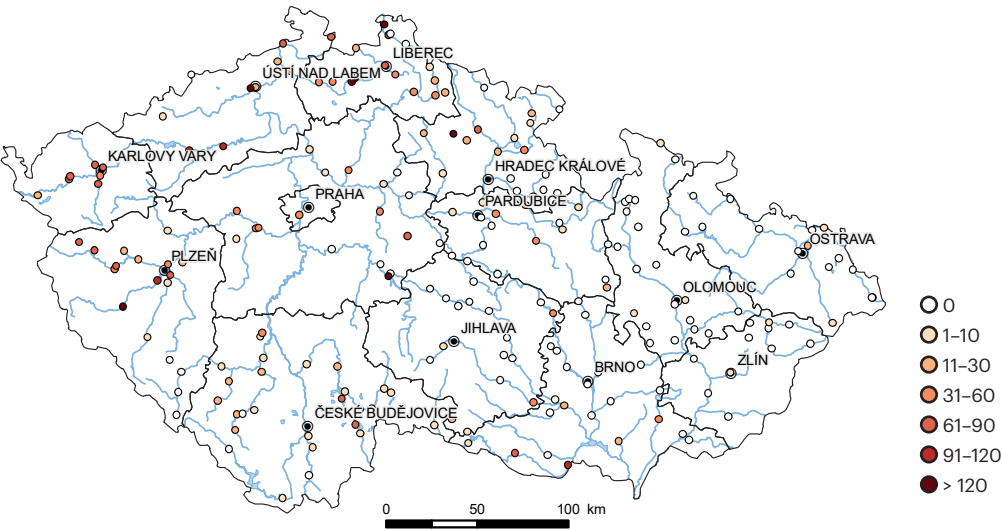
**Anomaly of the average annual air temperature in the Czech Republic from the 1981–2010 normal (surface temperature average) and classification of the extremity of the average annual temperature [°C], 1961–2020**



Data source: Czech Hydrometeorological Institute

**Figure 1**

**Flow rate under the long-term 355-day flow rate in the Czech Republic for the 1981–2010 period [number of days], 2020**



*Data source: Czech Hydrometeorological Institute*

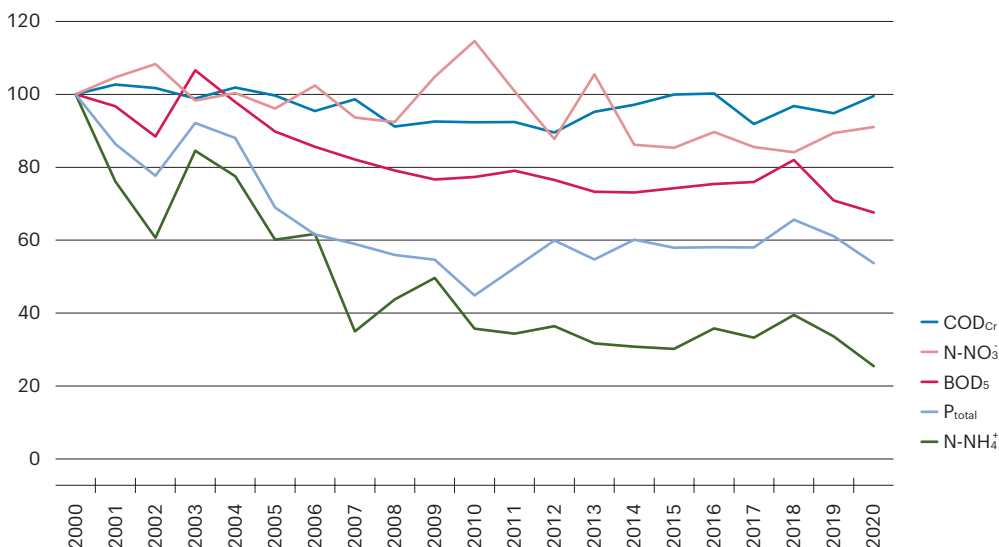
## Water availability and quality

- In a water quality assessment according to Czech Technical Standard 75 7221, polluted water prevails for the two-year 2019–2020 period (quality class III).
- In the 2000–2020 period, the reduction in  $\text{N-NH}_4^+$  pollution (a decrease in the average concentration of 74.5%) and  $\text{P}_{\text{total}}$  (a decrease of 46.3%) in the watercourses of the Czech Republic was most successful.
- In 2020, significant groundwater pollution was found in the sum of pesticides at a total of 200 sites (out of a total of 695 monitored sites).
- The share of the population connected to the public water supply has gradually increased – from 87.1% in 2000 to 94.6% in 2020.
- Total water abstraction has fallen by 24.3% since 2000. In 2020, total water abstraction amounted to 1,365.9 mil.  $\text{m}^3$ , a decrease of 9.3% compared to 2019.
- The number of waste water treatment plants (WWTPs) has been growing for a long time, and the share of WWTPs with a tertiary treatment stage is increasing. In 2020, a total of 2,795 WWTPs were operated in the Czech Republic, of which 58.2% had a tertiary treatment stage.
- 16.6% of the population is not yet connected to a sewer system terminated with a WWTP.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Water quality in watercourses				
Bathing water quality				
Groundwater quality				
Population supplied with water from the public water supply				
Waste water treatment				
Waste water discharge				
Groundwater and surface water abstraction by sector				
Water consumption from the public water supply and water losses in the water supply network				

**Chart 2****Trend in pollution concentration indicators in watercourses in the Czech Republic [index, 2000 = 100], 2000–2020**

index (2000 = 100)



Data source: Czech Hydrometeorological Institute from the state enterprise Povodí

**Chart 3****Percentage of population connected to sewerage systems and sewerage systems terminating in a waste water treatment plant in the Czech Republic [%], 2000–2020**

Data source: Czech Statistical Office



## Air quality

- Emissions of main air pollutants (NO<sub>x</sub>, VOC, SO<sub>2</sub>, NH<sub>3</sub> and PM<sub>2.5</sub>) are decreasing in the long term. As part of the fulfilment of commitments (emission ceilings), the required reductions for all emissions for 2020<sup>1</sup> were achieved in 2019, including emissions of suspended PM<sub>2.5</sub> particulate matter.
- Emissions of NO<sub>x</sub>, VOC and CO from transport are decreasing in the long term. In 2020, emissions of all monitored pollutants and greenhouse gases from transport decreased significantly year-on-year.
- Emissions from household heating are on a slightly downward trend, nevertheless households accounted for the largest share of total PM<sub>10</sub> (55.1%) and B(a)P (96.4%) emissions in 2019<sup>2</sup>.
- Some limit values are still being exceeded, but in 2020 there was a year-on-year decrease in the share of the population and the proportion of the country's territory where the daily limit values for PM<sub>10</sub> and the annual limit values for B(a)P and PM<sub>2.5</sub> were exceeded. The limit values for the annual average PM<sub>10</sub> concentration was not exceeded at all. Especially in the short term, there has been a very significant increase in the share of the population and territory affected by increased concentrations of ozone.
- The human health protection limit values set for arsenic, cadmium, lead, nickel, sulphur dioxide, carbon monoxide and benzene were not exceeded in 2020.
- No smog situation was announced in 2020.

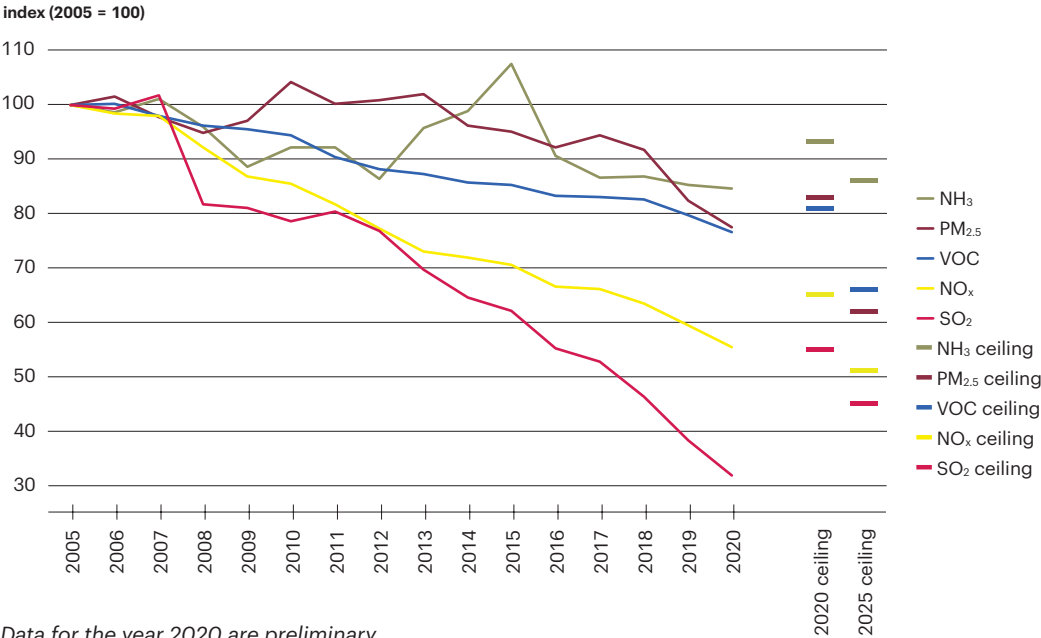
Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Emissions of selected air pollutants				
Emissions from transport*				
NO <sub>x</sub> , VOC and CO emissions from transport				
PM and N <sub>2</sub> O emissions from transport				
CO <sub>2</sub> and PAH emissions from transport				
Emissions from household heating				
Compliance with pollutant limits values for selected pollutants				
Air quality in terms of human health protection				
Air quality in terms of ecosystem and vegetation protection				

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.

