ANNUAL REPORT ON THE STATE OF AIR 2019

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Ministria e Infrastrukturës dhe Ambientit

AGJENCIONI PËR MBROJTJEN E MJEDISIT TË KOSOVËS	KOSOVSKA AGENCIJA ZA ZAŠTITU SREDINE	KOSOVO ENVIRONMENTAL PROTECTION AGENCY

ANNUAL REPORT

ON THE STATE OF AIR IN KOSOVO

2019

Prishtina

2020

1. Introduction

Annual reporting on the state of air in Kosovo is the responsibility and duty of the Directorate of Environmental State Assessment, i.e. the Sector for Environmental State Assessment.
The report provides an assessment based on existing data from the air quality monitoring system and data on emissions from economic operators and other sources of pollution.

Pursuant to the Law No. 03/L-025 on Environmental Protection, the Law No. 03/L-160 for Air Protection from Pollution, and the Law No. 02/L-79 on Hydro-Meteorological Activities, KEPA/KHMI is obliged to monitor the air quality across the territory of Kosovo.
KEPA/KHMI has a monitoring system consisted of 12 stations and a mobile station. The monitoring stations are located in various cities in Kosovo.
Monitoring stations monitor particulate matter (PM10, PM2.5), NO/NO_2, SO_2, O_3 and CO.

Environmental pressures from various polluting factors have influenced in deterioration of air quality in different periods of time during 2019. In 2019, air pollution was assessed to a higher extent in urban areas, which, according to the assessment of data, are: Prishtina, Obiliq, Drenas, Hani i Elezit, Mitrovica, etc.

2. Legal framework

National air legislation is in line with EU legislation, although there is stagnation in the transposition of legal provisions.

- Law No. 03/L-160 on Air Protection from Pollution, 2010,

Bylaws:

- ✓ Administrative Instruction (GRK) No. 06/2007 on the rules and standards of the discharges on air by the stationary sources of pollution,
- ✓ Administrative Instruction (GRK) No. 04/2009 on control of volatile organic compounds emissions during the storage, filling, discharging, packaging and transfer of fuels,
- ✓ Administrative Instruction (minister of MESP) No. 02/2011 on air quality assessment,
- ✓ Administrative Instruction No. 15/2010 on criteria for defining the air quality monitoring points, number and frequency of measurements, classification of pollutants which are monitored, the methodology of work, form and timing of data report,
- ✓ Administrative Instruction (GRK) No. 21/2013 on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in air,
- ✓ Administrative Instruction (GRK) No. 16/2013 for substances that deplete the ozone layer and fluorinated greenhouse gases,
- ✓ Administrative Instruction (GRK) No. 19/2013 for access to the information for economic consumption of fuel and CO_2 emission of new personal vehicles,
- ✓ Administrative Instruction GRK No. 01/2016 on mechanism for monitoring greenhouse gas emissions,
- ✓ Administrative Instruction (GRK) No. 08/2016 for the allowed norms of discharges in air from mobile sources.

2.1. Information and alert thresholds for the air quality

Information and alert thresholds for the air quality are defined according to ***Law No. 03/L-160 on Air Protection from Pollution*** and the AI No. 02/2011 on Air Quality Assessment (Tab.1, 2, 3).

Table 1. Alert thresholds for **sulphur dioxide (SO_2)** and **nitrogen dioxide (NO_2)**

Pollutant	Alert threshold
Sulphur dioxide (SO_2)	500 µg/m^3
Nitrogen dioxide (NO_2)	400 µg/m^3

Table 2. Alert thresholds for **PM10** and **Ozone(O_3)**:

Purpose	Averaging Period	Threshold
PM10		
Information	24-hour	100 µg/m^3
Alert	24-hour	100 µg/m^3 (for three consecutive days)
O_3		
Information	1-hour	180 µg/m^3
Alert	1-hour	240 µg/m^3

Table 3. Air quality assessment (AI No. 02/2011).

Parameter	Limit values	Measurement unit	Limit value µg/m^3	Exceedances allowed per year
NO_2	Limit values per hour for the protection of human health	µg/m^3	200	18
	Annual limit values for the protection of human health	µg/m^3	40	Not envisaged
	Annual limit values, for the protection of vegetation	µg/m^3	30	Not envisaged
SO_2	Limit values per hour for the protection of human health	µg/m^3	350	24
	Limit values per 24 hours for the protection of human health	µg/m^3	125	3
CO	Limit values for the daily average of the 8-hour maximum for the protection of human health	mg/m^3	10	Not envisaged
PM10	Limit values per 24 hours for the protection of human health	µg/m^3	50	35
	Annual limit value for the protection of human health	µg/m^3	40	Not envisaged
PM2.5	Annual limit value for the protection of human health	µg/m^3	25	Not envisaged
O_3	Long-term objective for the protection of human health	µg/m^3	120	Not envisaged

3. Prerequisites for assessment of air quality data

For the assessment or analysis of air quality data, in addition to the units whereby the results of measurements by monitoring stations are presented, it is necessary to consider additional information as a precondition for a realistic assessment of the state of the air, such as:

- Description of the location (position of the monitoring station, orography, surrounding residential buildings, industrial facilities, road infrastructure, traffic, station background and other data, which reflect the respective situation in time and space);
- Continuity of 24-hour measurements and monthly measurements - not an interpretation of a momentary value;
- Temperature, ^{0} C;
- Pressure; mbar or hPa;
- Relative humidity,%;
- Air speed, m/s;
- Precipitation;
- Wind rose for data evaluation time; and
- The impact of cross-border pollution by the countries of the region.

4. Air Quality

4.1. Air quality monitoring

The installation of an automatic air quality monitoring system began in 2009. Initially, monitoring equipment were installed at two stations: in Prishtina (Former Rilindja Building and KHMI).
During 2010, MESP/KEPA conducted a preliminary study to redefine air quality monitoring locations, supported by TAIEX.
According to the study, **zoning** is proposed for Kosovo to have an **Aglomerat-AKS1** (Prishtina KHMI and Rilindja and Obiliq, Dardhishta and Palaj), and **another** Monitoring **Zone-ZKS1** (Gjilan, Peja, Prizren, Drenas, Brezovica, Mitrovica and Hani i Elezit). (Tab. No. 4 and 5).
The number of air quality monitoring stations in Kosovo is determined based on the criteria set out in Directive 2008/50/EC. According to this, the air quality monitoring network in Kosovo should have 9 automatic monitoring stations. However, at the end of December 2012, MESP/KEPA reached a memorandum of understanding with the MED (funded by the World Bank) that the three automatic air quality monitoring stations located in the KEK area (funded by World Bank) be transferred to MESP/KEPA ownership. Thus, the national air quality monitoring network in Kosovo has 12 fixed stations and one (1) mobile automatic air quality monitoring station. (Fig.1).

Table 4. Air quality monitoring stations-**AKS 1 agglomeration**

Agglomeration		**Name of monitoring station**	**Code of the station**	**Location**	**Parameters measured**	**Type of station**	**Date of functionalization**
AKS 1	1	KHMI	KS0101	Prishtina	PM10,PM2.5,SO_2, NO_x,O_3,CO	Urban Background	09.01.2009
	2	Rilindja	KS0102	Rilindja yard,	PM10,PM2.5,03,SO_2,CO,NO_2	Urban Background	06.05.2010
	3	Obiliq	KS0110	FMC	PM10,PM2.5,SO_2, NO_x,O_3,CO	Urban Background	01.03.2013
	4	Dardhishta	KS0111	Primary school	PM10,PM2.5,SO_2, NO_x,O_3,CO	Urban/Industrial Background	01.03.2013
	5	Palaj	KS0112	Kosova Mont	PM10,PM2.5,SO_2, NO_x,O_3,CO	Industrial Background	01.03.2013

Table 5. Air quality monitoring stations-ZKS Zone 1

Zone		Name of monitoring station	Code of the station	Location	Parameters measured	Type of zone/agglomeration	Date of functionalization
ZKS 1 ZONE	6	Peja	KS0305	P.Sch. "Lidhja e Prizrenit	PM2.5,PM10,NOx, O_3,SO_2,CO	Urban Background	04.04.2012
	7	Prizren	KS0406	P.Sch. "Lidhja e Prizrenit	PM2.5,PM10,NOx, O_3,SO_2,CO	Urban Background	01.04.2012
	8	Hani i Elezit	KS0508	P.Sch" Ilaz Hallaqi"	PM2.5,PM10,NOx, O_3,SO_2,CO	Urb/Ind. Background	05.04.2012
	9	Gjilan	KS0609	Municipal Assembly	PM2.5,PM10,NOx, O_3,SO_2,CO	Urban Background	01.04.2012
	10	Drenas	KS0103	Municipal Assembly	PM2.5,PM10,NOx, O_3,SO_2,CO	Urban Background	05.04.2011
	11	Mitrovica	KS0204	Meteorological station	PM2.5,PM10,NOx, O_3,SO_2,CO	Urban Background	/06.2013
	12	Brezovica	KS0507	Ski area	PM2.5,PM10,NOx, O_3,SO_2,CO		

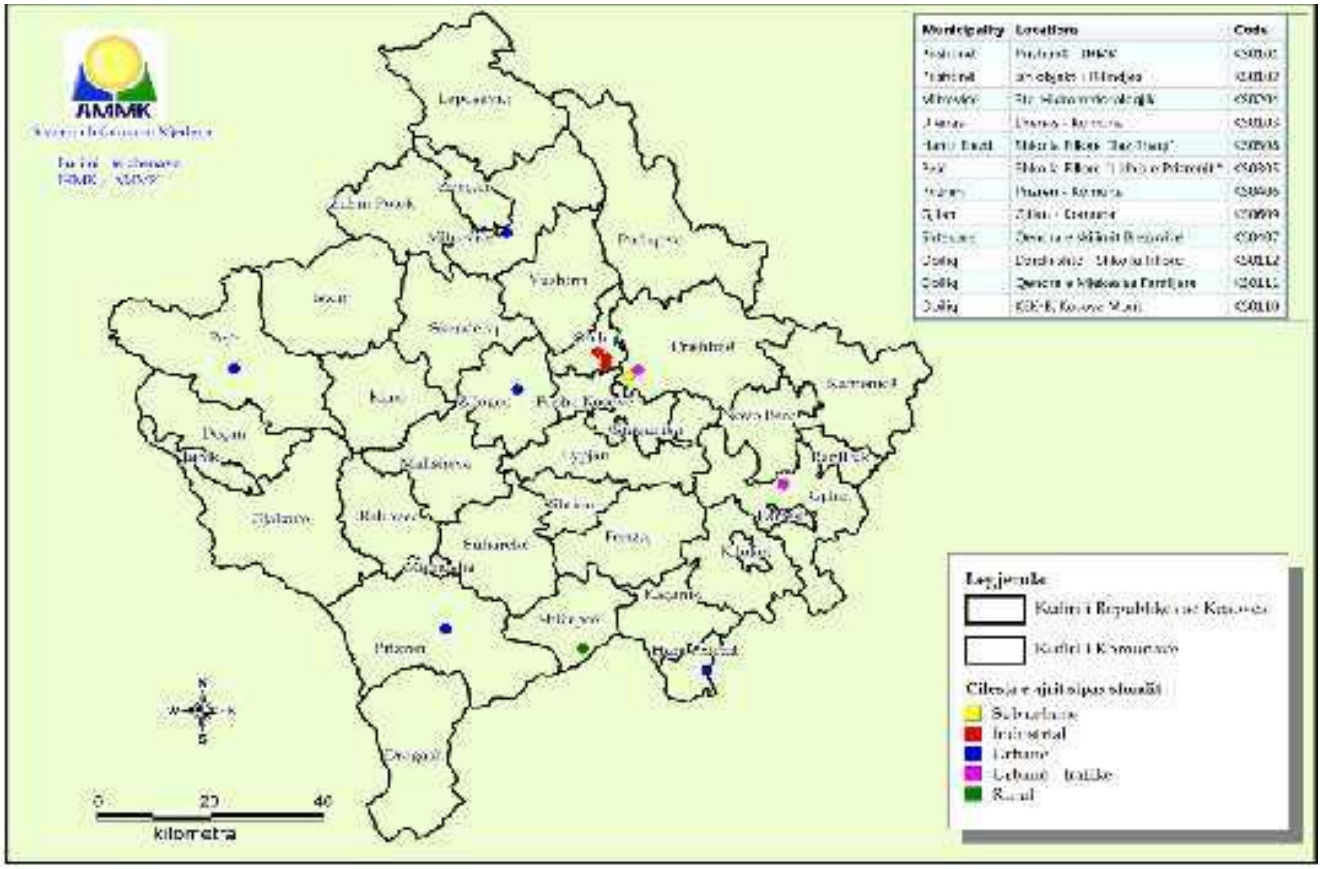


Fig. 1: Location of air quality monitoring stations

4.2. Online access system for air quality data

During 2019, MESP & KEPA launched the system for online reporting of air quality results monitored by the Kosovo Hydro Meteorological Institute. Software finalization was supported by the European Commission. The online system enables accurate and real-time public information on air quality.
The Air Quality Data Reporting Software is compatible with the European Air Quality Index and presents the monitoring data of the 5 main indicators in 12 air quality monitoring stations.
Access to real-time air quality data system is enabled by directly clicking on the link of the data system on the website of the Kosovo Hydro Meteorological Institute;
http://KHMI-rks.com/t/?page=1,5 ,
through the website of the Kosovo Environmental Protection Agency
http://ammk-rks.net/,
or through the website of the Ministry of Environment and Spatial Planning
https://mmph.rks-gov.net/.
Or via the link:
http://kosovoairquality.rks-gov.net/secure/index2.html

Investments in improving the air quality monitoring and reporting system are continuing with additional support from the US Government through the Millennium Challenge Corporation (MCC) Program and from the Japanese Government through the Japan International Development Agency (JICA).
The three World Bank-funded stations (Obiliq, Dardhishta and Palaj) are included in the MCC (Millennium Challenge Corporation) project.
The online network model enables:

- Online data on 12 monitoring stations presented on the map of Kosovo (Fig. 2.)
- Air quality index on monitored parameters (Tab. 6.)
- Online table for each hour for 12 monitoring stations (Tab. 7.)
- Tabular data for air quality for 24 hours for monitoring stations (Tab. 8.)
- Graphical presentation of data for 24 hours for 12 monitoring stations (Fig. 3.)

KEPA will continue to provide information and reporting on air quality through monthly reports, periodic and annual reports and assessments, as well as additional information to the public in case of exceeding the information thresholds or alert thresholds for certain parameters as defined by law.

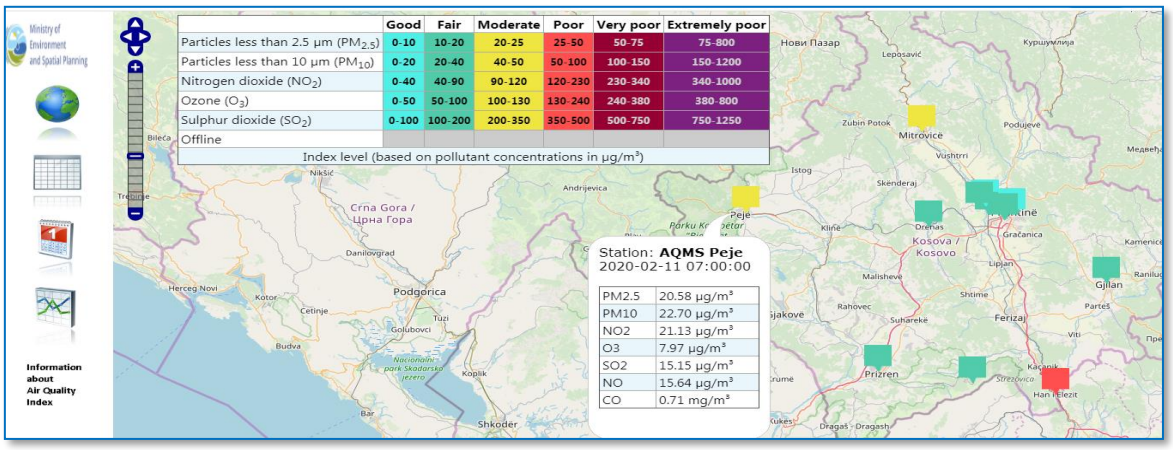


Fig. 2. Online data on the map of Kosovo from 12 monitoring stations

Tab. 6. Air quality index on monitored parameters

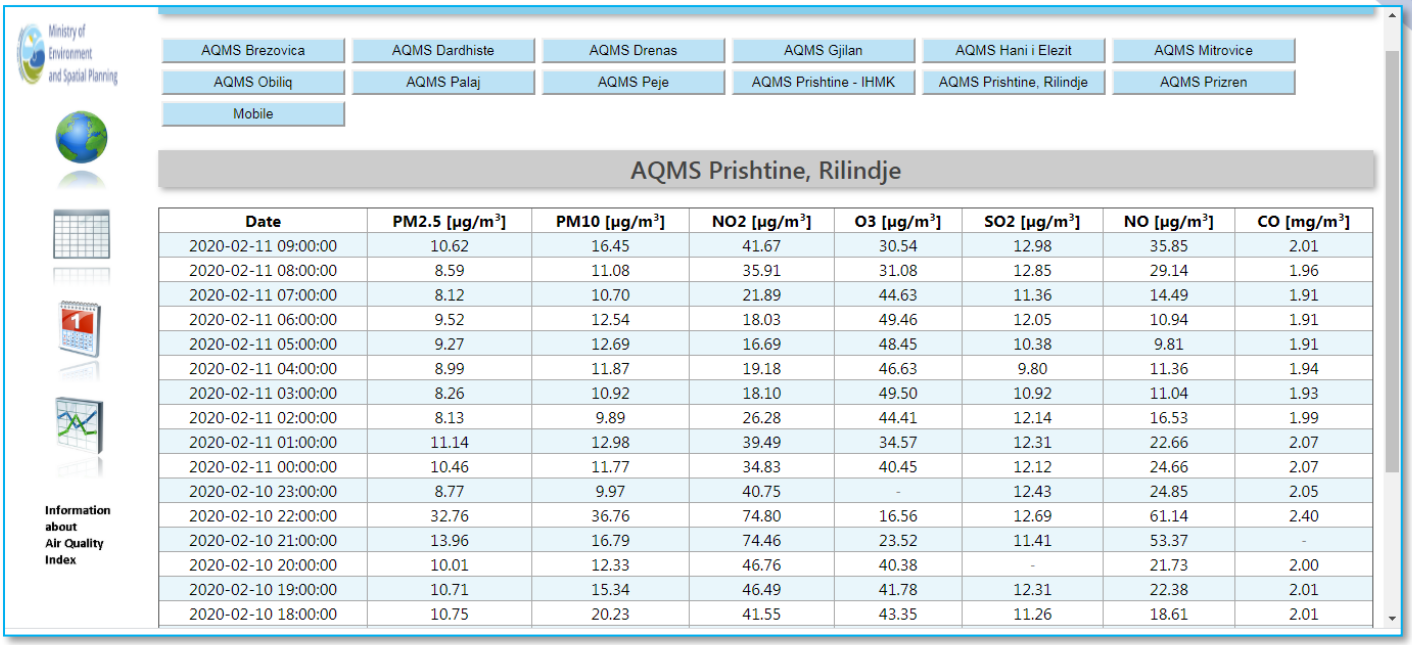
Quality	Very good	Good	Moderate	Unhealthy	Dangerous for health
Particles less than 2.5 µm ($PM_{2.5}$)	**0-10**	**10-20**	**20-25**	**25-50**	**50-800**
Particles less than 10 µm (PM_{10})	**0-20**	**20-35**	**35-50**	**50-100**	**100-1200**
Nitrogen Dioxide (NO_2)	**0-40**	**40-100**	**100-200**	**200-400**	**400-1000**
Ozone (O_3)	**0-80**	**80-120**	**120-180**	**180-240**	**240-600**
Sulphur dioxide (SO_2)	**0-100**	**100-200**	**200-350**	**350-500**	**500-1250**
Air Quality Index level (based on pollutant concentration, expressed in µg/m^3)					

