Audit Report

23/07

State and European Union funds earmarked to improve air quality

The audit was included in the audit plan of the Supreme Audit Office (hereinafter the "SAO") for 2023 under No 23/07. The audit was managed and the Audit Report drawn up by SAO Member RNDr. Petr Neuvirt.

The aim of the audit was to examine whether the funds of the state and the European Union earmarked for the implementation of the goals of projects aimed at improving air quality had been spent effectively and in accordance with legal regulations.

The audit was carried out at the audited entities in the period between April 2023 and November 2023.

The audited period was 2020-2022; both the previous and subsequent periods were also considered for contextual reasons.

Audited entities:
Ministry of the Environment (hereinafter the "MoE"); State Environmental Fund of the Czech Republic, Prague (hereinafter the "SEF"); Czech Hydrometeorological Institute, Prague (hereinafter the "CHMI"); Bergasto a.s., Olomouc; GIFF a.s., Frýdlant nad Ostravicí; HERKUL a.s., Obrnice; Liberty Ostrava a.s.; MAPECO MOST a.s.; Severočeské doly a.s., Chomutov; ŠTOKY s.r.o., Spořice.

At its 6th session held on 29 April 2024, the ***SAO Board***

approved, by Resolution No 7/VI/2024,

this ***Audit Report*** with the following wording:

State and European Union funds earmarked to improve air quality

BASIC INFORMATION

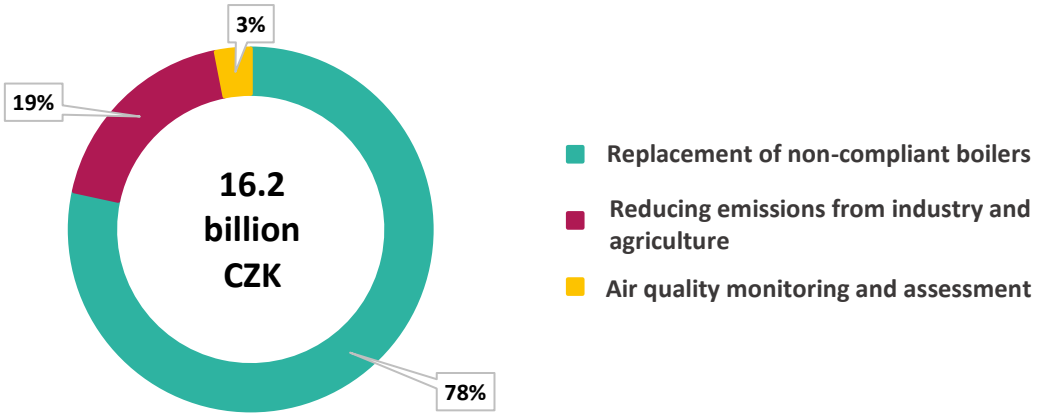
The Czech Republic has not been meeting **air pollution limits** in the long term, and in some regions they are significantly **exceeded.**

The share of the Czech population living in areas with poor air quality is decreasing, but in 2022 it was still **more than 1 million people.**

Households are the main source of **air pollution with dust particles** and **benzo[a]pyrene**.

Industry is a significant source of **air pollution with sulphur dioxide and nitrogen oxides.**

Funds spent by the MoE in 2014-2022 for air protection under PA 2 of the OPEn[1] and under the NGS[2]



MAIN FINDINGS

BOILER SUBSIDIES (2014 to 2022)

CZK **12.7** billion

OPEn projects accounted for approx. 18% of the overall change in reported annual emissions from household heating between 2014 and 2022, in the case of dust particles.

More than **150** thousand non-compliant boilers remain in service.

From 1 September 2024, the operation of boilers of emission classes 1 and 2 is prohibited.

Aid for their replacement will end.

SUBSIDIES IN INDUSTRY (2014 to 2022)

CZK **2.9** billion

Between 2014 and 2022, OPEn projects participated in reducing the volume of annual emissions of sulphur dioxide and nitrogen oxides only minimally.

FUNDS SPENT IN AN INEFFECTIVE MANNER

CZK **103.5** million at the MoE

CZK **5.6** million at the beneficiary

[1] Priority Axis 2: *Improving the quality of air in human settlements* (hereinafter "PA 2") of the Operational Programme *Environment 2014-2020* (hereinafter the "OPEn").

[2] The *New Green Savings* Programme (hereinafter the "NGS"), sub-programmes *Family Houses* and *Adaptation and Mitigation Measures* (only funds intended for the replacement of energy sources in family houses).

I. Summary and Evaluation

The Czech Republic is struggling with deteriorating air quality[3] and air pollution limits have not been observed in its territory in the long term[4]. According to the European Environment Agency, air pollution is the biggest health risk related to the environment in Europe. In 2015, the Government of the Czech Republic approved the goal of achieving the fulfilment of air pollution limits in the territory of the Czech Republic in 2020[5].

The SAO audited the provision of funds from the state budget and the EU for projects aimed at improving air quality in the total amount of CZK 16.2 billion. As at 31 December 2022, the MoE had spent CZK 13.9 billion under PA 2 of the OPEn. It had also spent CZK 2.3 billion under the NGS Programme. The SAO examined whether these funds had been spent effectively and in accordance with legal regulations. The SAO focused, among other things, on how the funds provided by the MoE had contributed to the reduction of emissions[6] of air pollutants and whether the goals adopted by the Government of the Czech Republic in the area of air quality protection had been fulfilled.

The MoE spent CZK 12.7 billion from PA 2 of the OPEn and the NGS, i.e., 78% of the funds, for replacing non-compliant boilers in households. The MoE supported 111 thousand replacements that have contributed to improving air quality. However, according to information from the MoE, more than 150 thousand non-compliant boilers of emission classes I and II remain in service.

The MoE also spent CZK 2.9 billion from PA 2 of the OPEn for reducing emissions from industry. The SAO found that the MoE had spent part of the funds, up to CZK 103.5 million, intended for reducing dust in industry, ineffectively. The SAO analysed the effect of subsidies provided on the reduction of emissions from industry between 2014 and 2022. The SAO concluded that the funds under PA 2 of the OPEn had contributed only minimally to the reduction of emissions of sulphur dioxide and nitrogen oxides.

The SAO also concluded that the Czech Republic had not met the air pollution limits set by the legislation of the Czech Republic and the EU by the end of 2020. In 2020 and in the following years, some air pollution limits continued to be exceeded, especially in central and north-eastern Moravia, which has a negative impact on the health of the population.

In some cases, the MoE did not proceed in accordance with legal regulations in the financing of air protection.

---

[3] This is a pan-European problem. According to the European Commission, in 2020 the majority of people living in urban areas in the EU were exposed to air pollution at a level that harmed their health.
Among the major air pollutants in the Czech Republic are dust particles ($PM_{2.5}$ and PM_{10}), benzo[a]pyrene (B[a]P), nitrogen oxides (NO_X) and ground-level ozone (O_3), manifested mainly in small settlements where households heat with solid fuels and also in industrial and traffic-heavy areas.

[4] The air pollution limit (ambient air quality standard) is the legally established highest permissible air pollution level, expressed in mass concentration units. The selected applicable air pollution limits are specified in Annex 1 to this Audit Report. Annex 2 contains information on non-compliance with air pollution limits in the Czech Republic in the period from 2013 to 2022. Annex 3 contains an overview of air pollutants.

[5] Government Resolution No 979 of 2 December 2015, *on the Medium-Term Strategy (until 2020) for improving air quality in the Czech Republic*.

[6] Emission means the introduction of substances into the ambient air, expressed in units of mass.

The above-mentioned overall evaluation is based on the following findings:

a) The MoE spent most of the funds intended for improving air quality on the replacement of non-compliant household heating sources. As at 31 December 2022, the MoE had spent funds in the amount of CZK 10.4 billion from PA 2 of the OPEn and CZK 2.3 billion through the NGS, of which CZK 1.5 billion was used to finance applications under the OPEn. In total, the MoE supported 111 thousand replacements of non-compliant boilers, which improved air quality and reduced dependence on fossil fuels.

   According to the valid rules of the OPEn 2021-2027, low-income households can apply for a subsidy to replace a non-compliant boiler until 31 August 2024. After that, the ban on operating boilers of emission classes 1 and 2 will come into effect, and it will therefore no longer be possible to apply for a subsidy for their replacement. Whether the ban on the operation of non-compliant boilers from 1 September 2024 will improve air quality will depend on the observance of the ban and the success of its enforcement.

b) To reduce emissions from industry, the MoE spent, from PA 2 of the OPEn, CZK 1.16 billion for the replacement or reconstruction of stationary sources of pollution, CZK 0.98 billion for the acquisition of additional technologies to reduce emissions, CZK 0.67 billion for reducing dust from surface sources and CZK 0.13 billion for other activities.

   During the audit, the SAO found that the MoE had spent up to CZK 103.5 million from PA 2 of the OPEn ineffectively, namely on the purchase of equipment[7] the main purpose of which had not been dust reduction. The SAO assessed that the expenditure on that equipment had not been eligible, and thus it is an irregularity within the meaning of Regulation (EU) No 1303/2013 of the European Parliament and of the Council[8]. The SAO also found out that a beneficiary had spent CZK 5.6 million on a piece of that equipment in an ineffective manner.

   The SAO found that a number of industrial entities were withdrawing from already approved projects. The MoE responded to the situation by establishing a new Priority Axis 7 (hereinafter "PA 7") to use up the gradually releasing funds within the OPEn. As part of that Priority Axis, the MoE provides funds to the Labour Office of the Czech Republic (hereinafter the "LO CR") to cover part of the housing allowance for households affected by the increase in energy prices as a result of Russia's military aggression against Ukraine and the increase in the cost of living due to inflation. Support in the form of compensation for household energy costs does not have a direct effect on improving air quality.

   The SAO investigated the amount of eliminated annual emissions from industry to which projects under PA 2 of the OPEn had contributed. The SAO compared the result with the data on the decrease in annual emissions monitored by the CHMI. Based on the comparison, the SAO concluded that the contribution of subsidies to reducing emissions dominantly produced by industry (NO_X and SO_2) had been minimal.

---

7 Generally a wheel loader, skid steer loader, tractor or telescopic handler.

8 Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

c) Already in 2015, the Government of the Czech Republic approved the goal of meeting all statutory limits by the end of 2020, taking into account the long-term deterioration of air quality and the non-fulfilment of air pollution limits. The SAO came to the conclusion, on the basis of data monitored by the CHMI, that some air pollution limits had not been met in 2020 and in the following years[9], especially in the Moravian-Silesian, Olomouc and Zlín Regions. Nevertheless, the share of the population living in areas with exceeded air pollution limits[10] has been declining since 2018. In addition to the sources of pollution as such, air quality is also influenced by dispersion conditions, which were favourable in the years under review.

   The SAO found that there was no statutory air pollution limit for maximum average daily concentrations of $PM_{2.5}$ particulate matter[11], although in the air that particulate matter represented a significant risk factor for human health. In terms of the recommended limits of the World Health Organization (hereinafter the "WHO") for the maximum daily concentrations of $PM_{2.5}$, according to the findings of the SAO the air quality in most of the Czech Republic is burdened by excessive concentrations of $PM_{2.5}$ particulate matter.

d) The SAO also found that the MoE had not acted in accordance with legal regulations, as the MoE:
   - had not used, in accordance with Section 15(14) of Act No 201/2012 Coll.[12], part of the revenues from air pollution charges for the years 2019 and 2020 for the purposes established by law in the area of air protection;
   - had not spent, in accordance with Section 7(6) of Act No 383/2012 Coll.[13], expenditure corresponding to earmarked income from emission allowance auctions through the NGS Programme;
   - had not monitored and evaluated, in accordance with Section 39(3) of Act No 218/2000 Coll.[14], the benefits of the NGS Programme for improving air quality.