<sup>1,2</sup> Final data for the year 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

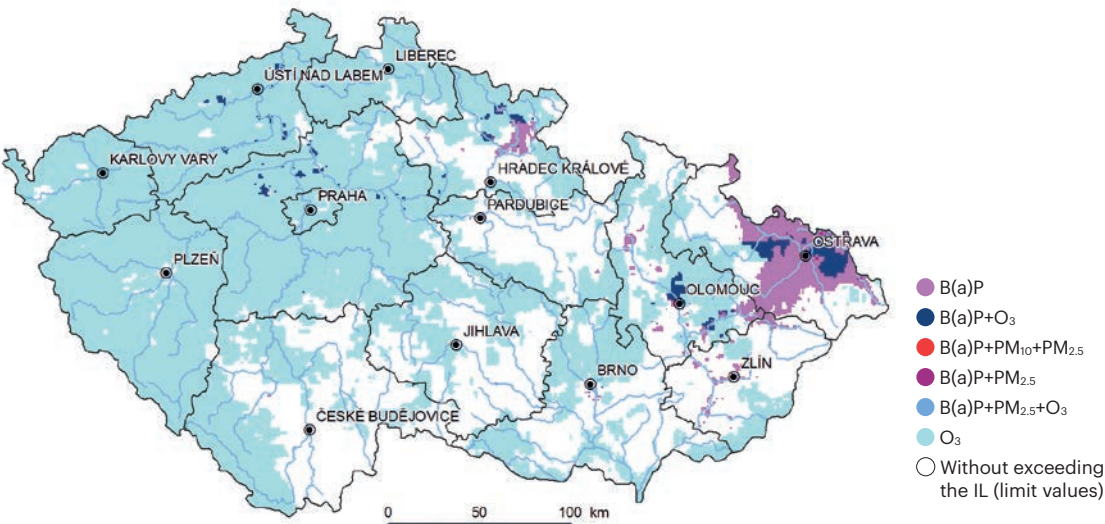
**Chart 4**

**Trends in total emissions of selected pollutants in the Czech Republic and national emission ceilings for 2020 and 2025 [index, 2005 = 100], 2005–2020**



**Figure 2**

**Areas within the Czech Republic with exceeding of the human health protection limit values [%], 2020**



Data source: Czech Hydrometeorological Institute

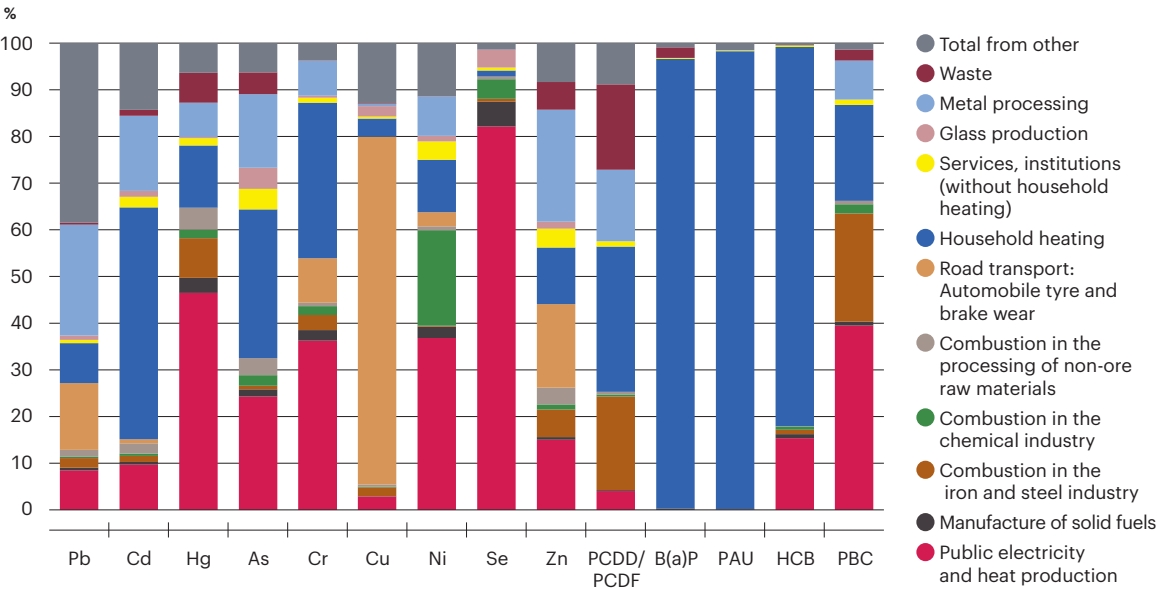
# Exposure of the population and the environment to hazardous substances

- Air emissions of heavy metals (except copper) and POPs are decreasing in the long and medium term.
- The remediation of 1,027 contaminated sites was completed in the 2010–2020 period while complying with remedial measure conditions, while the remediation of 437 sites was completed in 2020.
- The incremental Evidence System of Contaminated Sites database contained 11,036 sites in 2020.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Releases into water and soil and air emissions of selected hazardous substances	N/A	N/A	N/A	N/A
Air emissions of heavy metals and POPs*				
Air emissions of heavy metals	↘	↘	↗	✓
Air emissions of POPs	↘	↘	↘	✓
Contaminated sites (evidence and remediation)	N/A	N/A	N/A	↗

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.

**Chart 5**  
Sources of air emissions of selected heavy metals and POPs in the Czech Republic [%], 2019

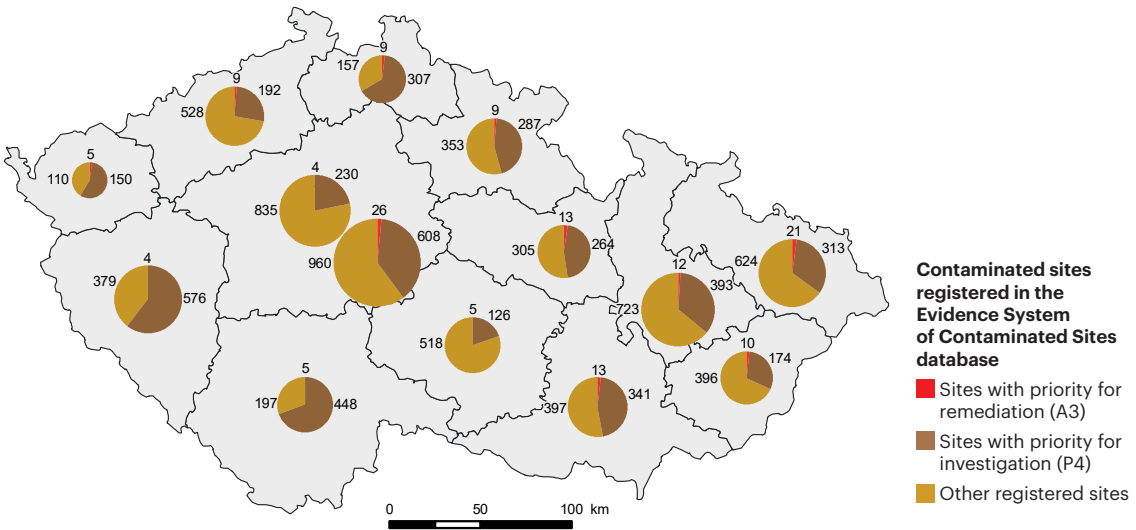


Data for the year 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

Data source: Czech Hydrometeorological Institute

**Figure 3**

**Number of contaminated sites registered in the Evidence system of Contaminated Sites in the Czech Republic, 2020**



Sites with priority for remediation (A3) and sites with priority for investigation (P4) are determined according to valid methodological instruction of the Ministry of the Environment of the Czech Republic No. 1/2011.

