



Republic of Kosovo
Government
Ministry of Environment and Spatial Planning
Kosovo Environmental Protection Agency



**ANNUAL REPORT ON THE STATE OF
THE AIR 2025**



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THE AIR 2025**



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Contents

1. Legal Framework for Air Protection

- 1.1. Legal Framework
- 1.2. Information on Air Quality Alert Thresholds
- 1.3. Description of Air Pollutants

2. Air Quality

- 2.1. Air Quality Monitoring
- 2.2. AKS1 Agglomeration (Prishtina Area) – Air Quality
- 2.3. ZKS1 Zone – Air Quality
- 2.4. Days with PM₁₀ Exceedances during 2025
- 2.5. Air Quality Trends for the Period 2013–2025

3. Assessment of Pollutant Emissions from Operators for 2025

- 3.1. Assessment of Air Emissions from TPP Kosova A and TPP Kosova B
- 3.2. Assessment of Air Emissions from Sharrcem

4. Assessment of emissions from residential sources through measurement of exhaust gases

- 4.1 Assessment of equipment
- 4.2 Emission results from households

5. Investments in the Air Sector

6. Health Effects of Air Pollution

7. Recommendations

- 7.1 Recommendations from the Japan International Cooperation Agency.**

List of Abbreviations, Figures and Tables

List of Abbreviations

MESPI - Ministry of Environment, Spatial Planning and Infrastructure

KEPA - Kosovo Environmental Protection Agency

DESA - Directorate for Environmental State Assessment

KHMI - Kosovo Hydrometeorological Institute

TPP Kosova A - Thermal Power Plant Kosova A

TPP Kosova B - Thermal Power Plant Kosova B

AQI - Air Quality Index

EU - European Union

WHO - World Health Organization

List of Figures

- Fig. 1. Locations of air quality monitoring stations.
- Fig. 2. Annual average PM₁₀ values in the AKS1 agglomeration, 2025.
- Fig. 3. Annual limit values of PM_{2.5} (µg/m³) in AKS1 for 2025.
- Fig. 4. Annual limit values of O₃ (µg/m³) in AKS1 for 2025.
- Fig. 5. Annual limit values of SO₂ (µg/m³) in AKS1 for 2025.
- Fig. 6. Annual limit values of NO₂ (µg/m³) in AKS1 for 2025.
- Fig. 7. Permitted annual average values of CO (mg/m³) in AKS1 for 2025
- Fig. 8. Annual limit values of PM₁₀ (µg/m³) in ZKS1 for 2025.
- Fig. 9. Annual limit values of PM_{2.5} (µg/m³) in ZKS1 for 2025.
- Fig. 10. Annual limit values of O₃ (µg/m³) in ZKS1 for 2025.
- Fig. 11. Annual limit values of SO₂ (µg/m³) in ZKS1 for 2025.
- Fig. 12. Annual limit values of NO₂ (µg/m³) in ZKS1 for 2025.
- Fig. 13. Annual limit values of CO (mg/m³) in ZKS1 for 2025.
- Fig. 14. Number of days with exceedances for PM₁₀ in 2025.
- Fig. 15. Air quality trend for 2013-2025
- Fig.16. Graphical representation of dust emissions from TPP Kosova A in 2025.
- Fig. 17. Graphical representation of SO₂ emissions from TPP Kosova A in 2025.
- Fig. 18. Graphical representation of NO_x emissions from TPP Kosova A in 2025.
- Fig. 19. Graphical representation of total emissions from TPP Kosova A and TPP Kosova B in 2025.
- Fig. 20. Graphical representation of dust emissions into the air from the Furnace in 2025.
- Fig. 21. Graphical representation of dust emissions into the air from the Mill in 2025.
- Fig. 22. Graphical representation of dust emissions into the air from the Clinker in 2025.
- Fig. 23. Graphical representation of SO₂ emissions into the air in 2025.
- Fig. 24. Graphical representation of NO_x emissions into the air in 2025

List of tables

- Tab. 1. Table 1. Alert threshold values for PM₁₀, O₃, NO₂, SO₂
- Tab. 2. Monthly average values of PM₁₀ in the AKS1 agglomeration, 2025
- Tab. 3. Monthly average values of PM_{2.5} in the AKS1 agglomeration, 2025
- Tab. 4. Monthly average values of O₃ in the AKS1 agglomeration, 2025
- Tab. 5. Monthly average values of SO₂ in the AKS1 agglomeration, 2025
- Tab. 6. Monthly average values of NO₂ in the AKS1 agglomeration, 2025
- Tab. 7. Monthly average values of CO in the AKS1 agglomeration, 2025
- Tab. 8. Monthly average values of PM₁₀ in ZKS1, 2025
- Tab. 9. Monthly average values of PM_{2.5} in ZKS1, 2025
- Tab. 10. Monthly average values of O₃ in ZKS1, 2025
- Tab. 11. Monthly average values of SO₂ in ZKS1, 2025
- Tab. 12. Monthly average values of NO₂ in ZKS1, 2025
- Tab. 13. Monthly average values of CO in ZKS1, 2025
- Tab. 14. Number of days with PM₁₀ exceedances in 2025
- Tab. 15. Air quality data from 2013 to 2025
- Tab. 16. Air emission concentration data for dust from TPP Kosova A
- Tab. 17. Air emission concentration data for SO₂ from TPP Kosova A
- Tab. 18. Air emission concentration data for NO_x from TPP Kosova A
- Tab. 19. Air emission quantity data for SO₂, NO_x, and dust from TPP Kosova A and TPP Kosova B
- Tab. 20. Dust emission data into the air from the Furnace during 2025
- Tab. 21. Dust emission data into the air from the Mill during 2025
- Tab. 22. Dust emission data into the air from the Clinker during 2025
- Tab. 23. SO₂ emission data into the air during 2025
- Tab. 24. NO_x emission data into the air during 2025
- Tab. 25. Comparative analysis of heating equipment costs
- Tab. 26. Measurement results from household equipment
- Tab. 27. Investment values from the budget of the Republic of Kosovo

Introduction

The Annual Report on Air Quality presents the results of the monitoring carried out during the 2025 calendar year in the territory of the Republic of Kosovo. The data were provided through the state air quality monitoring network, consisting of 12 fixed monitoring stations and one mobile station, distributed in urban and industrial areas of the country.

The purpose of this report is to provide a general assessment of the state of air quality, to present the level of atmospheric emissions, developments and investments in the air sector, as well as to summarize the existing legal framework and recommendations for the further improvement of air quality.

The monitoring data were collected by the Kosovo Hydrometeorological Institute and were processed to assess compliance with national standards and the relevant European Union directives on air quality. The results of the analysis serve to provide transparent information to the public on air pollution levels and their possible impacts on human health, as well as to support decision-making processes for the development of environmental policies and measures.

The analysis and interpretation of the data were carried out by the Environmental State Assessment Sector within the Directorate for Environmental State Assessment of the Kosovo Environmental Protection Agency.

The main air quality parameters included in this assessment are:

- Carbon monoxide (CO)
- Ozone (O₃)
- Sulphur dioxide (SO₂)
- Nitrogen dioxide (NO₂)
- Suspended particles with an aerodynamic diameter smaller than 10 µm and 2.5 µm (PM₁₀ and PM_{2.5})

1. Legal Framework for Air Protection

1.1. Legal Framework

The Law on Protection of Air from Pollution, Law No. 08/L-025 (2022), is the basic law for the protection of air from pollution.

The legal framework for the protection of air from pollution is further complemented by Administrative Instructions (subordinate legislation), such as;

- ✓ MESPI Administrative Instruction No. 09/2023 on the method of air quality monitoring, data collection, criteria and methodology;
- ✓ Administrative Instruction (MESPI) No. 16 /2024 on limit values, target values, alarm thresholds for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in the air
- ✓ Administrative Instruction (GRK)–No.07/2021) on the rules and norms of air emissions from stationary sources of pollution;
- ✓ Administrative Instruction (GRK) No.04/2009) on the control of emissions of volatile organic compounds during the storage, emptying, filling and transportation of fuels;
- ✓ Administrative Instruction (GRK) No.16/2013 on substances that damage the ozone layer and fluorinated greenhouse gases;
- ✓ Administrative Instruction (GRK)–No.19/2013 on access to information on fuel economy and CO2 emissions of new personal vehicles;
- ✓ Administrative Instruction (GRK)–No.01/2016 on the mechanism for monitoring greenhouse gas emissions;

1.2. Information on Air Quality Alert Thresholds

Information and alert thresholds for air quality are defined in accordance with the Law on Protection of Air from Pollution No. 08/L-025 and Administrative Instruction No. 02/2011 on Air Quality Standards (*Table.1*).

Table 1. Alert Threshold Values for PM₁₀, O₃, NO₂, SO₂

Pollutant	Alert	Alert Threshold
PM ₁₀ ,	100 µg/m ³ (in 24 hours)	100 µg/m ³ (in 24 hours for 3 consecutive days)
O ₃ ,	180 µg/m ³ (in 1 hour)	240 µg/m ³ (in 1 hour)
NO ₂ ,	—	400 µg/m ³ (in 1 hour)
SO ₂	—	500 µg/m ³ (in 1 hour)

1.3. Description of Air Pollutants

The atmospheric pollutants monitored within the state air quality monitoring network represent substances that have a direct impact on human health and the environment. The following presents a description of the main pollutants assessed in this report.

PM₁₀ (suspended particles with an aerodynamic diameter $\leq 10 \mu\text{m}$)

Impact on health: PM₁₀ particles penetrate the respiratory tract and may cause irritation of the airways, respiratory inflammation and aggravation of existing pulmonary diseases, such as asthma and chronic bronchitis. Long-term exposure is associated with an increase in respiratory problems within the population.

Impact on the environment: PM₁₀ contributes to the deposition of pollutants on soil and water surfaces, affects vegetation and causes a reduction in atmospheric visibility.

PM_{2.5} (suspended particles with an aerodynamic diameter $\leq 2.5 \mu\text{m}$)

Impact on health: Due to their small size, PM_{2.5} particles penetrate deep into the lungs and may enter the bloodstream, being associated with an increased risk of cardiovascular and respiratory diseases, as well as increased premature mortality.

Impact on the environment: These particles contribute to the formation of atmospheric aerosols and the reduction of visibility, affecting the visual quality of the environment and the local atmospheric balance.

CO (Carbon Monoxide)

Impact on health: Carbon monoxide reduces the blood's capacity to transport oxygen by forming carboxyhaemoglobin, which may cause fatigue, dizziness and, at high concentrations, serious health consequences.

Impact on the environment: CO indirectly contributes to atmospheric photochemical processes and the formation of tropospheric ozone

O₃ (Tropospheric Ozone)

Impact on health: Ozone is an oxidising pollutant that negatively affects the respiratory system, causing irritation of the airways, reduced pulmonary function and aggravation of respiratory diseases.

Impact on the environment: Ozone damages vegetation, reduces photosynthesis and agricultural productivity, and affects natural ecosystems.

SO₂ (Sulphur Dioxide)

Impact on health: SO₂ is an irritating gas that causes constriction of the airways and respiratory symptoms, particularly among individuals with respiratory sensitivities.

Impact on the environment: In the atmosphere, it is transformed into acidic compounds that contribute to acid rain and the acidification of soil and surface waters.

NO₂ (Nitrogen Dioxide)

Impact on health: NO₂ contributes to inflammation of the airways and increases susceptibility to respiratory infections, particularly among sensitive population groups.

Impact on the environment: It participates in the formation of tropospheric ozone and secondary particles, and contributes to the processes of acidification and eutrophication of ecosystems.

2. Air Quality

2.1. Air Quality Monitoring

Air quality monitoring constitutes a key element in assessing the impact of atmospheric pollution on public health and the environment. Within the national air quality monitoring system, the territory of the Republic of Kosovo is divided into two main monitoring units: the AKS1 Agglomeration and the ZKS1 Zone, in accordance with the requirements for air quality assessment and management.

The **AKS1 Agglomeration** includes urban and industrial areas with a high density of population and economic activities, where the pressure from air pollution is considered to be higher. In this agglomeration, air quality monitoring is carried out continuously through six monitoring stations: KHMI, Rilindja–Prishtina, Palaj, Obiliq, Dardhishtë and Kodra e Trimave. These stations are equipped with automatic instruments for measuring suspended particles (PM₁₀ and PM_{2.5}) as well as the main gaseous pollutants (CO, NO₂, SO₂ and O₃), providing continuous and comparable data for the assessment of air quality.

The **ZKS1 Zone** includes the remaining parts of the territory that are not classified as large urban agglomerations but are important for assessing the spatial distribution and regional trends of air pollution. In this zone, seven monitoring stations operate in Drenas, Mitrovica, Peja, Prizren, Brezovica, Hani i Elezit and Gjilan. The strategic placement of these stations enables the widest possible geographical coverage and provides data for comparative analysis between urban and regional areas.