II. Information on the Audited Area

The MoE is the central state administration authority and body of supreme state oversight in environmental matters, also responsible for air protection. The MoE is the Managing Authority of the OP Environment (OPEn) and the administrator of the NGS Programme. The MoE is the administrator of the SEF and the founder of the CHMI.

On the basis of agreements on the delegation of certain activities and powers of the MoE, the SEF performs the role of an intermediary body with respect to the OPEn and the NGS. The SEF also administers the *National Programme Environment* (hereinafter the "NPE"). Most of the activities under the NPE are financed from the funds of the SEF, which come from statutory

[9] Information on non-observed air pollution limits in the period from 2013 to 2022 is provided in Annex 2 to this Audit Report.

[10] Excluding O_3.

[11] The Czech Republic has air pollution limits set in Act No 201/2012 Coll. in accordance with applicable EU legislation.

[12] Act No 201/2012 Coll., on air protection.

[13] Act No 383/2012 Coll., on the conditions for trading in greenhouse gas emission allowances.

[14] Act No 218/2000 Coll., on budgetary rules and on amendments to certain related acts (Budgetary Rules).

fees, levies and fines. In 2021, the NPE was expanded to include activities financed from the subsidy provided by the SEF from the *National Recovery Plan*.

The CHMI is a state contributory organisation subordinate to the MoE. On the basis of its charter, it is entrusted, among other things, with detecting and evaluating the level of air pollution and assessing and evaluating the level of air pollution. For this purpose, it also provides the State Air Pollution Monitoring Network. The CHMI was a recipient of subsidies (beneficiary) from the OPEn during the audited period.

Within the EU, the management and assessment of air quality is regulated, in particular, by Directive No 2008/50/EC of the European Parliament and of the Council[15] (hereinafter "Directive 2008/50/EC") and Directive No 2004/107/EC of the European Parliament and of the Council[16] (hereinafter "Directive 2004/107/EC"). The reduction of emissions of air pollutants is regulated by Directive (EU) No 2016/2284 of the European Parliament and of the Council[17].

At the national level, air protection is regulated by Act No 201/2012 Coll. (hereinafter the "Air Protection Act") and its implementing legislation. Air quality is assessed according to the concentrations of selected pollutants in the ground layer of the atmosphere. For these selected pollutants, the Air Protection Act sets air pollution limits, listed in Annex 1 to this Audit Report.

For the purpose of evaluating the level of pollution and finding out whether valid air pollution limits are being exceeded, data obtained from the State Air Pollution Monitoring Network is used. The network includes monitoring stations of the CHMI and other operators (e.g., health institutes, municipalities or regions). Data from these stations is processed within the Air Quality Information System.

Medium-Term Strategy (until 2020) for improving air quality in the Czech Republic

The starting point for the development of the strategy was the fact that the air quality in the Czech Republic did not, in the long term, meet the requirements set by the legislation of the Czech Republic and the EU for the protection of the health of people and ecosystems and was causing significant health risks and damage to ecosystems in congested areas, as well as the fact that it was a requirement of the European Commission (hereinafter the "Commission") to prepare a comprehensive air quality management concept for the Czech Republic. This requirement was also worded as a prerequisite for the approval of PA 2 of the OPEn. The strategy was approved by Government Resolution No 979 of 2 December 2015.

The global objective of the strategy was to achieve a socially acceptable level of risks to human health arising from air pollution. One of the four specific objectives for meeting the global goal was to achieve air pollution limits throughout the Czech Republic by 2020 and at the same time maintain and improve air quality where the current concentrations of pollutants were below the air pollution limit values. In order to meet the specific objectives, conditions for achieving the objectives were set; these included, in particular, the implementation of measures at the national level contained in the *National Emission Reduction Programme of*

[15] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

[16] Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

[17] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (Text with EEA relevance).

the Czech Republic (hereinafter the "NERP") and at the regional level contained in Air Quality Improvement Programmes (hereinafter the "AQIPs").

National Emission Reduction Programme of the Czech Republic

The NERP is prepared on the basis of Section 8 of the Air Protection Act, taking into account the international obligations of the Czech Republic based on the EU legal framework and with regard to non-compliance with the air pollution limits for some pollutants (especially dust particles of the size fractions PM_{10} and $PM_{2.5}$, ground-level ozone and benzo[a]pyrene), which have significant negative impacts on human health, ecosystems and vegetation. The NERP was approved by Government Resolution No 978 of 2 December 2015, with the aim of achieving and maintaining the air pollution limits set for PM_{10}, $PM_{2.5}$ and B[a]P by 2020. The NERP update taking into account new facts and goals for 2030 was approved by Government Resolution No 917 of 16 December 2019.

Operational Programme Environment 2014-2020

PA 2 is focused on projects improving air quality and reducing emissions of pollutants into the air with an emphasis on the use of new, gentle methods of energy production and improvement of the air quality monitoring system. The global objective of PA 2 for the period of 2014-2020 is to improve air quality where air pollution limits are being exceeded and to maintain air quality where the quality is good. PA 2 includes four specific objectives (hereinafter also "SO"), which are further divided into supported activities:

- SO 2.1: *To reduce emissions from local household heating that contribute to the exposure of the population to above-limit pollution concentrations*,
- SO 2.2: *To reduce emissions from stationary sources that contribute to the exposure of the population to above-limit pollution concentrations*,
- SO 2.3: *To improve the system of monitoring, evaluation and forecasting of the air quality trends and related meteorological aspects*,
- SO 2.4: *To reduce emissions from stationary sources that contribute to the exposure of the population to above-limit pollution concentrations in coal regions*.

The new SO 2.4 was added to PA 2 of the OPEn in 2019. The reason for the creation of SO 2.4 was the reallocation of funds from the Operational Programme *Enterprise and Innovation for Competitiveness* to the OPEn in the amount of approximately CZK 1 billion. The MoE decided that these funds would be used for projects to reduce emissions from industrial and agricultural sources of air pollution, addressed within SO 2.2 of the OPEn. Since SO 2.2 is financed from the Cohesion Fund (hereinafter the "CF"), whereas the transferred funds come from the European Regional Development Fund (hereinafter the "ERDF"), it was necessary to create a new specific objective. SO 2.4 has a focus similar to that of SO 2.2, with the difference that, based on the Commission requirement, the transferred funds are used in the so-called coal regions (the Moravian-Silesian, Ústí and Karlovy Vary Regions).

New Green Savings Programme

The NGS Programme in its form since 2014 can be divided into three stages according to the source of funding (for the audited period of 2020-2022, the first two stages of the NGS were relevant):

- Stage I of the NGS 14+ – funding from the state budget using the revenue from emission allowance auctions through programme financing (programme 115 280).

- Stage II of the NGS 21+ – funding from the *Recovery and Resilience Facility* under the *National Recovery Plan*.
- Stage III of the NGS 23+ – funding from the revenue from emission allowances through the Modernisation Fund (HOUSEnerg Programme).

The goal of the NGS Programme is, in addition to the primary objective of improving the energy efficiency of buildings, also improving the state of the environment through the reduction of air pollutants, in particular by replacing solid fuel boilers, or, by replacing non-compliant heat sources in residential buildings.

Table 1: Income from the sale of emission allowances 2020-2022 (in CZK thousand)

	2020	2021	2022	2020-2022
Income from the sale of EU Allowances (EUA) (general emission allowances)	18,902,320	15,343,381	16,390,840	50,636,541
Income from the sale of European Aviation Allowances (EUAA)	34,572	53,619	73,582	161,773
Income from auctions in total	**18,936,892**	**15,397,000**	**16,464,422**	**50,798,314**

Source: closing accounts of Chapter 315 – MoE for 2020, 2021, 2022.

III. Scope of the Audit

The aim of the audit was to examine whether the funds of the state and the European Union earmarked for the implementation of the goals of projects aimed at improving air quality had been spent effectively and in accordance with legal regulations.

Spending and use of funds was considered effective if it had led to an optimal level of achievement of the objectives of PA 2 of the OPEn, the NGS and the NPE in the area of improving air quality, i.e., in particular, to reducing emissions of air pollutants, improving the air quality evaluation system or procuring Air Quality Improvement Programmes. In the case of the audited projects under PA 2 of the OPEn, the use of funds was considered effective if it had led to the fulfilment of the project's purpose and to the achievement of the set goals and expected results, and if the provided funds had demonstrably led to a reduction in air pollution or an improvement in the system for monitoring, evaluation and forecasting of the development of air quality.

The SAO carried out an audit at the MoE as the Managing Authority of the OPEn and the administrator of the NGS Programme, and at the SEF as the intermediary body for the OPEn and the NGS and the administrator of the NPE. The SAO also audited the CHMI, which is in charge of assessing and evaluating the level of pollution and air pollution and which was a beneficiary under PA 2 of the OPEn, and seven other selected beneficiaries under SO 2.4 of PA 2 of the OPEn.

In connection with the implementation of the OPEn, OPEn 2021-2027, the NGS Programme and the NPE, the SAO examined the administration, implementation and evaluation of these programmes at the MoE and the SEF, focusing on setting the conditions for providing subsidies, the control system, monitoring and achieving the objectives of these programmes. The SAO further examined the provision and administration of subsidies at the MoE and the SEF on a sample of 12 projects implemented within SO 2.3 and SO 2.4 of PA 2 of the OPEn and, at the SEF, on a sample of three projects implemented within Priority Area 2 of the NPE.

As part of the audit, the SAO also inspected whether the MoE and the CHMI had used part of the funds from the revenue from air pollution charges in accordance with the Air Protection Act for the specified purpose and whether the MoE had realised expenditure from the emission allowance auctions in accordance with Act No 383/2012 Coll.

Last but not least, the SAO audited, with the CHMI and other seven selected beneficiaries under PA 2 of the OPEn, compliance with the conditions of provision of the subsidy, the demonstrability and justification of eligible expenditure, the use of the subsidy funds for the specified purpose and the fulfilment of the objectives and sustainability of the projects. A total of 12 projects were selected for the audit; these were focused on the implementation of measures to improve the air quality evaluation system or reduce emissions of pollutants, and were financed from PA 2 of the OPEn.

The audit also examined the funds of the SEF intended to improve air quality within Priority Area 2 of the NPE. A sample of three projects was examined to determine whether the SEF had provided funds in accordance with legal regulations.

The selection of the project sample was mainly based on the requirement to cover selected subsidy titles, financial significance, the stage of implementation and disbursed funds. An overview of the audited projects is presented in Annex 4 to this Audit Report.

The audited volume of funds at the system level amounted to CZK 57.99 billion, of which CZK 39.82 billion was from the EU, CZK 17.86 billion from the state budget and CZK 0.31 billion from the SEF.

The audited volume of funds at the project level amounted to CZK 350.07 million, of which CZK 263.63 million was from the OPEn and CZK 86.44 million from the SEF.

The SAO conducted quantitative research using a standardised questionnaire during the audit. The purpose of the questionnaire survey was to obtain additional information on the aid provided from the beneficiaries of the subsidy intended for the replacement of heating sources in households. The results of the survey are presented in Annex 8 to this Audit Report.

Note: The legal regulations indicated in this Audit Report are applied in their wording effective for the audited period.

IV. Detailed Findings of the Audit

Priority Axis 2 of the Operational Programme *Environment 2014-2020*

As regards projects improving air quality and reducing emissions of pollutants into the air with an emphasis on the use of new, gentle methods of energy production and improvement of the air quality monitoring system, 351 projects with an EU contribution of CZK 15.1 billion were under implementation as at 31 December 2022, and CZK 13.9 billion had been paid to beneficiaries. According to data as at 21 September 2023, CZK 0.7 billion remains to be paid out to beneficiaries. Table 2 shows the financial indicators of PA 2 of the OPEn.

Table 2: Financial indicators of PA 2 **(in EUR)**

PA	Fund	Support from the EU	Member State contribution (national co-financing)	Total funding	Percentage of co-financing
PA 2	CF	576,073,560	101,660,041	677,733,601	85%
PA 2	ERDF	49,254,507	8,691,972	57,946,479	85%

Source: OPEn programming document, version 20.0 (Commission version 15.0), valid from 22 March 2023.