Data source: Ministry of the Environment of the Czech Republic

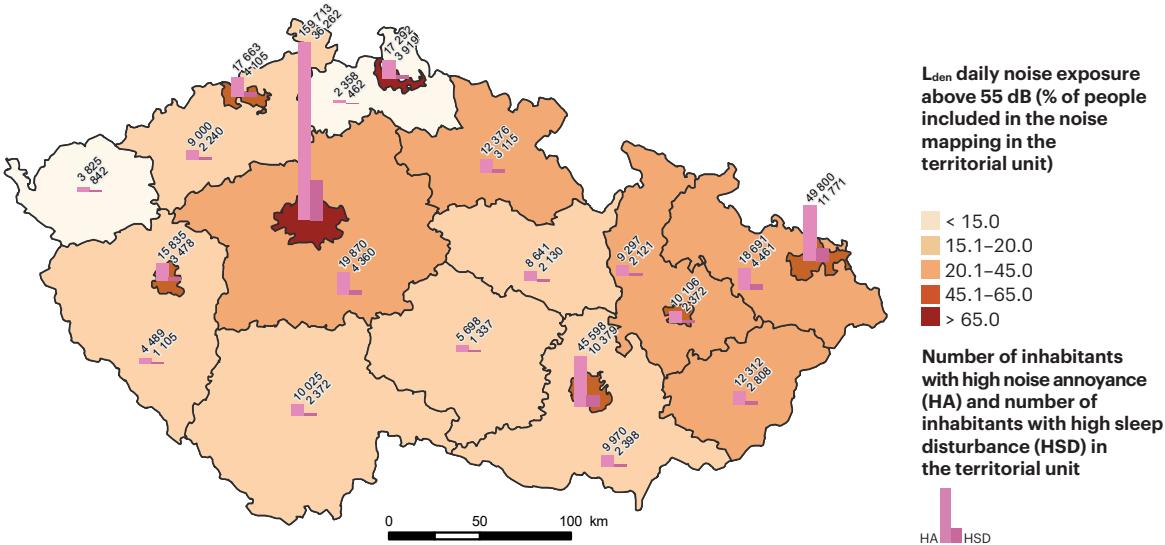
# Noise pollution burden of the population and light pollution

- Noise pollution burden of the population decreased between 2012 and 2017<sup>3</sup> in terms of the exposure of the population to high noise levels above the limit value.
- However, there is still significant noise pollution from road transport in urban agglomerations with more than 100,000 inhabitants, above average in a Europe-wide comparison.
- In 2020, about 20 km of new motorways were put into operation and another almost 90 km of motorways were under construction. In 2020, CZK 405.0 mil. was invested in noise barriers on road infrastructure, while noise barriers are a standard part of new road construction.
- The level of light pollution is constantly worsening due to the increasing amount of illuminated areas.
- We can no longer find an area not affected by artificial illumination in the Czech Republic. However, there is no objective measurement that can monitor the development of light pollution over time.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Noise pollution burden of the population	N/A	N/A		
Noise protection measures in transport and development of transport infrastructure	N/A			
Brightness of the night sky	N/A	N/A	N/A	

Figure 4

Share of the population in regions and agglomerations of the Czech Republic exposed to all-day road traffic noise pollution ( $L_{den}$ ) above 55 dB, share of the population highly annoyed by noise (HA), and share of the population with high sleep disturbance (HSD) in the total population included in the noise mapping [%], 2017



Outside agglomerations, data are only available for roads with traffic volumes higher than 3 mil. vehicles per year. Due to the five-year cycle of Strategic Noise Mapping data processing according to Directive 2002/49/EC, data for the 2018–2020 period are not available. This period covers the 4<sup>th</sup> round of the Strategic Noise Mapping, the results of which will be available in 2022.

Data source: National Reference Laboratory

<sup>3</sup> Data for the years 2018–2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

## Preparedness and resilience of society for emergencies

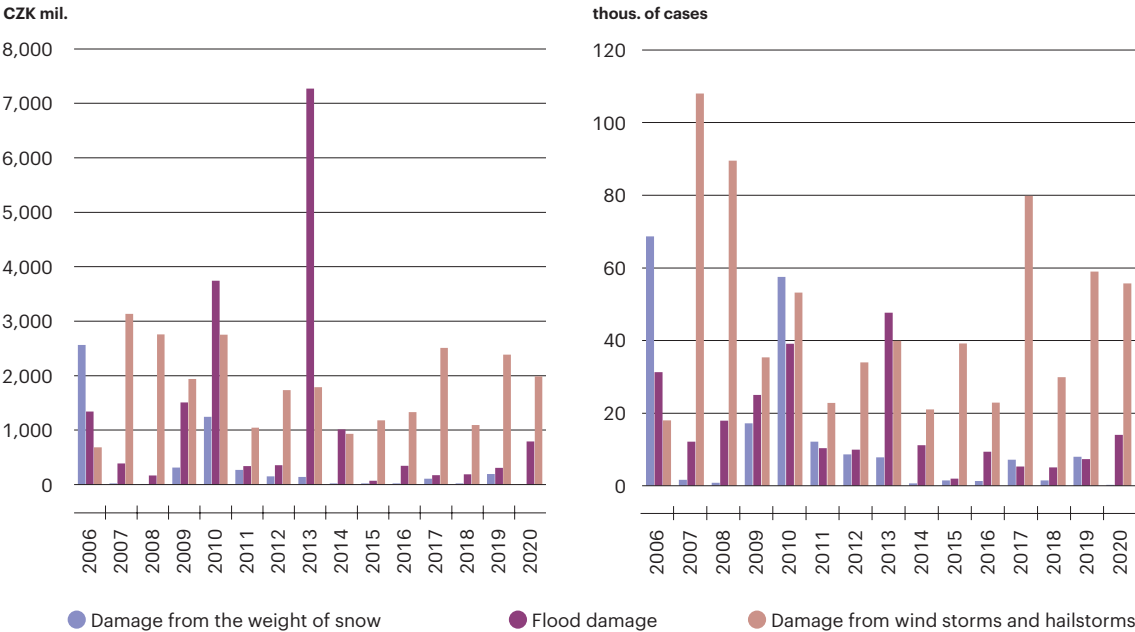
- To support preparedness for extreme weather or the manifestations of climate change, more than 1,100 projects worth more than CZK 10 bil. were approved in the Operational Programme Environment in the 2014–2020 programming period. At the Ministry of Agriculture of the Czech Republic, approximately CZK 14.0 bil. was spent in the Rural Development Programme and national programmes for the implementation of, for example, more than 900 flood protection structures.
- In 2020, there were a total of 28,605 events requiring the intervention of Integrated rescue system units in connection with natural disasters, in the vast majority of cases technical accidents. In the long term, the main cause of all events is strong wind followed by flooding or rain.
- In 2020, a total of 70 thous. insured events arising from natural disasters were registered by insurance companies with total damage of CZK 2.8 bil., while since 2006, insurance companies have registered a total of about 1.2 mil. insured events arising from natural disasters with total damage of CZK 50.4 bil.
- In 2020, there were eight major industrial accidents, namely spills of hazardous substances in chemical plants, a fire and an explosion.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Public expenditure spent on adaptation to the manifestations of climate change	N/A			
Issuing alerts of the Integrated Warning Service System*	N/A	N/A	N/A	
Events and interventions arising from natural disasters	N/A			
Amount of damage caused by natural disasters				
Preventive and educational activities for population protection and crisis management	N/A			
Number of major reported accidents				

\* It is not possible and does not make sense to set a trend for the operation of the alert system. The criterion for its success is not the number of alerts issued, but the quality, accurate and timely issuing of alerts.