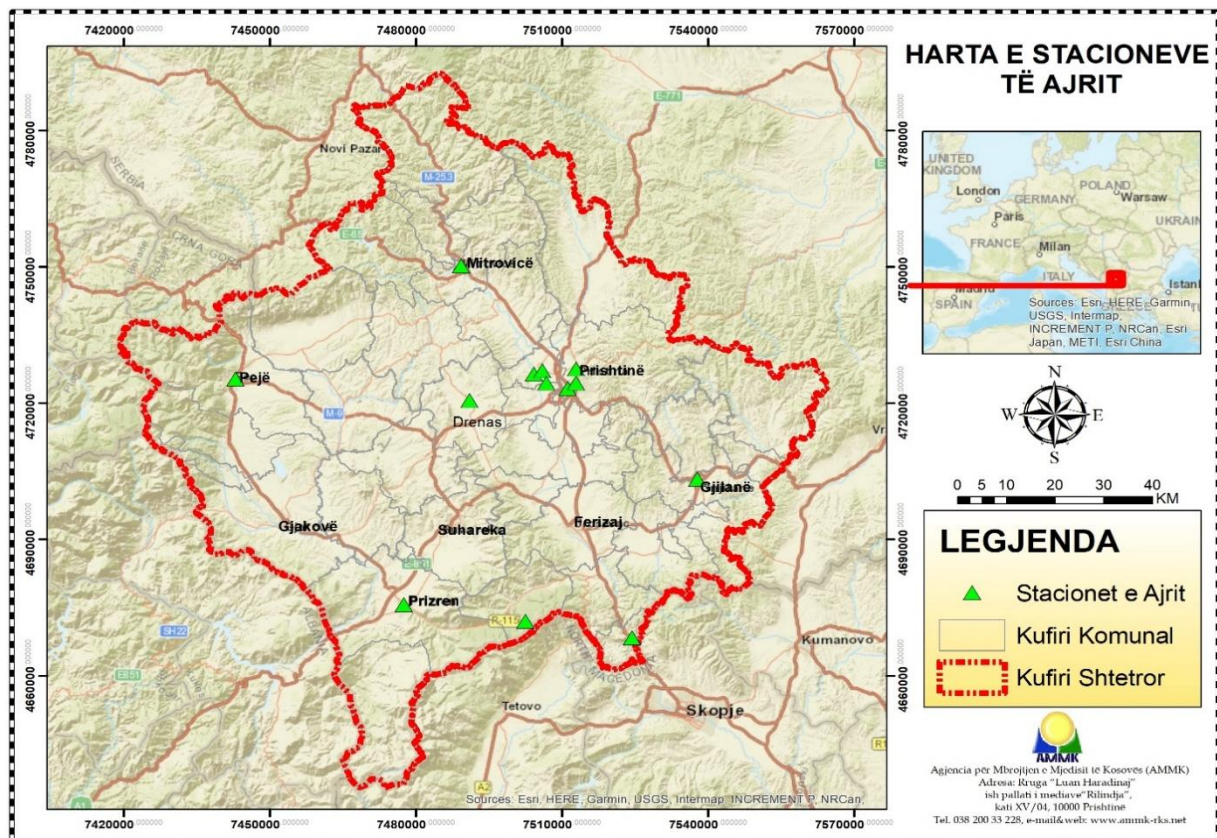


Fig.1. Locations of air quality monitoring stations

2.2. AKS1 Agglomeration - Air Quality

PM₁₀

The data for 2025 indicate that the highest levels of air pollution occurred during the winter months (January, February and December), when concentrations were significantly elevated at all monitoring stations. The Rilindja and Kodra e Trimave stations recorded the highest monthly averages, suggesting greater exposure to air pollution. During the summer months (May–September), a considerable decrease in concentrations was observed, which is associated with more favourable atmospheric conditions and reduced use of heating. The Palaj station recorded lower values compared to the other stations throughout the year. Overall, the seasonal trend indicates a strong influence of winter activities and meteorological conditions on air quality.

Table 2. Monthly average values of PM₁₀ µg/m³ in the AKS1 agglomeration

Month	KHMI	Rilindje	Palaj	Obiliq	Dardhishte	Kodra e Trimave
January	35	48	23	40	27	51
February	34	43	21	31	25	39
March	26	32	18	21	18	24
April	14	21	9	13	11	15
May	10	15	7	8	8	10
June	14	21	8	10	13	18
July	13	20	9	7	13	15
August	13	17	10	5	14	13
September	11	17	7	5	10	11
October	16	23	10	11	10	17
November	11	25	11	16	23	23
December	41	47	19	32	23	49

The graph below presents the annual average value for the PM₁₀ parameter, which remained within the annual standard of 40 µg/m³.

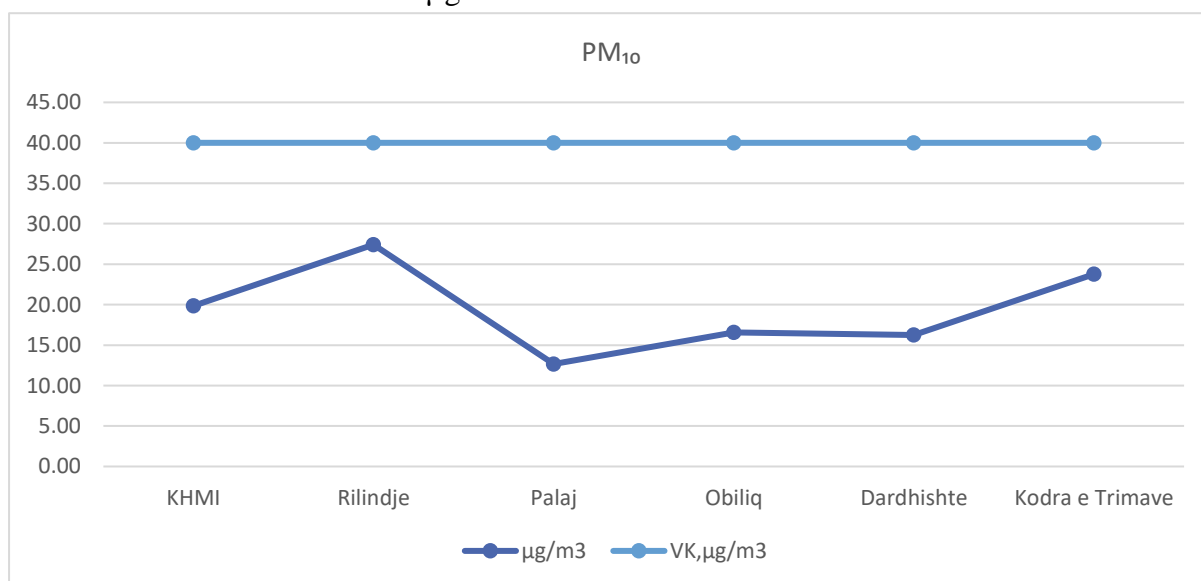


Fig. 2. Annual average PM₁₀ values in the AKS1 agglomeration, 2025

PM_{2.5}

The data show a clear seasonal variation in air quality, with higher concentrations during the winter months (January, February and December), particularly at the Rilindja and Kodra e Trimave stations. These elevated levels are associated with less favourable atmospheric dispersion conditions (thermal inversions and stable air masses) and increased urban pollution during the heating season. During the spring period (March–May), a gradual improvement in air quality is observed, with decreasing concentrations at all monitoring stations. The summer period (June–September) is characterised by better air quality and relative stability among the monitoring locations. From October, a progressive deterioration in air quality begins, reaching elevated levels again towards the end of the year. From a spatial perspective, the more densely populated urban areas (Rilindja and Kodra e Trimave) exhibit poorer air quality compared to stations such as Palaj and Dardhishtë, reflecting the influence of traffic and urban activities.

Table 3. Monthly average values of PM_{2.5} µg/m³ in the AKSI agglomeration AKSI

Month	KHMI	Rilindje	Palaj	Obiliq	Dardhishte	Kodra e Trimave
January	30	40	20	30	24	44
February	27	34	17	24	21	33
March	16	20	11	14	12	17
April	9	13	6	8	7	10
May	6	9	4	5	4	6
June	8	11	5	5	6	8
July	7	10	4	5	5	6
August	7	9	5	5	5	6
September	6	9	4	4	5	6
October	11	15	7	11	9	13
November	11	19	9	6	17	18
December	32	38	17	25	20	39

The graph below presents the annual average values for the PM_{2.5} parameter, which remained within the annual standard of 25 µg/m³ (see Fig. 3.)

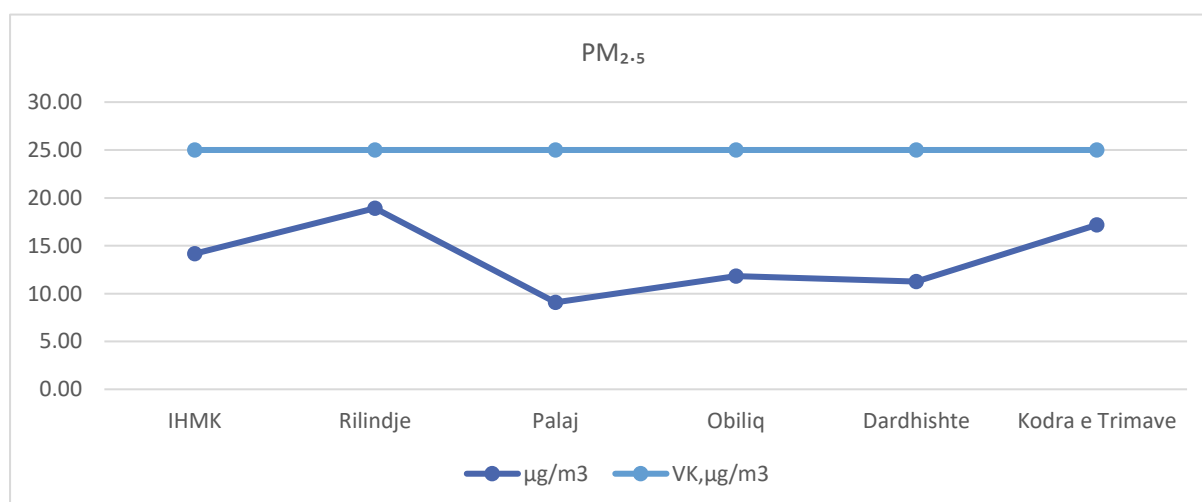


Fig. 3. Annual Average PM_{2.5} Values in the AKSI Agglomeration, 2025

O₃

The data show a typical seasonal variation in ozone concentrations, with low levels during the winter and a significant increase during the spring and summer periods. Peak concentrations are observed from April to August, particularly at the Rilindja and Kodra e Trimave stations. This is associated with the photochemical formation of ozone in the presence of strong solar radiation and high temperatures. During the winter period, due to the absence of these conditions, concentrations remain lower. Differences between the monitoring stations reflect the influence of local urban conditions and sources of ozone precursors.

Table 4. Monthly average values of O₃ µg/m³ in the AKSI agglomeration

Month	KHMI	Rilindje	Palaj	Obiliq	Dardhishte	Kodra e Trimave
January	18	20	24	22	20	25
February	40	40	40	31	26	36
March	17	53	43	40	45	54
April	16	53	44	29	49	59
May	17	61	47	9	53	69
June	26	77	34	65	55	83
July	27	75	40	55	56	84
August	24	73	58	55	54	82
September	32	52	39	37	38	62
October	25	31	22	25	24	37
November	20	21	17	10	15	25
December	12	14	13	13	15	17

The graph shows the average annual values of O₃, which during 2025 was below the standard allowed values of 120 µg/m³. (See Fig. 4.)

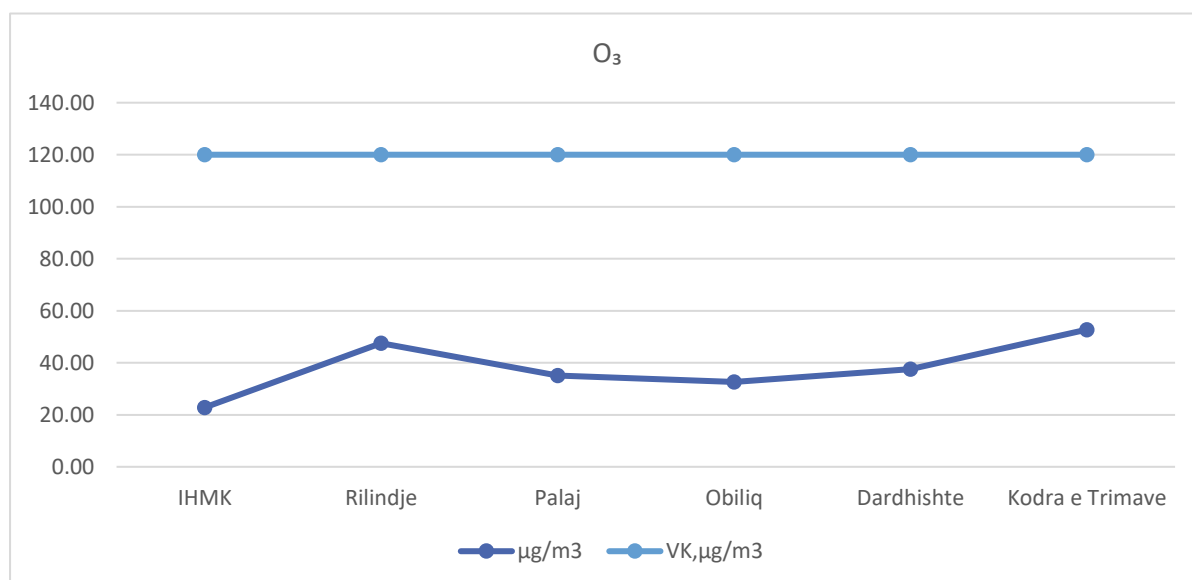


Fig. 4. Annual limit values of O₃ (µg/m³) in AKSI for 2025

SO₂

The SO₂ data show a seasonal variation, with higher concentrations during the autumn–winter period and lower levels during the spring–summer period. The most pronounced peaks are observed in October–November, particularly at the Obiliq station, indicating a strong influence from local sources. During the summer, concentrations are lower and more stable across all monitoring stations. The increase during the cold season is associated with less favourable pollutant dispersion conditions and higher activity of pollution sources. Overall, Obiliq appears to be the most heavily affected area, while the other stations exhibit more moderate variations.