A) Boiler subsidies

A necessary step to reduce the level of air pollution in the Czech Republic is the reduction of primary emissions of pollutants from the local heating of households. Local heating is currently one of the biggest air polluters, mainly from the point of view of emissions of solid pollutants and B[a]P. B[a]P emissions from household heating reached 14.2 t in 2019 and accounted for 96.4% of total emissions.[18] In 2020, B[a]P emissions from household heating amounted to 13.2 t. There was thus a year-on-year decrease of 7.1%.[19] The improvement of air quality can be attributed both to meteorological (especially dispersion) conditions, but also to the further introduction of modern technologies in production and the modernisation of the composition of combustion devices in households, including the effect of banning non-compliant boilers classified according to ČSN EN 305-1 in emission classes 1 and 2 from 1 September 2024[20].

→ The MoE places a major emphasis on reducing emissions from local household heating. The share of allocation of PA 2 of the OPEn is 64%.

Three calls for boiler subsidies were announced under the OPEn. As part of the last, 117th, call, the replacement of old heating sources with combined boilers (coal and biomass) was no longer supported; supported replacement was only for heat pumps, biomass boilers (manual or automatic fuel feed) or gas condensing boilers.

[18] Report on the Environment of the Czech Republic 2020 approved by Government Resolution No 959 of 5 November 2021.

[19] Report on the Environment of the Czech Republic 2021 approved by Government Resolution No 1085 of 21 December 2022.

[20] Act No 142/2022 Coll., amending Act No 586/1992 Coll., on income taxes, as amended, Act No 16/1993 Coll., on road tax, as amended, and Act No 201/2012 Coll., on air protection, as amended.

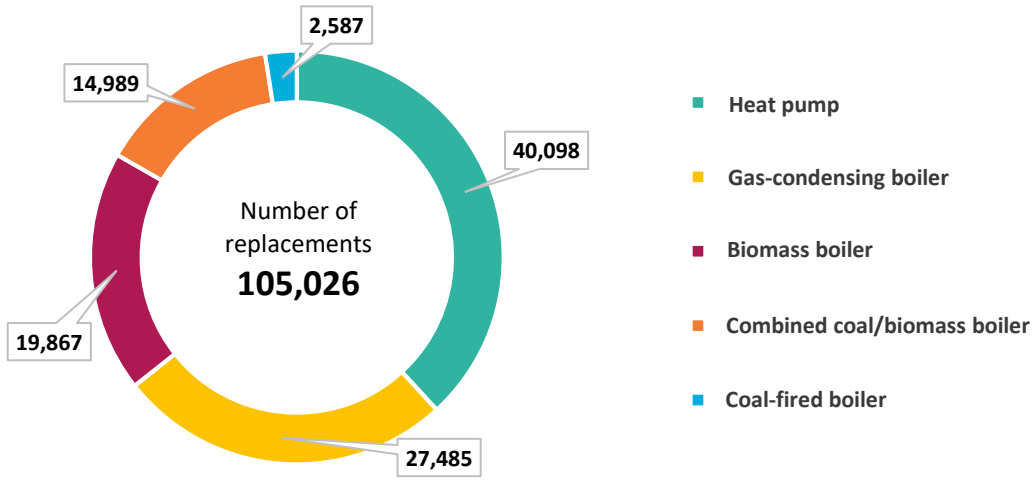
Table 3: Summary overview of the drawing of funds within SO 2.1 of PA 2 of the OPEn (boiler subsidies) as at 31 December 2022 (in CZK)

	Call No	Total
Amounts paid out to beneficiaries	05_15_016	3,177,643,538.52
	05_17_067	3,326,139,717.43
	05_19_117	3,923,679,965.66
For a total of three calls		**10,427,463,221.61**

Source: MoE data.

The ongoing evaluation data regarding boiler subsidies as of June 2023 monitored by the SEF indicates the average structure of new sources for all calls: 2.8% of purely coal-fired boilers (it was only possible to draw the subsidy in the first call), 16.3% of combined coal/biomass boilers, 18.7% of purely biomass boilers, 37.4% of heat pumps and 24.8% of gas-condensing boilers. Chart 1 shows the numbers of individual types of new heating sources.

Chart 1: Number of replacements by the new heating source



Source: evaluation of the 1st, 2nd and 3rd calls of Specific Objective 2.1 *To reduce emissions from local household heating that contribute to the exposure of the population to above-limit pollution concentrations* of the OPEn (as of June 2023, including the NGS 14+ – AMM).

Based on the monitored and reported data of the CHMI and the MoE, the SAO found that the share of boiler subsidies in the total change in reported annual emissions from household heating between 2014 and 2021 had been approximately 18% in the case of dust particles PM_{10} and $PM_{2.5}$ (see Annex 6 to the Audit Report).[21] The SAO further concluded that, as a result of boiler subsidies, the average annual concentrations of fine particulate matter $PM_{2.5}$ and B[a]P were decreasing.

The SAO evaluated the funds spent on replacing non-compliant household heating sources with boilers with lower emissions of pollutants as effective, as they contribute to reducing the level of air pollution and thereby improving air quality.

In 2019, a call under the sub-programme *Adaptation and Mitigation Measures* (hereinafter the "AMM") of Stage I of the NGS 14+ was announced for additional financing of applications for which there were no funds left from PA 2 of the OPEn. Financial support for the

[21] The share of the benefits of boiler subsidies is overestimated by the share of projects included in the evaluation of benefits for the period from 1 January 2023 to 30 June 2023 and by the share of projects from OPEn reservoirs financed from the sub-programme *Adaptation and Mitigation Measures* of the *New Green Savings* Programme.

replacement of solid fuel boilers with manual feeding in family houses was provided through projects of individual regions, the same as for the OPEn. In total, CZK 1.5 billion was paid in advance to the regions, and CZK 1.1 billion was posted by 31 December 2022.

As part of the newly purchased household heating sources, the MoE supported more than 105 thousand individual stationary sources from the OPEn and the NGS – AMM as of June 2023. The largest number of replacements was for heat pumps. As at 31 December 2022, the Moravian-Silesian Region was in first place, followed by the Central Bohemian and South Bohemian Regions, in the amount of funds drawn from the OPEn. Only a minimum of funds were invested in the territory of Prague, which is due to the fact that there are only a relatively small number of local sources of household heating in the territory of Prague. Detailed information is provided in the tables in Annex 7 to this Audit Report.

B) Subsidies for reducing emissions in industry

Within PA 2 of the OPEn, Calls Nos 8, 89 (SO 2.2) and 136 (SO 2.4) were announced, among others. These three calls supported, in order to reduce emissions, activities focused on the replacement or reconstruction of combustion or other stationary sources of pollution, acquisition of additional technologies and changes in technological procedures leading to the reduction of emissions and pollution levels from combustion or other stationary sources, and the **reduction of dust from surface sources**[22].

→ The MoE ineffectively spent up to CZK 103.62 million for the acquisition of equipment that did not primarily serve to reduce emissions of pollutants.

As part of **Call No 8**, 16 projects aimed at reducing dust from surface sources had been supported as at 31 December 2022. In three cases, the subject of the project was, among other things, the acquisition of a mobile device to reduce dust (fugitive emissions[23]). In two cases, a sweeping truck was purchased. In the third case, among other things, a wheel loader with a sweeping attachment was purchased with the reimbursement of the EU contribution of CZK 2.15 million from the CF.

Furthermore, the SAO audit found that three aid applications had been submitted as part of **Call No 8**, in which the applicants had stated that their intention was to replace the existing loaders with new reloading equipment ("wheel loader" or "reloading excavator") equipped with effective sprinkler systems in order to reduce dust in the operating areas. The SEF assessed all three applications with the result that the applications did not meet the formal requirements or conditions of acceptability and were excluded from the administration process.

As part of **Call No 89**, 25 projects aimed at reducing dust from surface sources had been supported as at 31 December 2022. The subject of 18 of the supported projects was the acquisition of multifunctional equipment for dust reduction. In four cases, a sweeping truck was purchased. In 14 cases, a drive unit (wheel loader, skid-steer loader or telescopic handler) with a sweeping attachment was purchased with a reimbursement of the EU contribution of CZK 44.72 million from the CF.

---

[22] Reducing dust from surface sources (depending on the nature of the process, e.g., water screens, sprinkling, dust removal or fogging equipment).

[23] Fugitive emissions mean the part of emissions that escape freely into the atmosphere and are not discharged through a specific chimney (exhaust).

As part of **Call No 136**, 34 projects aimed at reducing dust from surface sources had been supported as at 31 December 2022. The subject of 31 of the supported projects was the acquisition of multifunctional equipment for dust reduction. In 14 cases, a sweeping truck was purchased. In 17 cases, a drive unit (wheel loader, electric skid-steer loader or tractor) with a sweeping attachment was purchased with a reimbursement of the EU contribution of CZK 56.75 million from the ERDF.

Table 4: Projects where a "wheel loader" with a "sweeping attachment" was purchased

(in CZK)

Call	Number of projects	EU contribution	Paid out by the EU
8th call	1	2,147,990.00	2,147,990.00
89th call	14	44,726,747.10	44,722,997.10
136th call	17	59,056,011.75	56,748,077.40
TOTAL	**32**	**105,930,748.85**	**103,619,064.50**

Source: MS2014+.

For projects supported from calls focused on the activity of reducing dust from surface sources, in the framework of which machines – multifunctional devices for dust reduction – were to be purchased, basically two categories of multifunctional machines were purchased: a drive unit with a sweeping attachment (usually a wheel loader) or a sweeping truck.

If the applicants stated in the aid application that they would purchase a wheel loader or a reloading excavator with a superstructure sprinkler system, the MoE and the SEF did not support the projects. However, if the applicants stated that they would purchase a machine, e.g., a multifunctional dust removal unit, without a specification of the type of machine, then the MoE and the SEF did support those projects, although the beneficiaries actually purchased a wheel loader with a sweeping attachment. On the basis of the applications for payment, the MoE and the SEF considered the expenditure for the purchase of a wheel loader as eligible expenditure.

The MoE and the SEF supported a total of 32 projects under PA 2 of the OPEn aimed at reducing dust from surface sources, the object of which was the acquisition of a multifunctional device for reducing dust and the technology actually acquired was a drive unit and a sweeping attachment, with a total amount of subsidy provided of CZK 105.93 million. A total of CZK 103.62 million had been paid out of that amount as at 31 December 2022.

The SAO determined that funds of up to CZK 103.62 million had been spent by the MoE under the OPEn ineffectively, as the acquisition of new technology in the form of a drive unit such as a wheel loader, skid-steer loader, tractor or telescopic handler exceeded the goals of the supported activities to reduce dust from surface sources. Expenditure for the acquisition of these technologies cannot be considered eligible project expenditure, especially considering the fact that these devices are primarily used for purposes other than emission reduction (mainly for material handling) and can be purchased separately. This is thus an irregularity within the meaning of Regulation (EU) No 1303/2013 of the European Parliament and of the Council[24].

[24] Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

The SAO's conclusion was supported by rulings of the Municipal Court in Prague on the basis of lawsuits filed by excluded applicants for aid in the framework of Call No 8. In two cases, the court rejected the lawsuits and upheld the SEF's decision, and in one case the court declared the SEF's decision null and void. Subsequently, the MoE confirmed the opinion of the SEF on the non-fulfilment of the conditions of acceptability in this case as well, by a decision on appeal dated 18 March 2021. In the decision, the MoE stated, among other things, that the reference document on the best available technology for reducing emissions from storage clearly referred to water spraying/water screens and jet spraying when dealing with these sources, and not to loaders, etc.