Tab. 7. Online table for each hour for 12 monitoring stations

All Station Values

Station	Date	PM2.5 [µg/m³]	PM10 [µg/m³]	NO2 [µg/m³]	O3 [µg/m³]	SO2 [µg/m³]	NO [µg/m³]	CO [mg/m³]
AQMS Brezovica	2020-02-11 09:00:00	2.55	2.72	1.10	81.28	1.64	0.25	0.16
AQMS Dardhiste	2020-02-11 09:00:00	5.44	8.21	4.05	69.56	17.26	2.42	7.96
AQMS Drenas	2020-02-11 09:00:00	6.84	9.62	3.71	78.70	5.62	0.61	0.00
AQMS Gjilan	2020-02-11 09:00:00	52.64	60.47	46.67	34.44	0.65	20.24	0.52
AQMS Hani i Elezit	2020-02-11 09:00:00	67.32	75.99	49.87	12.57	2.49	39.14	0.58
AQMS Mitrovice	2020-02-11 09:00:00	17.95	22.01	12.11	43.44	72.46	1.84	0.02
AQMS Obiliq	2020-02-11 09:00:00	6.66	20.81	7.17	52.77	9.41	4.67	1.49
AQMS Palaj	2020-02-11 09:00:00	5.20	26.62	3.61	71.22	3.58	1.65	0.09
AQMS Peje	2020-02-11 09:00:00	53.75	60.35	41.66	10.01	15.93	45.79	1.57
AQMS Prishtine - IHMK	2020-02-11 09:00:00	5.31	7.84	9.66	64.64	12.70	2.20	2.52
AQMS Prishtine, Rilindje	2020-02-11 09:00:00	10.62	16.45	41.67	30.54	12.98	35.85	2.01
AQMS Prizren	2020-02-11 09:00:00	9.75	24.00	13.00	69.77	39.18	3.75	0.00
Mobile	2020-02-11 09:00:00	-	-	-	65.53	7.83	-	0.08

Tab. 8. Tabular data on air quality for 24 hours for monitoring stations



AQMS Prishtine, Rilindje

Date	PM2.5 [µg/m³]	PM10 [µg/m³]	NO2 [µg/m³]	O3 [µg/m³]	SO2 [µg/m³]	NO [µg/m³]	CO [mg/m³]
2020-02-11 09:00:00	10.62	16.45	41.67	30.54	12.98	35.85	2.01
2020-02-11 08:00:00	8.59	11.08	35.91	31.08	12.85	29.14	1.96
2020-02-11 07:00:00	8.12	10.70	21.89	44.63	11.36	14.49	1.91
2020-02-11 06:00:00	9.52	12.54	18.03	49.46	12.05	10.94	1.91
2020-02-11 05:00:00	9.27	12.69	16.69	48.45	10.38	9.81	1.91
2020-02-11 04:00:00	8.99	11.87	19.18	46.63	9.80	11.36	1.94
2020-02-11 03:00:00	8.26	10.92	18.10	49.50	10.92	11.04	1.93
2020-02-11 02:00:00	8.13	9.89	26.28	44.41	12.14	16.53	1.99
2020-02-11 01:00:00	11.14	12.98	39.49	34.57	12.31	22.66	2.07
2020-02-11 00:00:00	10.46	11.77	34.83	40.45	12.12	24.66	2.07
2020-02-10 23:00:00	8.77	9.97	40.75	-	12.43	24.85	2.05
2020-02-10 22:00:00	32.76	36.76	74.80	16.56	12.69	61.14	2.40
2020-02-10 21:00:00	13.96	16.79	74.46	23.52	11.41	53.37	-
2020-02-10 20:00:00	10.01	12.33	46.76	40.38	-	21.73	2.00
2020-02-10 19:00:00	10.71	15.34	46.49	41.78	12.31	22.38	2.01
2020-02-10 18:00:00	10.75	20.23	41.55	43.35	11.26	18.61	2.01

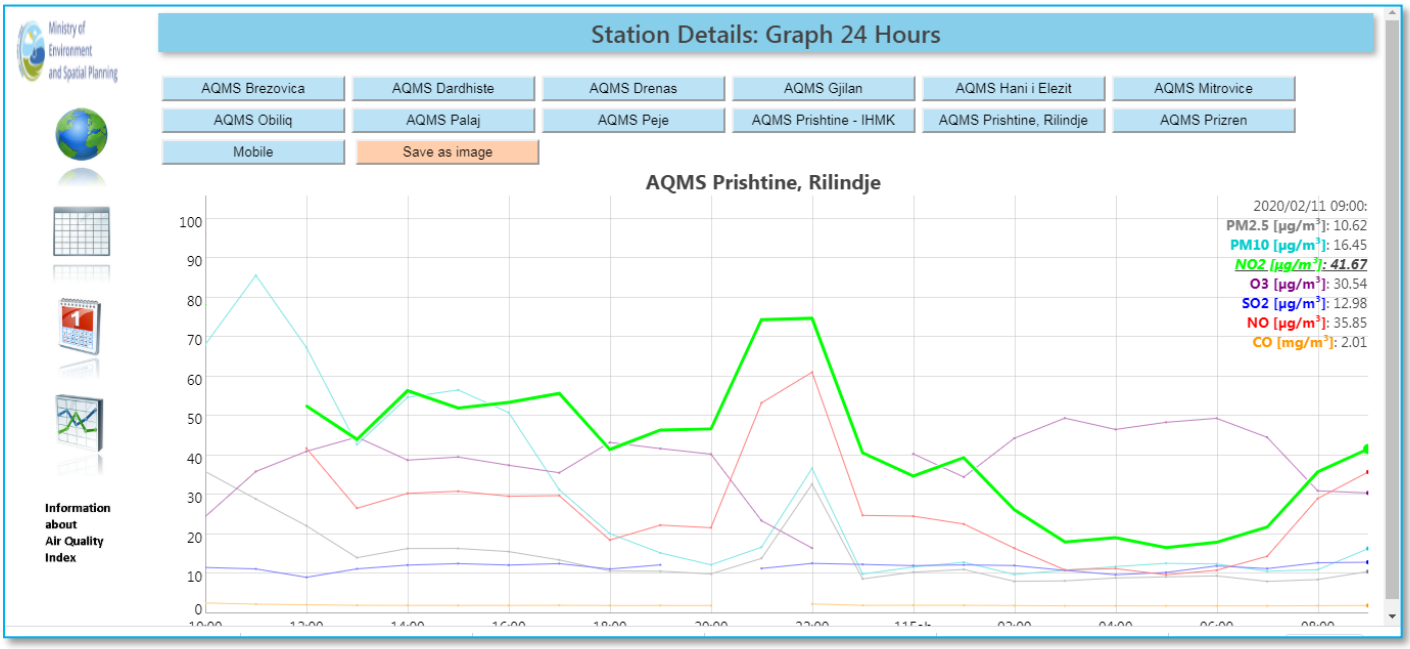


Fig.3. Graphical presentation of data for 24 hours for each monitoring station

4.3. **Description of an air quality monitoring station** (The same description applies to monitoring stations within NAQMN).

Prishtina-Rilindja-KS0102 monitoring station – is a location that, according to the type of area, is classified as an **urban** area, while according to the source of the pollution emission is considered a type of **traffic** station. The location of the station in Prishtina - Rilindja, as part of NAQMN (National Air Quality Monitoring Network), is shown in Figure 4.

Fig. 4. Air Quality Monitoring Station in Prishtina (Rilindja)

Description of Monitoring Location
NAQMN: Kosovo Location: Rilindja-Prishtina,
Station ID: KS0102
Grid Reference: 42°39'34.13" N, 21°9'25.89"E
Altitude: 584m
Date of commissioning: 06/05/2010

Status: The monitoring location meets the criteria envisaged for network design for this combined urban-traffic type.
The sample entry location is an open space without obstruction in the air flow (sample). Sample entry is at a height of 3-4 meters above ground level.
Monitoring objective: determining the level of air pollution with NO_2, SO_2, O_3, CO, PM10, PM2.5, reporting and informing the relevant institutions and the public on air quality in this area.
Table 6 presents the methodology of analysing measurements through analysers, which meet EU requirements for acceptable measurements.

Tab. 9 Parameters monitored at Prishtina-Rilindja station, KS0102

Parameters	Type of analysers	Methods of analysis	Sampling Freq.	Activation
SO_2	Thermo scientific	UV-Fluoresence	Continual	**06/05/2010**
NO_2	Thermo scientific	Chemiluminescence	Continual	
PM_{10}	Grimm M-180	Light scatering	Continual	
$PM_{2.5}$	Grimm M-180	Light scatering	Continual	
O_3	Thermo scientific	UV-photometri	Continual	
CO	Thermo scientific	Nondispersiveinfrared	Continual	
Meteor. sens.	**WS200, WS300**	**Ultrasonic**	**Continual**	

4.4. Characteristics of air pollution indicators

SO_2 - Sulphur dioxide is a toxic gas with acidic, colourless and strong odour properties. The main sources from where this gas is produced are energy capacities and district heating, which use oil and low quality coal as an emergency, which constitute sulphur.

Impacts on health and the environment. There are known effects on decreased pulmonary volume, increased respiratory resistance, and symptoms such as respiratory distress, chest tightness, and decreased respiratory rate. It can cause headaches, pain and irritation of the nose. Sulphur dioxide is one of the main causes of so-called **acid rain**, which accelerates the corrosion of construction sites and the acidification of soil, lakes and river flows.

CO-Carbon monoxide. It is a very poisonous and flammable gas. It is mainly a product of incomplete carbon combustion in fuels. Smoking in residential buildings, offices, cars and restaurants increases the concentration of carbon monoxide.

Impacts on health and the environment. Prolonged stay in the environment where CO is present can reduce the amount of oxygen for breathing to the extent that the person loses consciousness due to lack of oxygen. Carbon monoxide contributes to the effect on greenhouse gases and global warming.

NO_2-Nitrogen dioxide (represents about 80% of NOx). NO_2 is a toxic gas that mainly comes from burning fuel in cars, individual and collective heaters, and from thermal power plants.

Impacts on health and the environment. Nitrogen oxides have pronounced effects on the lungs but also on other body organs such as the liver and spleen. In the blood it may create defects methaemoglobin, which does not allow the transport of oxygen. Nitrogen gases in the air can be converted to acid rain. NO and NO_2 are also contributors to the ozone depletion.

Ozone- is a highly toxic substance with pronounced corrosive properties and is known as a common polluter. Ozone is formed in the atmosphere by the reaction between nitrogen oxides, hydrocarbons and sunlight. Many electrical appliances, such as televisions, photocopiers, and electric motors (which use brushes), produce so quantities of ozone that one can easily smell it.

Impacts on health and the environment. Acute impacts include symptoms in the respiratory system, changes in the functioning of the pulmonary system, increased respiratory sensitivity, and respiratory inflammation. Ozone damages vegetation and forests (photooxidation effect), degrading the appearance of cities, national parks and recreation areas.

PM10/PM2.5-Particulate matter -These two types of particles are not separate compounds, but the concentration of the suspended mass in the air having a diameter of less than 10 μm (PM10) or a diameter of less than 2.5 μm (PM2.5). Especially in locations with heavy traffic when these parameters exceed the allowed thresholds or MAV), these are of particular importance for the public and the population.

Impacts on health and the environment. A large number of studies show short-term effects on the cardiovascular system, which are associated with PM, while direct effects on a number of heart attacks have been argued to be caused by the presence of PM in the air. A long-term effect is considered the PM (particulate matter), which has toxicological content that attacks the respiratory system and reduces immunity due to the penetration of PM into the depths of the lungs and into the bronchial parts.

Smog is a polluted air phenomenon. The word Smog comes from English, Smoke + Fog = Smog. Smog occurs in large cities during autumn and winter, where large pollutants dominate in a small space (industry, district heating, gases released from automobile engine combustion, individual heating, etc.). The lack of winds contributes even more to the pollution with the presence of smog.
Smog is especially harmful to those suffering from asthma, the elderly and children.
The term "**electronic smog**" has been recently introduced. This means various pollutants, which originate from electrical and electronic devices, such as power substations, overhead power lines, mobile telephony stations, radio and television emitters, but also neon pipes, hairdryers, microwaves, various electric motors, monitors, etc.

1.1. Air quality during 2019

During 2019, KEPA was characterized by a significant progress regarding the advancement and provision of data from monitoring stations. The full functionalization of all monitoring stations (11 monitoring stations) and of parameters foreseen for continuous monitoring was achieved during 2017. At the beginning of 2018, the ***Online System*** was implemented as a testing phase for 8 monitoring stations, with the exception of stations in Obiliq, Dardhishta and Palaj which were included through the projects of the European Commission, JICA and MCC, to be connected to the online network.
Now the air quality monitoring system counts 12 monitoring stations. Data from the online system can be found here: http://www.kosovoairquality.rks-gov.net/secure/index2.html.
The timeliness of the monitoring results is very good except in certain cases where, due to objective circumstances, there may be some interruption in the operation of the equipment.
The autumn-winter season marks an increase in air pollution every year. Even during 2019, there were very high values of particles in the form of **PM10 and PM2.5** in some localities of the country. There was a significant excess of Limited Values (LV) in almost all monitoring stations, except in Brezovica. These exceedances were reported during January, February, October, November and December 2019. In fact, the level of air pollution in the entire territory of Kosovo during 2019 does not differ from the level of air pollution in the previous year due to the fact that the sectorial sources of air pollution are almost the same.
The meteorological conditions in the mentioned months were unfavourable, which affected the accumulation of pollutants in the air without the possibility of distribution. Air mass movements were of low intensity (less than 2 m/sec), variable temperatures (2-15^{0}C), high atmospheric pressure (1013-1016 hPa) and no precipitation. These meteorological conditions lead to the so-called temperature inversion, which keeps pollution over the territory in which such conditions prevail. With these atmospheric conditions in urban areas where we have heavy traffic, the movement of old vehicles, heating of buildings with coal, wood and pellets, have increased the level of air pollution.

Regarding the parameters of **SO_2, CO and Ozone**, it is easily ascertained that there was no exceeding of MAV during 2019. There were increased (from time to time) values of NO/NO_2 concentration in AKS1 agglomeration in KHMI monitoring stations Rilindja, Obiliq, Dardhishta and Palaj. In Kosova 1 (ZKS1) Zone there were exceedances of NO_2 values such as in Hani i Elezit, Gjilan and Prizren.

The average monthly data for each parameter will be presented in the following. Based on the EU Directives on air quality and according to the Administrative Instruction No. 15/2010 on criteria for defining the air quality monitoring points, number and frequency of measurements, classification of pollutants which are monitored, the methodology of work, form and timing of data report, ***AKS1 Agglomeration*** (Prishtina KHMI, Rilindja, Dardhishta, Palaj and Obiliqi) is treated separately from ***ZKS1 Zone*** (Drenas, Mitrovica, Gjilan, Hani i Elezit, Peja, Brezovica and Prizren).

4.5.1. AKS1 Agglomeration (Prishtina area)

AKS1 agglomeration includes 5 air quality monitoring stations. Two monitoring stations are located in Prishtina: one in the yard of the former Rilindja building and the other in the yard of KHMI. Three monitoring stations are located in Obiliq (FMC), Dardhishta (Primary School) and one in Palaj (Kosovoomont facility in the KEK area).