Table 5. Monthly average values of SO₂ µg/m³ in the AKS1 agglomeration

MONTH	KHMI	RILINDJE	PALAJ	OBILIQ	DARDHISHTE	KODRA E TRIMAVE
JANUARY	10	12	2	15	13	13
FEBRUARY	3	10	1	22	13	11
MARCH	6	13	3	12	12	11
APRIL	8	15	3	12	9	11
MAY	6	17	4	12	8	11
JUNE	9	22	5	13	8	13
JULY	21	26	7	16	9	13
AUGUST	23	27	5	15	7	12
SEPTEMBER	26	29	5	14	6	13
OCTOBER	27	31	6	15	6	13
NOVEMBER	31	21	7	74	9	15
DECEMBER	7	3	7	52	6	11

The graph in Fig. 5 presents the data for the annual average of the SO₂ parameter, which remained within the standard of 125 µg/m³.

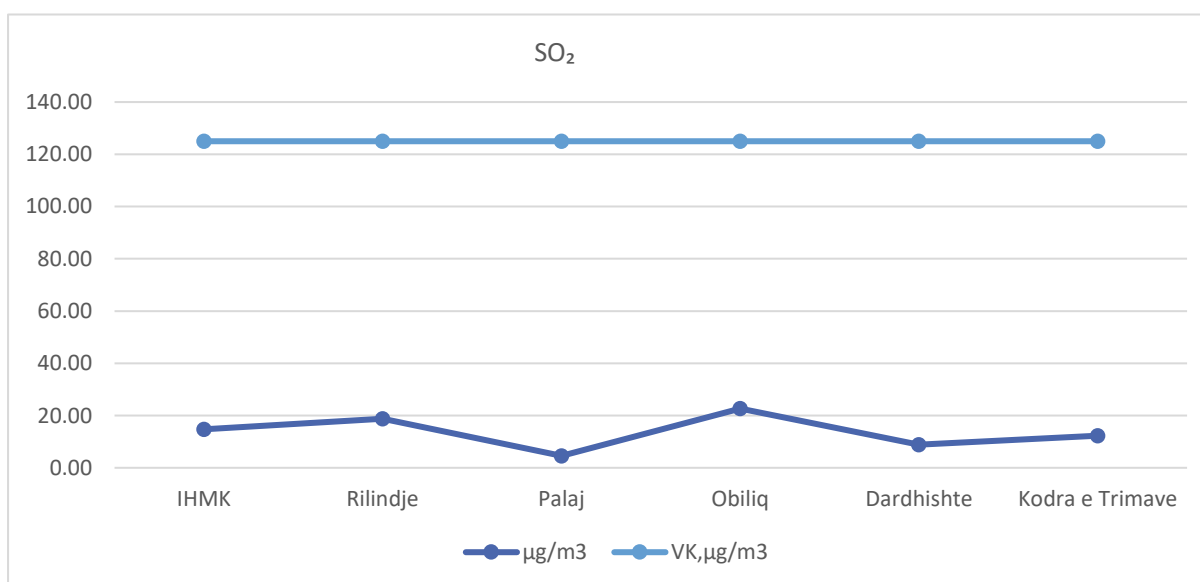


Fig. 5. Graphical representation of the average annual values of SO₂ in AKS1, 2025

NO₂

The NO₂ data show a relatively moderate seasonal variation, with higher levels in winter and early spring. The maximum values are observed in January–March, particularly at the KHMI and Rilindja stations, reflecting the influence of traffic and urban activity. During spring and summer (April–September), a gradual decrease and stabilization of concentrations is observed. In autumn and winter (October–December), a slight increase is noted, associated with less favourable pollutant dispersion conditions. Spatial differences indicate higher levels in urban areas, while Palaj and Dardhishtë show lower concentrations.

Table 6. Average monthly values of NO₂ µg/m³, in AKSI

Month	KHMI	Rilindje	Palaj	Obiliq	Dardhishte	Kodra e Trimave
January	34	33	13	12	6	21
February	42	34	10	11	5	18
March	40	34	9	9	5	15
April	36	25	6	9	3	9
May	35	23	5	14	3	8
June	31	24	7	6	3	9
July	31	26	8	6	4	8
August	35	28	8	6	4	11
September	32	26	7	6	3	11
October	31	23	7	8	3	13
November	27	24	9	8	4	16
December	37	26	11	9	5	17

The graph below shows the data for the annual average of NO₂, the average of which was below the allowed values of the standard value of 40 µg/m³. (See fig. 6)

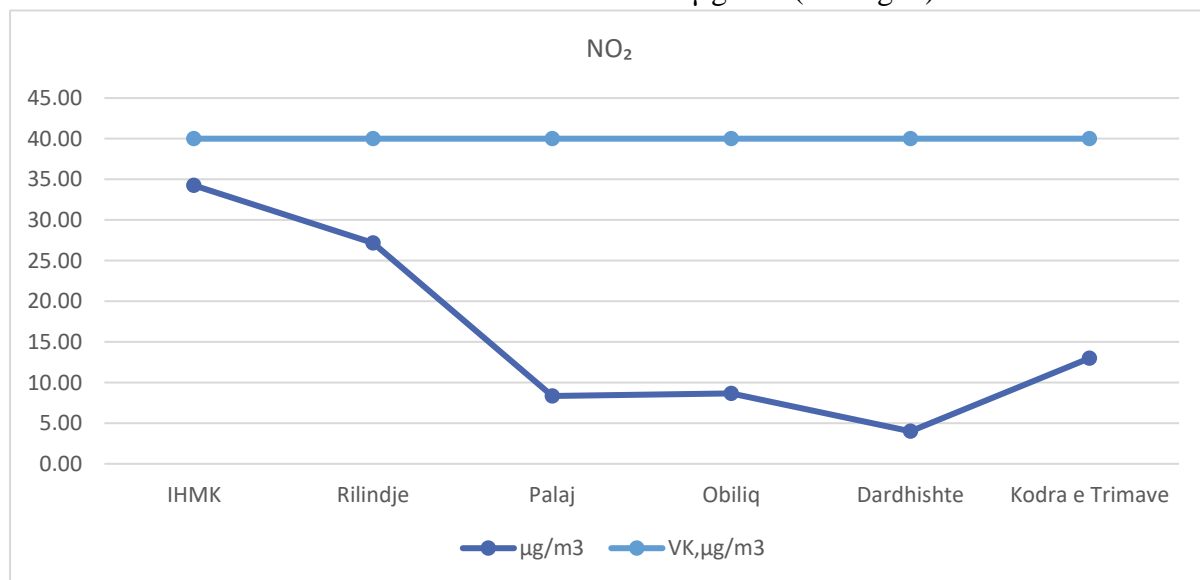


Fig. 6. Graphical presentation of average annual NO₂ values, in AKSI, 2025

CO

The CO data show a clear seasonal variation, with higher levels during winter and lower levels during summer. Peaks are observed in December and January, particularly at the KHMI and Obiliq stations, reflecting the influence of heating and traffic. During spring and summer, concentrations decrease significantly and remain relatively low. In autumn, a gradual increase in levels begins, in parallel with the start of the cold season. Differences between stations are moderate, but urban areas and those influenced by energy production show higher values.

Table 7. Monthly average values of CO mg/m³ in the AKSI agglomeration

Month	KHMI	Rilindje	Palaj	Obiliq	Dardhishte	Kodra e Trimave
January	1.3	0.8	1	1.8	0.9	1.2
February	0.8	0.3	0.5	1.3	1.2	1
March	0.8	0.3	0.6	1.1	0.6	0.8
April	0.5	0.3	0.6	0.9	0.6	0.8
May	0.7	0.3	0.7	0.8	0.4	0.3
June	0.9	0.4	0.6	0.7	0.5	0.2
July	0.3	0.5	0.4	0.6	0.3	0.4
August	0.2	0.5	0.5	0.8	0.5	0.2
September	0.5	0.5	0.5	0.8	0.4	0.3
October	0.5	0.6	0.6	0.6	0.5	0.5
November	1.3	0.7	0.8	1.1	0.7	0.6
December	2.2	0.9	1.2	1.5	0.8	1.1

The graph shows data on the annual average of CO, which was within the allowed values of 10 mg/m³. (See Fig. 7)

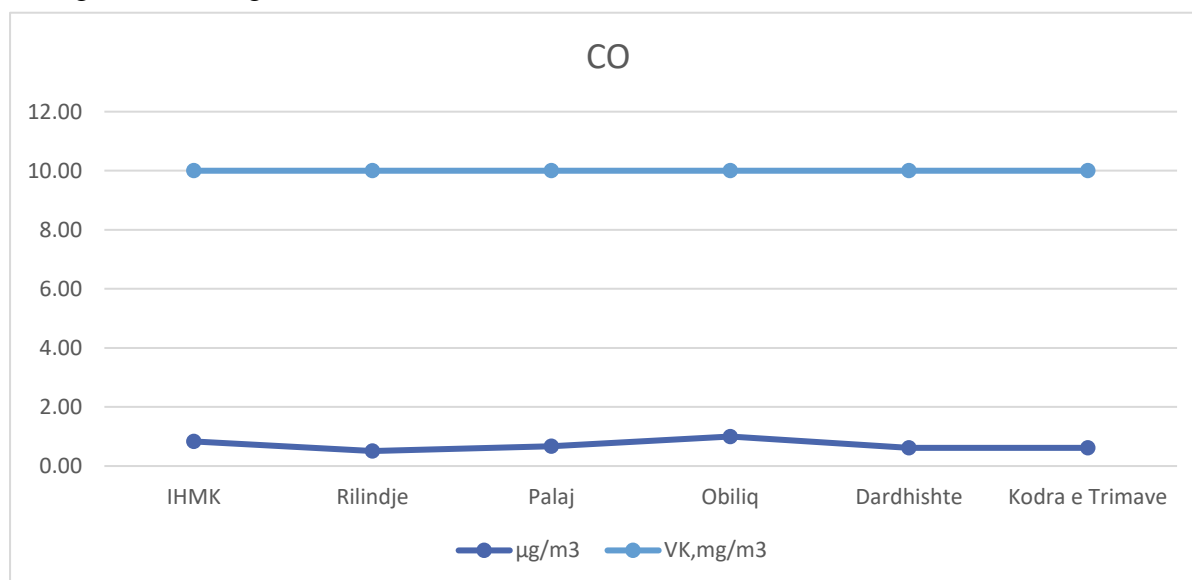


Fig. 7. Graphic presentation of annual average values of CO, in AKSI, 2025

2.3 ZKS1 Zone – Air Quality

PM₁₀

The table below presents the monthly average concentration values of PM₁₀, based on monitoring data provided by the monitoring stations. The analysis of the recorded data shows that during the reporting period, PM₁₀ concentrations remained within the limit values defined by air quality standards and legislation, with no exceedances of the permitted thresholds identified.

Table 8. Monthly average PM₁₀ µg/m³ values in ZKS1, 2025

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	22	41	32	23	29	36
February	31	38	25	33	25	28
March	20	26	12	13	15	18
April	12	14	11	9	8	11
May	8	11	9	6	7	7
June	22	14	12	7	10	12
July	20	14	11	7	8	11
August	19	13	9	6	8	11
September	14	11	7	6	7	9
October	14	17	11	8	9	15
November	13	21	23	8	12	30
December	23	37	28	24	22	27

The graph shows data on the annual average of the PM₁₀ parameter, a parameter that has been below the allowed values according to the annual standard, which is 40 µg/m³.

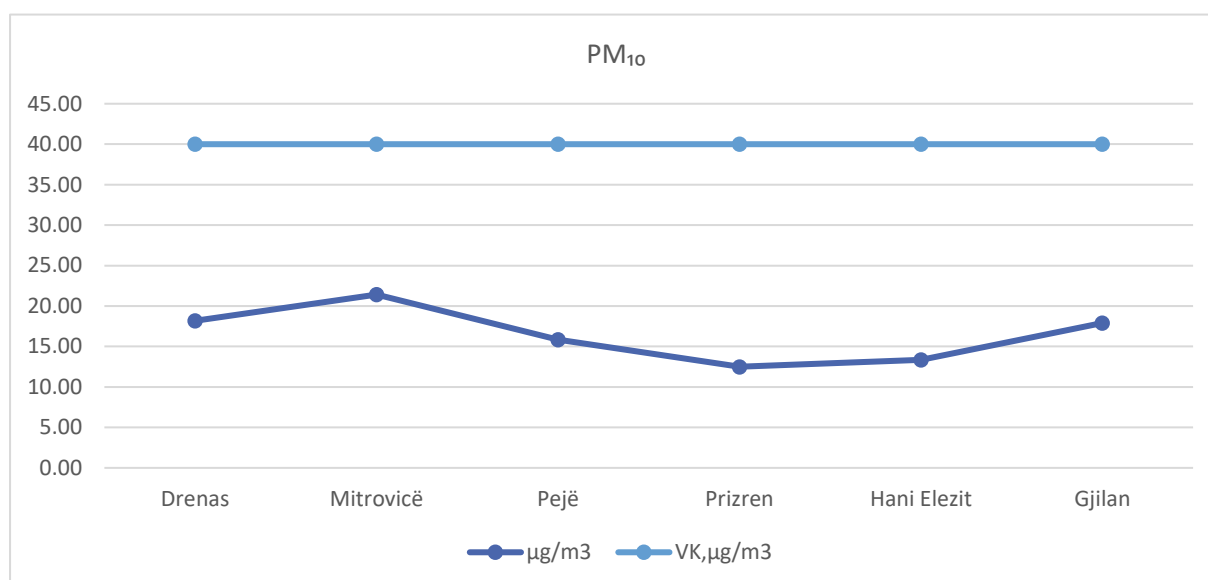


Fig.8 Graphic presentation of the annual average values of PM₁₀, in ZKS1, 2025

PM_{2.5}

The PM_{2.5} data show a clear seasonal pattern throughout the year, with higher values in the winter months (January, February and December) across all cities included. Mitrovica and Gjilan show the highest concentrations, reaching peaks of up to 37 µg/m³ and 34 µg/m³, respectively, mainly associated with heating and anthropogenic activities. During the spring–summer period, a significant decrease in values is observed, reflecting an improvement in air quality. Prizren and Hani i Elezit show lower and more stable levels throughout the year. Overall, the data indicate a strong seasonal influence on PM_{2.5} concentrations and more pronounced pollution during the cold season.