The Municipal Court in Prague, by its ruling in Case No 5 A 109/2016 – 52 and No 5 A 108/2016 – 50 rejected the lawsuits and stated in the justification, among other things, that it was illogical and contrary to the basic intention of the OPEn to require that support be provided to the extent of the costs necessary for the acquisition of equipment which in itself was a source of pollution (emission of flue gas, swirling of dust during handling/movement of the equipment, etc.). According to the Municipal Court in Prague, the support of the given activity is possible on the condition that there is a reduction in the dust that arises from surface sources. The replacement or acquisition of new equipment which primarily fulfils a different (basic) function than dust reduction and the technology in question is only part of it is explicitly not accepted.

→ Between 2014 and 2022, projects under PA 2 of the OPEn participated in reducing the volume of annual emissions of sulphur dioxide and nitrogen oxides only minimally.

Based on the monitored and reported data of the CHMI and the SEF, the SAO found that the share of projects implemented within SO 2.2 and SO 2.4 (in order to reduce emissions from stationary sources participating in the population's exposure to above-limit concentrations of pollutants) in the total change in reported annual emissions from industry in 2014-2022 had been 26 % in the case of dust particles PM_{10}, 15 % in the case of fine particulate matter $PM_{2.5}$ and less than 1 % in the case of pollutants SO_2, NO_X and VOC (see Annex 6 to this Audit Report).

→ The beneficiary ineffectively spent up to CZK 5.57 million on equipment that was supposed to be used to reduce dust.

The SAO checked, among other things, the provision of a subsidy to the beneficiary for the implementation of a project to reduce dust at the beneficiary's premises. The beneficiary stated in the application that the company was focused on the storage of loose material on the premises with a total area of 33,085 m^2, which were operated 250 days a year and which constituted a surface source of dust.

The considered investment action consisted in the purchase of a machine, namely a multifunctional dust removal unit equipped with a system of brushes with sprinkling and suction, as well as nozzles for overhead sprinkling of the stored material with pressurised water and a water tank. The implementation of the project was supposed to reduce emissions of dust blown up by the movement of trucks on the site roads and paved surfaces (so-called resuspension) and also from stored loose material (rubble, sand, gravel) on piles of an area of approx. at least 850 m^2. The calculation of the expected emission reduction was based on the description of the current situation for the period of 2016-2018.

The MoE paid a subsidy to the beneficiary in the amount of CZK 5,574,000, which represented 75 % of the reported total eligible expenditure. In the audit, the SAO found facts indicating a breach of the budgetary discipline.

The SAO audit found that the site specified in the aid application did not belong to the beneficiary. The beneficiary had a leased part of the land with an area of 1,143 m^2, and only from 1 September 2018. As part of the aid application, the beneficiary documented the existence of the operated site with the Rules of Operation dated September 2018. From the Rules of Operation, it was clear that the beneficiary was operating a facility with containers for the storage of used old railway sleepers, and not a facility for the handling and storage of loose materials (rubble, sand, gravel), on a part of the land with an area of 500 m^2. At the time of submitting the aid application, the leased part of the land was not kept in the public part of the Trade Register among the data on the beneficiary's establishments.

The SAO found that the information on the operation of the surface pollution source provided by the beneficiary in the aid application had not corresponded to the actual situation. The beneficiary was not in fact the owner or operator of the stationary source of air pollution to the extent that the beneficiary had defined it in the aid application, and thus it could not have resulted in the reduction of emissions of air pollutants to the expected extent. The beneficiary was not an eligible applicant according to the conditions of Call No 136 under the OPEn.

The SAO found that the beneficiary, as part of the implementation of the project, had purchased a mobile sweeping and vacuuming machine for paved surfaces consisting of a wheel loader and a sweeping attachment, which, according to the SAO, could not have been used for overhead sprinkling of piles of stored material or for sprinkling the area for handling loose materials to the required extent. The SAO concluded that the beneficiary had not implemented the project in accordance with the analysis of the project's compliance with the set rules.

The beneficiary spent CZK 6,996,000 excluding VAT on the purchase of the mobile sweeping and vacuuming machine for paved areas, of which the subsidy provided amounted to CZK 5,247,000.

The purchased machine was to be used for regular cleaning of the site's roads at a frequency of once per day during the operation of the site and for regular (daily during the operation of the site) sprinkling of deposited material (heaps with a minimum area of 850 m^2). Through an on-site audit and a comparison of aerial photographs, the SAO found that, during the period of project implementation or its sustainability, the beneficiary had reported, in the machine log book and in the records of the number of vehicle entrances to the site, days when the site was not in operation or there was no loose material on it.[25]

Due to the fact that the beneficiary was provided with aid for the project according to Article 36 of Commission Regulation (EU) No 651/2014[26], the beneficiary was obliged to ensure that the object of the aid (the machine) would be used exclusively in the premises to which the

[25] The audit of the documentation at the SEF also revealed that even at the time of the monitoring visit by the SEF in May 2019, there had been only soil at the site operated by the beneficiary, and no other material had been stored in the warehouse area.

[26] Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

project was tied for the duration of the project's sustainability. The beneficiary was also not allowed to use the object of aid for other purposes, for example in the form of a lease or for the provision of road cleaning services to other entities. The SAO found out, based on the data in the machine's log book, the machine's operating data (so-called engine hours[27]) and information provided by the beneficiary, that the beneficiary had not used the acquired machine only for activities carried out within the project. The reading of the wheel loader's engine hour indicator was about 6 times higher than the time needed to implement the project activities.

The SAO concluded that the beneficiary had ineffectively spent up to CZK 5,574,000 on the implementation of the project, as it had violated the conditions for the provision of the subsidy stipulated in the subsidy decision.

On the basis of two mandate contracts, the beneficiary entrusted the management of the project and the complete administration of the public contract to one of the approached companies. Expenditures for project management in the amount of CZK 211 thousand without VAT and complete administration of the public contract in the amount of CZK 225 thousand without VAT were included in the eligible expenditure of the project. When awarding small-scale public contracts, the beneficiary was obliged to proceed in accordance with the principles of transparency, adequacy, equal treatment and non-discrimination.

On the basis of the audit, the SAO concluded that the beneficiary had not proceeded with the awarding of small-scale public contracts for project management services and complete public contract administration services in accordance with the *instructions for awarding public contracts* in the Operational Programme *Environment 2014-2020* by failing to comply with the principle of transparency, as the beneficiary had not obtained and kept written documentation on all significant actions related to the selection of a supplier, and at the same time it had not complied with the principle of non-discrimination as the beneficiary had not carried out a supplier selection process, e.g., by contacting other suppliers, based on a market survey or in another form ensuring the participation of several suppliers, thereby limiting the circle of possible participants in the tender procedure.

By auditing similar projects, the SAO found that a wheel loader with the same sweeping attachment had been purchased in at least six other cases, in which emissions were also supposed to be reduced as a result of regular sprinkling of piles of stored material on an area of 300 m^2 to 6,000 m^2.

The SAO found that in at least seven projects, machines had been purchased that had not allowed for the top sprinkling of piles of stored material with pressurised water. These were four projects from Call No 89 with a subsidy paid from the CF in the total amount of CZK 12.49 million and three projects from Call No 136 with a subsidy paid from the ERDF in the total amount of CZK 15.22 million.

The SAO found that the MoE had ineffectively spent up to CZK 27.71 million of funds. The funds reimbursed by the MoE included expenditure for the acquisition of equipment that could not be used for overhead sprinkling of piles of stored material to the extent according to approved analyses of the project's compliance with the rules or issued subsidy decisions.

[27] The reading of the engine hour indicator provides information about the amount of work that the wheel loader has done since its purchase.

In the course of 2022, the effects of Russian aggression in Ukraine began to manifest more significantly on the implementation of the programme, in the form of withdrawals from previously approved projects or the extension of the deadlines for the implementation of tender procedures. The MoE created a new **Priority Axis 7** in order to use up the gradually released funds within the OPEn: ***Support for mitigating the consequences of the energy crisis.*** The amount of allocation to PA 7 for the programming period of 2014-2020 is EUR 25,450 million. The aim of the measure is to support vulnerable households that have been negatively affected by the increase in energy prices in connection with the consequences of Russia's military aggression against Ukraine, as well as the increase in living costs due to inflation, through a housing allowance that was paid through the LO CR in the period from 1 February 2022 to 31 December 2023. The aid was intended for more than 230 thousand households.

The audit by the SAO found that the aid applications of the applicant LO CR approved by the Managing Authority on 24 October 2023 in the total amount of CZK 1.8 billion (EU contribution) had not been in accordance with the OPEn programming document (version no: 20.0 /Commission version 15.0/, valid from 22 March 2023). Changes resulting from the creation of a new PA 7, or the new version of the OPEn programming document, when the organisational unit of the state should be the beneficiary from the so-called grant scheme[28] for PA 7, were only valid from 8 November 2023. The MoE thus provided aid contrary to the valid OPEn programming document. The MoE had not paid out any funds as at 15 November 2023 (the end of the audit by the SAO at the MoE).

The MoE consulted and pre-negotiated with the Commission representatives regarding the changes made in the OPEn programming document related to the new PA 7, but the Commission's actions cannot be anticipated and active pre-negotiation was not necessarily a guarantee of subsequent approval of the draft OPEn programming document.

Providing financial assistance to offset the increase in energy costs for households that draw a housing allowance does not have a direct effect on improving air quality, as it does not support specific replacements of heating sources.

C) Compliance with air pollution limits

The goal of the MoE anchored in strategic documents[29] approved by the Government in 2015 was to achieve the air pollution limits set in the Air Protection Act throughout the Czech Republic by the end of 2020.

The condition for achieving the set goal was, in particular, the implementation of the measures included in the NERP and AQIP financed, among other things, from PA 2 of the OPEn and the NGS.

→ The goal of achieving air pollution limits by the end of 2020 was not met.

The SAO, based on data from the CHMI, found that the set goal had not been met. In 2020, the air pollution limits for average annual concentrations of $PM_{2.5}$ and B[a]P and for average daily concentrations of PM_{10} were not met in part of the territory of the Czech Republic. Air

[28] In the case of the grant scheme, it is socially sustainable support for vulnerable households through the provision of housing allowances. Pre-financing of EU funds takes place through the relevant administrator of the state budget – the chapter of the MoLSA.

[29] *Medium-Term Strategy (until 2020) for improving air quality in the Czech Republic* approved by Government Resolution No 979 of 2 December 2015; *National Emission Reduction Programme of the Czech Republic* approved by Government Resolution No 978 of 2 December 2015.

pollution limits were not met in 2020 or in the following years 2021 and 2022, especially in the Ostrava/Karviná/Frýdek-Místek agglomeration and in the Central Moravia and Moravian-Silesian zones.

Analyses of air pollution sources show that the contribution of foreign sources to the territory of the Czech Republic can range between 30% and 50% of the annual average for PM_{10} and 40% to 60% of the annual average for $PM_{2.5}$ in most areas. More detailed data on non-observed air pollution limits are listed in Annex 2 to this Audit Report.

The development of the evaluated indicators (the area of the Czech Republic in % where one of the air pollution limits was not observed; the share of the population who live in defined areas where the air pollution limit is exceeded) for the years 2013 to 2022 is shown in Table 5.

Table 5: Failure to comply with the air pollution limit in 2013-2021 excluding O_3

(% of the area; % of population)

CR total	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Territory with an exceeded air pollution limit	17.5	13.5	20.4	25.9	26.2	12.7	8.4	4.6	6.1	1.7
Population affected	54.6	54.2	51.5	56	62	36	27.5	19	19.7	11.7

Source: MoE and CHMI data.

According to the monitored indicators for the evaluation of areas with exceeded air pollution limits from the point of view of human health protection (without the inclusion of O_3) listed in Table 5, an improvement in air quality has been evident since 2018.

→ From the point of view of limits recommended by the WHO, most of the territory of the Czech Republic is burdened with excessive average annual and daily concentrations of $PM_{2.5}$.