During 2019, there were exceedances of the limit values (LV) of **PM10** (40 µg/m^3) in the monitoring station KHMI, Rilindja, Dardhishta and Obiliq, as an annual average. Exceedances were highlighted during January, February, March, October and December (Tab. 9). Figure 7 shows the average annual values of PM10 for 2019 in AKS1.

Tab. 10. Average monthly values of PM10 for AKS1 Agglomeration for 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	71	12.7	16.9	19.3	9	15.4	15.1	19.4	18.5	25.1	22.9	43.6	23.7
Rilindja	44	33.3	27.8	22.3	16.1	14.6	12.3	14.7	14.5	25.7	22	35.8	23.5
Palaj	38	29.3	28.5	24.9	9.6	13.8	14.4	16.4	15.6	33.5	17	22.5	21.9
Obiliq	78.2	57.6	43.7	35.9	16.8	18.1	18.9	20	22	38.7	31.9	42.3	35.3
Dardhishta	63.3	46.5	37.6	38.4	9.8	15.9	**16.1**	33.1	27.8	40.9	22	40.3	32.6

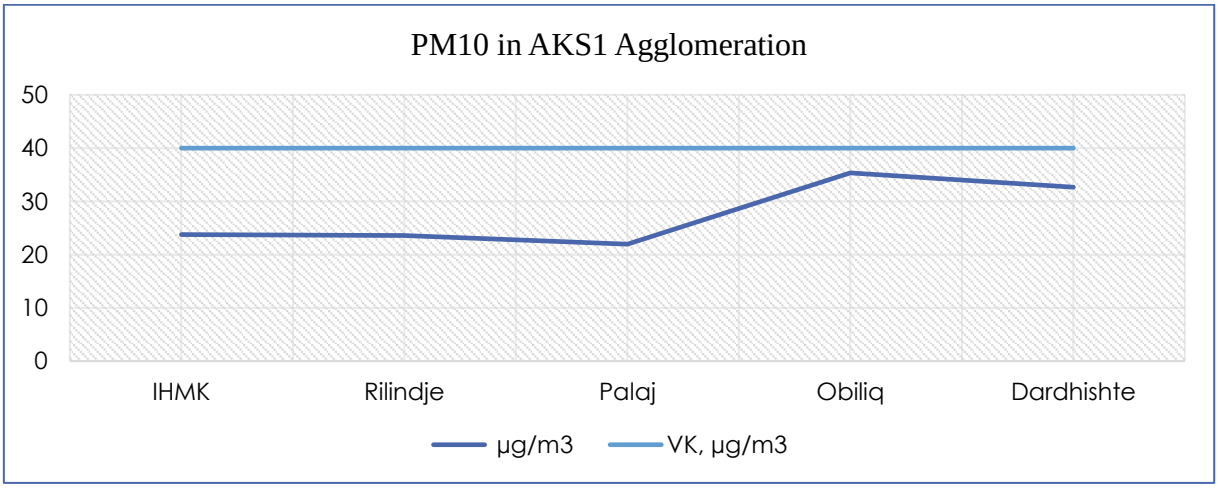


Fig. 5. Annual average of PM10 for 2019 in AKS1

PM2.5 values appear with exceedances of the limit values during January, February, October, November and December 2019. With the exception of Palaj, where there were slight exceedances, in other stations (KHMI, Rilindja, Obiliq and Dardhishta) there were significant exceedances of LV (25 µg/m^3), (Tab. 8). Figure No. 6 shows the average annual values of PM2.5 for 2019 in AKS1.

Table 11. Average monthly values of PM2.5 in AKS1

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	57.8	33.2	24	16.7	8.2	10.9	9.5	10.2	11	22.6	16.9	27	20.6
Rilindja	41.1	24.6	18.4	13.1	8	8.7	7.5	7.9	8.9	15.6	14.3	27.5	16.3
Palaj	34.9	20.1	15	11.7	4.3	6.6	6.4	7.3	7.7	23.8	12.8	18.2	14.1
Obiliq	75.9	43.6	28.8	19.8	8.5	9.5	8.9	9.8	11.3	26.9	24.4	34.6	25.1
Dardhishta	61.4	33.9	22.4	28.3	4.9	6.4	6.3	10.1	11.6	31.1	18.8	34.2	22.4

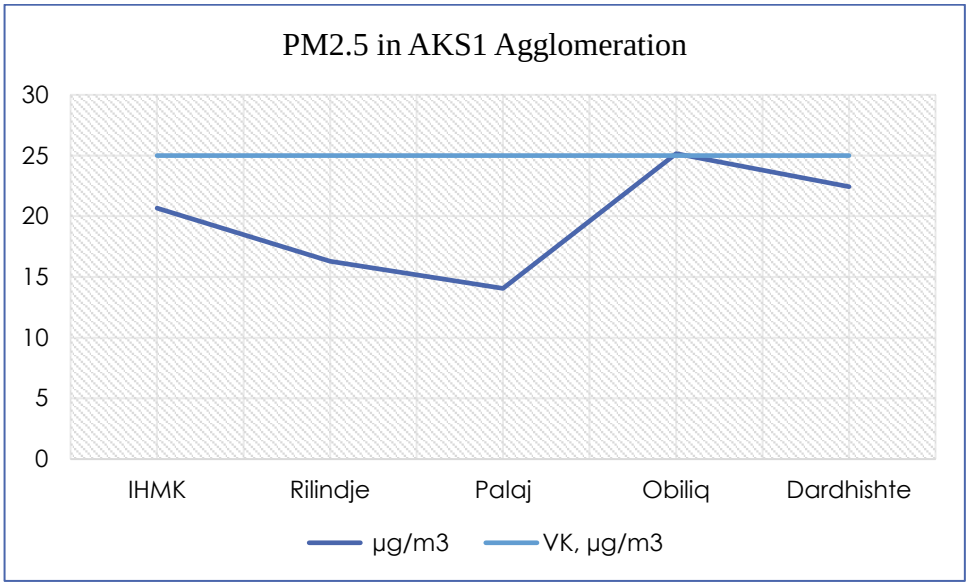


Fig. 6. Annual average of PM2.5 for 2019 in AKS1

Ozone in the AKS1 zone did not exceed LV (120 µg/m^3). In Obiliq, Dardhishta and Palaj, there were higher values compared to ozone values in other monitoring stations. (Tab. 9.). Figure 7 shows the average annual values of ozone for 2019 in AKS1.

Table 12. Average monthly values of ozone in AKS1 during 2019

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	57.8	33.2	24	16.7	8.2	10.9	9.5	10.2	11	22.6	16.9	27	20.6
Rilindja	41.1	24.6	18.4	13.1	8	8.7	7.5	7.9	8.9	15.6	14.3	27.5	16.3
Palaj	34.9	20.1	15	11.7	4.3	6.6	6.4	7.3	7.7	23.8	12.8	18.2	14.1
Obiliq	75.9	43.6	28.8	19.8	8.5	9.5	8.9	9.8	11.3	26.9	24.4	34.6	25.1
Dardhishta	61.4	33.9	22.4	28.3	4.9	6.4	6.3	10.1	11.6	31.1	18.8	34.2	22.4

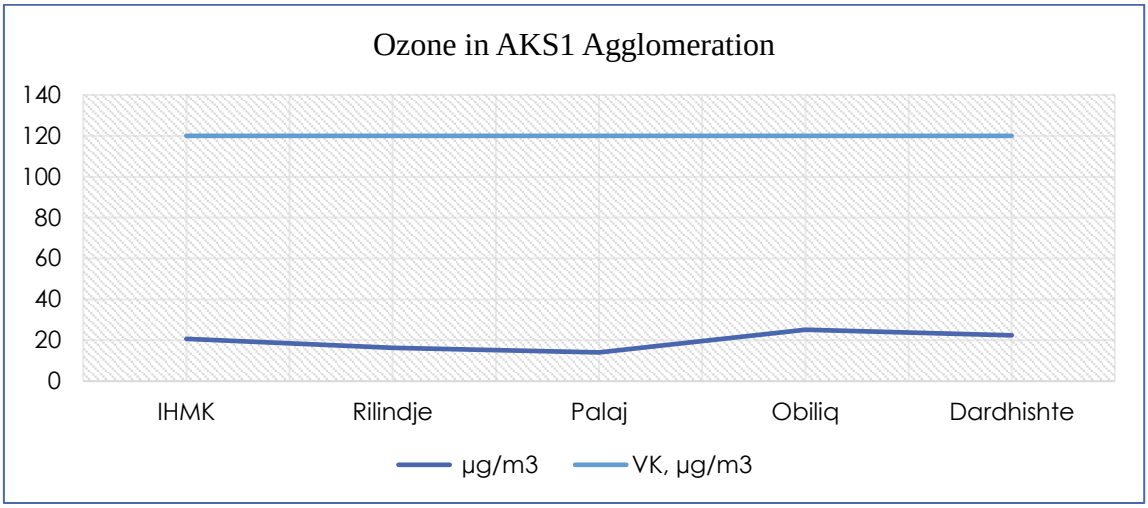


Fig. 7. Annual average of ozone for 2018 in AKS1

NO_2 appears with some exceedances of LV (40 µg/m^3). At the monitoring station in Rilindja there were exceedances for 5 months, in KHMI there were exceedances for 2 months and in Dardhishta for one month. (Tab.10). Figure 8 shows the average annual values of NO_2 for 2019 in AKS1.

Table 13. Average monthly values of NO_2 in AKS1 during 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	53	39.7	43.5	34.6	23.9	22.6	25.9	31	26.3	36.7	18.6	23.7	31.6
Rilindja	65.2	41.8	47.8	39.7	31.8	32.7	43.2	*	*	56.7	40.4	39.9	43.9
Palaj	37	18.2	14.3	11.2	5.3	6.4	7.2	8.2	7.3	12.3	9.8	12.6	12.4
Obiliq	59	32.3	24.4	18.4	10.7	8.3	14.5	21.1	84	28.1	21.8	21.9	28.7
Dardhishta	68.5	27.3	27.4	12	13.8	10.3	11.2	13.3	12.9	18.4	15.2	17.3	20.6

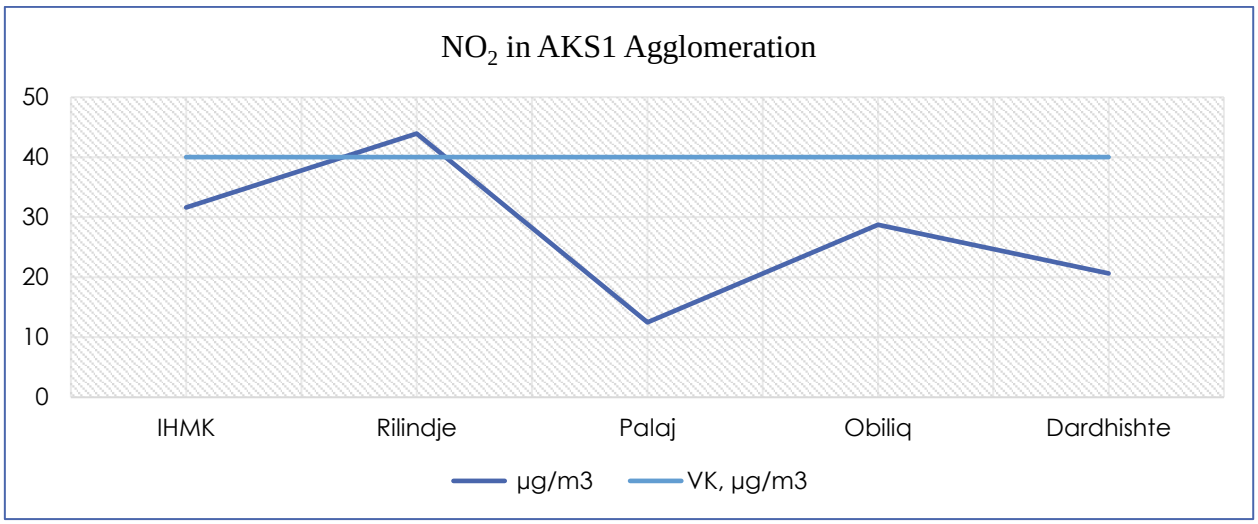


Fig. 8. Average annual values of NO_2 for 2019 in AKS1

SO_2 during 2019 does not appear with exceedances of LV (120 µg/m^3) in any of the monitoring stations (Tab. 11). Figure 9 shows the average annual values of SO_2 for 2019 in AKS1.

Table 14. Average monthly values of SO_2 in AKS1 during 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	6.2	3.1	3.2	2.7	3.7	6.6	8	7.4	8.1	11.2	6.8	11.1	6.5
Rilindja	18.2	19.6	28.1	31.4	4.6	8.6	12.1	10.7	9.5	11	10.4	12.4	14.7
Palaj	19.7	12.9	0	6.8	9.6	10.1	10.3	10.6	9.8	9.5	5.1	5.3	9.9
Obiliq	2.4	10.6	7	6.8	6.6	3.2	26	35.2	3.8	7.5	5.9	8.7	10.3
Dardhishta	*	*	9.4	0	4.9	**10.2**	**21.1**	31.3	9.4	16.5	10.3	13.5	14.1

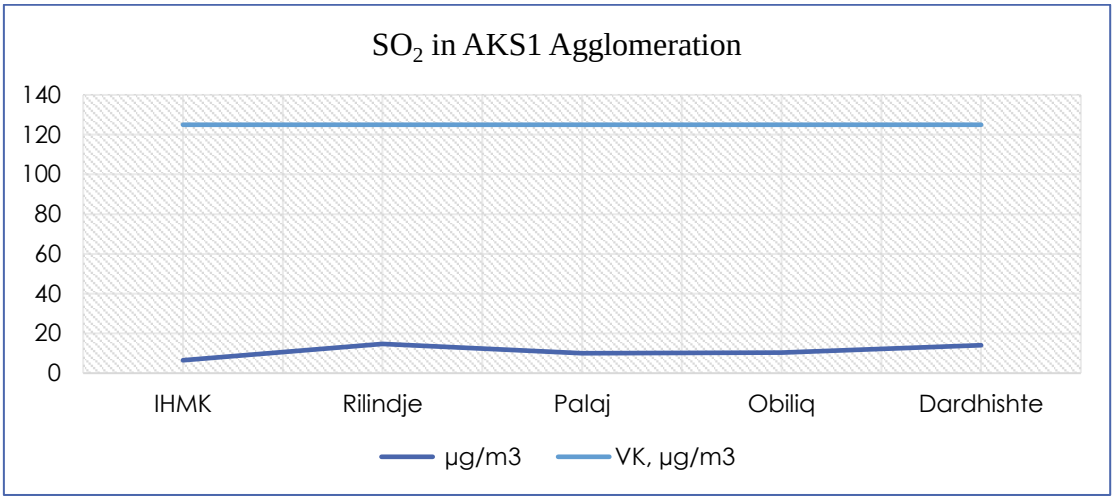


Fig. 9. Average annual values of SO_2 for 2019 in AKS1

CO had no exceedances of LV (10 mg m^3) at any air quality monitoring station in AKS1. (Tab.12). Figure 10 shows the average annual values of CO for 2019 in AKS1.

Table 15. Average monthly values of CO in AKS1 in 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2019
KHMI	1.4	1.4	1.5	1.6	1.3	0.5	0.8	0.7	1.1	1.6	2	2.4	1.3
Rilindja	2.1	1.8	1.6	1.6	1	0.3	0.5	0.7	0.9	1	1.4	3.2	1.3
Palaj	*	*	*	0	0.3	0.2	0.4	0.2	0.1	0.2	0.1	0.3	0.2
Obiliq	2	1.2	0.8	0.7	0.3	0.4	1.9	2.8	0.4	0.6	0.5	1.9	1.1
Dardhishta	3.3	3.9	3.8	0.2	0.1	1	1.7	2.7	3.7	4.6	5.9	6.2	3.1

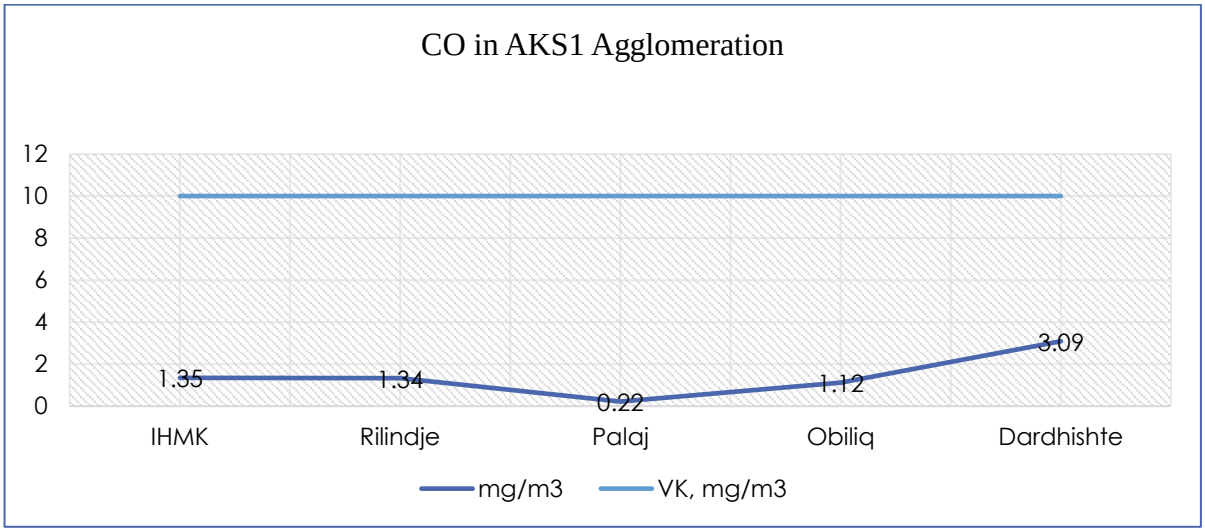


Fig. 10. Average annual values of CO for 2019 in AKS1

Table 13 shows the **days with exceedances** of PM10 during 2019. The rate allowed for PM10, according to AI No. 02/2011 for air quality assessment, is up to 35 days exceedances during a calendar year. From the table it can be seen that apart from Palaj (20 days) and Rilindja (29 days), in 3 other stations of the AKS1 zone there were exceedances of the allowed norm, such as: KHMI-51 days, Obiliq-72 days and Dardhishta-53 days. These exceedances have been reported in the winter/autumn/spring season.