Table 9. Average monthly values of PM_{2.5} µg/m³, in ZKSI, 2025

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	20	37	27	20	27	34
February	22	32	22	28	22	26
March	12	18	10	10	11	14
April	7	9	7	6	6	9
May	4	7	6	3	4	5
June	9	8	7	4	7	8
July	7	7	6	4	5	7
August	7	8	6	4	5	7
September	6	7	5	4	4	6
October	8	14	10	7	7	13
November	10	18	18	6	10	21
December	19	33	26	21	21	26

The graph presents the data for the annual average of the PM_{2.5} parameter, the average of which was below the allowed values according to the standard, which is 25 µg/m³,(Fig.9).

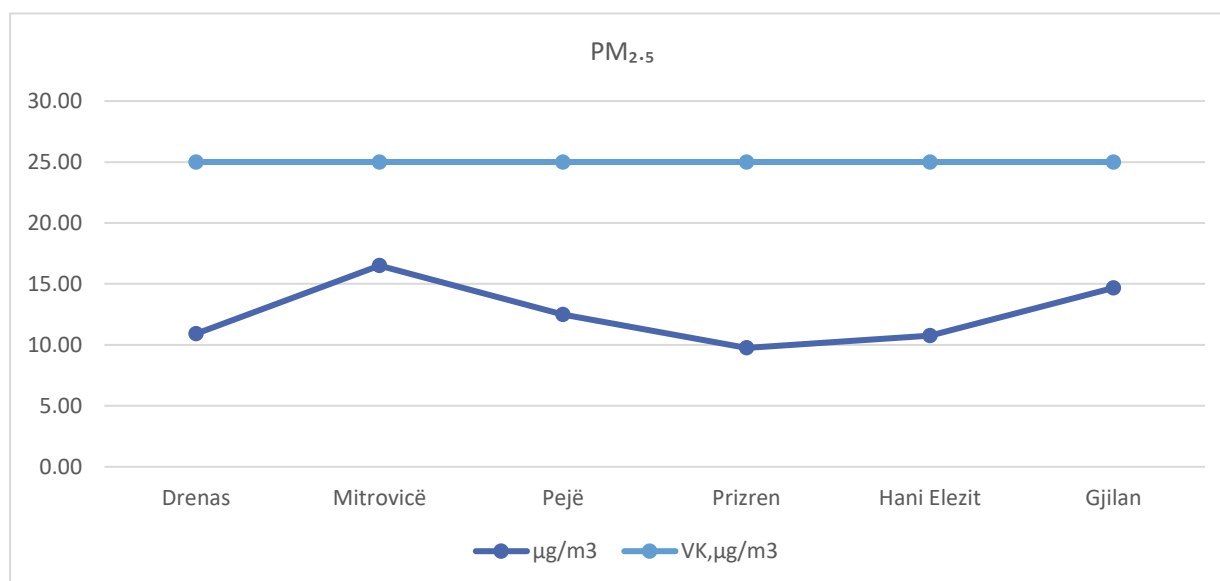


Fig. 9. Graphic presentation of the annual average values of PM_{2.5}, in ZKSI, 2025

O₃

The data show a seasonal trend opposite to that of particulate pollutants, with lower values during winter and a significant increase during the spring–summer period. The highest concentrations are recorded in June, July and August, which is associated with higher solar radiation intensity and photochemical processes in the atmosphere. Peja and Hani i Elezit record the highest values during the summer season, with peaks of up to 84 $\mu\text{g}/\text{m}^3$ and 85 $\mu\text{g}/\text{m}^3$, respectively. Gjilan and Prizren also show a gradual increase during the warm months, but at more moderate levels. During the winter months, values remain relatively low across all monitoring stations. Overall, the data reflect the influence of meteorological conditions and photochemical reactions on the formation and dispersion of this atmospheric pollutant..

Table 10. Average monthly O₃ $\mu\text{g}/\text{m}^3$ values, in ZKSI, 2025

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	38	14	23	27	24	16
February	34	21	40	29	42	20
March	51	28	59	34	56	22
April	59	30	64	34	62	22
May	67	27	69	35	61	25
June	69	34	81	54	78	41
July	73	33	81	59	85	55
August	73	30	84	57	78	55
September	51	19	63	38	56	37
October	38	13	37	22	32	32
November	25	9	20	22	23	16
December	16	6	14	14	25	15

The graph shows the annual average values for O₃, which during 2020 was the standard values of 120 $\mu\text{g}/\text{m}^3$. (See Fig. 10.)

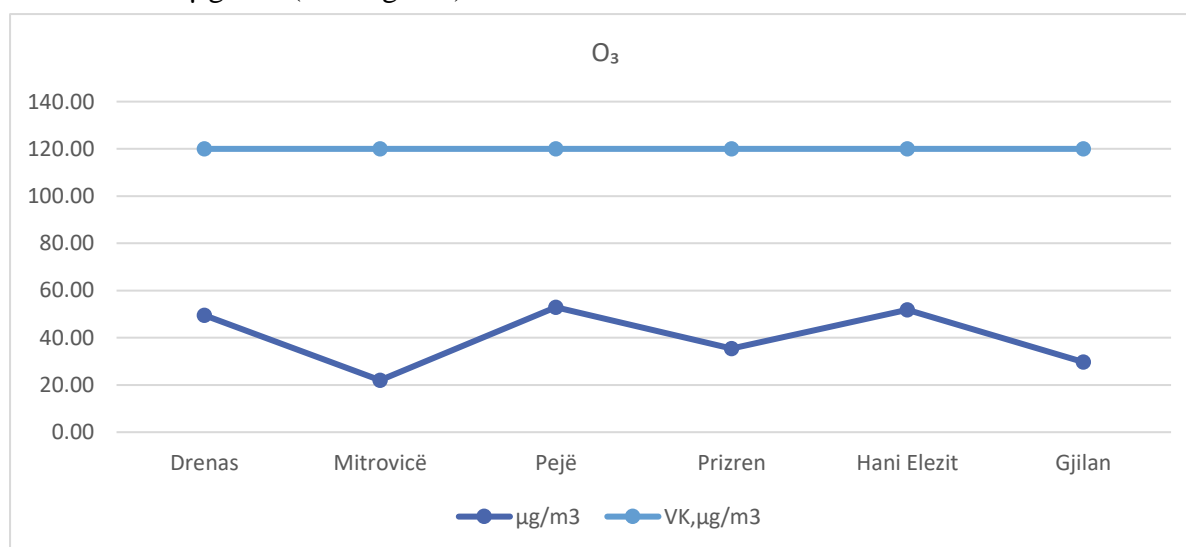


Fig. 10. Graphical presentation of annual average values of O₃, in ZKSI, 2025

SO₂

The SO₂ data show that concentrations were generally low and stable throughout the year across all monitoring stations. The highest values were recorded mainly during the winter months and early spring, particularly in Drenas and Gjilan, which may be linked to heating activities and industrial sources. During the summer months, a decrease in concentrations is observed in most locations, reflecting more favourable conditions for pollutant dispersion in the atmosphere. Prizren shows the lowest and most stable SO₂ levels throughout the year. Overall, the data indicate no significant exceedances and relatively low concentrations of sulphur dioxide across all monitoring areas.

Table 11. Average monthly SO₂ µg/m³ values, in ZKS1, 2025

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	15	8	7	5	3	13
February	18	9	6	7	4	7
March	17	8	6	5	4	4
April	14	6	9	5	4	2
May	4	5	13	6	6	3
June	5	4	11	4	8	4
July	7	4	6	2	10	7
August	7	4	6	2	8	3
September	4	4	6	2	7	3
October	5	4	7	2	7	7
November	6	6	5	6	7	10
December	5	8	1	4	7	7

The graph shows the data for the annual average of the SO₂ parameter, this average was below the allowed standard value of 125 µg/m³, (Fig. 11.)

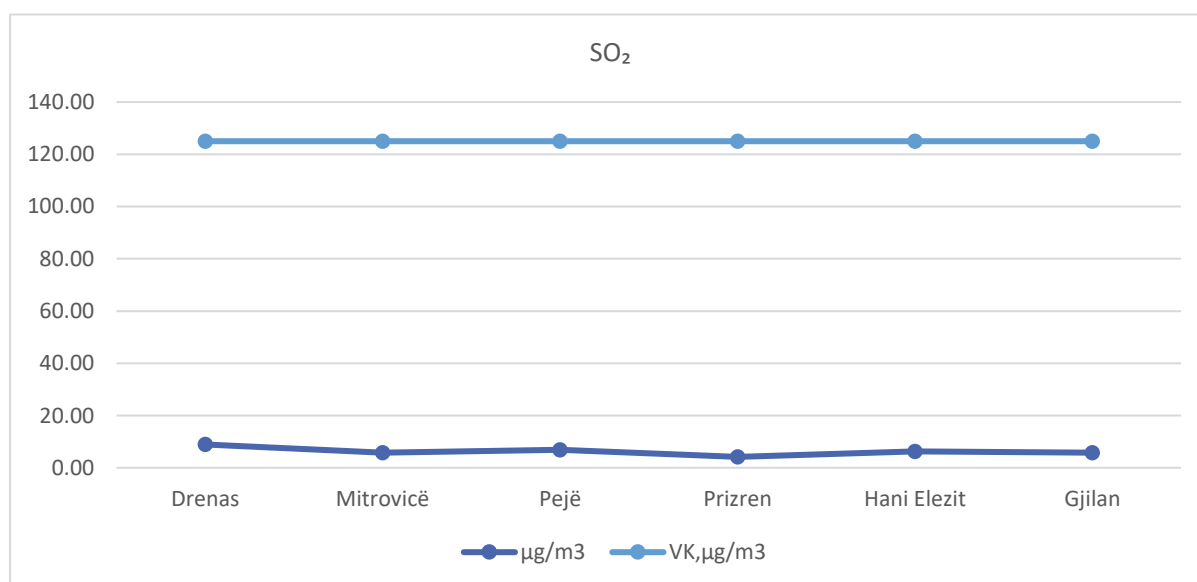


Fig. 11. Graphic presentation of average annual values of SO₂, in ZKS1, 2025

NO₂

The NO₂ data show relatively stable concentrations throughout the year, with higher values observed mainly during the winter and autumn months. Peja, Mitrovica, and especially Prizren record the highest nitrogen dioxide levels, with values reaching up to 30 µg/m³ in some months. Prizren shows more consistent and higher concentrations compared to other locations throughout the year. During the spring–summer period, a slight decrease in concentrations is observed at most monitoring stations as a result of more favourable atmospheric conditions for pollutant dispersion. Gjilan and Hani i Elezit record lower NO₂ levels during the reporting period. Overall, the data reflect the influence of traffic, urban activities, and combustion sources on NO₂ concentrations in the air.

Table 12. Average monthly NO₂ µg/m³ values in ZKSI

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	16	24	27	25	24	13
February	21	22	23	30	18	13
March	15	18	15	26	15	15
April	10	8	10	23	10	12
May	8	6	8	24	12	11
June	11	14	8	19	7	12
July	12	15	10	20	6	16
August	14	17	12	22	6	15
September	14	15	11	24	6	12
October	13	14	17	27	7	10
November	16	18	24	27	8	12
December	20	24	28	26	10	12

The graph presents the data for the annual average of the NO₂ parameter, the average of which was below the allowed standard value of 40 µg/m³. (See Fig. 12)

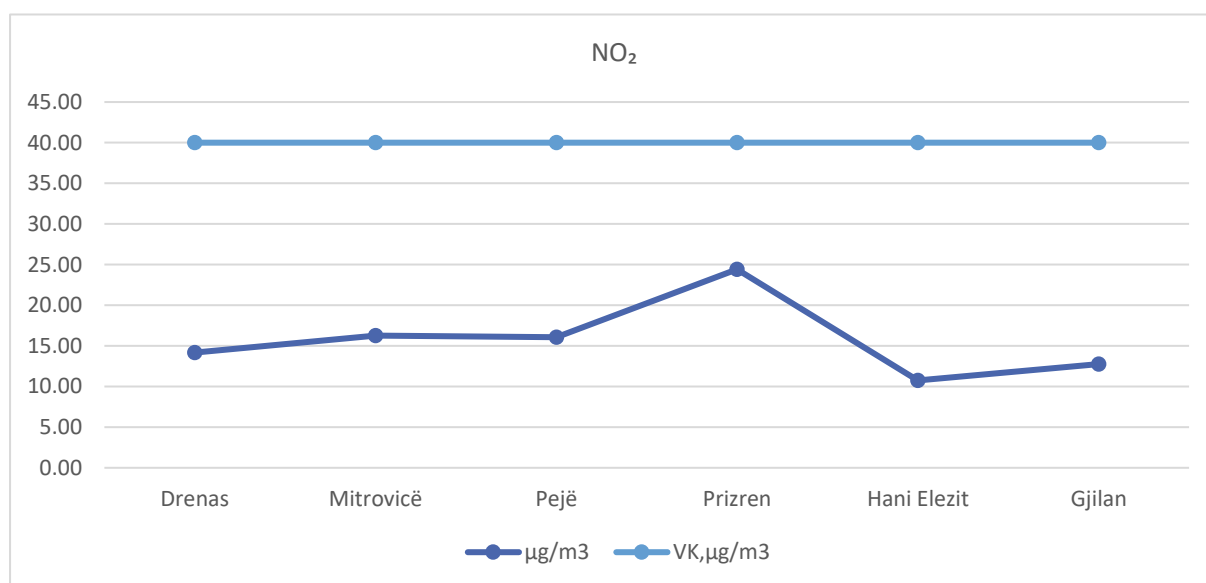


Fig.12. Graphic presentation of annual average values of NO₂ in ZKSI, 2025

CO

The CO data show low and relatively stable concentrations throughout the year across all monitoring stations. The highest values were recorded mainly during the winter months, particularly in Peja and Prizren, which may be linked to heating-related combustion processes and increased urban traffic. During the summer season, a gradual decrease in concentrations is observed in most locations as a result of more favourable atmospheric conditions and better air ventilation. Overall, CO concentrations remained at low levels, with no significant risk identified for air quality during the monitoring period.