From the point of view of human health, due to their ability to penetrate deeper into the human organism, $PM_{2.5}$ dust particles, which may also include B[a]P, which is mostly linked to the fine fraction of dust particles, are problematic. The most significant source of $PM_{2.5}$ and B[a]P emissions in the Czech Republic is household heating, including fuel consumption for heating, cooking and hot water, which accounts for more than 83 % of $PM_{2.5}$ emissions and 95 % of B[a]P emissions. Act No 201/2012 Coll. and Directive 2008/50/EC, however, do not currently set an air pollution limit for average daily concentrations of $PM_{2.5}$.

Taking into account the latest scientific findings, the WHO updated its guidelines and recommendations for air quality management in 2021, including recommended concentration levels for key air pollutants, including $PM_{2.5}$. In 2022, among other things, in order to harmonise air quality standards with WHO recommendations, the Commission published a draft of a revised directive on ambient air quality and cleaner air for Europe[30]. A comparison of the currently valid air pollution limits, the WHO recommended concentration levels and the Commission's newly proposed air pollution limits from 2030 is shown in Annex 5 to this Audit Report.

With regard to published findings on the effect of $PM_{2.5}$ on human health, the impact of local heating on air pollution in the Czech Republic and the current absence of an air pollution limit for the maximum daily concentrations of $PM_{2.5}$, the SAO focused on comparing the achieved average

[30] As part of the Zero Pollution Action Plan, the *European Green Deal*, the Commission has set a target of reducing the number of premature deaths caused by particulate matter $PM_{2.5}$, a major air pollutant, by at least 55 % by 2030 compared to 2005 levels. To this end, in 2022 it published a proposal for the revision of Directive 2008/50/EC and Directive 2004/107/EC – a proposal for a directive of the European Parliament and of the Council on ambient air quality and cleaner air for Europe (recast) COM(2022) 542 final/2 of 26 October 2022.

annual and daily concentrations of $PM_{2.5}$ compared to the WHO recommended values and Commission proposal.

Table 6 provides an overview of the number of stations with valid data for average annual concentrations of $PM_{2.5}$ in the years 2020 to 2022, as well as a comparison of the number of measuring stations at which the valid air pollution limit, WHO 2021 recommendation or Commission proposal was exceeded in a given year.

Table 6: Assessment of average annual concentrations of $PM_{2.5}$

Year	Number of stations with valid measurements	Number of stations with an annual average >20 µg/m³ (Act No 201/2012 Coll.)	Number of stations with an annual average >10 µg/m³ (Commission proposal)	Number of stations with an annual average >5 µg/m³ (WHO 2021 recommendation)
2020	101	2	91	100
2021	93	9	85	92
2022	101	4	93	101

Source: CHMI tabular yearbooks: https://www.chmi.cz/files/portal/docs/uoco/isko/tab_roc/tab_roc_CZ.html.

Based on the data established, the SAO found the following:

- **the statutory air pollution limit for average annual concentrations of $PM_{2.5}$ was exceeded at two measuring stations in 2020, at nine measuring stations in 2021 and at four measuring stations in 2022. The air pollution limit was exceeded, but for one station in Zlín, only at stations in the Ostrava/Karviná/Frýdek-Místek agglomeration in 2021;**
- **the stricter air pollution limit proposed by the Commission from 2030 onwards was exceeded at more than 90 % of measuring stations with valid measurements between 2020 and 2022;**
- **the strictest standard recommended by the WHO was exceeded in the years 2020 to 2022, with the exception of one measuring station in the district of Prachatice, at all measuring stations.**

Table 7 contains an evaluation of daily $PM_{2.5}$ concentrations in relation to their recommended level according to the WHO and the Commission proposal for 2022.

Table 7: Assessment of average daily concentrations of $PM_{2.5}$

Year	Number of stations at which it was possible to assess daily concentrations of $PM_{2.5}$	Failure to comply with the recommendation / limit	
		WHO 2021*	Commission proposal**
2022	110	110	92

Source: MoE data.

* Limit value of 15 µg/m³ exceeded 4 times or more.

** Limit value of 25 µg/m³ exceeded 19 times or more.

Based on the data identified, the SAO found that, from the point of view of the recommended WHO limits for $PM_{2.5}$ particulate matter, the air quality in most of the Czech Republic was burdened by their excessive concentrations. The air quality standard recommended by the WHO for maximum daily concentrations was exceeded in 2022 at all stations where this parameter could be evaluated. The less strict air pollution limit proposed by the Commission was exceeded at 92 stations out of 110 stations at which this parameter could be evaluated.

D) Non-compliance with legal regulations in the financing of air protection

Revenues from air pollution charges

Since 2017, the income from air pollution charges has been the income of the SEF at 65%, the income of the region in whose territory the stationary source of pollution is located at 25%, and the income of the state budget at 10%. According to Section 15(14) of Act No 201/2012 Coll., the income from air pollution charges, which is income of the state budget, can only be used to finance activities provided by the MoE through the CHMI, a contributory organisation established by it.

The collection of these charges is ensured by the General Directorate of Customs (hereinafter the "GDC"). Although the MoE had requested the GDC to transfer the funds to its revenue account, this request was not complied with, so the MoE reported non-fulfilment of these revenues. The GDC transferred revenues from air pollution charges to a special account of the state budget under Chapter 398 – *General Treasury Administration*. The MoE applied a procedure where it regularly asked the GDC about the actual income from charges allocated to the state budget. Subsequently, the relevant amount was released for the CHMI. The years 2019 and 2020 showed the inappropriateness of this procedure, as the actual income from the charges was much higher than the budgeted expenditure. From 2021, on the basis of an agreement with the GDC, these funds are already being transferred to the revenue account of the MoE.

→ Part of the revenue from air pollution charges in 2019 and 2020, which was the income of the state budget, was not used in full for the purposes set by law.

Table 8: Overview of air pollution charges – Chapter of the state budget 315 – MoE, item 1332 – *Charges for air pollution* for the years 2017-2022 (in CZK)

Period	Approved budget	Budget with changes	Final budget	Actual 10% revenue	Budget fulfilment (%)	Transferred to the CHMI	Fulfilment (%)
2017	27,500,000	27,500,000	0	19,105,149.00	69.47	19,105,149.00	100
2018	27,500,000	27,500,000	0	27,240,548.20	99.06	27,240,548.70	100
2019	20,000,000	20,000,000	0	46,152,243.32	230.76	14,959,538.80	32.41
2020	19,000,000	19,000,000	0	46,252,091.28	243.43	20,000,000.00	43.23
2021	39,000,000	39,000,000	0	36,923,486.81	94.68	36,923,486.81	100
2022	59,000,000	59,000,000	0	34,527,756.27	58.52	34,527,756.27	100
Total in 2017-2022	**192,000,000**	**192,000,000**		**210,208,274.88**		**152,756,479.58**	

Source: State treasury for the years 2017-2022, MoE data, SAO calculation.

The revenue from air pollution charges for the years 2019 and 2020 amounted to a total of CZK 92.41 million, and the amount of only CZK 34.96 million was transferred to the CHMI in those years.

The SAO audit found that, for the years 2019 and 2020, state budget funds in the total amount of CZK 57.45 million had not been used for the purposes specified in Section 15(14) of Act No 201/2012 Coll.

The funds in 2019 and 2020 ended up in the revenue account of the GDC and, according to the MoE, were used to reduce the state budget deficit in the given year.

New Green Savings Programme

In addition to reducing energy consumption and increasing energy efficiency, the objectives of the NGS Programme set by the MoE include reducing emissions of air pollutants, especially as a result of replacing solid fuel boilers that do not meet the parameters for Class 3 according to ČSN EN 303-5:201 in households or other local solid fuel heaters. Until the end of 2022, the MoE had supported approx. 6 thousand replacements of solid fuel boilers under the sub-programme *Family Houses* of the NGS Programme. For these replacements, funds from the state budget in the amount of CZK 304.88 million were spent as part of Stage I of the NGS 14+ and CZK 488.3 million from EU funds as part of Stage II of the NGS 21+.

→ The MoE did not set any parameters or indicators on the basis of which it would be possible to evaluate the benefits of the NGS Programme for improving air quality.

Table 9: Number of projects which included the replacement of old solid fuel boilers during the period of the NGS implementation until 31 December 2022 (sub-programme *Family Houses*)

NGS stage	Project type	Number of implemented projects	Funds paid out (in CZK)
Stage I 14+	Separate replacements	250	15,950,248
	Combined measures including the replacement of the heating source	631	288,928,710
Stage II 21+	Separate replacements	4,739	408,620,012
	Combined measures including the replacement of the heating source	228	79,681,224
Total		**5,848**	**793,180,194**

Source: MoE and SEF data.

The SAO concluded that the MoE had not monitored and evaluated the economy, efficiency and effectiveness of the expenditures provided under the NGS Programme in relation to the set goal of the programme, i.e., improvement of air quality including reduction of emissions of dust particles PM_{10} and $PM_{2.5}$, thereby not proceeding in accordance with Section 39(3) of Act No 218/2000 Coll.

Revenues from the auctioning of emission allowances

Greenhouse gas emission allowances (hereinafter "emission allowances") are the main instrument of the European Emissions Trading System, which aims to reduce greenhouse gas emissions and which brings together the largest emitters responsible for approximately 45 % of the total emitted greenhouse gas emissions in Europe. In the Czech Republic, the system for trading emission allowances is regulated by Act No 383/2012 Coll. The Act states which devices are covered by the system and what the rights and obligations of their operators are. Proceeds from auctions of emission allowances were to be used to finance measures to reduce greenhouse gas emissions, increase energy efficiency and develop renewable energy sources. In the audited period, part of the income was redistributed for the implementation of expenditure between the MoIT and the MoE with the SEF. The MoEused the proceeds from the sale of emission allowances exclusively to finance Stage I of the NGS Programme.

According to Section 7 of Act No 383/2012 Coll., revenues from emission allowance auctions are income of the state budget and are purpose-bound[31], inter alia, to the financing of activities leading to the reduction of greenhouse gas emissions, up to a maximum of CZK 12 billion per year in the period until 31 December 2020 and up to a maximum of CZK 8 billion per year as of 1 January 2021. Expenditures corresponding to the purpose-bound revenue from emission allowance auctions are to be realised at 50% through the MoIT and 50% through the MoE and the SEF.

Table 10: Income from the sale of emission allowances in the years 2013-2023 (until 30 September 2023), of which earmarked income in accordance with Section 7(6) of Act No 383/2012 Coll. (in CZK)

Year	Income from the sale of emission allowances*	Earmarked revenues
2013	2,240,784,138.74	1,120,392,069.37
2014	1,521,636,145.14	760,818,072.57
2015	3,025,563,550.00	1,512,781,775.00
2016	3,172,996,365.66	1,586,498,182.83
2017	5,220,325,437.71	2,610,162,718.86
2018	14,934,783,011.48	6,000,000,000.00
2019	16,098,489,118.14	6,000,000,000.00
2020	18,936,891,675.13	6,000,000,000.00
2021	15,396,999,737.11	4,000,000,000.00
2022	16,464,422,064.00	4,000,000,000.00
until 30 September 2023	13,148,954,531.80	4,000,000,000.00
Total	**110,161,845,774.91**	**36,590,652,818.63**

Source: MoE data, SAO calculation.

* Budget item 3114 – Revenues from the sale of intangible fixed assets. This includes, inter alia, revenues of the MoE from the sale of emission allowances pursuant to the provisions of Section 7(5) and Section 17 of Act No 383/2012 Coll.