Table 16. Days with exceedances of PM10/2019

Month	January	February	March	April	May	June	July	August	September	October	November	December	2019
KHMI	15	11	7	**3**	0	0	0	0	0	8	1	6	51
Rilindja	8	4	1	2	**0**	0	**0**	0	0	3	0	11	29
Obiliq	22	12	10	**8**	**0**	**0**	**0**	**0**	0	10	0	10	72
Dardhishta	13	9	6	8	0	0	0	0	0	8	0	9	53
Palaj	7	4	1	2	0	**0**	0	**0**	0	5	0	1	20
Total	65	40	25	23	0	0	0	0	0	34	1	37	225

4.2.2. ZKS1 zone includes the territory monitored for air quality in the following centres: Drenas, Mitrovica, Prizren, Elez Han, Peja, Brezovica and Gjilan.

During 2019 there were exceedances of LV for **PM10** (40 µg/m3) in all monitoring stations of ZKS1 (Table 14). Figure 11 shows the average annual values of PM10 for 2019 in the ZKS1 Zone.

Table 17. Average monthly values of PM10 during 2019 in ZKS1

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	71	12.7	16.9	19.3	9	15.4	15.1	18.1	15.8	25.1	22.9	43.6	23.7
Mitrovica	66.3	36.7	35.2	31.8	17.8	21.5	16.6	19.1	18.3	33.4	38.4	45.5	31.7
Peja	76.9	48.5	35.4	16.5	9.6	11	10.7	7.8	0	*	54.3	58.7	32.9
Prizren	68	42	28.8	26.1	13.3	13.8	15.3	16.9	17.3	30.1	40.5	58.5	30.8
Hani i Elezit	46.5	40.1	44.6	28.4	13.1	8.9	7.6	7.7	11.9	29.7	31.3	35	25.4
Gjilan	87.4	79.8	35.4	16.1	7.5	5.3	4.4	4.2	4.3	28.2	45.2	49.5	30.6
Brezovica	*	*	*	*	*	*	*	*	*	*	2.5	1.8	2.1

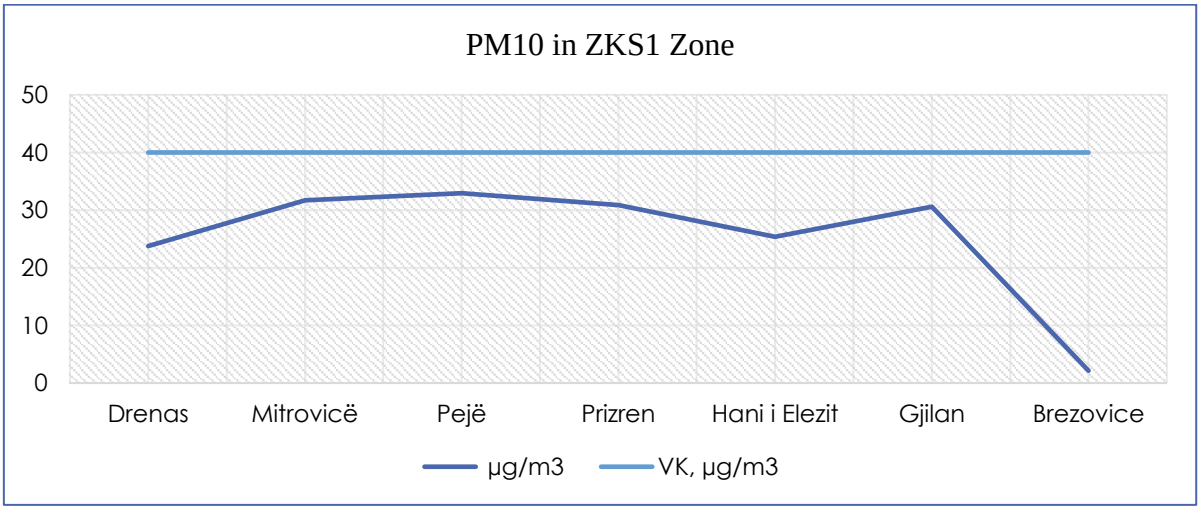


Figure 11. Average annual values of PM10 for 2019 in ZKS1

PM2.5 shows exceedances of LV (25 µg/m^3) in all monitoring stations. The exceedances in the spring/autumn/winter season (Table 15) are more pronounced. Figure 12 shows the average annual values of PM2.5 for 2019 in ZKS1.

Table 18. Average monthly values of PM2.5 during 2019 in ZKS

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	59.8	12.2	11.7	12.3	6.2	9	8.6	9.7	9.8	18.7	17.8	33.9	17.4
Mitrovica	58.2	26.8	22.1	21.5	11.8	14	10.8	12	11.9	22	28.3	36.9	23.1
Peja	71.6	38.3	25.6	12.3	7.2	7.5	7.5	5.7	*	*	47.9	47.2	27.1
Prizren	62.2	31.8	17.5	16.3	8.1	7.9	8.9	9.5	10.1	19.6	30.5	47.5	22.5
Hani i Elezit	40.4	25.2	21.1	14.9	7.5	6.2	5.4	5.5	7.6	17.9	20.3	26.9	16.5
Gjilan	78.1	51.3	26.1	11.6	5.3	4	3.3	3.4	3.8	22.3	26.1	40	22.9
Brezovica	*	*	*	*	*	*	*	*	*	*	2.1	1.8	1.9

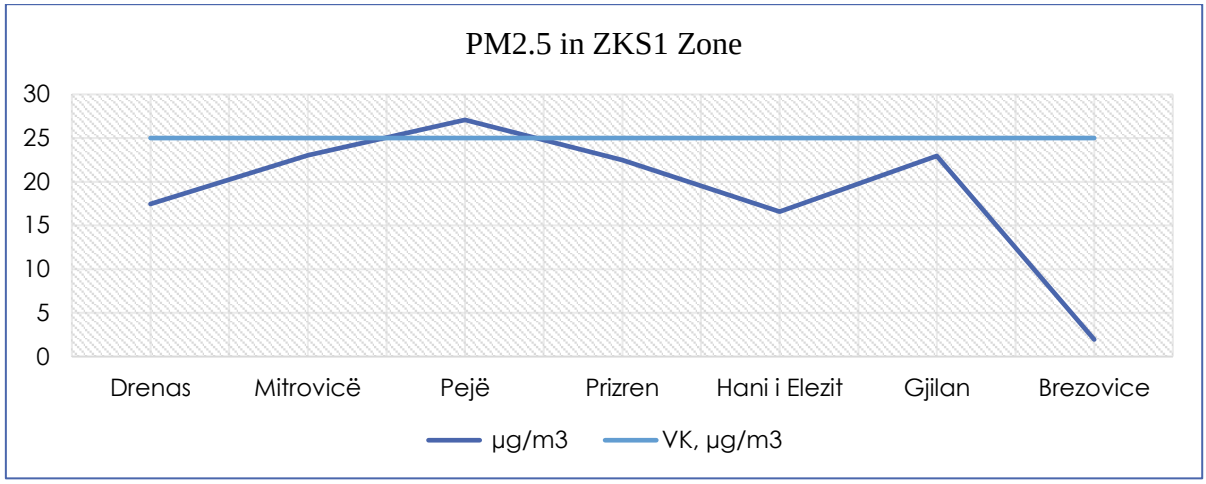


Figure.12. Average annual values of PM2.5 for 2019 in ZKS1

Ozone appears at normal values and had no exceedances of LV (120 µg/m^3) for all stations (see Table 16). Figure 13 shows the average annual values of ozone for 2019 in ZKS1 Zone.

Table 19. Average monthly values of ozone during 2018 in ZKS1

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	*	*	*	*	*	*	*	*	*	28.7	39.1	32	33.2
Mitrovica	53.1	52.8	58.9	52.6	41.1	33.1	35.4	34.6	32.9	24	17	23.6	38.2
Peja	*	*	*	*	*	*	*	*	*	25.7	11	14.6	17.1
Prizren	35.7	54.7	71.7	72.1	54	60.6	67.4	75.9	59.2	39	31.1	29	54.2
Hani i Elezit	37.8	44.6	48.8	51.2	43.6	31.4	38.2	46.5	50.8	41.4	21.3	23.4	39.9
Gjilan	23.8	26.1	40.3	53.2	53	60.7	69.6	68	46.7	29.2	29.9	30.8	44.2
Brezovica	*	*	*	*	*	*	*	*	*	41.6	73.9	74	63.1

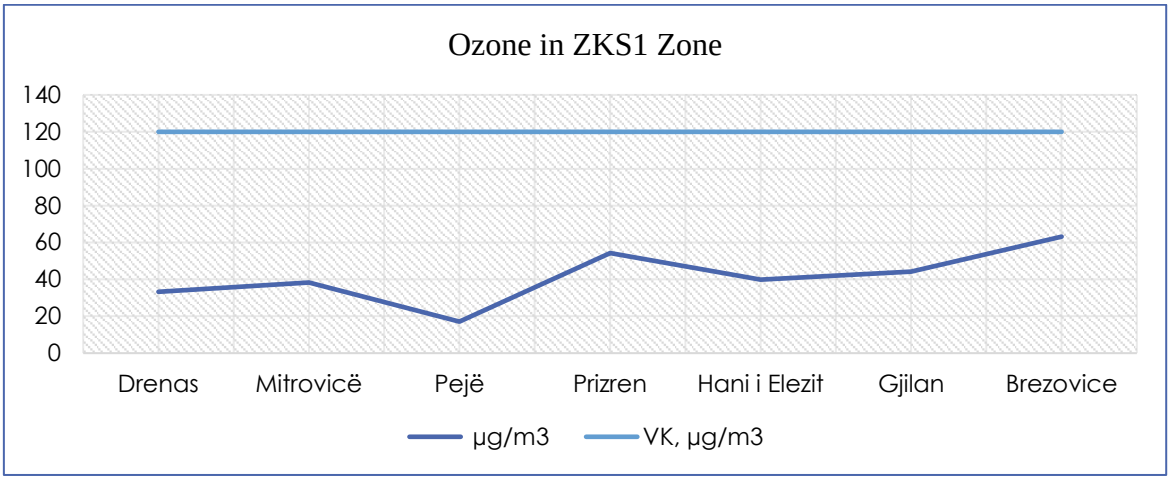


Figure13. Average annual ozone values for 2019 in ZKS1

NO_2 appears with some values with continuous exceedances of LV (40 µg/m^3) in Hani i Elezit and less exceedances in Gjilan and Prizren (see Table 19). Figure 14 shows the average annual values of NO_2 for 2019 in the ZKS.

Table 20. Average monthly values of NO_2 during 2019 in ZKS1

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	39.3	21.3	16.7	16.6	11.1	10.8	12.7	16.1	13.4	16.2	14.5	17.5	17.1
Mitrovica	31.1	14.5	15.9	13	9.4	9.8	16	18.7	15.5	17.2	13.9	15.6	15.8
Peja	*	*	*	*	*	*	*	*	*	15.7	10.4	13.4	13.1
Prizren	29.1	17.9	9	9.6	12.8	9.3	7.2	10.1	6.8	15.4	26.5	15.6	14.1
Hani i Elezit	38	55.2	61.3	57.4	42.6	22.4	26.3	34.8	36.3	40.5	2.3	19.6	36.4
Gjilan	67.7	51.2	35.2	24.3	17.9	16	19.2	23.4	20.8	28.6	22.2	21.3	28.9
Brezovica	*	*	*	*	*	*	*	*	*	2.3	1.2	1.4	1.6

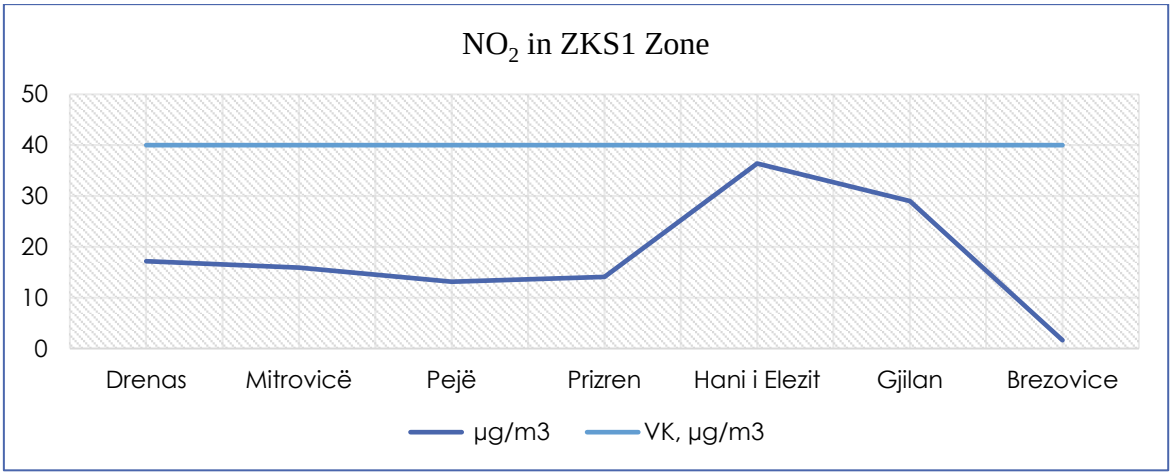


Figure 14. Average annual values of NO_2 for 2019 in ZKS1

SO_2 did not have exceedances of LV (125 µg/m^3) at any monitoring station within the ZKS1 Zone (see Table 18). Figure 15 shows the average annual values of SO_2 for 2019 in ZKS1 Zone.

Table 21. Average monthly values of SO_2 during 2018 in ZKS1

Month	Jan.	Feb.	Mar.	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	2019
Drenas	12.3	6.8	6.9	17.5	33.3	33	32.3	30.8	28.6	15.3	2.2	5.5	18.7
Mitrovica	3.2	3.9	3.5	6.1	11.1	15.5	15.7	16.7	16.8	12.5	28.9	46.8	15.1
Peja	*	*	0	0	0	0	0	0	0	1.2	1.9	1.5	1.5

Prizren	*	6.8	0	22.1	8	12.8	15.5	7.6	11.7	10.1	5.9	5.1	10.5
Hani i Elezit	4	3.5	3.5	5.1	7.5	9.1	13.5	15	17.3	13	1.4	0.8	7.8
Gjilan	9.8	9.1	10.4	10.9	11	11	14.3	17.5	18.5	25.5	4.6	2.2	12.0
Brezovica	*	*	*	*	*	*	*	*	*	0.8	1.3	1.3	1.1

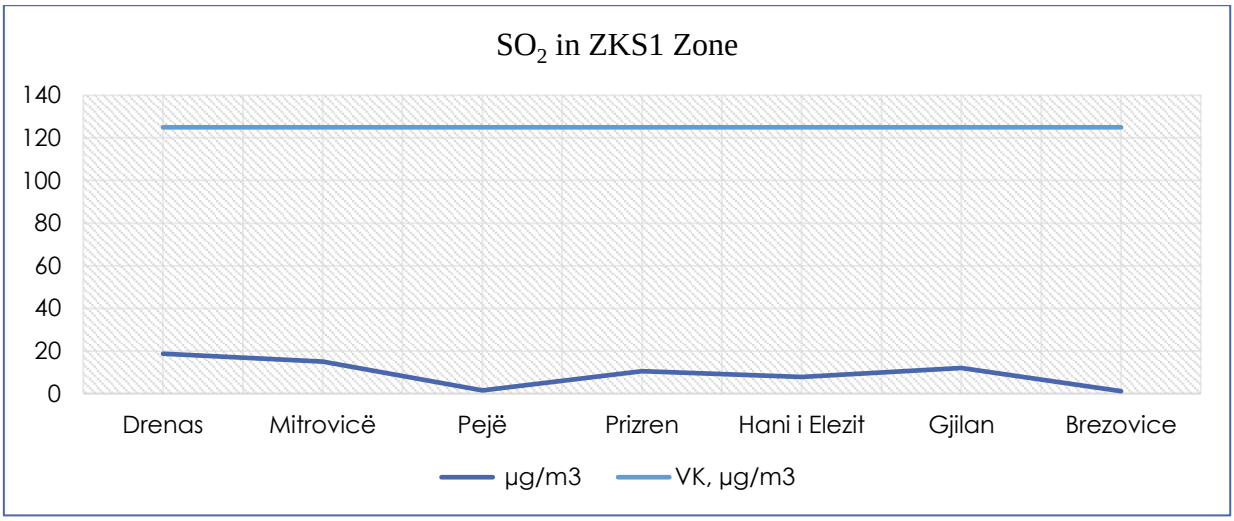


Figure 15. Average annual values of SO_2 for 2019 in ZKS1

CO does not appear with exceedances of LV (10 mg/m^3) at any monitoring station in ZKS1 Zone (see Table 19). Figure No. 16 shows the average annual values of CO for 2019 in ZKS1.