Table 13. Average monthly CO mg/m³ values in ZKSI

Month	Drenas	Mitrovicë	Pejë	Prizren	Hani Elezit	Gjilan
January	1.1	0.9	2.1	1.5	1.1	1.4
February	1	0.5	1.3	1.4	0.9	0.6
March	0.8	0.4	1	0.9	0.8	0.4
April	1	0.2	1	0.9	0.6	0.3
May	0.6	0.2	0.9	0.9	0.6	0.2
June	0.4	0.3	1	0.7	0.5	0.2
July	0.3	0.2	0.8	0.5	0.3	0.2
August	0.3	0.2	0.4	0.5	0.3	0.2
September	0.5	0.5	0.4	0.6	0.3	0.2
October	0.8	0.7	0.6	0.8	0.4	0.4
November	0.5	0.4	0.8	0.4	0.5	0.7
December	0.8	0.8	1.7	1	0.8	1

The graph below shows the data for the annual average of the CO parameter, the average of which was below the allowed standard value of 10 mg/m³. (See Fig. 13)

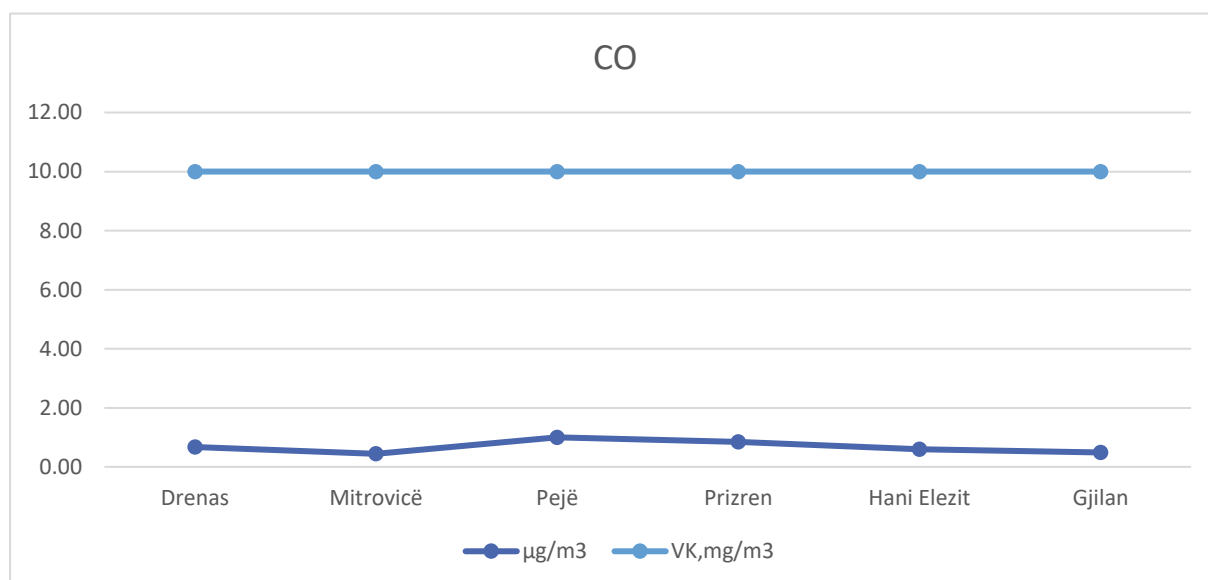


Fig.13. Graphical representation of average annual CO values in ZKSI, 2025

2.4 Days with PM₁₀ Exceedances during 2025

The data present the number of days with exceedances of the PM₁₀ limit value during 2025, with a total of 171 exceedance days recorded across all monitoring stations. The highest number of exceedance days was recorded at the Rilindja station with 43 days, followed by Prizren with 32 days and Gjilan with 26 days. KHMI recorded 21 days, while Mitrovica recorded 16 days of exceedances. Exceedances were mainly concentrated during the winter season. January recorded the highest number of exceedance days with 73 days, followed by December with 46 days and February with 34 days. In March, 10 exceedance days were recorded, while November had 8 days. During the period April–October, no exceedances of the PM₁₀ limit value were observed at the monitoring stations.

Table 14. Number of days with PM₁₀ exceedances, 2025

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot.
KHMI	7	4	2	0	0	0	0	0	0	0	0	8	21
Rilindje	15	10	3	0	0	0	0	0	0	0	1	14	43
Palaj	1	0	0	0	0	0	0	0	0	0	0	0	1
Obiliq	10	1	1	0	0	0	0	0	0	0	1	3	16
Dardhishtë	3	0	0	0	0	0	0	0	0	0	0	2	5
K. Trimave	13	8	0	0	0	0	0	0	0	0	0	11	32
Drenas	1	3	2	0	0	0	0	0	0	0	0	0	6
Mitrovicë	10	7	2	0	0	0	0	0	0	0	0	7	26
Pejë	5	0	0	0	0	0	0	0	0	0	2	0	7
Prizren	2	1	0	0	0	0	0	0	0	0	0	0	3
Hani Elezit	3	0	0	0	0	0	0	0	0	0	0	1	4
Gjilan	3	0	0	0	0	0	0	0	0	0	4	0	7
2025	73	34	10	0	0	0	0	0	0	0	8	46	171

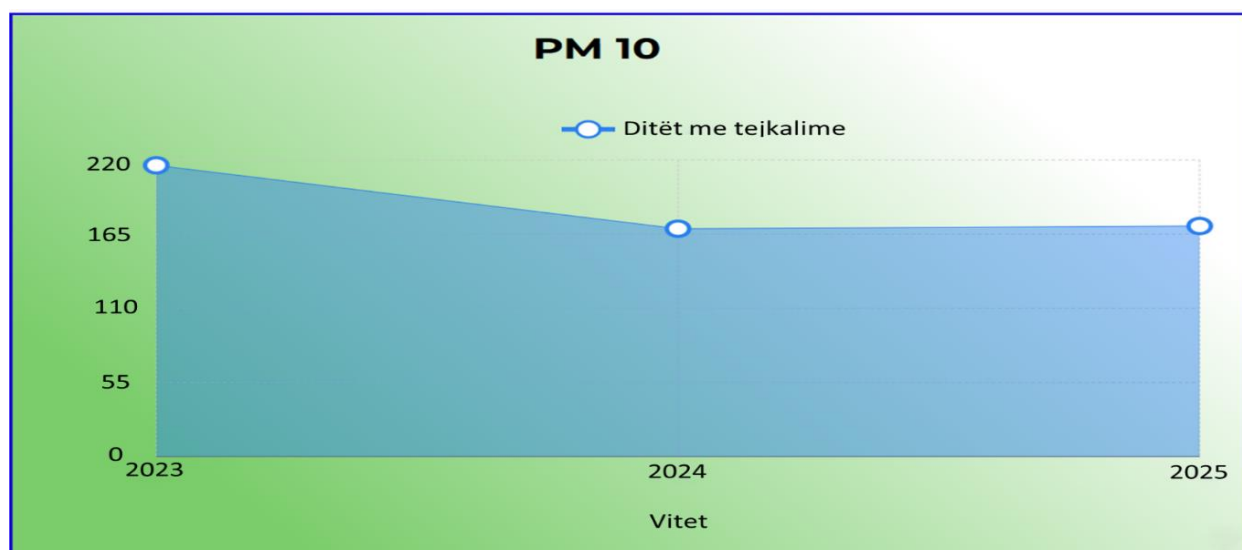


Fig.14. Graphic representation of the number of days with exceedances for PM₁₀ during the years 2023, 2024 and 2025

2.5 Air quality trends for the period 2013–2025

The data present the long-term air quality trend for the period 2013–2025 and show noticeable changes in the concentrations of key atmospheric pollutants. PM₁₀ concentrations have shown a gradual decrease over the years. From 42.3 µg/m³ in 2013, the concentration declined to 17.97 µg/m³ in 2025, indicating a clear improvement in air quality and a reduction in particulate pollution. A similar trend is observed for PM_{2.5}, where values decreased from 28.86 µg/m³ in 2013 to 13.13 µg/m³ in 2025, although higher levels were recorded in 2015 and 2018. Nitrogen dioxide (NO₂) concentrations fluctuated over the years, with higher values observed during the 2015–2018 period, while after 2020 a relative decrease and stabilization of levels is observed. Carbon monoxide (CO) also shows a declining trend, decreasing from 0.72 mg/m³ in 2013 to 0.69 mg/m³ in 2025, with higher values recorded in 2015–2016. Regarding sulphur dioxide (SO₂), the data show significant fluctuations, with the highest value recorded in 2018 at 34.65 µg/m³. After this year, a marked decrease and stabilization at lower levels is observed. Ozone (O₃), meanwhile, does not show a clear downward trend. Values have fluctuated over the years, with relatively high levels in 2013, 2021, and 2024, while in 2025 a decrease to 39.13 µg/m³ was recorded. Overall, the data indicate a gradual improvement in air quality in recent years, particularly for PM₁₀ and PM_{2.5}, which are considered among the most harmful pollutants to human health. However, fluctuations in pollutants such as O₃ and SO₂ indicate the need for continuous monitoring and ongoing measures for air pollution management.

Table 15. Air quality data from 2013 to 2025

Years	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
PM ₁₀	42.3	34.69	43.77	39.46	33.13	41.57	29.96	27.6	22.29	22.21	18.97	18.23	17.97
PM 2.5	28.86	18.73	33.87	17.91	25.36	25.43	20.75	20.58	16.66	16.06	14.11	12.98	13.13
O ₃	59.9	41.37	38.09	47.66	26.22	45.18	43.02	48.99	50.57	47.05	47.81	50.59	39.13
SO ₂	6.37	13.6	14.7	20.63	16.19	34.65	11.05	12.55	10.64	9.4	8.53	8.62	9.99
NO ₂	15.57	16.56	21.45	27.35	26.22	26.45	23.91	15.04	12.25	15.12	13.52	13.7	15.82
CO	0.72	1.2	2.18	2.36	1.93	1.87	1.05	0.98	0.8	0.7	0.61	0.62	0.69

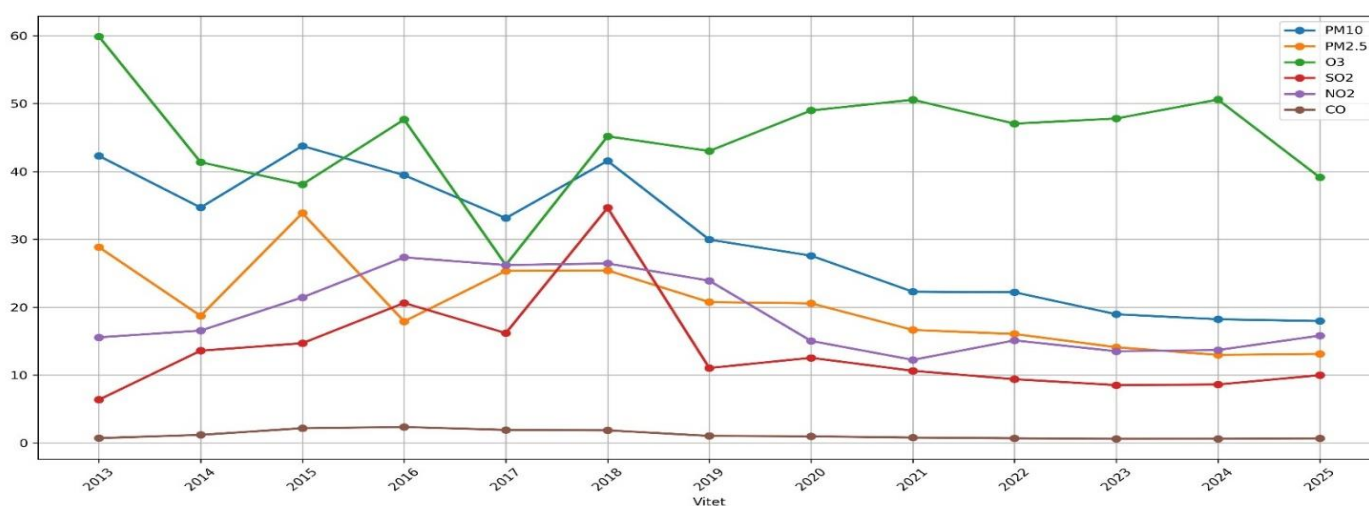


Fig. 15. Air quality trend from 2013 to 2025

3. Assessment of Pollutant Emissions from Operators for 2025 Dust

3.1 Assessment of Air Emissions from TPP Kosova A and TPP Kosova B

The results show that at all monitoring points, the concentration of dust exceeds the ELV (Emission Limit Value) by approximately three times, which is 20 mg/Nm³. It is also observed that there are no significant seasonal fluctuations, as the values remain almost constant throughout the year. This may indicate the presence of a continuous source of dust emissions and the need to implement measures for their reduction and control.