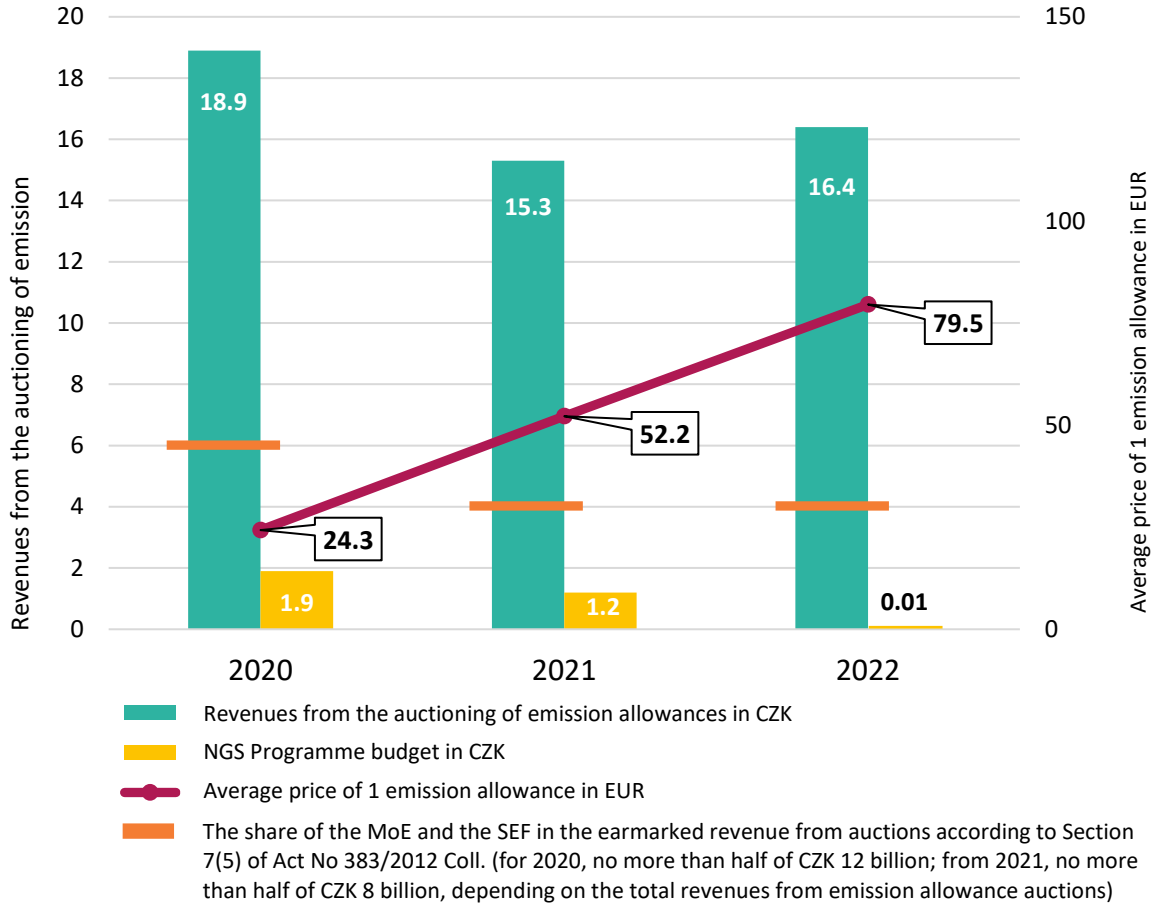
→ The MoE did not realise expenditure in the amount corresponding to the part of the proceeds from emission allowance auctions set by law.

For the period from the start of the NGS Programme 115 280 (Stage I of the NGS) to 30 September 2023, funds from the state budget in the total amount of CZK 19.2 billion were budgeted for the implementation of the programme. The MoE actually spent funds in the total amount of CZK 16.4 billion. Another approx. CZK 1.2 billion represented transfers to other organisational units of the state within the NGS 14+ sub-programme *Public Sector Buildings* (i.e., a total of approx. CZK 17.6 billion). However, the MoE was supposed to realise expenditure for additional financing of activities according to Section 7(4) of Act No 383/2012 Coll. in the total amount of CZK 36.6 billion.

[31] *"Revenues from the auctioning of allowances (...) constitute the income of the state budget, unless otherwise provided by law, are earmarked for additional funding of activities to reduce greenhouse gas emissions and to support innovation in industry, for measures to increase energy efficiency, including the construction and renovations of heat supply systems, promotion of combined heat and power production, reducing energy intensity of buildings and increasing the efficiency of energy use in industry and energy, to support science and research in the field of efficient use of resources, to support energy savings on the part of consumers, for adaptation measures, for measures to meet the Czech Republic's international obligations and development aid in the field of climate protection, and for costs associated with the operation and administration of the European Trading System and administration of the register, and to support research, development, production and implementation of suitable technologies and science and technology initiatives in the field of reducing greenhouse gas emissions from traffic, in particular civil aviation."*

Income from the sale of emission allowances in the audited years 2020 to 2022 amounted to CZK 50.8 billion. According to Section 7(6) of Act No 383/2012 Coll., the MoE was authorised to dispose of revenues of CZK 14 billion based on the results of emission allowance auctions in the audited years.

Chart 2: Revenues from the auctioning of emission allowances and share of the NGS Programme in 2020-2022



Source: closing accounts of Chapter 315 – MoE for the years 2020, 2021, 2022, MoE data, prepared by the SAO.
Explanation: EUA – general emission allowances.

In the audited period from 2020 to 2022, the MoE budgeted a total of CZK 3.1 billion of state budget funds for the NGS Programme 115 280. The MoE spent a total of CZK 8.6 billion[32] within the NGS Programme between 2020 and 2022 including involved claims from unused expenditure from previous years. Through the NGS Programme 115 280, expenditures in the amount corresponding to the legally designated part of the revenues from the auctioning of emission allowances were not realised by the MoE in 2020-2022. The MoE spent CZK 5.4

[32] This amount does not include transfers provided to other OUS within the NGS 14+ sub-programme – PSB; for the years 2020 to 2022, the MoE reported a total amount of CZK 9.42 billion in the Commission reports.

billion less than it should have. The MoE failed to proceed in the manner indicated in accordance with Section 7(6) of Act No 383/2012 Coll.

According to the explanatory report to the amendment to Act No 383/2012 Coll.[33], the Government should have aimed at the highest possible use of proceeds from auctions for purpose-related expenditure to finance measures to reduce greenhouse gas emissions, increase energy efficiency and develop renewable energy sources. The earmarked revenues were not intended to serve as general state income to finance current expenditures.

The receipt of applications under the NGS Programme 115 280 ended as at 11 October 2021. Since 12 October 2021, the MoE has been reimbursing expenditure related to the gradual termination of supported projects, which must be terminated by 31 August 2024 at the latest.

The SAO's audit found that the MoE had not adopted any follow-up programme by the end of the SAO's audit, within the framework of which it would continue to realise expenditures in the amount corresponding to the part of the revenues from emission allowance auctions set by law. Thus, the MoE did not ensure the fulfilment of the obligation arising from Section 7(6) of Act No 383/2012 Coll.

In the Audit Report from Audit No 20/05 – *Support of energy savings in public buildings,* the SAO already drew attention to non-compliance with the amount of expenditure realised by the MoE within the framework of the NGS Programme 115 280 from the point of view of the purpose-related income from emission allowance auctions according to Act No 383/2012 Coll.

[33] The amendment was approved as Act No 1/2020 Coll., amending Act No 383/2012 Coll., on the conditions for trading in greenhouse gas emission allowances, as amended, and Act No 458/2000 Coll., on the conditions of business and on the performance of state administration in energy sectors and on the amendment of certain acts of law (Energy Act), as amended.

List of terms and abbreviations

t	tonne
µg/m^3	microgram per cubic metre (the unit of measure of the concentration of pollutants in the air)
µm	micrometre
ng/m^3	nanogram per cubic metre (the unit of measure of the concentration of pollutants in the air)
AMM	sub-programme *Adaptation and Mitigation Measures* under the *New Green Savings* Programme
B[a]P	benzo[a]pyrene
PSB	sub-programme of the NGS 14+ *Public Sector Buildings*
CHMI	Czech Hydrometeorological Institute
CR	Czech Republic
ERDF	European Regional Development Fund
Commission	European Commission
EU	European Union
CF	Cohesion Fund
GDC	General Directorate of Customs
air pollution limit	air pollution limit (limit of immissions)
MS2014+	*Monitoring system of the European Funds for the programming period of 2014-2020*
MoE	Ministry of the Environment
VOC / NMVOC	non-methane volatile organic compounds
SAO	Czech Supreme Audit Office
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NERP	*National Emission Reduction Programme of the Czech Republic*
NPE	*National Programme Environment*
NGS	*New Green Savings* Programme
OPEn	Operational Programme *Environment 2014-2020*
PJ	petajoule, unit of work and energy (10^{15} joules)
$PM_{2.5}$	particulate matter of fraction 2.5 µm (fine particles)
PM_{10}	particulate matter of fraction 10 µm
PA 2	Priority Axis 2: *Improving the quality of air in human settlements* (one of the priority axes of the OPEn)
PA 7	Priority Axis 7: *Support for mitigating the consequences of the energy crisis*
AQIP(s)	Air Quality Improvement Programme(s)
REZZO	Register of Emissions and Air Pollution Sources
SO	specific objective (in the OPEn)
SEF	State Environmental Fund of the Czech Republic
SO_2	sulphur dioxide
SO_X	sulphur oxides
state budget	state budget of the Czech Republic
LO CR	Labour Office of the Czech Republic
WHO	World Health Organization

Annex 1

Selected air pollution limits according to Act No 201/2012 Coll.

Table 1: Air pollution limits for health protection and the maximum number of exceedances [µg/m^3]

Pollutant	Averaging period	Assessment threshold		Air pollution limit
		LAT	UAT	
SO_2	1 hour	-	-	350 max. 24 times per year
	24 hours	50 max. 3 times per year	75 max. 3 times per year	125 max. 3 times per year
NO_2	1 hour	100 max. 18 times per year	140 max. 18 times per year	200 max. 18 times per year
	Calendar year	26	32	40
PM_{10}	24 hours	25 max. 35 times per year	35 max. 35 times per year	50 max. 35 times per year
	Calendar year	20	28	40
$PM_{2.5}$	Calendar year	12	17	20*/25
Pb	Calendar year	0.25	0.35	0.5
CO	Maximum daily 8-hour moving average	5,000	7,000	10,000
Benzene	Calendar year	2	3.5	5

Source: Annex 1 to Act No 201/2012 Coll.

Note: $PM_{2.5}$ air pollution limit valid from 2020; until 2019 the 25 µg/m^3 air pollution limit applied.

Table 2: Air pollution limits for health protection – total content in PM_{10} particulate matter [ng/m^3]

Pollutant	Averaging period	Assessment threshold		Air pollution limit
		LAT	UAT	
As	Calendar year	2.4	3.6	6
Cd	Calendar year	2	3	5
Ni	Calendar year	10	14	20
B[a]P	Calendar year	0.4	0.6	1

Source: Annex 1 to Act No 201/2012 Coll.

Annex 2

Non-compliance with air pollution limits in the Czech Republic

Through the Air Protection Act, the air quality requirements stipulated in the EU Directive 2008/50/EC are transposed into the legal system of the Czech Republic. The Directive allowed Member States the option of extending the deadlines for reaching limit values (air pollution limits) for PM_{10} and NO_2. The Czech Republic requested exemptions from reaching the limit values for both PM_{10} and NO_2. Subsequently, the Czech Republic had to meet the air pollution limits for PM_{10} by 11 June 2011 and for NO_2 by 1 January 2015. Non-compliance with the air pollution limits resulted in the initiation of so-called infringement proceedings[34], conducted by the European Commission with the Czech Republic due to non-fulfilment of obligations arising from Directive 2008/50/EC, or, non-fulfilment of air pollution limits for PM_{10} and NO_2. The exceedances of the limit values are currently the subject of infringement proceedings. The proceedings are at the stage of additional reasoned opinion (PM_{10}) and at the stage of formal notification (NO_2).

The MoE informs the Commission about the current status of meeting the air pollution limits for PM_{10} and NO_2. The data for the years 2020 to 2022 show that the limit values for NO_2 are not exceeded. In the case of PM_{10}, limit values continue to be exceeded in the Ostrava/Karviná/Frýdek-Místek agglomeration.