**Chart 6**

**Insurance events in natural disaster insurance in the Czech Republic [CZK mil., thous. of cases], 2006–2020**



Data source: Czech Insurance Association

## Adapted settlements

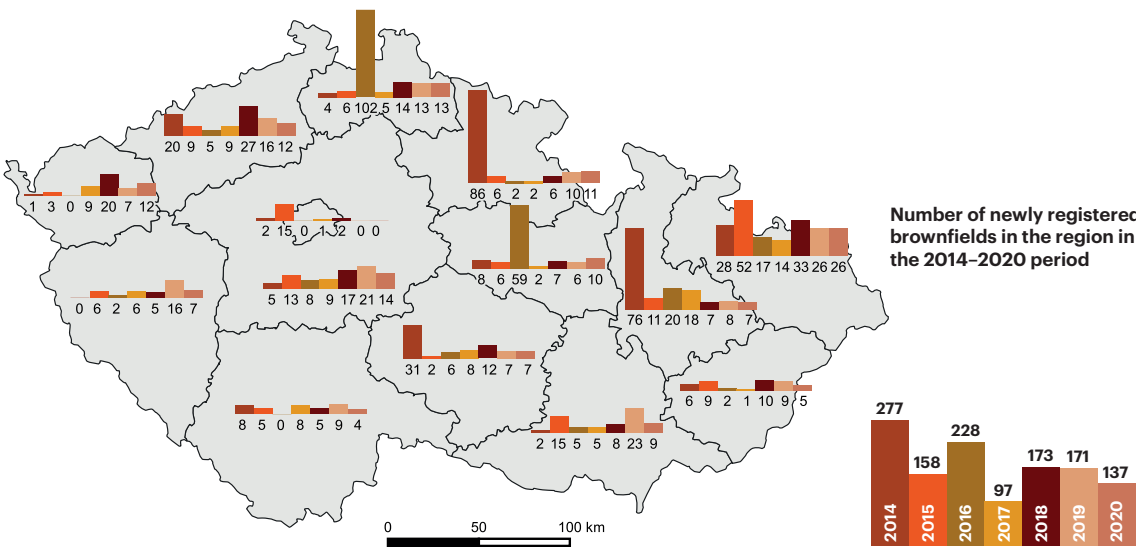
- In 2020, 18 cities or city districts in the Czech Republic had an adaptation strategy or plan prepared, with a total of over 2.6 mil. inhabitants living on their territory, and another 30 cities or municipalities were preparing these documents. However, the implementation of relevant adaptation measures at local or regional level is progressing slowly.
- In 2020, a total of 142 implementers were involved in the implementation of Local Agenda 21 at local and regional level, mainly from the ranks of municipalities or small municipalities. In the higher categories of Local Agenda 21 implementation, we can assess the stable representation and, in the case of the best implementers of Local Agenda 21 (category A), even a slight growth as positive.
- The total share of the population of cities with a verified Sustainable Urban Mobility Plan in 2020 amounted to 25.3% of the population of the Czech Republic and 70.8% of the total population of cities with over 40,000 inhabitants. All ten of the largest cities in the Czech Republic by population have an approved Sustainable Urban Mobility Plan or at least a Strategic Framework for Sustainable Urban Mobility.
- Overall, 1,241 brownfields with a total area of 3,285.0 ha were newly registered in the 2014–2020 period. Brownfields in Czechia are being regenerated (in 2020 a total of 174 brownfields with a total area of 257.7 ha), mainly through subsidy programmes.
- The management of rainwater or greywater in settlements is financially supported mainly through the Operational Programme Environment and the Dešťovka (Rainwater) Programme. By the end of 2020, 115 projects had been approved in the Operational Programme Environment with a total of CZK 507.6 mil. of total eligible expenditure, the implementation of which will enable 6,500 m<sup>3</sup> of rainwater to be retained within the municipalities. By the end of 2020, a total of 6,230 projects had been approved in the Dešťovka (Rainwater) Programme with total support of CZK 232.8 mil., while the total volume of accumulation tanks acquired with support from this programme is almost 30 thous. m<sup>3</sup>.
- The representation of greenery and water areas in the urban area of settlements over 20,000 inhabitants is relatively high and averaged 76.0%. However, low greenery makes up a significant part of the share of greenery in the total urban area of settlements (78.0% of the total greenery in settlements), the potential of which for increasing the adaptation capacity of settlements is low compared to high greenery.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Number of municipalities with adaptation plans	N/A	N/A		
Brownfields	N/A	N/A	N/A	
Local Agenda 21				
Sustainable Urban Mobility Plans	N/A	N/A		
Supported projects for the use of rainwater and greywater	N/A	N/A		
Green areas in cities	N/A	N/A		



**Figure 5**

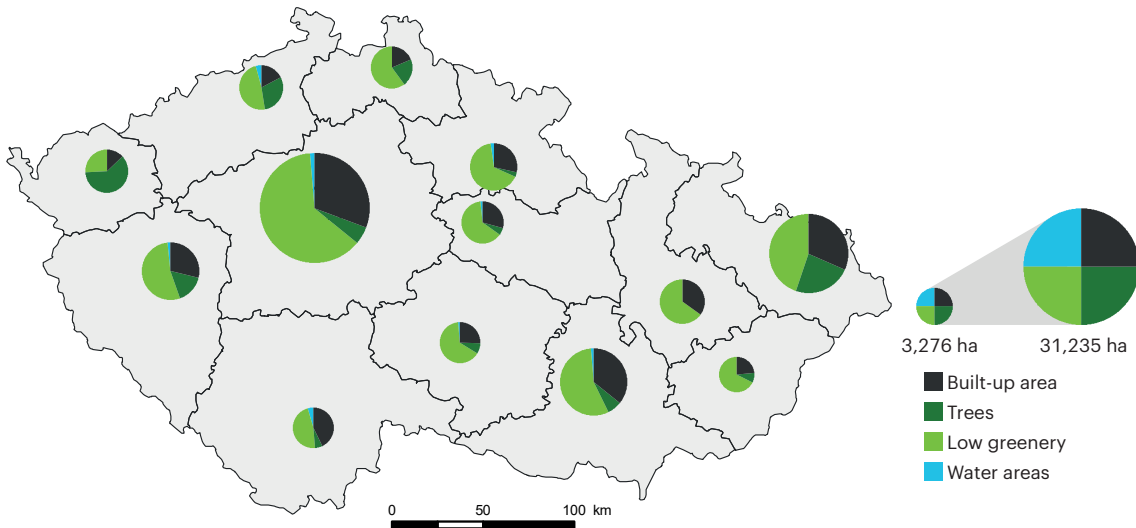
**New brownfields entered into the National Database of Brownfields by regions of the Czech Republic [number], 2014–2020**



Data source: CzechInvest

**Figure 6**

**Share of greenery in settlements and water areas in the total urban area of regional cities of the Czech Republic [%], 2020**



Data source: Sentinel-2, Czech Statistical Office

## Transition to climate neutrality

- Greenhouse gas emissions without the LULUCF sector are decreasing. The Czech Republic's climate targets for 2020 were met partly thanks to a significant contribution from the impacts of the COVID-19 pandemic.
- The balance of greenhouse gas emissions from the LULUCF sector has increased to record high positive values as a result of the bark beetle calamity. Transport emissions and waste emissions are also rising.
- Energy consumption in transport has had an increasing trend over the long term (except year 2020). Fossil fuels accounted for 94.9% of transport energy consumption from fuel combustion in 2020.
- The use of alternative fuels and propulsion in transport is growing dynamically, but their representation remains marginal in relation to the overall size of the fleet.
- Gross electricity generation reached 81,443.4 GWh in 2020. It fell by 6.4% year-on-year, and is at its lowest value in 18 years.
- For the first time in history, electricity generation from nuclear power exceeded that from lignite.
- The generation of heat from solid fossil fuels has had a significantly decreasing trend since 2010, while the share of renewable sources and biofuels has been growing significantly.
- Foreign trade in electricity has retained its export character, with the balance corresponding to 14.2% of domestic consumption in 2020.
- 15.9% of households used solid fuels (coal + wood) for heating in 2019, an increase of 9.1% in the last five years. However, the total consumption of solid fossil fuels in households has been declining for a long time.
- The energy intensity of the economy is declining, is a result of GDP growth and, to a lesser extent, a decline in consumption.
- The overall energy dependence of the Czech Republic is increasing significantly, reaching 40.9% in 2019<sup>4</sup>.
- Both primary and final energy consumption reached the levels for meeting the 2020 energy efficiency targets in 2019<sup>5</sup>. However, the structure of primary energy resources still significantly differs from the targets set for 2040.
- Electricity generation from renewable sources increased by 2.6% year-on-year to 10,291.1 GWh in 2020.
- The share of RES in final energy consumption in transport was 7.8% in 2019<sup>6</sup>.
- The target for the share of RES in gross final energy consumption, i.e. 13% by 2020, has been met since 2013, with a share of 16.2% in 2019<sup>7</sup>.
- The generation of heat from renewable sources grew significantly in the monitored period, the year-on-year increase in 2019<sup>8</sup> being 9.3%, while the generation of heat from RES actually increased by 162.6% in the 2010–2019 period.
- The energy intensity of the EU28 economies decreased from 5.6 TJ to 4.0 TJ.(EUR mil.)<sup>1</sup> over the 2010–2019<sup>9</sup> period, i.e. by 28.6%.
- The share of renewable energy sources in final consumption in the EU28 is growing, standing at 18.9% in 2019<sup>10</sup>, with a target of 20% for the EU28 as a whole by 2020. 14 EU28 countries, including the Czech Republic, have already achieved their national targets.