Table 22. Average monthly values of CO during 2019 in ZKS1 Zone

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	1	0.5	0.8	0.7	1	1.2	1	0.4	0.6	0.8	0.5	0.8	0.7
Mitrovica	1.5	0.8	0.7	0.5	0.2	0.2	0.3	0.1	0.1	0.1	0.4	0.6	0.4
Peja	*	*	*	*	*	*	*	*	*	0.7	0.6	0.9	0.7
Prizren	1.5	0.9	1.1	1.4	0.2	0.3	0.3	0.9	0.9	1	o.6	0.9	0.8
Hani i Elezit	0.9	0.8	1.2	0.9	1.1	0.7	1.3	0.4	0.3	0.2	0.3	0.4	0.7
Gjilan	1.8	1.5	0.8	0.5	0.6	0.8	1	0.7	0.4	0.4	0.5	0.8	0.8
Brezovica	*	*	*	*	*	*	*	*	*	0.1	0.4	0.6	0.3

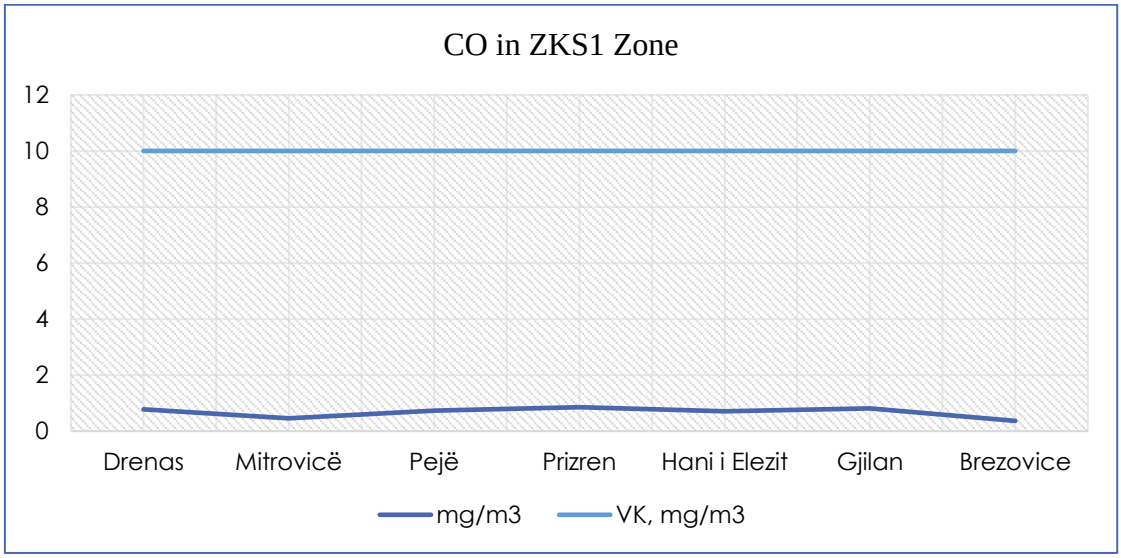


Figure 16. Average annual values of CO for 2019 in ZKS1

The following table shows the exceedances of PM10 in ZKS1 during 2019. Excedances of the allowed rate are presented in Table 20. Exceedances of the allowed rate were present in Mitrovica with 48 days, Hani i Elezit with 42 days, Gjilan with 65 days, Peja with 63 days and Prizren with 59 days. In Drenas, no exceedances of allowed rate of PM10 were recorded, which means that there were less than 35 days with exceedances.

Table 23. Days with exceedances for PM10/2019

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	2019
Drenas	14	4	0	**0**	**0**	**0**	**0**	**0**	0	3	0	12	33
Mitrovica	17	8	1	**4**	**0**	**0**	**0**	**0**	0	6	0	12	48
Peja	22	12	5	**0**	**0**	**0**	**0**	**0**	0	0	10	14	63
Prizren	21	7	0	**2**	0	0	0	0	0	4	9	16	59
Hani i Elezit	13	7	10	1	**0**	0	**0**	0	0	3	2	6	42
Gjilan	27	20	5	0	0	0	0	0	0	0	7	6	65
Brezovica	*	*	*	*	*	*	*	*	*	0	0	0	0
Total	114	58	21	7	0	0	0	0	0	16	28	66	310

4.5.2. Average monthly data for PM10/PM2.5 for 2019

The following shows the data for these two parameters for each station and month for 2019. At the end of each graph is the average of PM10 and PM2.5 with corresponding colours, based on EU standards for AQI (Air Quality Index). There were exceedances of LV of PM10 and PM2.5 in the following months; January, February, March, October, November and December. In these months of the year there is always the highest level of air pollution, as it had been in previous years. The causes of increased pollution during the months in question are the same, including: urban traffic, heating with fuels (coal, wood, pellets, petroleum products, etc.), energy industry, agriculture, waste treatment and other operators. Average monthly data for PM10/PM2.5, for each station, are presented in figures 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28.