AIR POLLUTION LIMITS NOT COMPLIED WITH IN THE CZECH REPUBLIC IN 2013-2022 (EXCLUDING O_3)

Table 1: Overview of the number of stations with annual average concentrations of NO_2

NO_2	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Number of stations	90	94	93	96	93	95	99	103	100	100
Number of stations where the limit was exceeded	4	4	2	4	4	3	1	0	0	0
Percentage of the total number of stations	4.4	4.3	2.2	4.2	4.3	3.2	1	0	0	0

Source: MoE and CHMI data.

[34] The infringement procedure is a mechanism through which the Commission fulfils its obligation to ensure compliance with EU law (Article 17(1) of the *Treaty on the Functioning of the EU*). If, according to the opinion of the Commission (or according to another Member State), there is a violation of EU law by a Member State, the Commission has the possibility, according to Article 258 of the *Treaty on the Functioning of the EU*, to start a multi-phase procedure, which can result in the submission of a lawsuit to the Court of Justice of the EU.

Table 2: Failure to comply with the air pollution limit for an average 24-hour concentration of PM_{10} in 2013-2022

Year / five-year average	Total number of stations	Number (proportion) of stations where the air pollution limit was exceeded	Affected area of the territory of the CR [%]	Population of the CR affected [%]
2013	129	42 (32.6 %)	5.73	16.00
2014	133	57 (42.9 %)	8.16	24.40
2015	124	29 (23.4 %)	2.54	10.40
2016	145	23 (15.9 %)	1.43	7.30
2017	143	50 (34.9 %)	8.25	23.10
2018	144	45 (31 %)	3.20	13.80
2019	147	7 (5 %)	0.30	0.90
2020	156	3 (2 %)	0.001	0.002
2021	152	4 (3 %)	0.10	0.40
2022	157	3 (2 %)	0.02	0.03
2013-2017			5.22	16.24
2014-2018			4.72	15.80
2015-2019			3.14	11.10
2016-2020			2.64	9.02
2017-2021			2.37	7.64
2018-2022			0.72	3.02

Source: MoE and CHMI data.

Table 3: Failure to comply with the air pollution limit for an average annual concentration of PM_{10} in 2013-2022

Year / five-year average	Total number of stations	Number (proportion) of stations where the air pollution limit was exceeded	Affected area of the territory of the CR [%]	Population of the CR affected [%]
2013	136	10 (7.4 %)	0.73	5.00
2014	141	10 (7.1 %)	0.45	2.20
2015	132	3 (2.3 %)	0.02	0.01
2016	152	1 (0.7 %)	0.00	0.00
2017	146	2 (1.4 %)	0.02	0.01
2018	144	2 (2.1 %)	0.10	0.30
2019	147	3 (2.3 %)	0.02	0.01
2020	152	0 (0 %)	0.00	0.00
2021	152	0 (0 %)	0.00	0.00
2022	161	0 (0 %)	0.00	0.00
2013-2017			0.24	1.44
2014-2018			0.12	0.50
2015-2019			0.03	0.07
2016-2020			0.03	0.06
2017-2021			0.03	0.06
2018-2022			0.02	0.06

Source: MoE and CHMI data.

Table 4: Failure to comply with the air pollution limit for an average annual concentration of $PM_{2.5}$ in 2013-2022

Year / five-year average	Total number of stations	Number (proportion) of stations where the air pollution limit was exceeded	Affected area of the territory of the CR [%]	Population of the CR affected [%]
2013	46	9 (19.6 %)	2.40	9.60
2014	52	8 (15.4 %)	1.80	8.60
2015	48	5 (10.4 %)	0.90	5.10
2016	81	9 (11.1 %)	0.50	3.00
2017	79	10 (12.7 %)	0.90	4.90
2018	80	13 (16 %)	1.20	6.10
2019	89	2 (2.2 %)	0.04	0.10
2020	101	2 (2 %)	0.04	0.20
2021	93	9 (9.7 %)	0.30	1.50
2022	101	4 (4 %)	0.03	0.10
	2013-2017		1.30	6.24
	2014-2018		1.06	5.54
	2015-2019		0.71	3.84
	2016-2020		0.54	2.86
	2017-2021		0.50	2.56
	2018-2022		0.32	1.60

Source: MoE and CHMI data.

Table 5: Failure to comply with the air pollution limit for an average annual concentration of B[a]P in 2013-2022

Year / five-year average	Total number of stations	Number (proportion) of stations where the air pollution limit was exceeded	Affected area of the territory of the CR [%]	Population of the CR affected [%]
2013	31	21 (54.5 %)	17.37	54.50
2014	31	23 (51.1 %)	10.67	51.10
2015	34	21 (50.8 %)	20.35	50.80
2016	44	31 (55.7 %)	25.89	55.70
2017	38	25 (66 %)	26.00	61.80
2018	39	22 (56 %)	12.60	35.50
2019	46	19 (41 %)	8.40	27.50
2020	53	21 (40 %)	4.60	19.00
2021	49	19 (40 %)	6.10	20.00
2022	51	19 (37 %)	1.70	11.70
2013-2017			20.06	54.78
2014-2018			19.10	50.98
2015-2019			18.65	46.26
2016-2020			15.50	39.90
2017-2021			11.54	32.76
2018-2022			6.34	22.74

Source: MoE and CHMI data.

Annex 3

Overview of pollutants

PARTICULATE MATTER PM_{10} and $PM_{2.5}$ (also called suspended or solid particles)

This particulate matter is a diverse mixture of organic and inorganic liquid and solid particles of various sizes, composition and origins. Airborne particulate matter represents a major risk factor with multiple effects on human health. Unlike gaseous substances, it does not have a specific composition (the size and composition of the particulate matter is influenced by its source) and, instead, these are mixture substances with various effects. At the same time, it acts as a vector for gaseous harmful pollutants. Suspended particulate matter is divided into primary and secondary particulate matter. Primary particulate matter is emitted directly from the sources and can be further divided into particulate matter originated from anthropogenic sources (fossil fuel burning, transport, technological processes, anthropogenic activities) and that coming from natural sources (sea salt aerosol, volcanic activity, space fallout…). Secondary particulate matter is that which is generated in the atmosphere by the ongoing chemical and physical processes and that which is re-suspended (raised into atmosphere) as a result of human activity (transport…) or weather factors (wind).

The effect of suspended particulate matter depends on its size, shape and chemical composition. The size of the particulate matter is crucial for its entry into and deposition in the respiratory tract. Fine $PM_{2.5}$ particulate matter represents a significantly higher health risk because of its ability to penetrate deeper into the human organism (alveoli) and to carry both heavy metals and persistent organic pollutants, in comparison with the PM_{10} particulate matter, which has a higher tendency to sediment because of its weight. Long-term exposure to suspended particulate matter leads to an increase in mortality, with sensitive people (the long-term ill or the elderly) always being the most affected.

BENZO[a]PYRENE

B[a]P is produced by imperfect combustion and in the air it is mostly bound to the fine fractions of dust particles ($PM_{2.5}$). High concentrations are reached at industrial sites; however, above-limit concentrations occur, in the long term, mainly in small settlements where solid fuels are used for heating. B[a]P concentrations show a significant annual trend with maxima in the winter period as a result of worsened dispersion conditions and emissions from local household heating. B[a]P is proven to have carcinogenic effects.

NITROGEN OXIDES (NO_X)

When monitoring and evaluating ambient air quality, the term “nitrogen oxides” refers to a mixture of nitrogen monoxide (NO) and nitrogen dioxide (NO_2). High concentrations of nitrogen oxides cause breathing difficulties, in particular in areas with heavy traffic. The largest amount of nitrogen oxide emissions comes from mobile sources.

SULPHUR DIOXIDE (SO_2)

SO_2 mainly enters the air as a product of combustion of fuels containing sulphur. Volcanic activity is a major natural source. Over a certain period of time in the air, SO_2 changes to sulphur trioxide and then to sulphuric acid aerosol. The resulting sulphuric acid may react with the particles of the dust aerosol, resulting in the production of sulphates and the consequent increase in the concentrations of suspended particulate matter. Sulphates settle on the ground surface gradually or are washed away from the air by rain. SO_2 a NO_X can then form

so-called acid rain that causes extensive damage to forests and industrial crops, damaging microorganisms, reducing water quality and even causing fish death. Significant damage to historical buildings and works of art has also been observed as acid rain dissolves certain types of masonry and causes rock weathering.

VOLATILE ORGANIC COMPOUNDS (VOC/NMVOC)

Non-methane volatile organic compounds referred to as VOC or NMVOC represent organic compounds or mixtures of organic compounds (alcohols, aldehydes, alkanes, aromatic compounds, ketones or halogenated derivatives of these substances). These are often various thinners, cleaners and solvents used, for example, in the production of varnishes and paints. NMVOCs mainly pollute the atmosphere and cause the formation of O_3. Some of the NMVOCs are proven human carcinogens. NMVOC emissions are also generated from the imperfect combustion of fossil fuels. This means the combustion of fuel in transport, local heating of households, public energy and heat production.

GROUND-LEVEL OZONE (O_3)

O_3 is produced by chemical reactions from so-called ozone precursors (VOC, NO_X, CO and CH_4) and, together with its precursors, is a significant pollutant and a strong oxidising agent, thereby negatively affecting human health and ecosystems. In humans, it has a strong irritating effect on the conjunctivae of the eyes, damages the respiratory system and, in higher concentrations, causes difficulty breathing and an inflammatory reaction of the mucous membranes in the respiratory tract. Its concentrations are mainly influenced by the nature of meteorological conditions (intensity and duration of sunshine, air temperature and occurrence of precipitation).

Annex 4

Audited projects

Table 1: Audited projects under PA 2 of the OPEn (data as at 31 December 2022) (in CZK)

Project registration number	Project title	Total eligible expenditure	EU contribution	Paid out
CZ.05.2.32/0.0/0.0/17_079/0006450	Immission Monitoring System – Innovation and Development 2	49,227,270.82	41,843,180.19	41,843,180.19
CZ.05.2.32/0.0/0.0/18_098/0008218	Modernisation and Addition of Automatic Measuring Systems of the CHMI Volunteer Network II.	17,567,675.00	14,932,523.75	14,932,523.75
CZ.05.2.32/0.0/0.0/18_098/0008238	Immission Monitoring System – Innovation and Development 3	47,250,756.56	40,163,143.07	40,163,142.28
CZ.05.2.32/0.0/0.0/18_098/0009090	Immission Monitoring System – Innovation and Development 4	64,762,830.00	55,048,405.50	55,048,405.50
CZ.05.2.28/0.0/0.0/19_136/0009927	Reduction of Fugitive Solid Pollutant Emissions on the Departure Routes of the Northern Part of the AMO Sinter	51,561,500.00	28,358,825.00	28,358,825.00
CZ.05.2.28/0.0/0.0/19_136/0009928	Reduction of Fugitive Solid Pollutant Emissions at the Medium Section Mill at Plant 14 of AMO	15,795,308.00	8,687,419.40	8,687,419.39
CZ.05.2.28/0.0/0.0/19_136/0009935	MAPECO MOST a.s. – Dust Reduction	5,756,700.00	4,317,525.00	4,317,525.00
CZ.05.2.28/0.0/0.0/19_136/0009951	Reduction of Fugitive Emissions at the GIFF a.s. Foundry in Frýdlant n. Ostravicí	78,530,697.00	51,044,953.05	50,893,310.91
CZ.05.2.28/0.0/0.0/19_136/0009958	Comprehensive Project to Reduce Dust in the Southern Slopes of the Bílina Mine	91,103,119.00	50,106,715.45	5,092,809.70
CZ.05.2.28/0.0/0.0/19_136/0009968	Dust Removal at the Premises of ŠTOKY s.r.o.	5,092,450.00	3,819,337.50	3,819,337.50
CZ.05.2.28/0.0/0.0/19_136/0009978	Bergasto a.s. – Dust Reduction Technology	7,437,000.00	5,577,750.00	5,574,000.00
CZ.05.2.28/0.0/0.0/19_136/0009986	HERKUL a.s. – Dust Reduction	7,533,000.00	4,896,450.00	4,896,450.00
Total		**441,618,306.38**	**308,796,227.91**	**263,626,929.22**

Source: MoE data, MS2014+.