Table 16. Air emission concentration data for Dust from Kosovo A for 2025

Month	A3 mg/Nm ³	A4 mg/Nm ³	A5 mg/Nm ³	ELV` mg/Nm ³
January	60.2	57.1	56.9	20
February	59.8	60.4	58.9	20
March	59.1	58.3	58.9	20
April	57.8	59.2	0	20
May	57.8	59.5	60.2	20
June	58.1	0	59.6	20
July	59.3	60.5	59.1	20
August	59.1	59.5	60.3	20
September	59.1	59.5	60.3	20
October	58.5	59.3	60.1	20
November	0	59.3	60.1	20
December	57.8	58.5	58.9	20

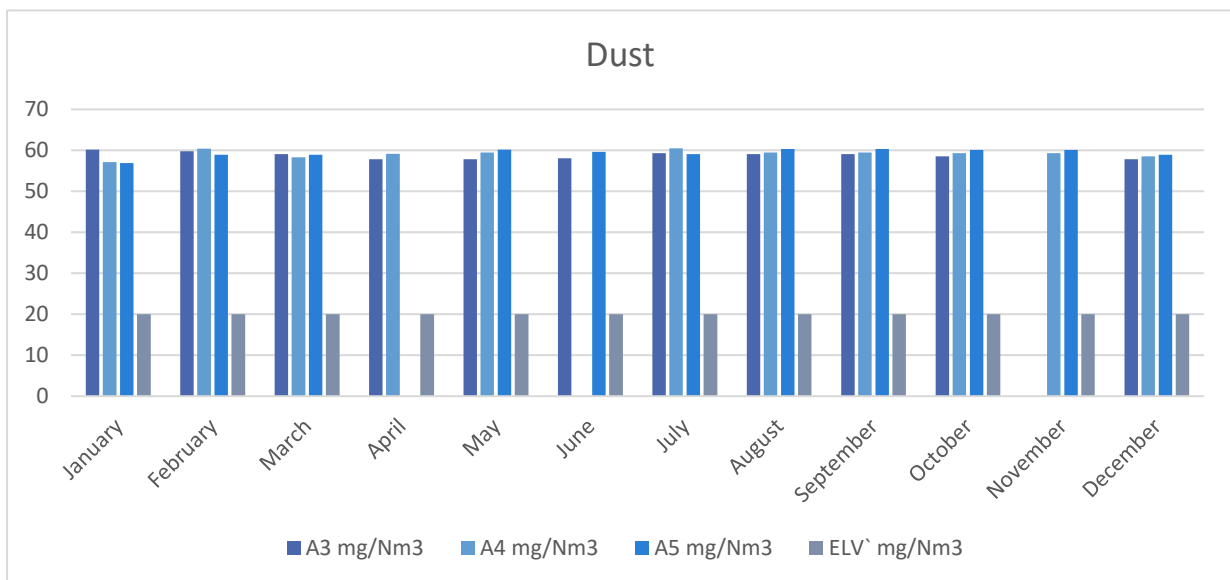


Fig. 16. Graphical presentation of emissions for Dust, TPP Kosova A 2025

SO₂

The SO₂ data show that concentrations at all monitoring points (A3, A4, and A5) are above the Emission Limit Value of 400 mg/Nm³ throughout almost the entire year. At point A3, values are mostly around 448.14 mg/Nm³, while the maximum was recorded in December at 503.75 mg/Nm³. At point A4, higher values are observed, reaching up to 548.64 mg/Nm³ in December. At point A5, concentrations also remain high, with a maximum value of 533.75 mg/Nm³ in December. It is observed that winter months are characterized by increased SO₂ concentrations. Additionally, in some months, monitoring data for certain points are missing.

Table 17. Air emission concentration data for SO₂ from Kosovo A for 2025

Month	A3 mg/Nm ³	A4 mg/Nm ³	A5 mg/Nm ³	ELV` mg/Nm ³
January	448.14	498.48	466.41	400
February	448.14	498.48	466.41	400
March	448.14	498.48	466.41	400
April	448.14	498.48	0	400
May	448.14	498.48	466.41	400
June	448.14	0	466.41	400
July	448.14	498.48	466.41	400
August	448.14	498.48	466.41	400
September	448.14	498.48	466.41	400
October	448.14	498.48	466.41	400
November	0	498.48	466.41	400
December	503.75	548.64	533.75	400

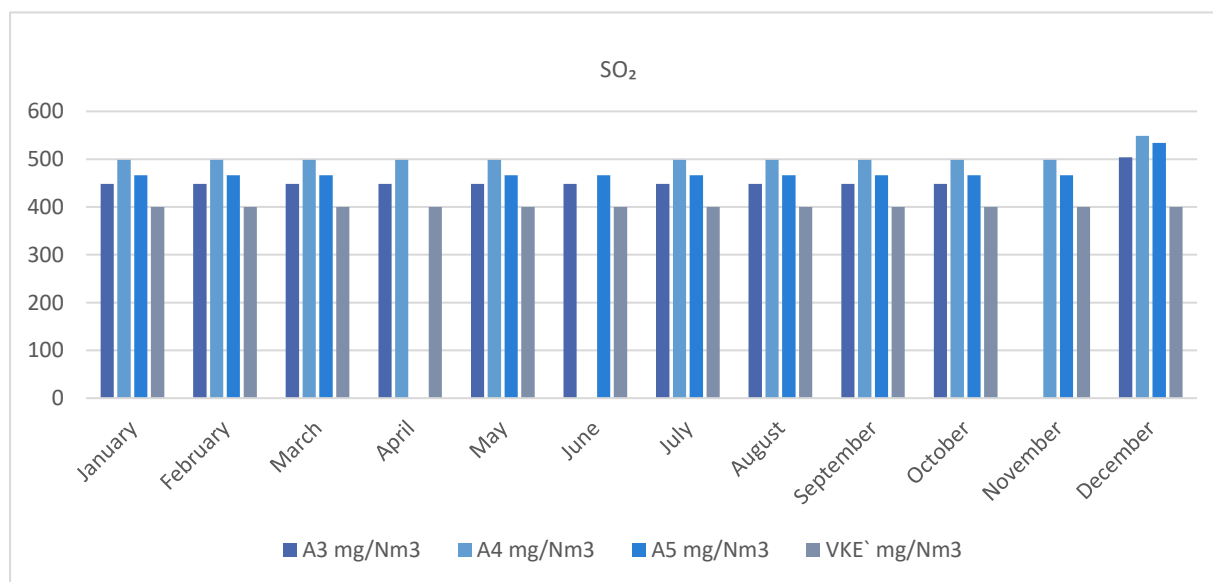


Fig. 17. Graphical representation of emissions for SO₂ TPP Kosova A 2025

NO₂

The NO₂ data show that concentrations at all monitoring points significantly exceed the Emission Limit Value of 400 mg/Nm³ throughout the entire year. At point A3, values are mainly around 597.52 mg/Nm³, while the maximum was recorded in December at 671.66 mg/Nm³. At point A4, concentrations reach up to 677.33 mg/Nm³ in December. At point A5, similarly high values are observed, with a maximum of 687.73 mg/Nm³ in December. The increase in concentrations during the winter months indicates a stronger impact of combustion processes and atmospheric conditions. In some months, monitoring data for certain points are missing.

Table 18. Air emission concentration data for NO_x from Kosovo A for 2025

Month	A3 mg/Nm ³	A4 mg/Nm ³	A5 mg/Nm ³	ELV` mg/Nm ³
January	597.52	615.41	600.96	400
February	597.52	615.41	600.96	400
March	597.52	615.41	600.96	400
April	597.52	615.41		400
May	597.52	615.41	600.96	400
June	597.52	0	600.96	400
July	597.52	615.41	600.96	400
August	597.52	615.41	600.96	400
September	597.52	615.41	600.96	400
October	597.52	615.41	600.96	400
November	0	615.41	600.96	400
December	671.66	677.33	687.73	400

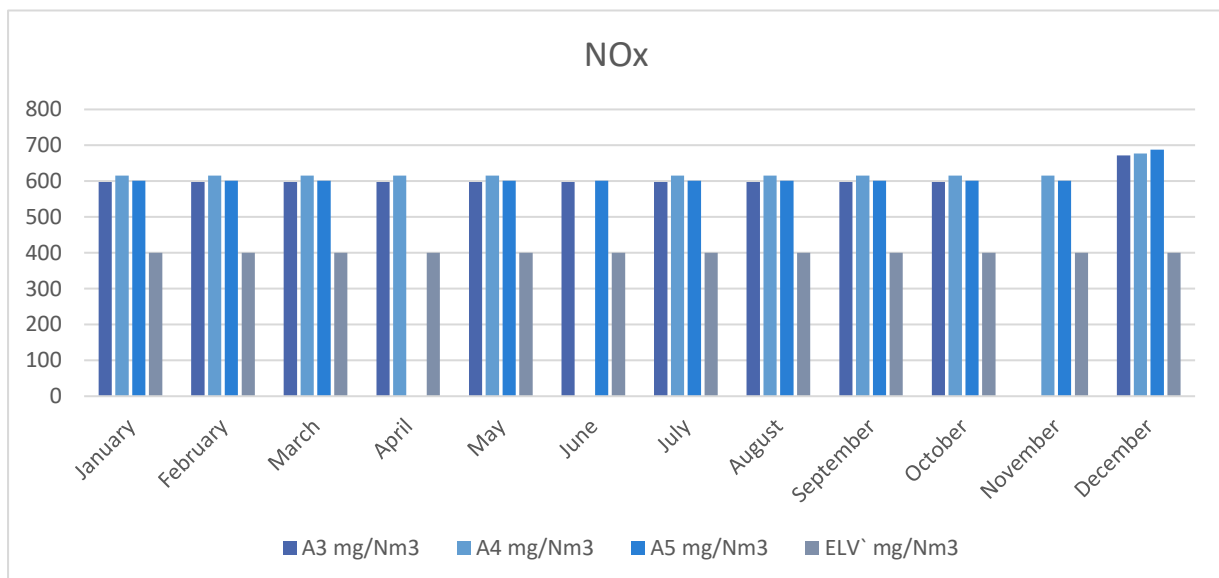


Fig. 18. Graphic representation of emissions for NO_x TPP Kosova A 2025

Quantity in tons

The data show that the highest emissions are recorded at TPP Kosova B, particularly for NO₂ and dust, where point B1 represents the highest load with 5,223 tons of NO₂ and 2,575 tons of dust. Compared to TPP Kosova B, the units at TPP Kosova A have lower and more stable emissions across points A3, A4, and A5. For SO₂, values at TPP Kosova A range from 1,599 to 1,662 tons, while for NO₂ they range from 2,007 to 2,141 tons. Overall, the results indicate that TPP Kosova B is the main source of atmospheric pollution and has a greater impact on air quality, especially regarding NO₂ and dust emissions.

Table 19. Air emission quantities of SO₂, NO_x, and dust from TPP Kosova A and TPP Kosova B for the year 2025

	Unit	SO ₂	NO ₂	Dust
		tons	tons	tons
TCA	A3	1599	2132	213
TCA	A4	1626	2007	197
TCA	A5	1662	2141	210
TC B	B1	2821	5223	2575
TC B	B2	2384	3178	1567

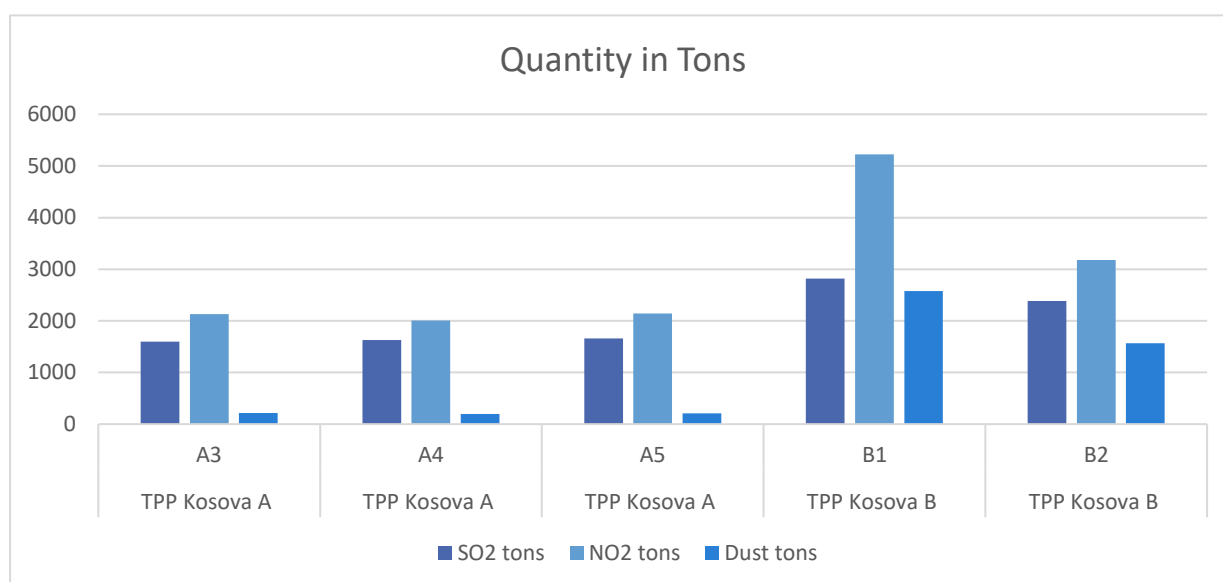


Fig. 19. Graphical representation of the amount of TPP Kosova A and TPP Kosova B emissions 2025

3.1 Assessment of Air Emissions from Sharrcem

3.2

Dust emissions from the Sharrcem furnace during 2025 were significantly below the permitted limit of 30 mg/Nm³ for all monitored months. The recorded values ranged from 0 to 0.86 mg/Nm³, indicating that the emission filtration and control system was operating efficiently. The lowest values were recorded in March and April (0 mg/Nm³), while the highest value was recorded in July with 0.86 mg/Nm³. A slight increase in dust concentration was observed during the summer period, but without ever exceeding the established limit value. Overall, the results show that dust emissions from the factory furnace were in compliance with environmental standards and requirements during the period January–December 2025.