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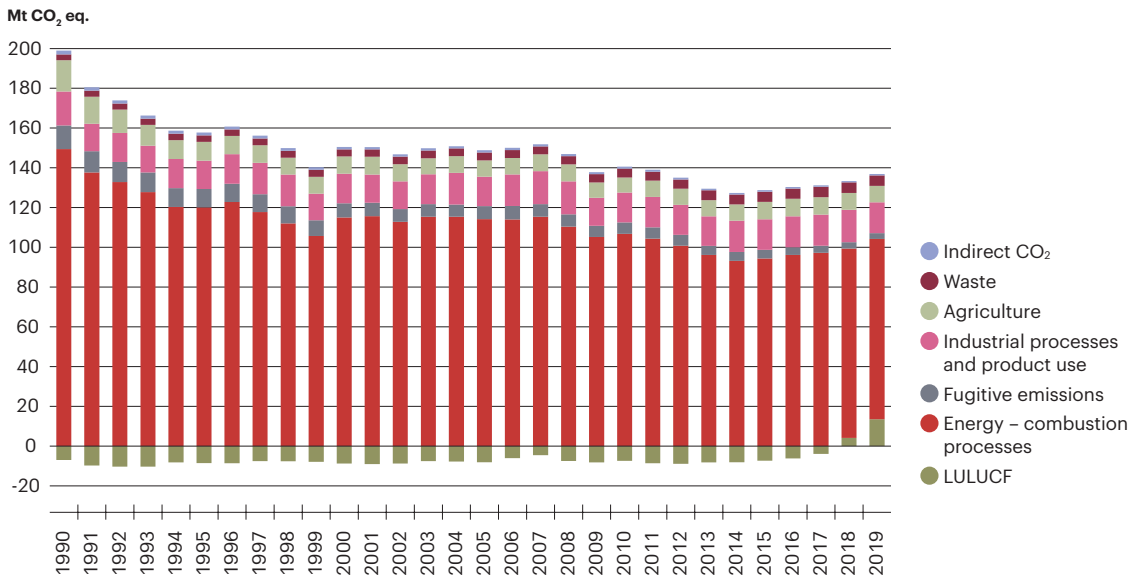
<sup>4-10</sup> Data for the year 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Greenhouse gas emissions (without LULUCF)				
Electricity and heat generation*				
Gross electricity generation				N/A
Gross heat generation	N/A			N/A
Share of the balance of foreign trade in electricity in domestic consumption				
Household heating by fuel*				
Number of households heated with solid fuels (coal + wood)				
Consumption of solid fossil fuels in households				
Energy and fuel consumption in transport				
Energy intensity of the economy*				
Development of the energy intensity of the economy	N/A			
Structure of primary energy sources	N/A			
Energy efficiency	N/A			
Import energy dependence	N/A			
Renewable energy sources				
Consumption of RES in transport				

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.

**Chart 7**

**Development of aggregated greenhouse gas emissions in the Czech Republic by sector [Mt CO<sub>2</sub> eq.], 1990–2019**

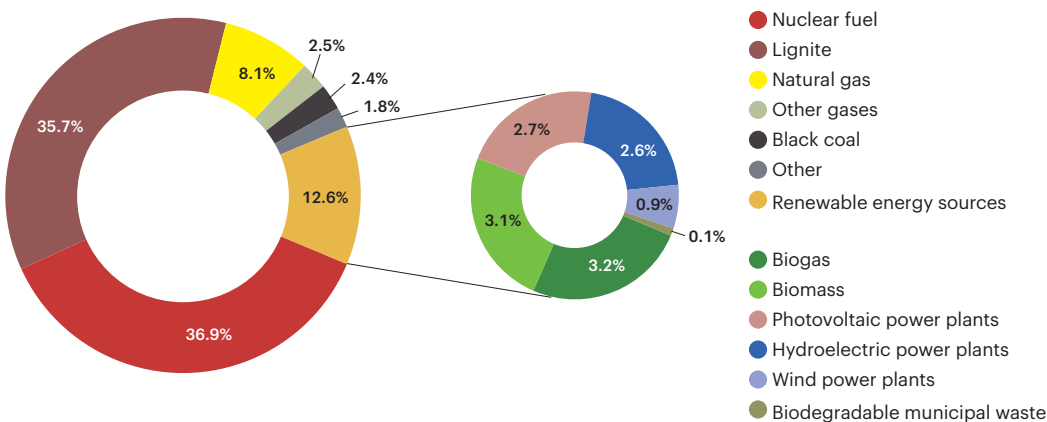


Data for the year 2020 are not available due to the preparation schedule of the emission inventory.

Data source: Czech Hydrometeorological Institute

**Chart 8**

**Structure of electricity generation by fuel in the Czech Republic [%], 2020**



Data source: Energy Regulatory Office

## Transition to a circular economy

- The material intensity of the economy is steadily decreasing.
- The specific indicators of domestic material consumption per capita and per unit of GDP in the Czech Republic are slightly above average compared to other EU28 countries.
- In 2018<sup>11</sup>, the share of secondary raw materials production volume in direct material input was 8.3%.
- Total waste generation has a significantly increasing trend in the medium and short term, as does the generation of non-hazardous waste. Municipal waste generation is increasing in the medium term. The generation of packaging waste has significantly growing medium-term and short-term trends.
- In the medium term, there has been a slight reduction in the generation of mixed municipal waste.
- The eco-labelling of products and services guarantees an environmentally friendly approach in terms of waste or packaging generation. The number of licences for the Czech Environmentally Friendly Product and Environmentally Friendly Service eco-labels has been decreasing significantly in the long term, on the other hand the number of EU Ecolabel licences is growing. In 2020, there were a total of 32 valid licenses for the use of the Czech Environmentally Friendly Product/Environmentally Friendly Service ecolabels, which corresponds to 42 certified products, while there were 20 licenses for 5,147 certified products in the case of the EU Ecolabel.
- Something positive in terms of the transition to a circular economy is that overall waste treatment is dominated by recovery, especially material recovery, the share of which is increasing in the medium term at the expense of landfilling.
- The main objective in municipal waste treatment is to significantly reduce landfilling in favour of material recovery in particular, yet almost half of municipal waste continues to be landfilled.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Material intensity of the economy				
Share of secondary raw materials production volume in direct material input				
Waste generation				
Ecolabelling*				
Total number of valid Environmentally Friendly Product and Environmentally Friendly Service ecolabel licences				
Total number of valid EU Ecolabel licences				
Waste treatment structure				
Municipal waste treatment				

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.

<sup>11</sup> Data for the years 2019 and 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

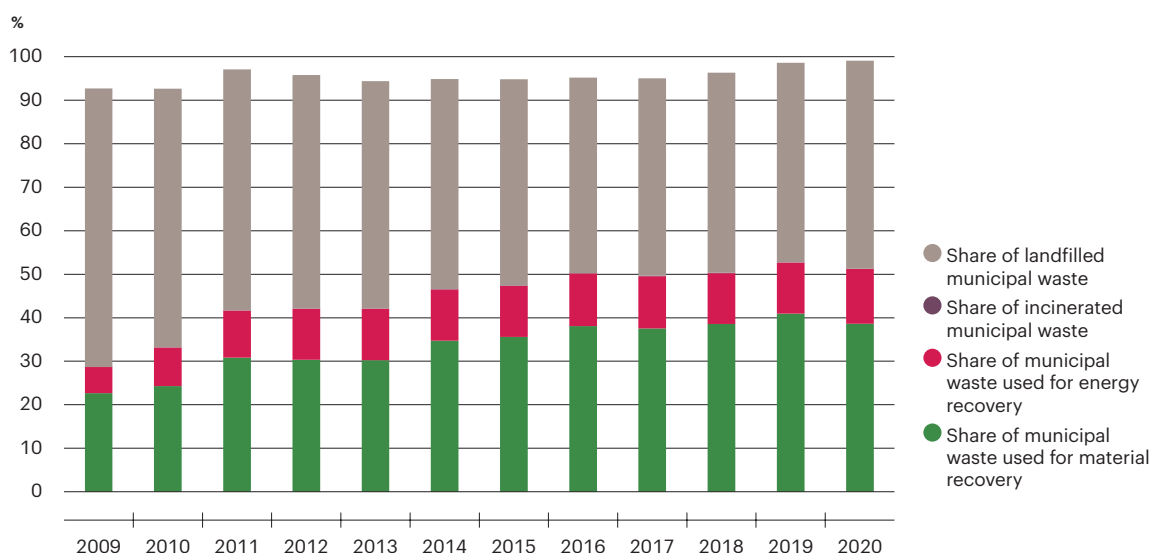
**Chart 9****Development of material intensity of the economy, domestic material consumption and GDP in the Czech Republic [index, 2000 = 100], 2000–2019**

index (2000 = 100)



Data for the year 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

Data source: Czech Statistical Office














































**Chart 10****Share of selected municipal waste treatment methods in total municipal waste generation in the Czech Republic [%], 2009–2020**

The data was determined using the methodology Mathematical expression of the "Waste management indicator system" calculation valid for the given year.