Table 2: Audited projects of the NPE under Call No 1/2019 – "boiler loans" (in CZK)

Project number	Applicant	Total subsidies according to the Minister's decision	Subsidy paid	Returned in total
3241962	Municipality of Kravaře	26,340,000	25,080,000	10,140,000
2921961	Statutory City of Ostrava	76,170,000	52,170,000	40,350,000
5281961	Municipality of Mikulášovice	18,150,000	9,190,000	880,000
TOTAL		**120,660,000**	**86,440,000**	**51,370,000**

Source: SEF data.

Annex 5

Comparison of air pollution limits, WHO recommendations and the draft EU directive

Table 1: Comparison of air quality standards / air pollution limits

Pollutant	Averaging period	Currently valid standards[1]	WHO 2005[2]	WHO 2021[3]	Draft EU directive on ambient air quality[4]
$PM_{2.5}$ [µg/m^3]	Calendar year	20	10	5	10
	1 day	-	25*	15*	25 (18)
PM_{10} [µg/m^3]	Calendar year	40	20	15	20
	1 day	50 (35)	50*	45*	45 (18)
NO_2 [µg/m^3]	Calendar year	40 (0)	40	10	20
	1 hour	200 (18)	-	-	200 (1)
SO_2 [µg/m^3]	1 day	125 (3)	20*	40*	50 (18)
	1 hour	350 (24)			350 (1)
O_3 [µg/m^3]	8-hour average	120 (25)	100	100	100

Source:

1 Annex 1 of Act No 201/2012 Coll.; Annexes VII and XI of Directive 2008/50/EC; Annex I of Directive 2004/107/EC.

2 *Air Quality Guidelines Global Update*, WHO 2005.

3 *WHO global air quality guidelines. Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide*, WHO 2021.

4 Annex I of draft EU directive on ambient air quality.

Note: The maximum possible number of limit value exceedances in a calendar year is given in parentheses.

Explanation:

* Maximum number of exceedances 3 to 4 times.

The comparison of air quality standards indicates the following:

1) The currently valid EU standards for air quality applied in the Air Protection Act are less strict than the WHO recommendations from 2005, or, the updated recommendations from 2021.
2) The European Commission's newly proposed maximum concentration levels are more moderate than the WHO 2021 recommendations for most pollutants, and will thus allow air pollution levels higher than the WHO recommends.[35]

[35] The unambitious goals are pointed out, for example, in an article published in The Lancet – Public Health in July 2023: https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(23)00132-9/fulltext.

Annex 6

Annual emissions from local heating of households and from industry

Table 1: Achieved reduction in annual emissions in the local household heating sector

Local household heating sector (1A4bi)	NO_X (NO_2) [t/year]	NMVOC [t/year]	SO_X (SO_2) [t/year]	$PM_{2.5}$ [t/year]	PM_{10} [t/year]	B[a]P [t/year]
Projects – achieved annual reduction of pollutant emissions[1]	-68.50	8,225.00	2,104.30	3,802.97	3,921.04	2.30
Annual emissions 2014[2]	10,162.77	196,596.87	19,311.57	66,722.64	68,085.59	19.61
Annual emissions 2022[2]	10,722.39	157,766.92	17 424.16	45,751.10	46,782.66	17.35
Share of projects in the change in annual emissions [%]	12.24	21.18	111.49	18.13	18.41	101.67

Source: SEF data and emission balance announced by the CHMI.

Note:

[1] Model of evaluation of PA 2 SO 2.1; evaluation of the 1st, 2nd and 3rd calls of Specific Objective 2.1 *To reduce emissions from local household heating that contribute to the exposure of the population to above-limit pollution concentrations* of the OPEn (as of June 2023, including the NGS – AMM).

The share of the benefits of boiler subsidies is overestimated by the share of projects included in the evaluation of benefits for the period from 1 January 2023 to 30 June 2023 and by the share of projects from OPEn reservoirs financed from the sub-programme *Adaptation and Mitigation Measures* of the *New Green Savings* Programme.

[2] Emissions were taken from the emission balance of the Czech Republic announced by the CHMI according to international sectors (NFR) in March 2024 (NFR Code 1A4bi – Residential: Stationary): https://cdr.eionet.europa.eu/cz/un/clrtap/inventories/envzflmhq/CZ_Annex_I_rev18-11_1990-2022_v2.0.xlsx/manage_document.

Table 2: Achieved reduction in annual emissions in the industry sector (in t/year)

Industry sector		SO_X (as SO_2)	NO_X (as NO_2)	NMVOC	PM_{10}	$PM_{2.5}$
Projects completed as at 31 December 2022 – achieved annual reduction of pollutant emissions		631.31	80.81	36.67	737.98	295.29
Emission balance REZZO[1]	Annual emissions 2014	114,885.60	91,760.04	22,407.51	7,295.10	4,854.33
	Annual emissions 2022 (preliminary data)	46,960.35	60,159.34	17,168.36	4,027.47	2,587.92
	Share of projects in the change in annual emissions [%]	**0.93**	**0.26**	**0.70**	**22.58**	**13.03**
Emission balance of the CR broken down by international sectors (NFR)[2]	Annual emissions 2014	110,486.12	83,823.77	23,526.00	9,860.61	4,954.39
	Annual emissions 2022	44,447.52	53,882.08	18,448.34	6,998.60	2,938.67
	Share of projects in the change in annual emissions [%]	**0.96**	**0.27**	**0.72**	**25.79**	**14.65**

Source: SEF data and emission balance announced by the CHMI.

Note:

[1] Emissions from the industry sector were taken from the REZZO emission balance compiled on the basis of classification according to the Register of Emissions and Stationary Sources (REZZO). Data on individually monitored sources REZZO 1 and REZZO 2 was utilised. Small devices that do not fall into the category of large and medium sources and emissions from surface sources, which are monitored collectively and are reported together with emissions from local heating from households within REZZO 3, are not included. For the year 2022, the CHMI provided preliminary data to the SAO.

[2] The emissions were taken from the emission balance of the Czech Republic announced by the CHMI according to international sectors (NFR) in March 2024 (items falling under the grouping: A_PublicPower; B_Industry; D_Fugitive):
https://cdr.eionet.europa.eu/cz/un/clrtap/inventories/envzflmhq/CZ_Annex_I_rev18-11_1990-2022_v2.0.xlsx/manage_document.

Annex 7

Boiler subsidies

Table 1: Number of projects by type of newly installed source in total for the 1st, 2nd and 3rd call under SO 2.1 of the OPEn (date 6/2023 including the NGS 14+ – AMM)

Region	Number of projects	Number of newly purchased heating sources and the share of sources by region									
		A1 – coal		A2 – coal/biomass		A3 – biomass		B – heat pump		C – gas boiler	
		Number	%	Number	%	Number	%	Number	%	Number	%
South	10,339	314	3.0	1,346	13.0	1,820	17.6	5,073	49.1	1,786	17.3
South	4,089	57	1.4	245	6.0	1,415	34.6	813	19.9	1,559	38.1
Karlovy Vary	2,489	35	1.4	340	13.7	327	13.1	1,185	47.6	602	24.2
Hradec	4,701	132	2.8	871	18.5	573	12.2	2,212	47.1	913	19.4
Liberec	4,401	158	3.6	914	20.8	770	17.6	1,941	43.9	618	14.1
Moravian-	23,677	340	1.4	3,397	14.3	3,779	16.0	6,138	25.9	10,023	42.3
Olomouc	5,871	94	1.6	876	14.9	1,456	24.8	1,601	27.3	1,844	31.4
Pardubice	5,814	186	3.2	895	15.4	1,329	22.9	1,877	32.3	1,527	26.3
Pilsen	7,026	262	3.7	905	12.9	944	13.4	3,666	52.2	1,249	17.8
Prague	709	0	0.0	13	1.8	37	5.2	310	43.7	349	49.2
Central	16,806	538	3.2	2,595	15.4	2,317	13.8	8,993	53.5	2,363	14.1
Ústí	5,678	176	3.1	1,176	20.7	804	14.2	2,699	47.5	823	14.5
Vysočina	7,632	229	3.0	1,204	15.8	2,226	29.2	2,056	26.9	1,917	25.1
Zlín	5,794	66	1.1	212	3.7	2,070	35.7	1,534	26.5	1,912	33.0
Total	**105,026**	**2,587**	**2.5**	**14,989**	**14.3**	**19,867**	**18.9**	**40,098**	**38.2**	**27,485**	**26.2**

Source: evaluation of the 1st, 2nd and 3rd calls of Specific Objective 2.1 *To reduce emissions from local household heating that contribute to the exposure of the population to above-limit pollution concentrations* of the OPEn (as of June 2023, including the NGS 14+ – AMM).

Table 2: Overview of funds broken down into individual regions of the CR within SO 2.1 under PA 2 of the OPEn (boiler subsidies) as at 31 December 2022 – part 1

(in CZK thousand)

Beneficiary	Call No	City of Prague	South Bohemian Region	South Moravian Region	Karlovy Vary Region	Vysočina Region	Hradec Králové Region	Liberec Region
Amounts paid out to beneficiaries	05_15_016	22,198.08	309,887.85	142,713.11	73,274.60	254,391.78	214,521.68	153,577.89
	05_17_067	22,597.40	302,953.33	133,710.49	65,339.97	229,497.89	196,483.89	140,093.79
	05_19_117	28,597.09	405,524.70	147,110.79	104,035.19	296,831.06	216,667.05	160,939.89
Total		**73,392.57**	**1,018,365.88**	**423,534.39**	**242,649.76**	**780,720.73**	**627,672.62**	**454,611.57**

Source: MoE data.

Table 3: Overview of funds broken down into individual regions of the CR within SO 2.1 under PA 2 of the OPEn (boiler subsidies) as at 31 December 2022 – part 2

(in CZK thousand)

Beneficiary	Call No	Moravian-Silesian Region	Olomouc Region	Pardubice Region	Pilsen Region	Central Bohemian Region	Ústí Region	Zlín Region
Amounts paid out to beneficiaries	05_15_016	507,309.03	185,005.26	195,412.95	253,141.18	512,501.66	177,425.35	176,283.13
	05_17_067	851,896.82	168,881.23	177,663.69	224,075.82	492,950.99	160,657.05	159,337.37
	05_19_117	680,479.90	224,334.58	203,068.97	272,037.81	743,359.84	256,618.75	184,074.35
Total		**2,039,685.75**	**578,221.07**	**576,145.61**	**749,254.81**	**1,748,812.49**	**594,701.15**	**519,694.85**

Source: MoE data.

Annex 8

Questionnaire survey

During the audit No 23/07, the SAO conducted a quantitative research using a standardised questionnaire in two versions for beneficiaries of subsidies for the replacement of non-compliant heating sources under the OPEn and the NGS. The purpose of the questionnaire survey was to obtain additional information on the aid provided from the beneficiaries of the subsidy intended for the replacement of heating sources in households. The SAO addressed 71,142 beneficiaries of boiler subsidies from the OPEn and 87,102 beneficiaries of subsidies from the NGS Programme (according to the data submitted by the SEF), by sending a questionnaire electronically. A total of 5,637 respondents under the OPEn and 16,395 respondents under the NGS answered the questionnaire. The questionnaire survey was voluntary and anonymous.

The questionnaire contained a maximum of 12 questions (depending on the filtering of the answers). The last question in both versions of the questionnaires was used to complement or express the respondent's attitude. Some questions in the questionnaire offered an open-ended response.

The survey was conducted between 13 September 2023 and 27 September 2023.

For the results of the questionnaire survey, see
https://www.nku.cz/scripts/detail.php?id=13866.