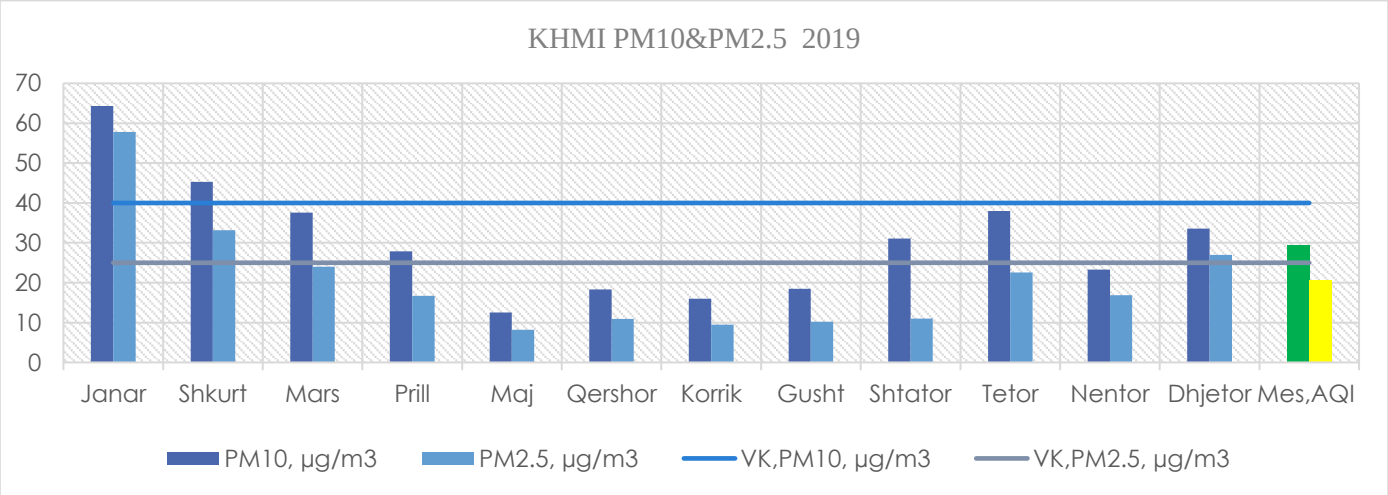


Figure 17. Average monthly values of PM10 & PM2.5 at KHMI Station

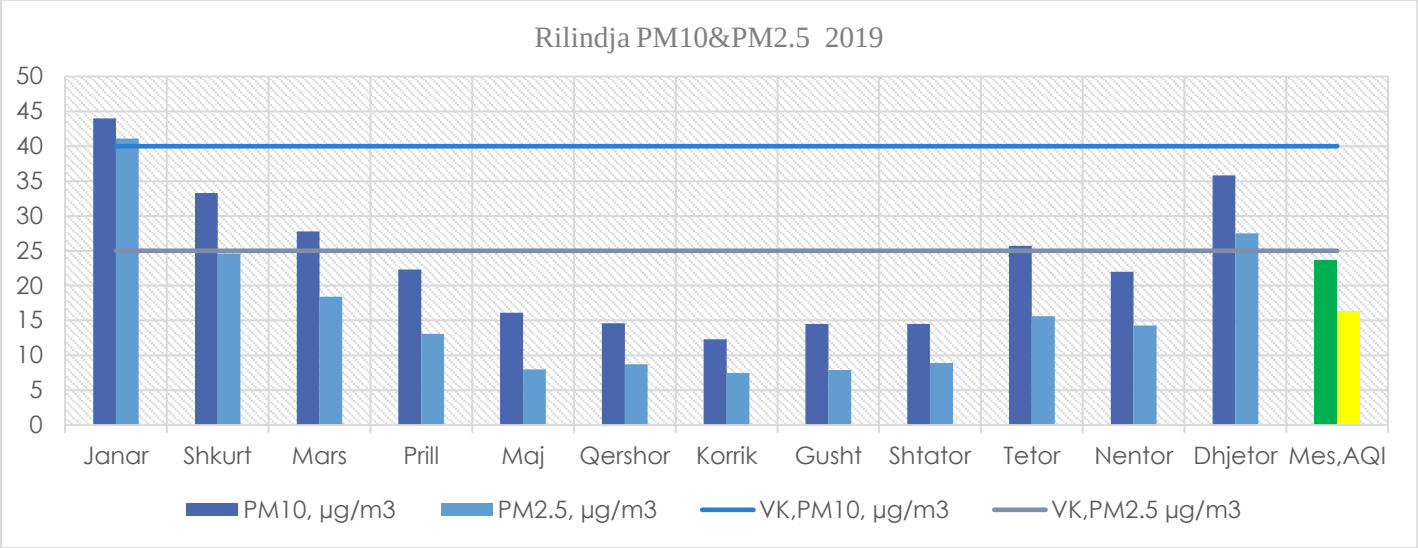


Figure 18. Average monthly values of PM10 & PM2.5 at the Rilindja Station

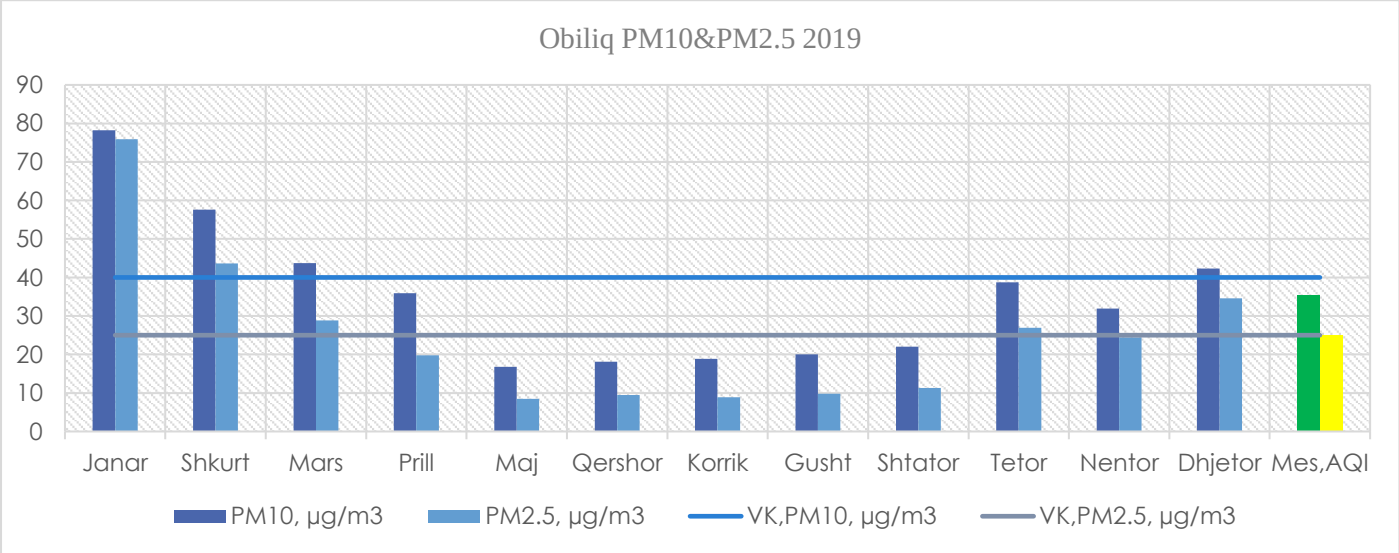


Figure 19. Average monthly values of PM10 & PM2.5 at Obiliq Station

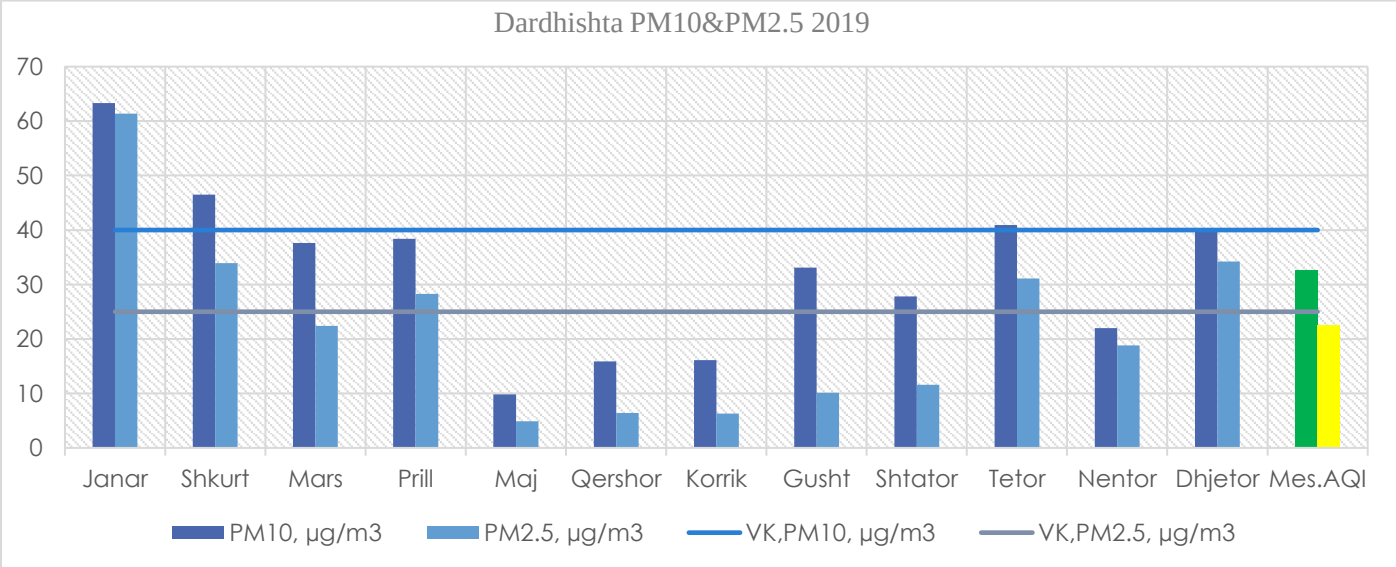


Figure 20. Average monthly values of PM10 & PM2.5 at Dardhishta Station

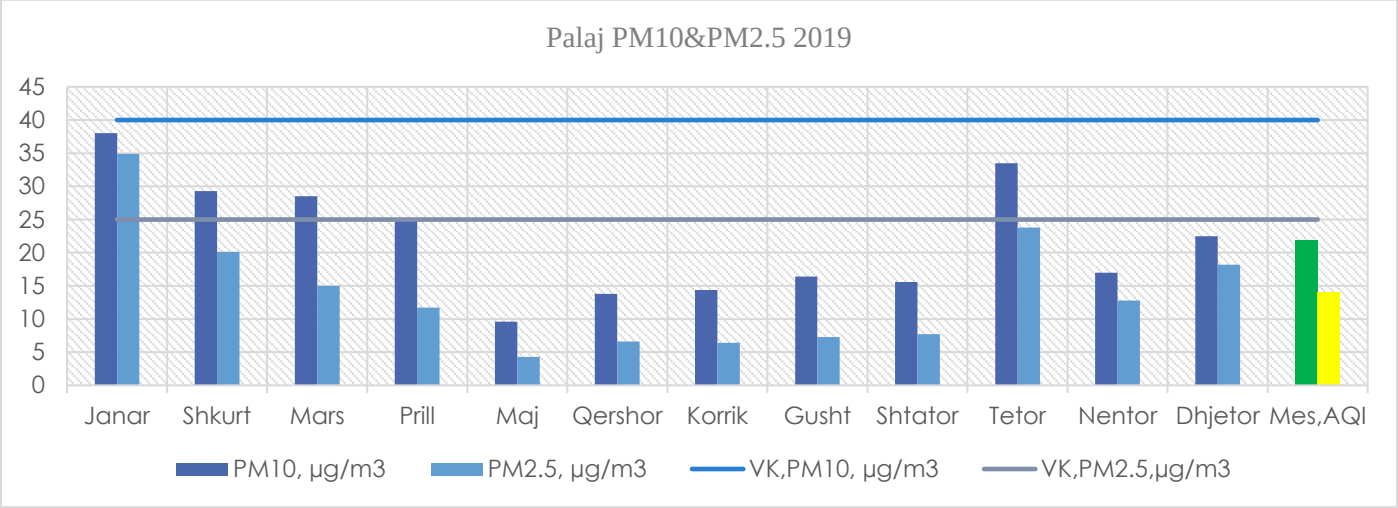


Figure 21. Average monthly values of PM10 & PM2.5 at Palaj Station

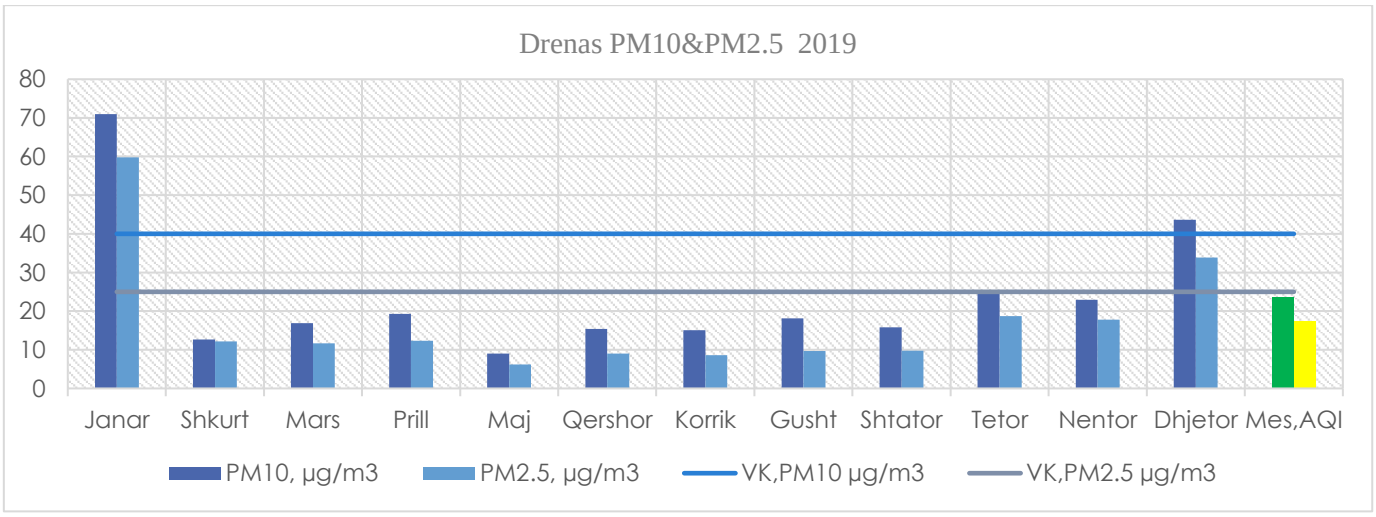


Figure 22. Average monthly values of PM10 & PM2.5 at Drenas Station

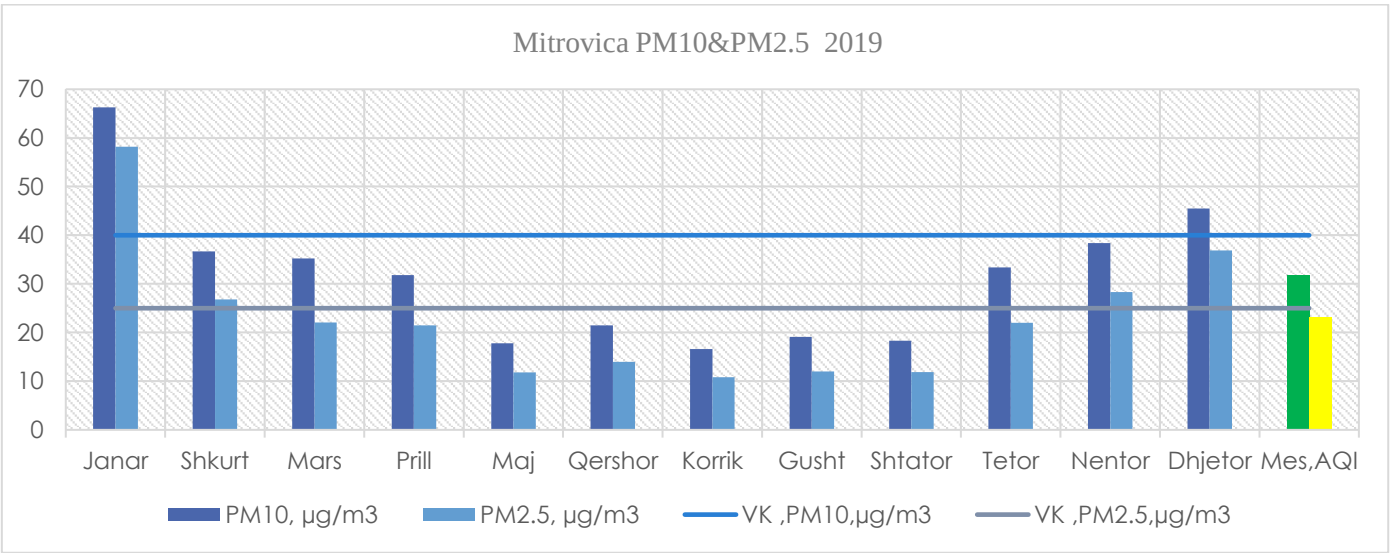


Figure 23. Average monthly values of PM10 & PM2.5 at Mitrovica Station

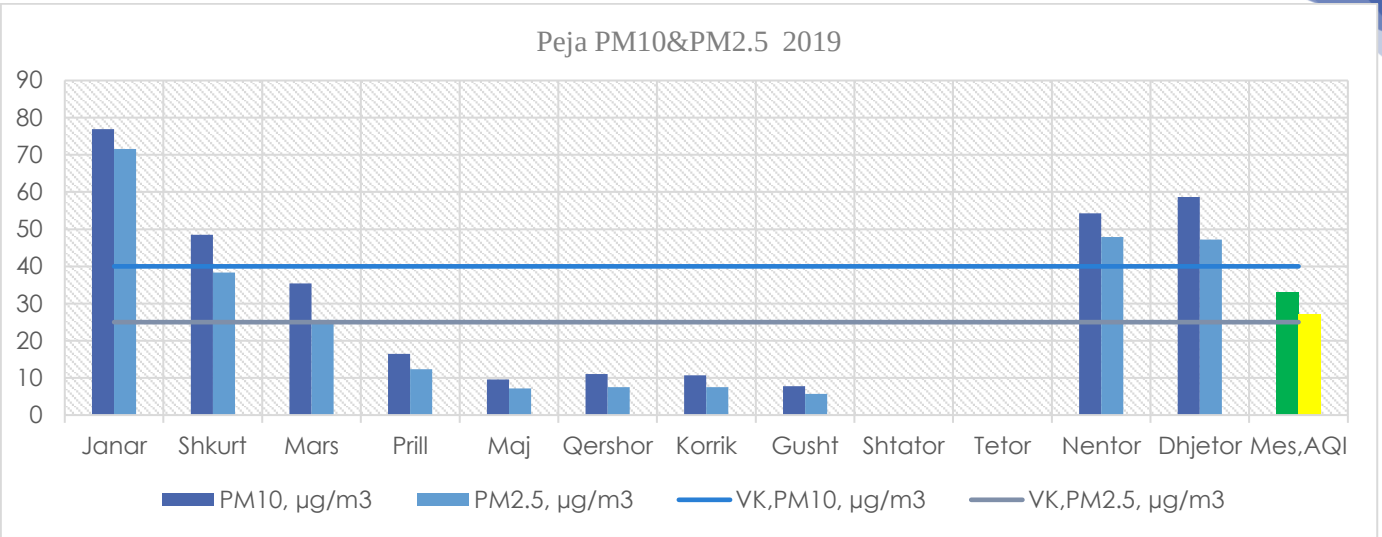


Figure 24. Average monthly values of PM10 & PM2.5 at Peja Station

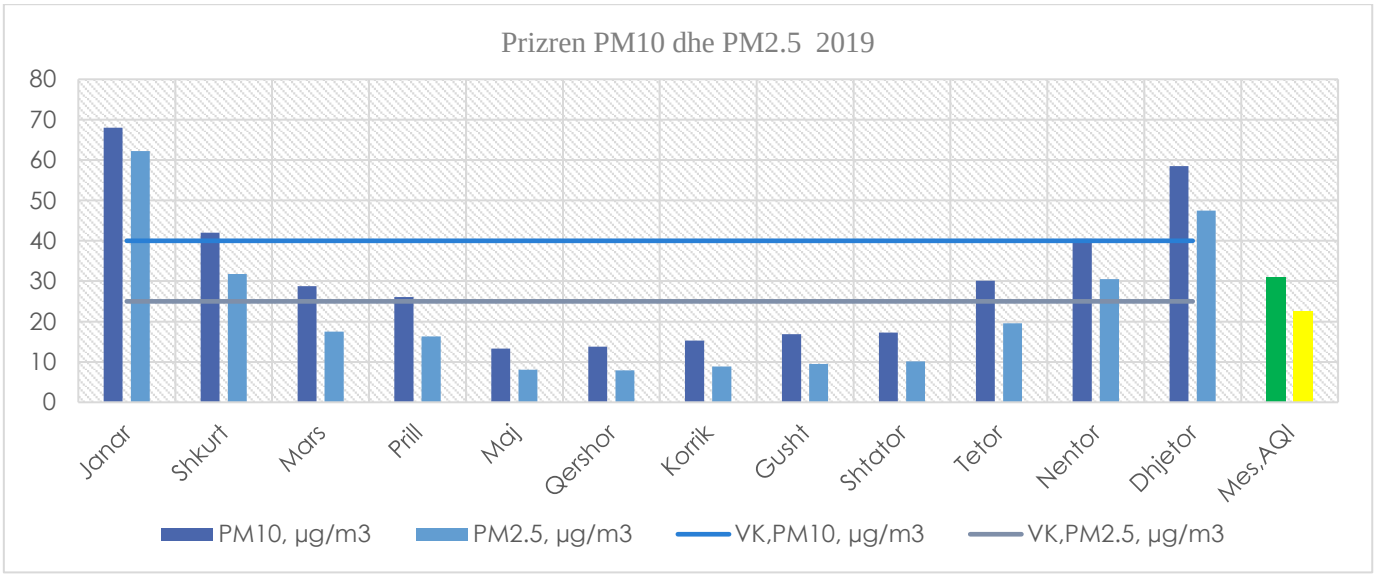


Figure 25. Average monthly values of PM10 & PM2.5 at Prizren Station

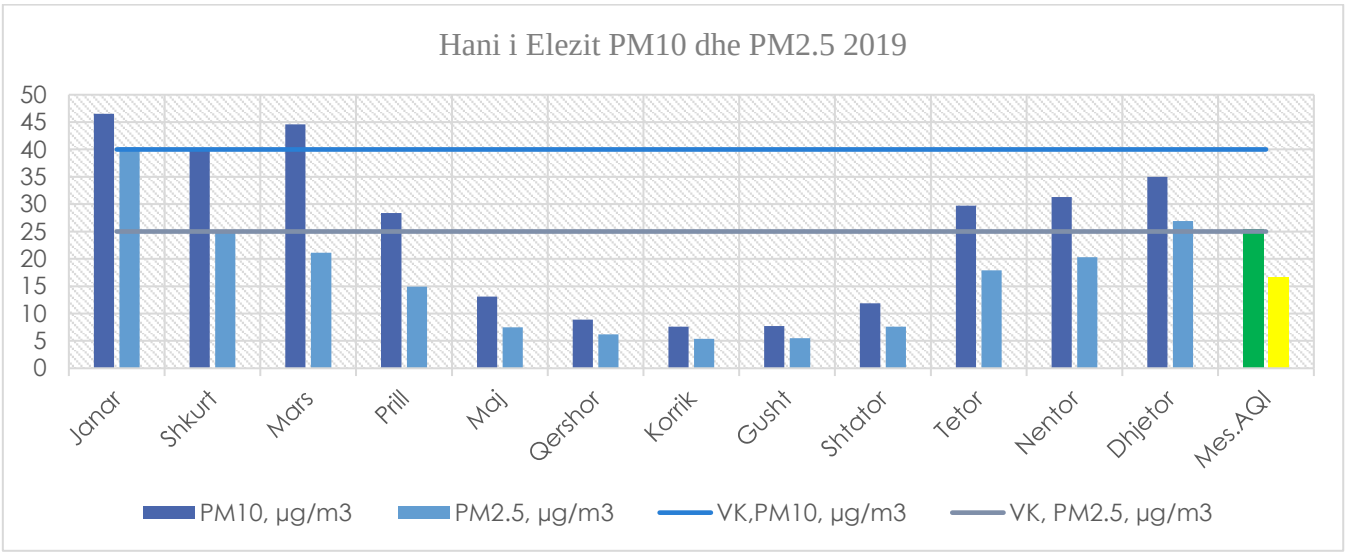


Figure 26. Average monthly values of PM10 & PM2.5 at Hani i Elezit Station

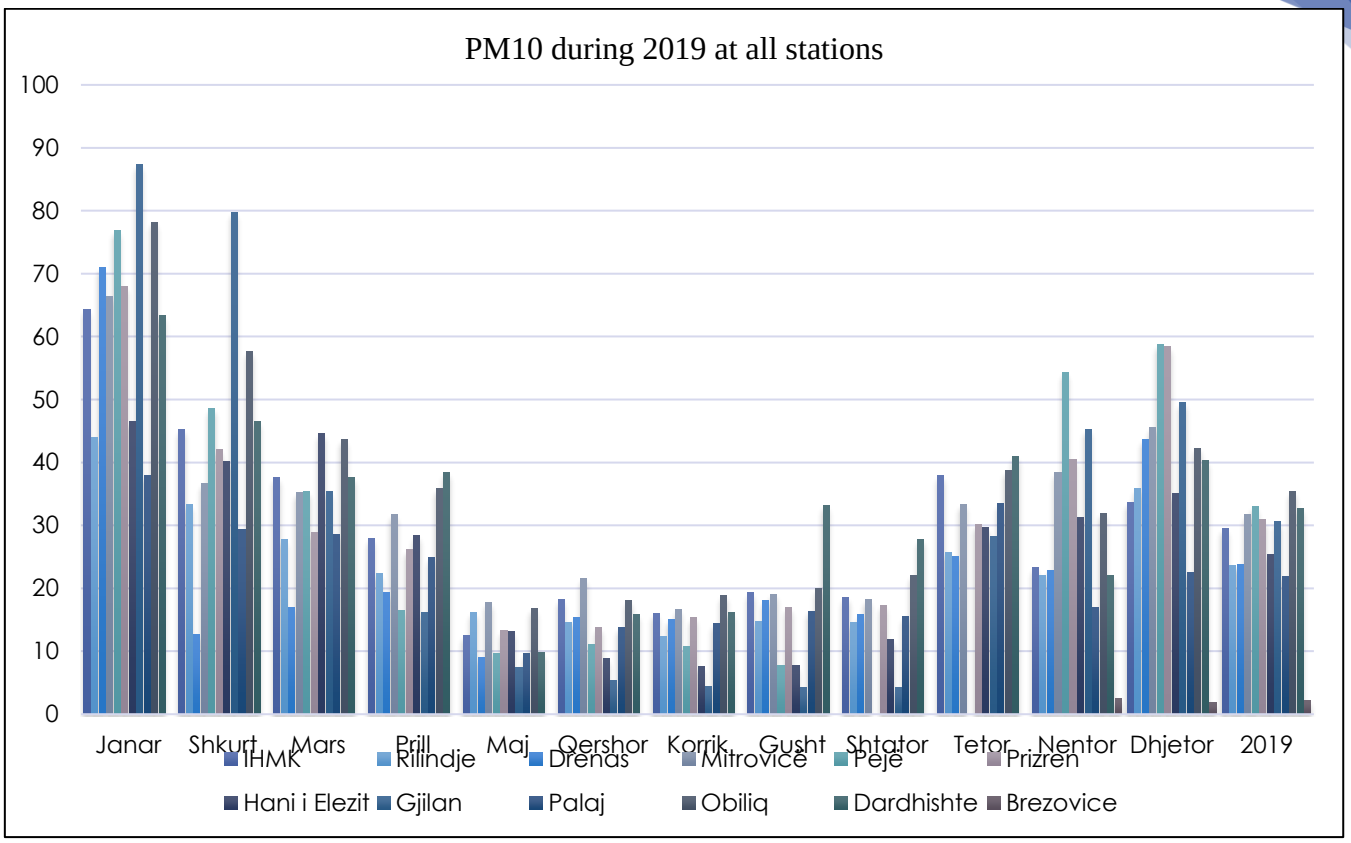


Figure 27. PM10 values during 2018 for each monitoring station

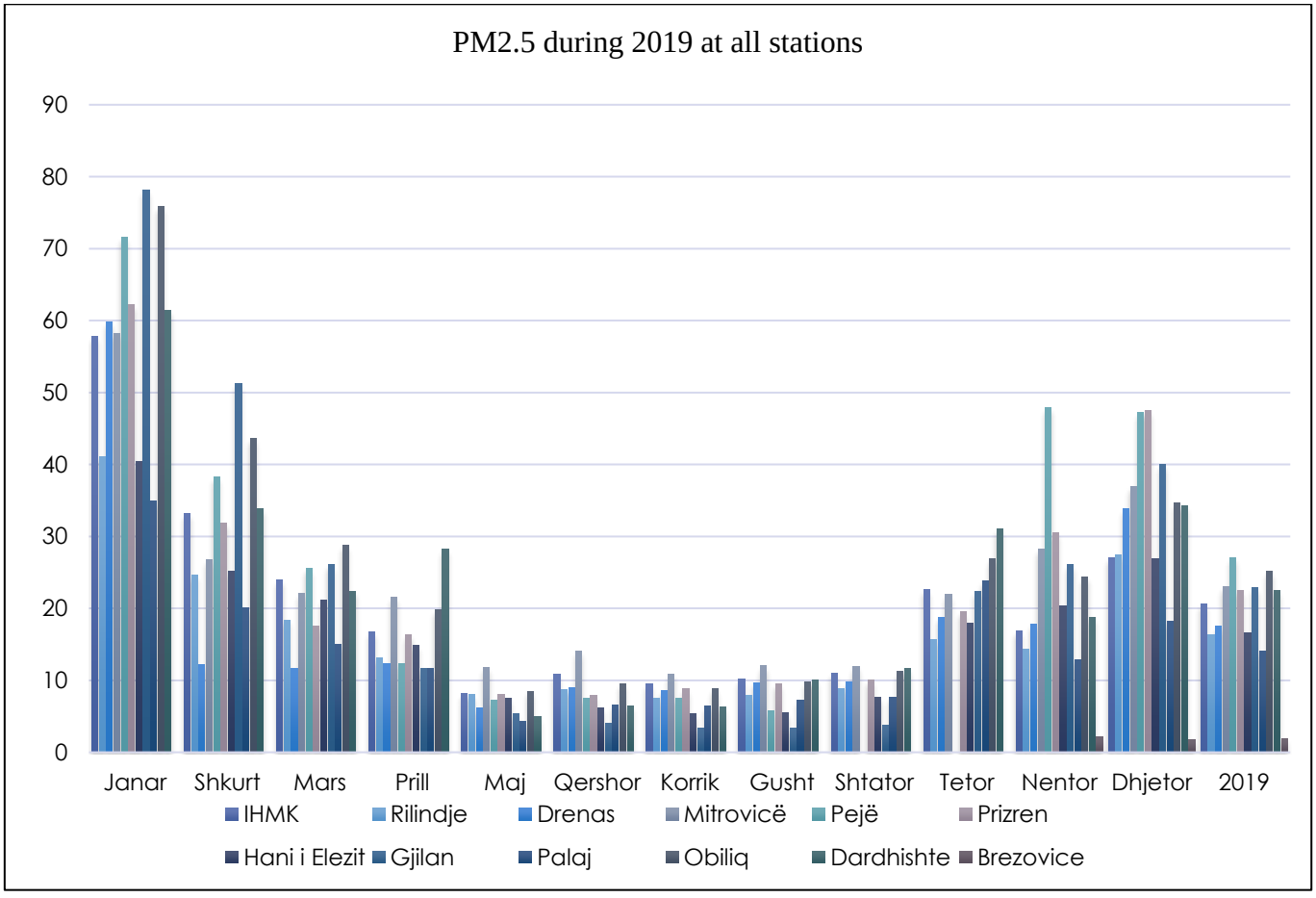


Figure 28. PM2.5 values during 2018 for each monitoring station

4.5.3. The trend of pollution parameters for the years 2013-2019

Based on the data we have for the years 2013-2019, the annual averages for SO_2, NO_2, O_3, CO, PM10 and PM2.5 at the national level have been calculated. The trend presented in the form of graphs highlights the trends of growth of SO_2 and NO_2, while the parameters PM10, PM2.5 and other parameters show a trend of decline of average values (see Figures 29, 30, 31, 32, 32, 33, and 34). It is difficult to discuss the causes of these trends due to the fact that during 2013 to 2017 there were no continuous measurements of all parameters in question. 