Table 20. Air dust emission data from the furnace during 2025

	January	February	March	April	May	June	July	August	September	October	November	December
Dust mg/Nm ³	0.21	0.27	0	0	0.47	0.69	0.86	0.81	0.78	0.64	0.64	0.6
ECV 30 mg/Nm ³	30	30	30	30	30	30	30	30	30	30	30	30

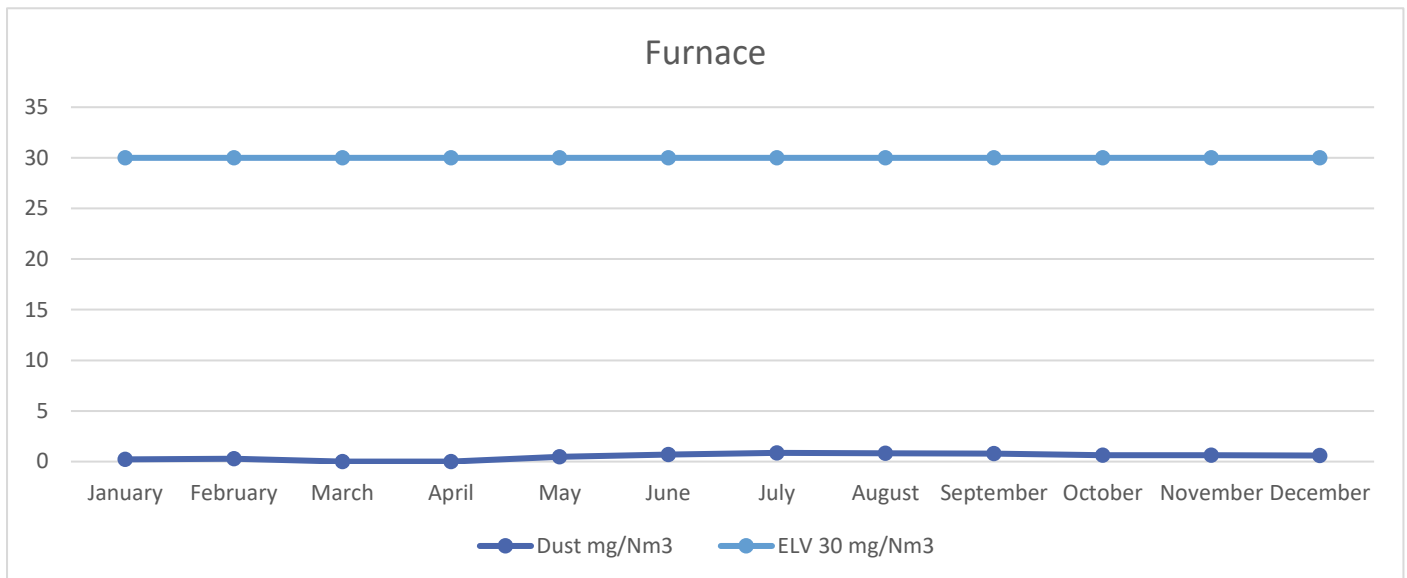


Fig. 20. Graphical representation of dust emissions into the air from the furnace during 2025

Cement Mill

Dust emissions from the Sharrcem cement mill during 2025 were well below the emission limit value of 20 mg/Nm³ in all monitored months. The measured values have ranged from 0 to 1 mg/Nm³, indicating very good performance of the dust filtration and control system. The lowest values were recorded in March and April (0 mg/Nm³), while the highest value was recorded in July with 1 mg/Nm³. During the period May–August, a slight increase in dust concentration was observed, but all results remained significantly within the permitted limits. Overall, the results show that dust emissions from the cement mill have been in full compliance with environmental standards and requirements during the period January–December 2025.

Table 21. Data on dust emissions into the air from the Mill during 2025

	January	February	March	April	May	June	July	August	September	October	November	December
Dust mg/Nm ³	0.08	0.15	0	0	0.55	0.91	1	0.91	0.72	0.12	0.14	0.1
ECV 20 mg/Nm ³	20	20	20	20	20	20	20	20	20	20	20	20

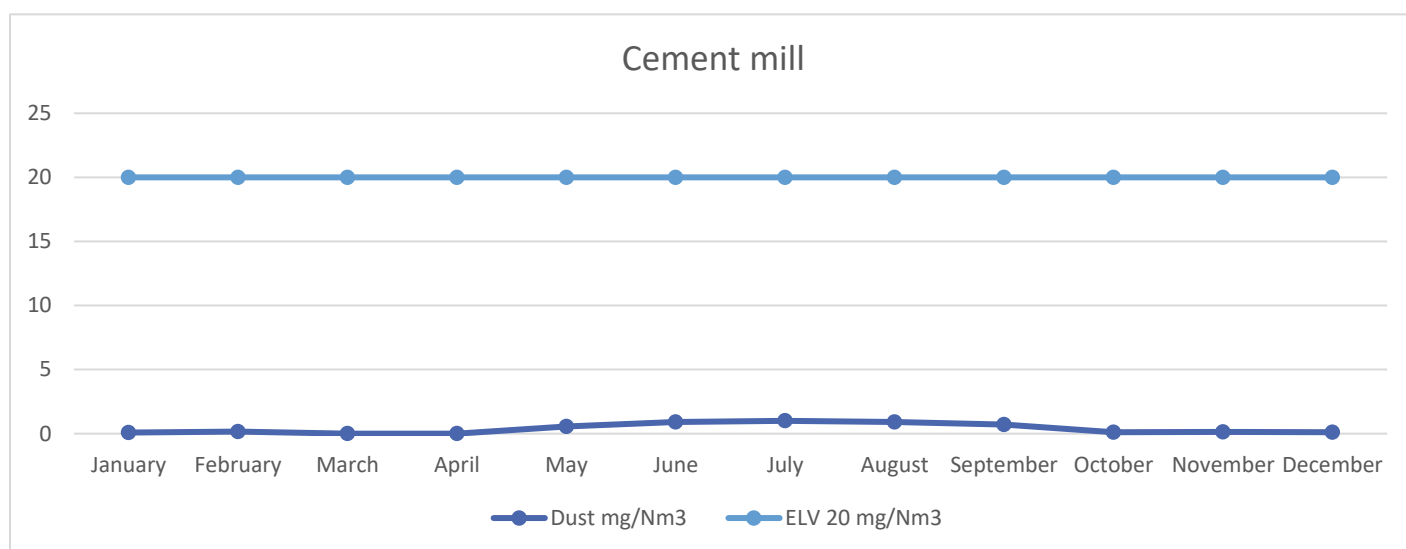


Fig. 21. Graphical representation of dust emissions into the air from the Mill during 2025

Clinker

The data show that dust emissions from clinker during 2025 were significantly below the emission limit value (ELV) of 20 mg/Nm³. The measured values ranged from 0 to 1.05 mg/Nm³, indicating a very low level of emissions and good functioning of the filtration system. The highest values were recorded in January (1.05 mg/Nm³), while no dust emissions were recorded in March and April. Overall, the results show full compliance with the permitted environmental standards.

Table 22. Dust emission data into the air from the Clinker during 2025

	January	February	March	April	May	June	July	August	September	October	November	December
Dust mg/Nm ³	1.05	0.93	0	0	0.84	0.47	0.46	0.48	0.54	0.53	0.59	0.64
ELV 20 mg/Nm ³	20	20	20	20	20	20	20	20	20	20	20	20

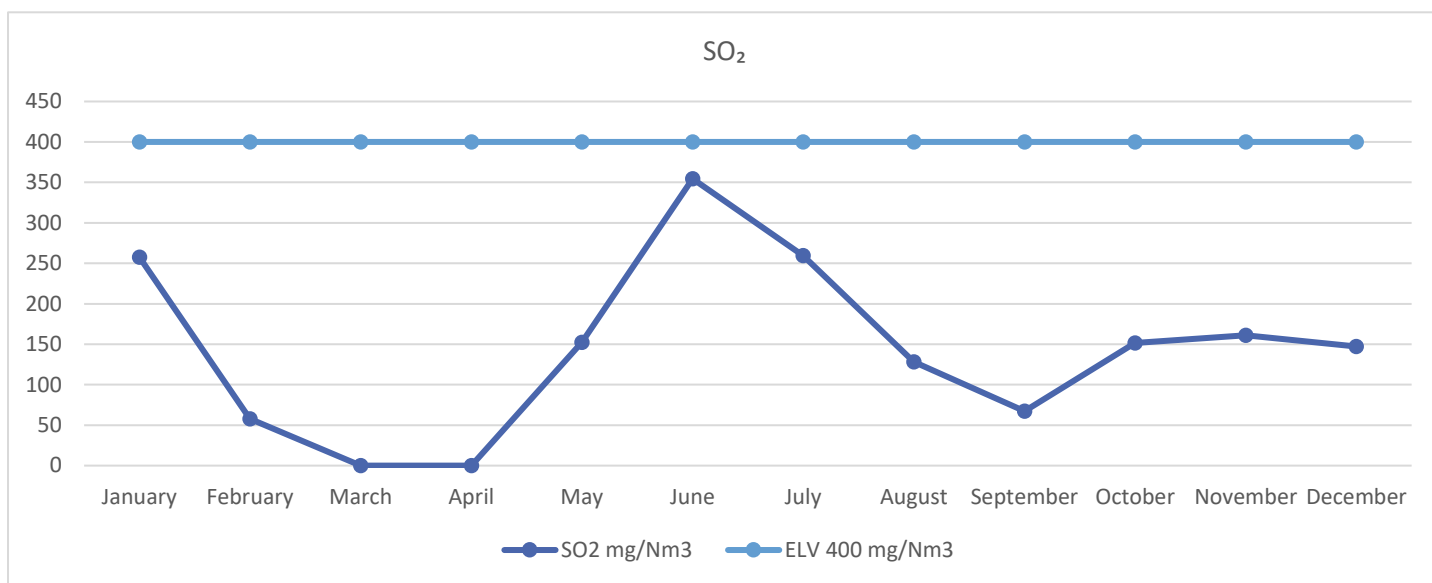


Fig. 22. Graphical representation of dust emissions into the air from the Clinker during 2025

SO₂

SO₂ emission data for 2025 show that all measured values were below the emission limit value (ELV) of 400 mg/Nm³. The values ranged from 0 to 354.49 mg/Nm³, with the highest level recorded in June, while no emissions were recorded in March and April. Overall, the results show that SO₂ emissions were within permitted limits and in line with environmental standards.

Table 23. SO₂ emissions data in the air during 2025

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
SO₂ mg/Nm³	257.45	57.61	0	0	152.44	354.49	259.57	128.28	67.11	151.59	161.08	147.1
ELV 400 mg/Nm³	400	400	400	400	400	400	400	400	400	400	400	400

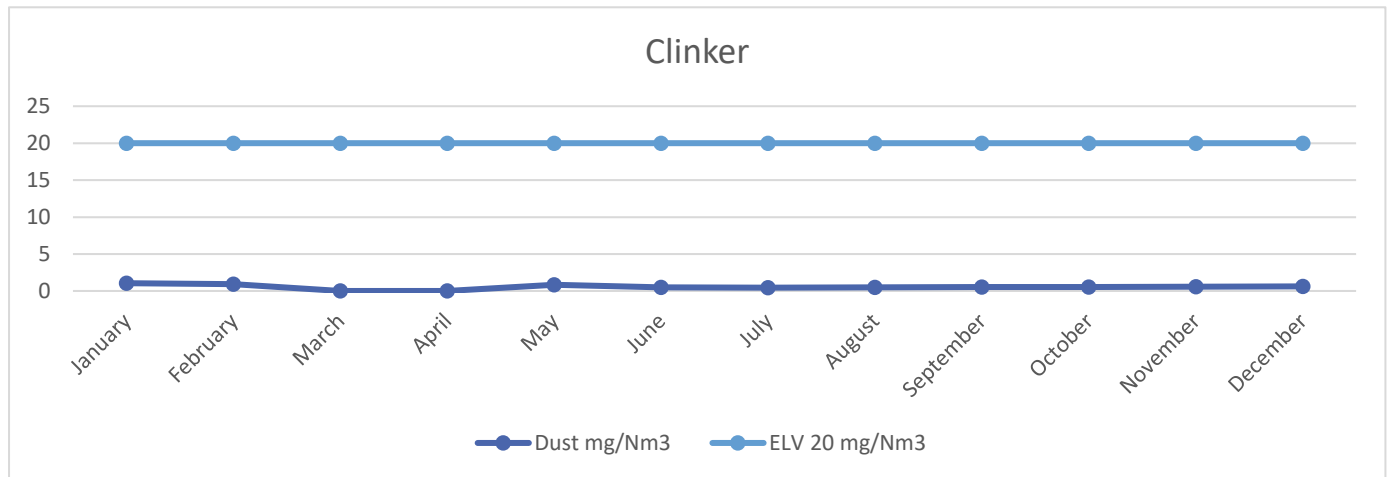


Fig. 23. Graphical representation of SO₂ emissions in the air during 2025

NOx

NOx emissions data for 2025 show that all measured values were below the emission limit value (ELV) of 500 mg/Nm³. The values ranged from 0 to 478.35 mg/Nm³, with the highest level recorded in May, while no emissions were recorded in March and April. Overall, the results show that NOx emissions were within permitted limits and in line with environmental standards.