Data source: CENIA

## Ecological stability of the landscape and sustainable land management

- Soil sealing has been increasing for a long time. Between 2019 and 2020, the area of built-up areas increased by 410 ha.
- In 2019, a total of 254.7 ha of agricultural and forest land was taken over for road infrastructure.
- The consumption of mineral fertilizers decreased 13.0% year-on-year to 101.7 kg of pure nutrients/ha in 2020.
- The consumption of plant protection products is gradually decreasing. In 2020, this amounted to 3,784.2 thous. kg of active substances, i.e. 9.7% less than in 2019.
- There was a further increase in the consumption of rodenticides (by 172.7% year-on-year), but this was not reflected in the total consumption of plant protection products as they have a minority share.
- The acidification of soils and reduction in the content of alkaline elements could become a limiting factor in forestry. The base saturation (BS) of the sorption complex of soils in the top part of mineral soil (up to 20 cm) ranges from 4% to 18%.
- There is extensive soil loss through erosion every year. 51.7% of agricultural land is potentially endangered by water erosion, of which 15.6% by extreme erosion. 22.9% of agricultural land is endangered by wind erosion. In 2020, a total of 399 erosion events were recorded.
- The mining of mineral resources fluctuates with an overall decreasing trend, mainly influenced by industrial production and construction.
- The area affected by mining is decreasing and, on the contrary, the area of reclaimed areas is increasing.
- Agricultural land is vulnerable to degradation due to excessively sized fields and a high level of ploughing; nevertheless, grassing is taking place and in the 2010–2020 period the average size of field soil blocks decreased by an average of 1.8% per year.
- Damage to forest stands, expressed as a percentage of defoliation, remains at a high level. In the older stands category (60 years and over), the sum of defoliation classes 2 to 4 is 78.3% for conifers and 42.7% for deciduous trees. In younger stands (up to 59 years) the situation is more favourable – in the case of conifers, 28.7% of stands fell in classes 2 to 4, and 23.3% for deciduous trees.
- In 2020, forest ecosystems were again impacted by large-scale logging after the bark beetle calamity. The volume of recorded logging increased to 35.8 mil. m<sup>3</sup> of wood excluding bark, surpassing the previous record set in 2019. The volume of insect-related logging in 2020 (26.2 mil. m<sup>3</sup> of wood excluding bark) reached almost the value of the total volume of insect-related logging for the 1990–2012 period. This large-scale logging created a large, deforested area, with forests becoming a source of greenhouse gas emissions.
- Forests are being restored in areas affected by the bark beetle calamity and, thanks to the reduction in the share of restored coniferous trees in favour of deciduous trees, a gradual approximation to the recommended tree composition is occurring. In 2020, a record 17,300 ha of deciduous trees and 16,400 ha of conifers were planted as part of the artificial regeneration, while the most frequently planted tree species was still spruce (10,300 ha).
- Over the long term, we can observe a gradual approaching to the natural (and more stable) structure of forest stands. However, the long regeneration cycle of the forest means this process is slow and will require many years of intensive effort.

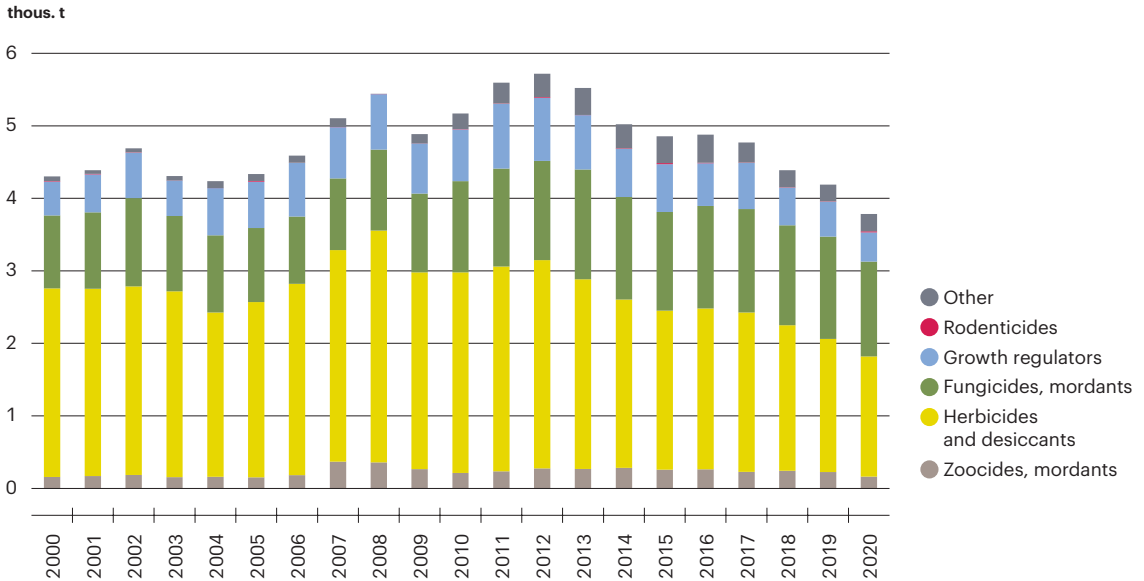
Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Infiltration ability of soils	N/A	N/A	N/A	N/A
Land use				
Quality of agricultural and forest soil*				
<i>Quality of agricultural soil</i>	N/A	N/A	N/A	
<i>Quality of forest soil</i>				
Erosion and compaction of agricultural soil	N/A			
Consumption of fertilisers and plant protection products				
Land take				
Mineral extraction and reclamation*				
<i>Mineral extraction</i>				N/A
<i>Reclamation after mineral extraction</i>				N/A
Organic farming				
Average size of fields	N/A			
Forest health condition				
Sustainable forest management				
Tree species composition of forests				

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.



**Chart 11**

**Consumption of active substances in plant protection products and other products by purpose of use in the Czech Republic [thous. t of active substance], 2000–2020**

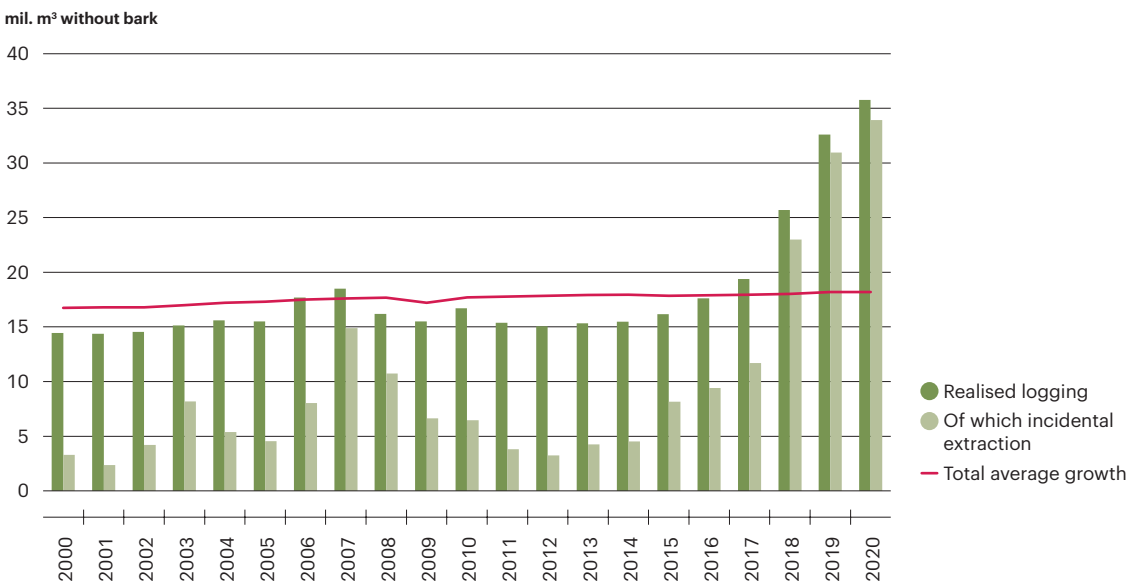


\*Other – excipients, repellents, mineral oils, etc.