2018 and 2019 are characterized by satisfactory coverage (over 75%).

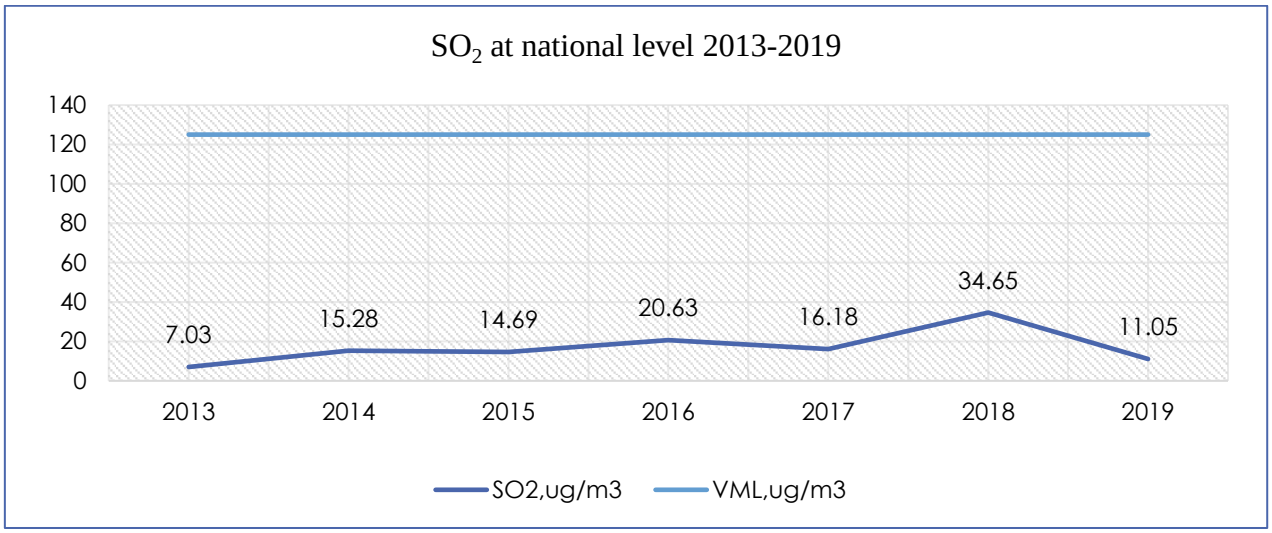


Figure 29. Trend of values of SO_2 for the years 2013 to 2019

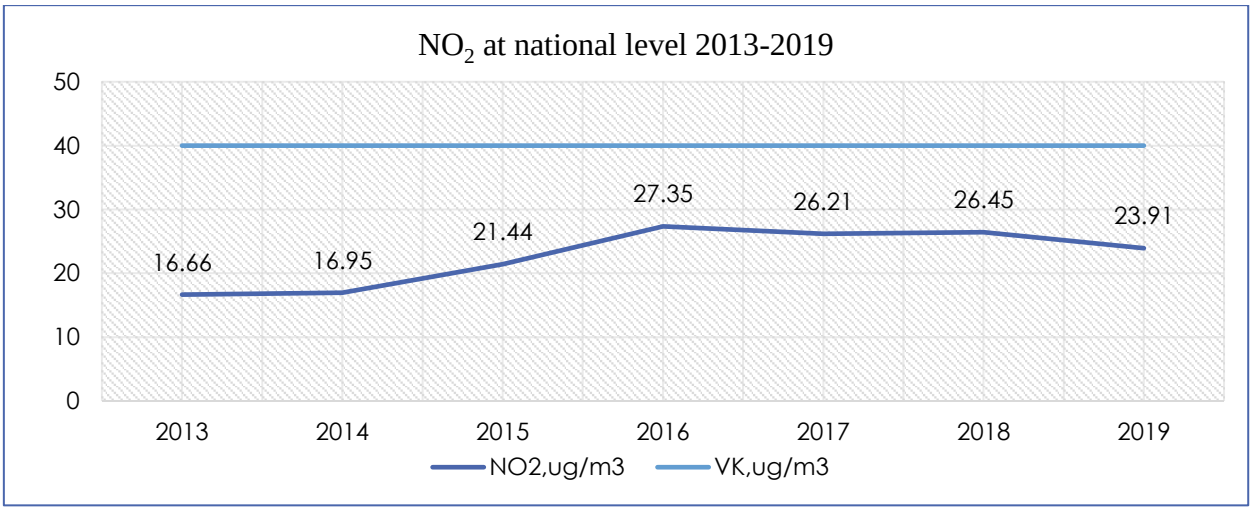


Figure 30. Trend of values of NO_2 for the years 2013 to 2019

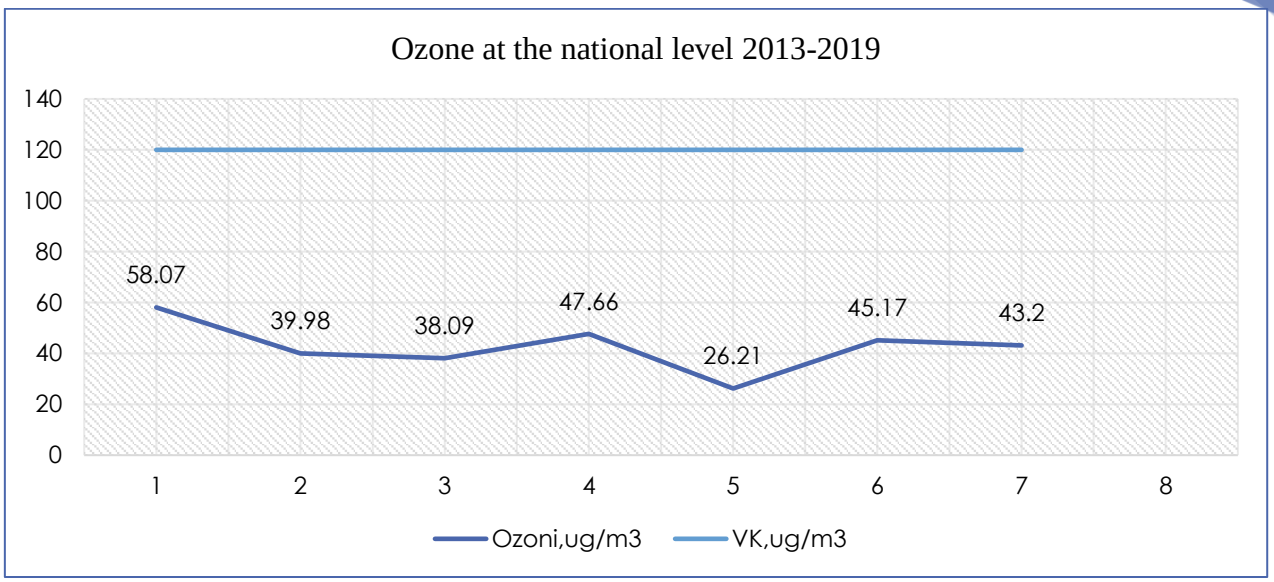


Figure 31. Trend of values of O_3 for the years 2013 to 2019

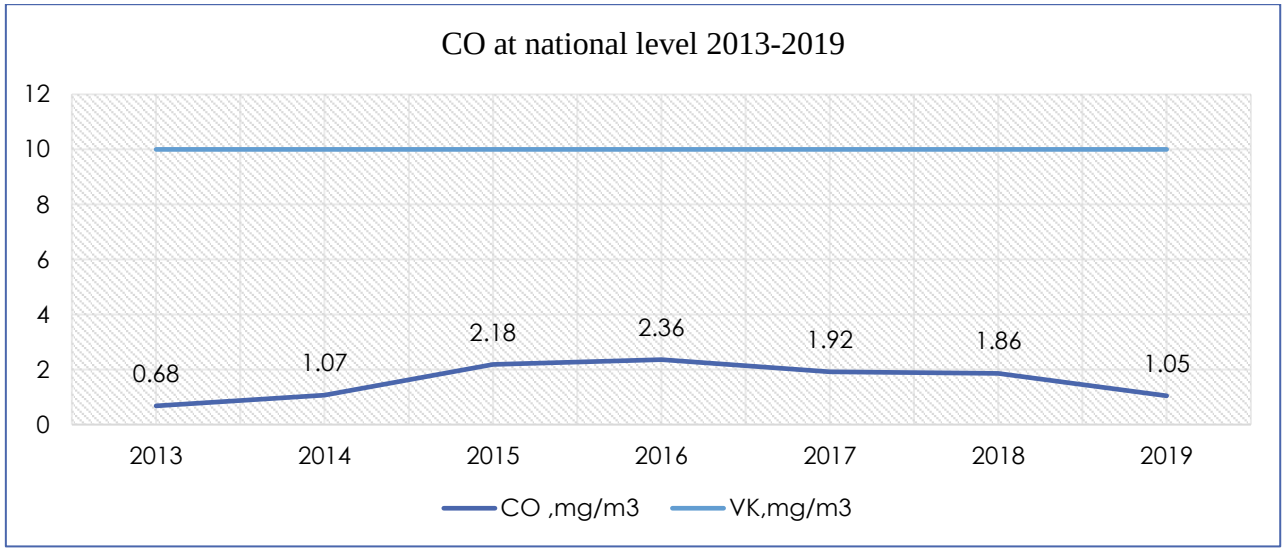


Figure 32. Trend of values of CO for the years 2013 to 2019

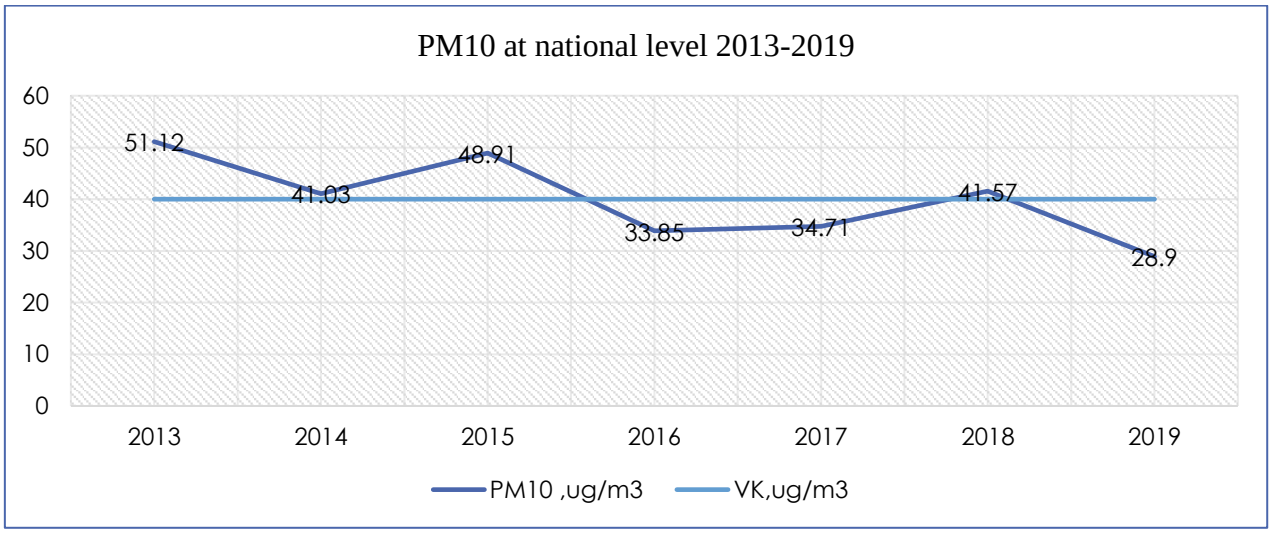


Figure 33. Trend of values of PM10 for the years 2013 to 2019

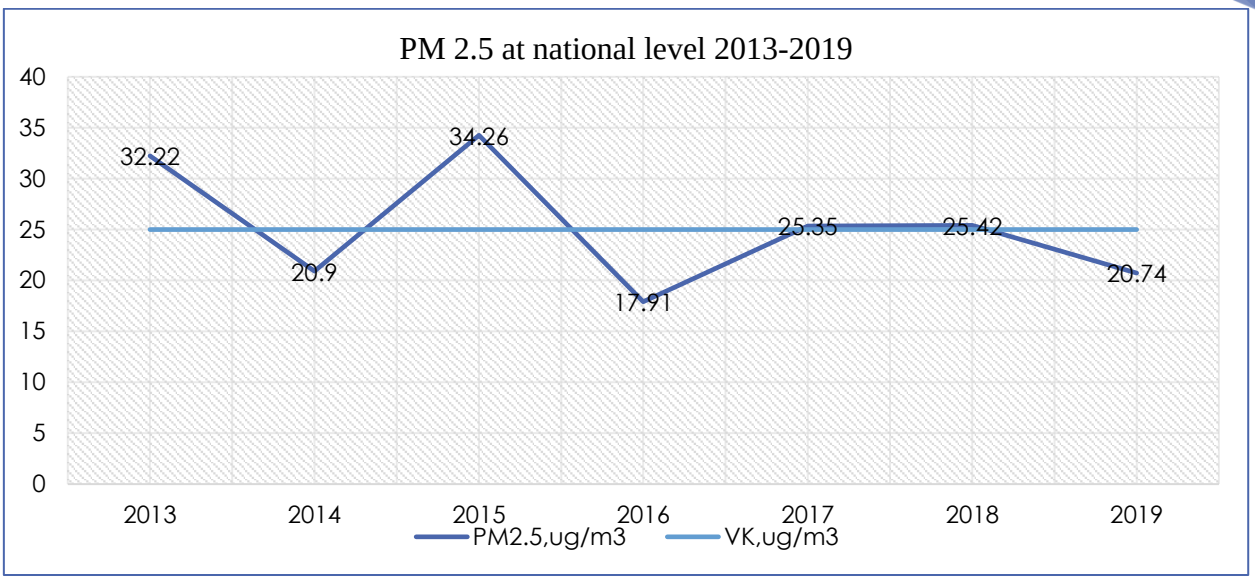


Figure 34. Trend of values of PM2.5 for the years 2013 to 2019

5. Polluting emissions from industrial operators

The estimated data for polluting emissions for 2019 are from Kosova A&B Thermal Power Plants, Feronikeli and Sharrcem.

5.1. Evaluation of air emissions from Kosova A&B Thermal Power Plants

The two thermal power plants Kosova A and Kosova B are amongst the biggest polluters during 2019 in Kosovo.
The norms and rules of discharge for industrial pollutants-KEK are specified in Directive 2001/80/EC, as well as AI No. /2007, as follows:

- ***SO_2***.....*400 mg/Nm^3*
- ***NOx***.....*500 mg/Nm^3*
- ***Dust***.....*50 mg/Nm^3*

The pollution parameters of SO_2 and NOx emissions are calculated, while dust emissions are measured in TCA, whereas the online measurement system (SAKME) is installed in TCB but currently the pollution parameters are calculated due to the malfunction of SAKME.