Table 24. NOx emissions data in the air during 2025

	Jan.	Febri.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec
NOx mg/Nm3	468	261	0	0	478.35	345.42	340.68	356.61	454.53	396.72	402.33	478.31
ELV 400 mg/Nm3	500	500	500	500	500	500	500	500	500	500	500	500

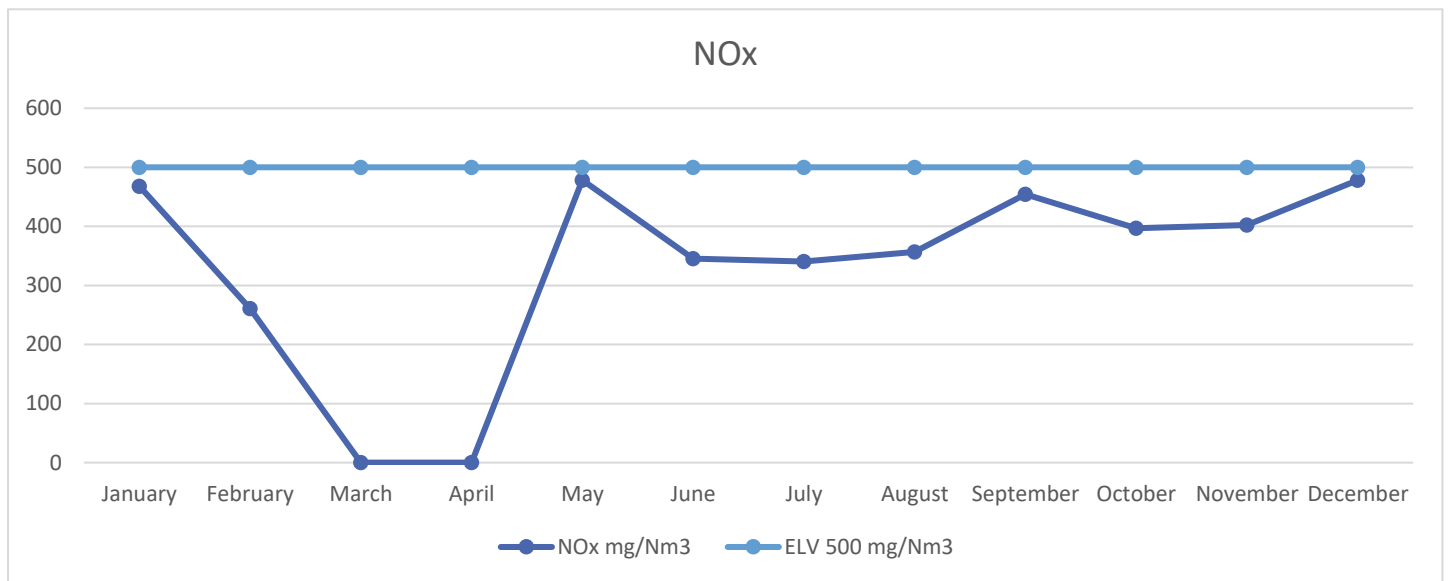


Fig. 24. Graphical representation of NOx emissions in the air during 2025

3. Assessment of Emissions from Residential Sources through Measurement of Exhaust Gases

In cooperation with the Japan International Cooperation Agency, within the framework of the “Capacity Development for Air Pollution Control” Project, an activity was carried out to assess household heating equipment and measure gas and dust emissions. This study included equipment such as cooking stoves, pellet stoves and general-purpose stoves. Different types of wood (beech and oak), two types of pellets and coal were analysed as fuels. The effective amount of heat was also assessed, as the efficiency of heat transfer from the fuel to space heating, cooking and other household uses was calculated. The activity aimed to assess the impact of equipment and fuels on air quality through the measurement of emissions and energy efficiency.



1. Cooking Stove



2. Pellet Stove



3. General-purpose stove

4.1 Assessment of Equipment

The data show significant differences in terms of cost, efficiency and effective heat production between different energy sources for heating. Lignite is presented as one of the cheapest alternatives for heating, with a cost of 3.20 cents/kWh and an efficiency of up to 88% in cooking stoves. However, its use negatively affects air quality due to emissions of dust, SO₂ and NO_x. Pellets present better energy and environmental performance, with pellet boilers achieving efficiencies of up to 95% and the lowest cost of heat production of 1.16 cents/kWh. Wood continues to be widely used, but traditional wood stoves have relatively low efficiency (51%), resulting in higher real heating costs. Electricity with classic heaters appears as the most expensive alternative, with a cost of 14.24 cents/kWh. On the other hand, air conditioners are more efficient and economical, with a cost of 4.42 cents/kWh. In general, modern pellet appliances and air conditioners offer more efficient and favourable solutions for heating, while the use of lignite and traditional wood remains more problematic for the environment and air quality.

Energy Types	Wood		Lignite		Pellets		Electric Energy
Selling price (Based on interviews)	50 Euro/m ³		40 Euro/ton		235 Euro/ton* ¹		15.43 cent/kW* ²
Types of equipment	General-purpose stove	Cooking stove	General-purpose stove	Cooking stove	Pellet stove	Pellet boiler	Electric heating
Fuel price per kg	12.5 cent/kg* ³		4.0 cent/kg		23.5 cent/kg		
Efficiency at nominal load (%)	51%	88%	65%	90%	84%	95%	
Lower heating value (kJ/kg)	15,989		13,671		17,003		
Effective Heat Output (kWh/kg)	2.3	3.9	2.5	3.5	4.0	4.5	
Cost per unit of heating value (cent/kJ)	0.78		0.29		1.38		4.30
Cost of effective heat production (cent/kWh of heat produced)	5.52	3.20	1.60	1.16	5.93	5.22	14.24* ⁴ 4.42 ⁵

Tab 25. Comparative analysis of the cost and efficiency of different types of energy and heating equipment.

- 1) In March 2023, the price of pellets was around 230–240 Euro/ton, although during the winter of 2022 the price had increased very significantly.
- 2) Unit price of electricity: 0–800 kWh/month = 9.05 cents/kWh, over 800 kWh/month = 15.43 cents/kWh. Assuming that air conditioners and electric heaters replace existing heating equipment, a price of 15.43 cents/kWh was used.
- 3) Apparent specific density of 0.4 was assumed. Efficiency of 92% was assumed for electric heating.
- 4) A coefficient of performance (COP) of 3 was assumed.
- 5) For the air conditioner.

4.2 Emission Results from Households

The analysis of emissions from different heating devices shows significant differences in their environmental performance. Traditional devices using wood and especially lignite are characterized by higher levels of pollution, showing increased values of PM particles, organic gaseous compounds (OGCs) and carbon monoxide (CO), which indicates a less efficient combustion process. NOx emissions appear more moderate, although in certain cases the recommended limits are exceeded. On the other hand, pellet stoves and boilers have significantly lower emissions thanks to more advanced technology and more efficient combustion control, although there is still a need for further improvements. In general, traditional devices remain a major source of air pollution, while pellet devices represent a more favourable and cleaner alternative for the environment.

Tab 26. Measurement results from household equipment.

	General Stove and Cooking Stove						Pellet stove and boiler		
	General information			Cooking stove			Pellet heater		
	Application	Wood	Lignite	Application	Wood	Lignite	Application	Wood	Lignite
PM mg/m³	40	91	76	40	229	348	20	85	68
OGCs mg- Carbon/m³	120	(322) ¹⁾	(668) * ₁₎	120	(2,626) ₁₎	(867) * ₁₎	300		
CO mg m³	1500	6,680	4,042	1500	14,176	7,313	300	1,303	910
NOx mg/m³	200* ₂₎ 300* ₂₎	100	208	200* ₂₎ 300	68	139	200	125	163

1) The values in brackets () indicate the amount of CH₄ measured with a simplified measurement method (OGCs – organic gaseous compounds are estimated as the amount converted to CH₄).

2) NO_x: 200 mg/m³ for biomass fuels and 300 mg/m³ for fossil fuels.

5. Investments in the Air Sector for 2024

Investments for the air sector from the budget of the Republic of Kosovo in 2023-2026

Tab.27. Value of investments from the budget of the Republic of Kosovo

Type of investment	Total value	Year
Station maintenance air quality monitoring, for a period of 3 years	600,000.00	2023-2026

6. Health Effects of Air Pollution

Air pollution is one of the most important public health risks, negatively affecting the physical and mental well-being of the population. It has a particular impact on the most vulnerable groups, such as children, the elderly and people with chronic diseases, including asthma and cardiovascular diseases.

Major air pollutants, such as fine particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), ground-level ozone, and carbon monoxide, are associated with the development of various respiratory diseases, including chronic bronchitis, respiratory infections, and impaired lung function. Long-term exposure to these pollutants increases the risk of cardiovascular disease, stroke, and some forms of cancer, particularly lung cancer.

In addition to impacts on the respiratory and cardiovascular systems, scientific studies show that air pollution can also have negative effects on neurological development, affecting children's cognitive abilities, such as memory, concentration, and behaviour.

At a societal level, air pollution increases the burden on the health system through increased hospital admissions and medical costs, while also causing significant economic impacts. For this reason, taking effective measures to reduce air pollution and protect public health is essential and a priority.

7. Recommendations

- Strengthen the implementation of legislation to limit emissions of pollutants into the air from stationary and mobile sources, through continuous monitoring and control by responsible institutions.
- Inspectorates at central and local level should intensify supervision of polluting operators, in order to ensure compliance with environmental permit standards and conditions.
- Municipalities should draft and implement local air protection plans, including concrete measures to reduce pollution in the most affected areas.
- Economic operators that do not yet possess environmental permits should obtain them as soon as possible and implement emission control measures.
- Reduce the use of fossil fuels and traditional equipment with high emissions in households, schools, public institutions and economic operators.
- Increase citizens' awareness of the impact of traditional heating equipment and the importance of using more energy-efficient and less polluting technologies.
- Expand the cogeneration and central heating system in Pristina and to consider the possibility of its application in other cities in Kosovo.
- Vehicle technical inspection centres should implement more rigorous controls to verify pollutant gas emissions from vehicles.
- Promote the use of urban public transport and sustainable transport alternatives, with the aim of reducing individual vehicle use.
- Strictly prohibit the burning of waste and other materials in open areas, except in cases permitted by appropriate authorization.
- Increase green spaces in urban areas and rehabilitate degraded spaces to positively impact air quality.
- Increase investments in the air protection and air quality monitoring sector, with continued support from the Kosovo budget and international partners.
- The National Institute of Public Health of Kosovo (NIPHK) should continue conducting periodic assessments on the impact of air pollution on public health, based on air quality monitoring data.

7.1. Recommendations from the Japan International Cooperation Agency (JICA)

- Strengthening capacities for the maintenance and management of monitoring equipment, supporting the development of future plans for equipment replacement and rehabilitation of the AQMS.
- Environmental laboratory staff to continue the ongoing training plan.
- Strengthening vehicle emissions regulation, promoting eco-driving, using portable emission measurement systems (PEMS) and developing emission factors adapted to Kosovo conditions, JET recommends that Kosovo continue activities for measuring vehicle emissions and their technical control, as these activities are considered effective for reducing air pollution from transport.
- Continue training for officers from stationary sources until teams are able to conduct independent measurements.
- MESP should continue measurements at thermal power plants and other stationary sources, analyse the results and provide recommendations as needed.
- In the future, it is recommended to create a system where private companies will conduct emissions measurements, while IHMK will ensure their quality control.
- Conducting more emissions measurements, collecting data from neighbouring countries, and reviewing measures to ensure the quality of fuels used in the household stationary source sector

Main findings

- Air quality in Kosovo during 2025 has shown gradual improvement compared to previous years, especially for PM₁₀ and PM_{2.5} particles.
- The highest pollution was recorded during the winter months (January, February and December), mainly due to:
 - the use of heating,
 - the burning of fossil fuels,
 - adverse meteorological conditions.
- The most polluted areas were:
 - Rilindja, Pristina,
 - Kodra e Trimave, Pristina,
 - Obiliq,
 - Mitrovica and Gjilan during winter periods.
- All key air quality parameters (PM₁₀, PM_{2.5}, NO₂, SO₂, CO and O₃) remained within the annual limits allowed according to legal standards.
- A total of 171 days with PM₁₀ exceedances were recorded during 2025.
 - The "Rilindja" station in Pristina had the highest number of exceedances with 43 days.
 - Most of the exceedances occurred in January and December.
- The 2013–2025 trend shows significant reductions in pollution:
 - PM₁₀ dropped from 42.3 µg/m³ to 17.97 µg/m³.
 - PM_{2.5} dropped from 28.86 µg/m³ to 13.13 µg/m³.
- The Kosovo A and Kosovo B power plants continue to be the main sources of industrial pollution.
 - Dust, SO₂ and NO_x emissions in many cases exceed the permitted limit values.
 - B power plant appears to be the largest polluter, especially for NO₂ and dust.
- The Sharrcem factory has been found to be in compliance with environmental standards.
 - Dust, SO₂ and NO_x emissions have been significantly below permitted limits throughout the year.
- Traditional household heating equipment (wood and lignite) are a significant source of air pollution.
- Air pollution continues to have serious impacts on health:
 - respiratory disease,
 - cardiovascular problems,
 - higher risk for children, the elderly and people with chronic diseases.
- State investments in the air sector for the period 2023–2026 are:
 - EUR 600,000 for the maintenance of air quality monitoring stations.

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