Data source: Ministry of Agriculture of the Czech Republic

**Chart 12**

**Comparison of realised timber logging with total average growth rate in the Czech Republic [mil. m<sup>3</sup> without bark], 2000–2020**



Data source: Czech Statistical Office, Forest Management Institute

## Biodiversity

- In the 2000–2016<sup>12</sup> period, the unfragmented landscape area decreased from 68.8% to 60.6% of the territory of Czechia.
- The numbers of common bird species have been declining for a long time. The largest decrease was recorded for agricultural landscape bird species, whose numbers decreased by 30.8% between 1982 and 2020.
- The influence of climate change on the species composition of avifauna has been growing for a long time. Since 2010, the climate indicator value has increased by 17.9%.
- The river network is not being effectively cleared. The overall implementation of the River Network Clearing Concept plan stands at 13.7%.
- Total specially protected areas, including both small-area and large-scale specially protected areas, increased by 1,800 ha in 2020 – this increase was mainly due to the emergence of new small-area specially protected areas.
- Out of a total of 1,454 non-native plant species that occur or have been recorded in Czech territory, 61 species are considered invasive. Out of a total of 278 non-native animal species, 113 are invasive.
- The number of exported specimens of protected species according to CITES is growing. The most commonly exported group of animals are birds (mainly parrots), with reptiles and amphibians in second place.

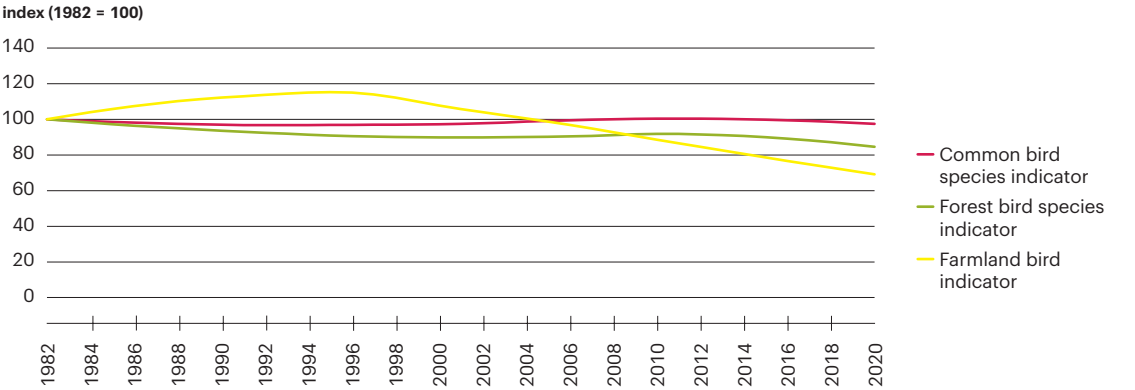
Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Landscape fragmentation				
State of species and habitats of European importance				
State of bird species				
Common bird species*				
Abundance of populations of all common bird species				
Abundance of populations of forest bird species				
Abundance of bird populations of agricultural landscapes				
Indicator of the impact of climate change on common bird species				
State of plant, animal and mushroom species according to the Red Lists				
Share of Red List species among those protected				
Specially protected areas and Natura 2000 areas on national territory				
Share of the area of natural habitats and species in Natura 2000 sites				
Non-native species in Czechia				
International trade in endangered species protected by CITES				
Breeding of endangered animal species in zoos				

\* Due to the different trends of the time series on which the construction of the indicator is based, an assessment of partial (elementary) indicators is given.

<sup>12</sup> Data for the years 2017–2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

**Chart 13**

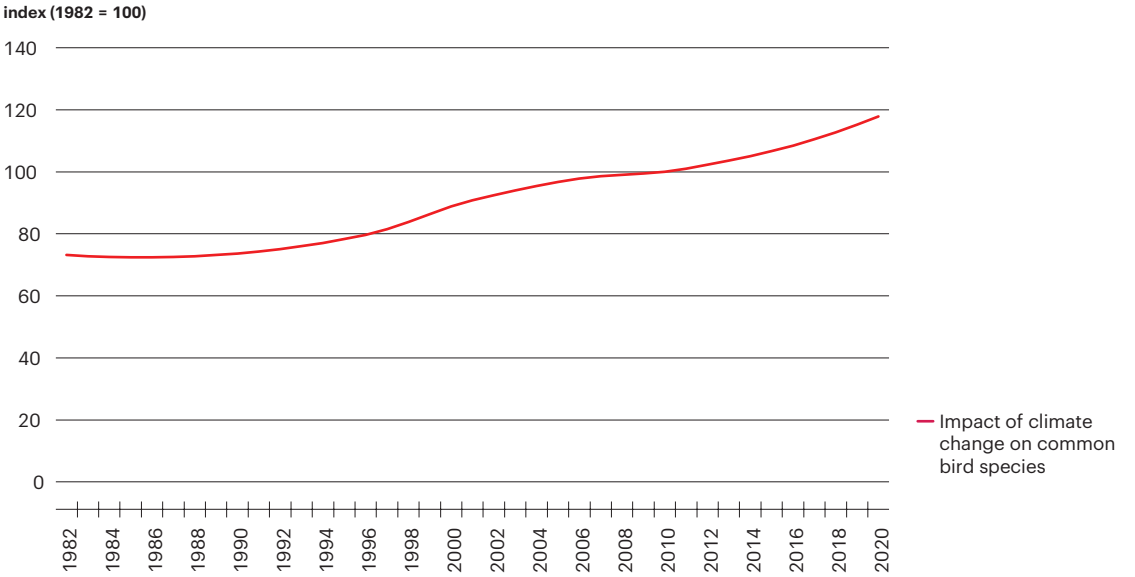
**Indicators of all common bird species, forest bird species and farmland bird species in the Czech Republic [index, 1982 = 100], 1982–2020**



Data source: Czech Statistical Office

**Chart 14**

**Indicator of the impact of climate change on common bird species in the Czech Republic [index, 1982 = 100], 1982–2020**



The climate indicator is based on changes in the abundance of bird species in relation to their climatic requirements and is expressed as a ratio of abundance changes between “winners” and “losers” over a defined time period.

Data source: Czech Statistical Office

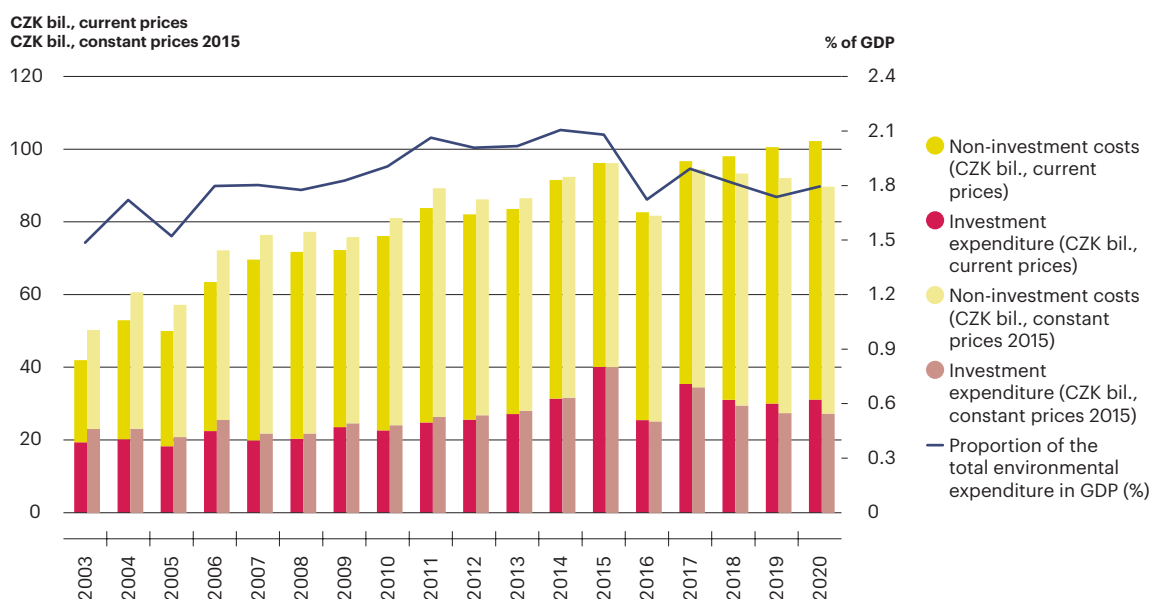
## Financing of environmental protection

- Expenditure from central sources in 2020 increased by 14.8% year-on-year to CZK 60.4 bil. and expenditure from territorial budgets by 9.8% to CZK 44.9 bil. Priority areas of support included water protection, biodiversity and landscape protection, waste management and, last but not least, air protection. In this area, the implementation of programmes aimed at supporting thermal insulation, energy savings and changes in heating technologies (e.g. the New Green Savings Programme and so-called boiler subsidies) continued.
- By the end of 2020, a total of 69,472 applications for support had been submitted in the individual calls of the New Green Savings Programme, and 45,239 applications worth approximately CZK 10.0 bil. had already been paid out.
- Under the Operational Programme Environment for the 2014–2020 programming period, 19 new calls amounting to EUR 279.4 mil. (CZK 7.3 bil.) of total eligible expenditure were announced in 2020. Since the beginning of the programming period, the provision of subsidies for 9,122 applications totalling EUR 3.5 bil. (CZK 90.4 bil.) of total eligible expenditure.
- The Operational Programme Environment also finances so-called boiler subsidies; in three calls 101 thous. solid fuel boiler replacements were approved by the end of 2020 in a total volume of EUR 428.5 mil. (CZK 11.2 bil.).
- The share of environmental protection investment in GDP has long been above average in international comparison terms.

Indicator	Long-term trend (15 years and more)	Medium-term trend (10 years)	Short-term trend (5 years)	State
Investments and non-investment costs in environmental protection				
Public expenditure on environmental protection				

**Chart 15**

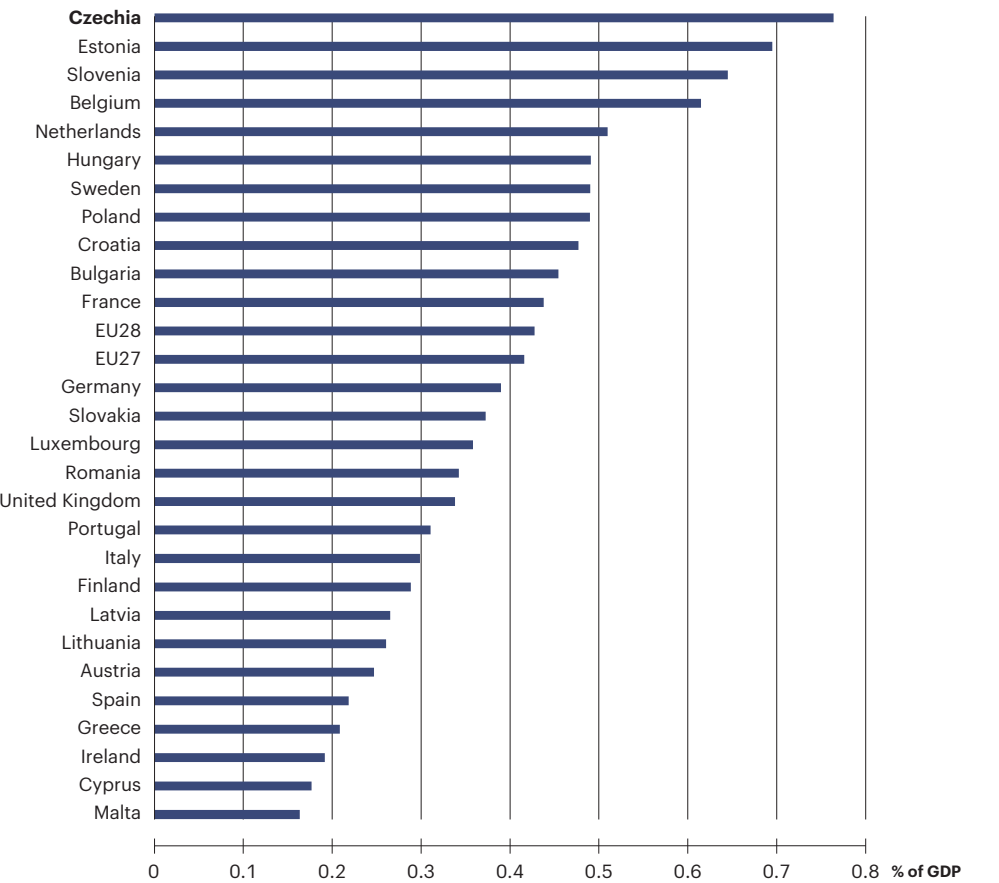
**Total expenditure on environmental protection in the Czech Republic [CZK bil., % GDP, current prices, constant prices 2015], 2003–2020**



Data source: Czech Statistical Office

**Chart 16**

**Total investment in environmental protection (public and industrial sectors) in EU countries [% of GDP, current prices], 2018**



Data for the years 2019 and 2020 were not available at the time of the publication of the Report on the Environment of the Czech Republic 2020.

Data source: Eurostat

# Opinions and attitudes of the Czech public

- Less than two-thirds of the Czech public is interested in information related to the environment in the Czech Republic.
- Respondents think the state of the environment is better in their place of residence (70%) compared to the overall situation in the Czech Republic (53%).
- Citizens of the Czech Republic consider the most serious global problems to be the accumulation of waste, pollution, and lack of drinking water.
- A significant majority of the Czech public (three quarters) agree that climate change exists and that it is a serious problem.
- For more than two-thirds of the Czech public it is important that the Czech Republic takes measures against climate change.

Chart 17

## Belief in the existence of climate change



Question asked: Which of the following statements about global climate change is closest to your own opinion?








Data source: Czech Climate 2021 (Krajhanzl et al., 2021)

# Assessment methodology for trends and indicator state

The assessment methodology is based on the statistical analysis of trends (linear regression parameters – trend direction and the statistical significance value) and is used in cases where a homogeneous time series is clearly defined (data for each year without any major change in the data reporting methodology).

The assessment of individual quantities of a given indicator is made on the basis of linear regression parameters for specific time series converted into index series (linear regression equation  $Y = ax + c$ ,  $R^2 = \{0,1\}$ , where  $a$  is a linear trend direction that indicates the change in % per year and  $R^2$  is the significance value that expresses whether the trend is really linear – to assess the significant trend,  $R^2$  needs to be greater than 0.8). The resulting values are also used as a basis for verbal assessment in the text.




**The trend of individual indicators** is assessed on the basis of determining the trend of individual datasets. The aggregate trend or state is assessed using the expert estimation method based on the aggregation of the assessment of indicators composed of several time series of individual quantities.

Graphical representation of the aggregate trend		
 Positive upward trend	 Stagnation	 Negative upward trend
 Positive downward trend	 Fluctuating trend	 Negative downward trend
 The trend cannot be determined		

**Assessment of structural indicators** is without determination of the trend (e.g. structure of municipal waste management, land use, etc.). The aggregate trend or state is assessed using the expert estimation method based on the aggregation of the assessment of indicators composed of several time series of individual quantities with inverse trend direction.

Graphical representation of the trend in the structure indicator		
 Positive trend	 Neutral trend	 Negative trend

**The state** is assessed using the expert estimation method based on the distance from the set target in the given year. If a target is not set, the general trend is assessed to see whether the development is heading in the right direction and whether the advancement is adequate.

Graphical representation of the state		
 Good state	 Neutral state	 Bad state

## List of abbreviations

**B(a)P** benzo(a)pyrene

**BOD<sub>5</sub>** biochemical oxygen demand over five days

**CENIA** Czech Environmental Information Agency

**COD<sub>Cr</sub>** chemical oxygen demand by potassium dichromate

**CZK** Czech crowns

**EU** European Union

**EU28** Member States of the European Union (including the United Kingdom)

**Eurostat** European Statistical Office

**GDP** gross domestic product

**HCB** hexachlorbenzen

**HCH** hexachlorcyklohexan

**LULUCF** Land Use, Land-use Change and Forestry

**PAHs** polycyclic aromatic hydrocarbons

**PCBs** polychlorinated biphenyls

**PM** particulate matter

**RES** renewable energy sources

**VOC** volatile organic compound

**WWTPs** waste water treatment plants



## Downloadable publications



**Czech Environmental Information Agency**

<https://www.cenia.cz/publikace/zpravy-o-zp/>

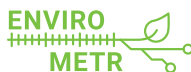


<https://www.cenia.cz/publikace/krajske-zpravy/>



<https://www.cenia.cz/publikace/statisticka-rocenka-zivotniho-prostredi-cr/>

## Detailed data



<https://www.envirometr.cz>



2020