Dust emissions in TPP A and TPP B

Figure 36 shows the dust emissions in TPP A and TPP B, from which it can be seen that we have a difference of emissions discharged into the air between the two thermal power plants. In TPP A there was no exceedance of the emission limit values (ELV) during the months of January-December, whereas in TPP B the values of dust emissions are much higher.

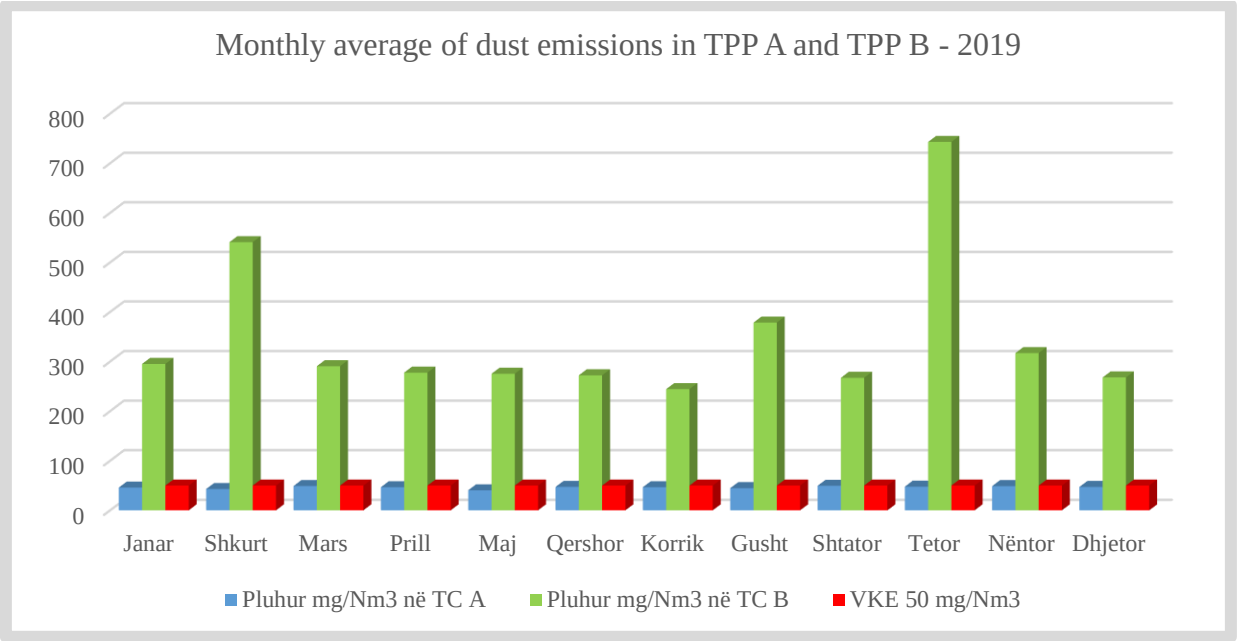


Figure 35. Dust emissions in TPP A and TPP B, January - December 2019

SO_2 emissions in TPP A and TPP B

During February and May, the emission limit values (ELV) were not exceeded in TPP A, while they were exceeded during all other months.
In TPP B, SO2 emission values were being exceeded during all months, except for April and September, when the values were under the allowed limit. (Fig. 36).

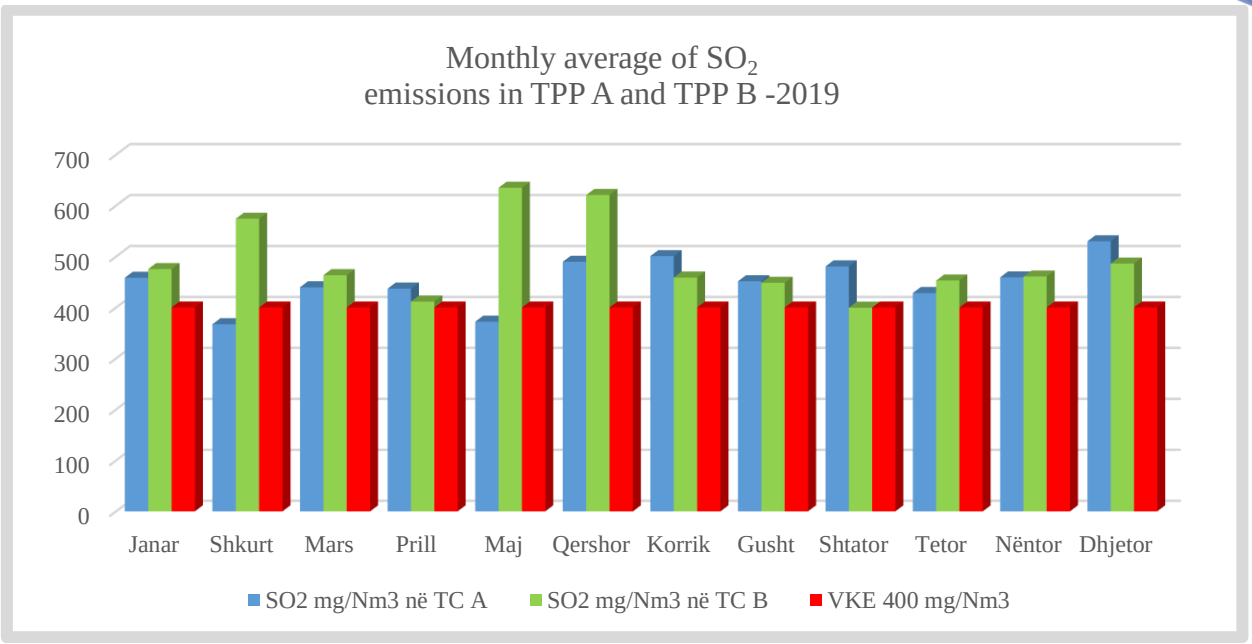


Fig.36. SO_2 emissions in TPP A and TPP B, January - December 2019

NOx emissions in TPP A and TPP B

NOx emissions in TPP A and TPP B, throughout the year, exceeded the emission limit values. NOx values reached 800 mg/Nm^3 (Fig. 37).

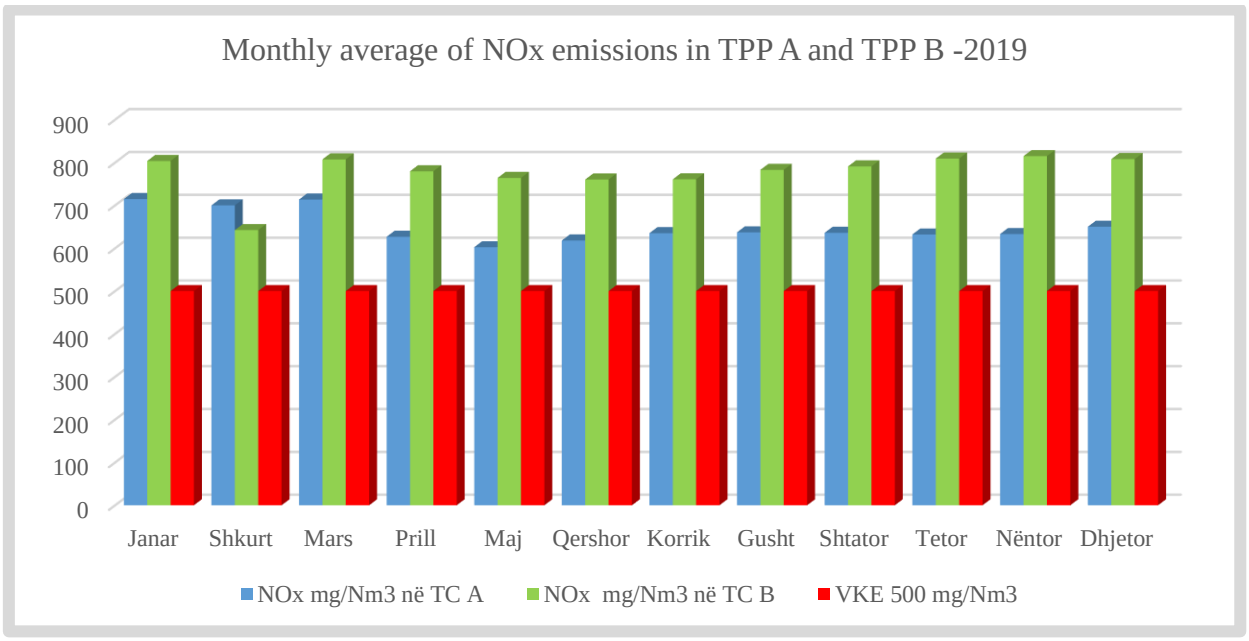


Fig.37. NOx emissions in TPP A and TPP B, January - December 2019

5.2. Evaluation of air emissions from Feronikeli

Pollution emission limit values (ELV) according to AI 06/2007 and the "Integrated environmental permit" for Feronikeli operator apply (see Tab. 24).

Table 24. Emission limit values according to AI 06/2007

Pollutants	Value (mg/Nm3)
Dust	30
CO	1000
SO_2	600
NOx (NO_2)	350

Emission results have been estimated by the measurements carried out in the following:

- Chimney of Rotary Furnace;
- Chimney of Conveyor;
- Chimney of Electric Furnace 1

There are no measurements regarding Chimney of Electric Furnace 2 as it is not operating since November 2015.

Dust emissions in the rotary furnace

Figure 38 shows the average values of dust emissions in the rotary furnace, which shows that there are no exceedances of allowed values during 2019, according to the estimations.

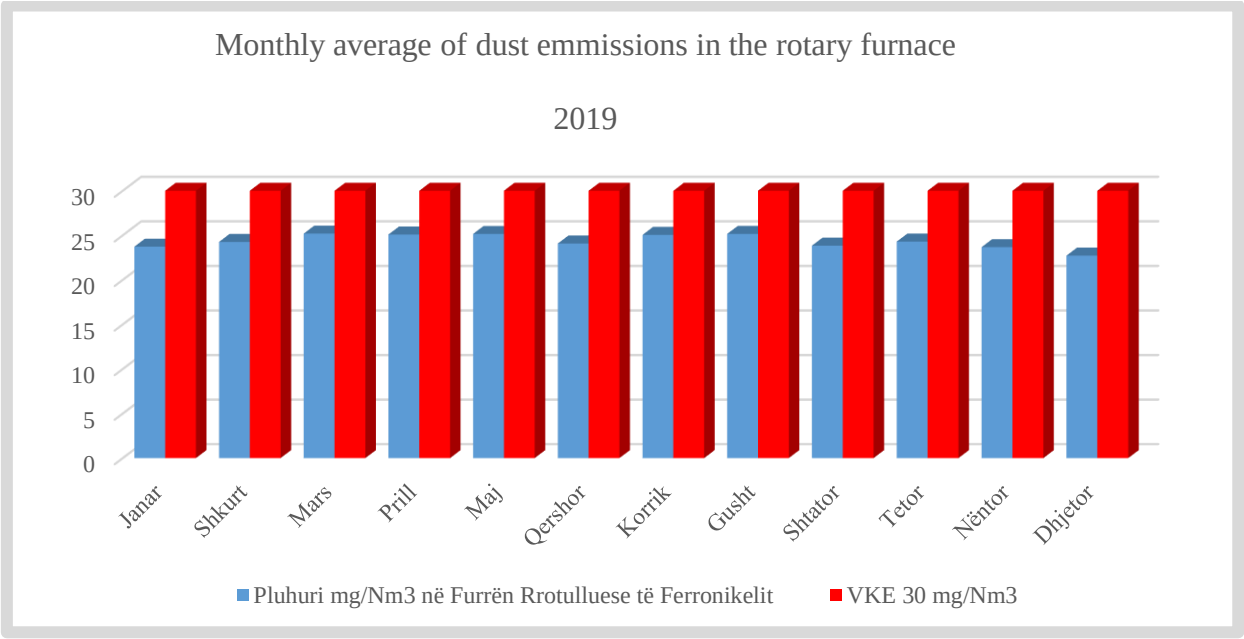


Fig.38. Dust emissions in the rotary furnace January - December 2019.

CO emissions in the rotary furnace

Figure 40 shows the average values of CO from the rotary furnace, and it has been estimated that that there are no exceedances of allowed values during 2019.

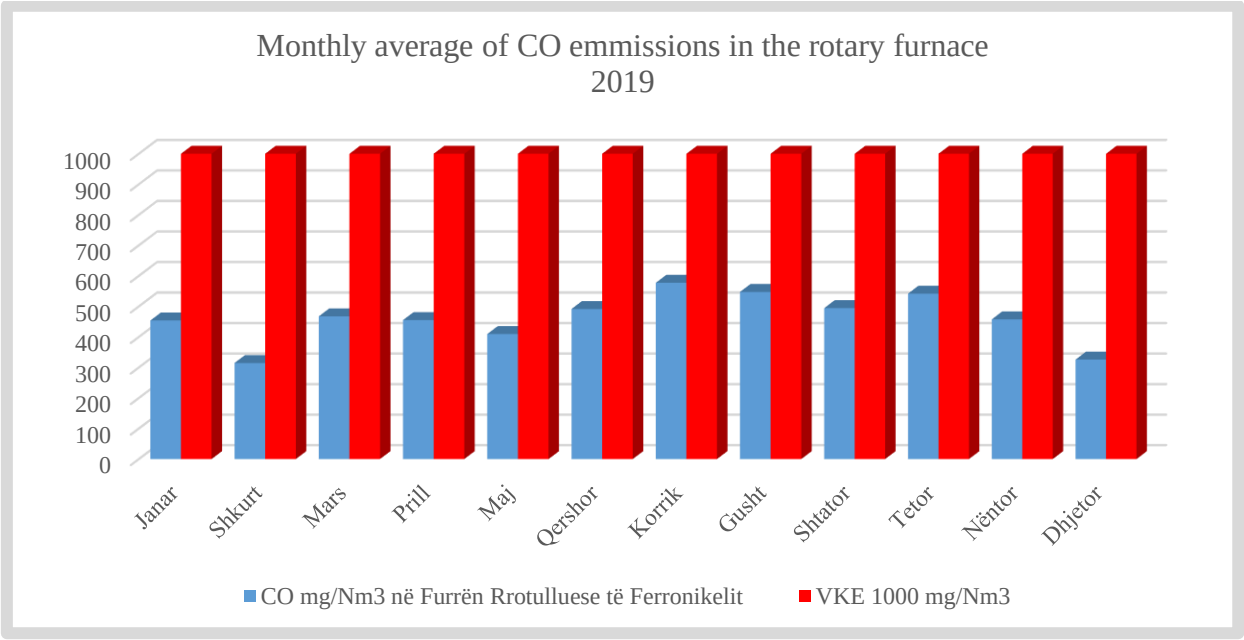


Fig.39. CO emissions in the rotary furnace January - December 2019.

SO_2 emissions in the rotary furnace

Figure 40 shows the average monthly values of SO_2 in the rotary furnace, and it has been estimated that that there are no exceedances of allowed values during 2019.

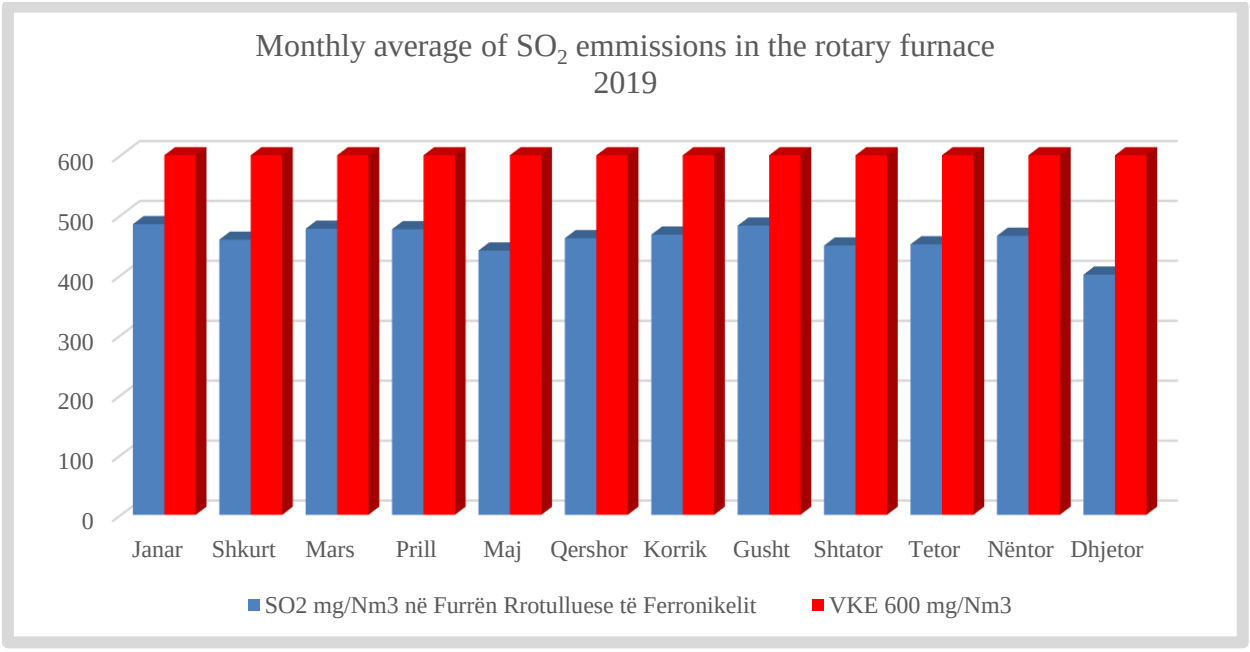


Fig.40. SO_2 emissions in the rotary furnace January –December 2019.

NO_2 emissions in the rotary furnace

Figure 41 shows the average monthly values of NO_2 in the rotary furnace, and it has been estimated that that there are no exceedances of allowed values during 2019.

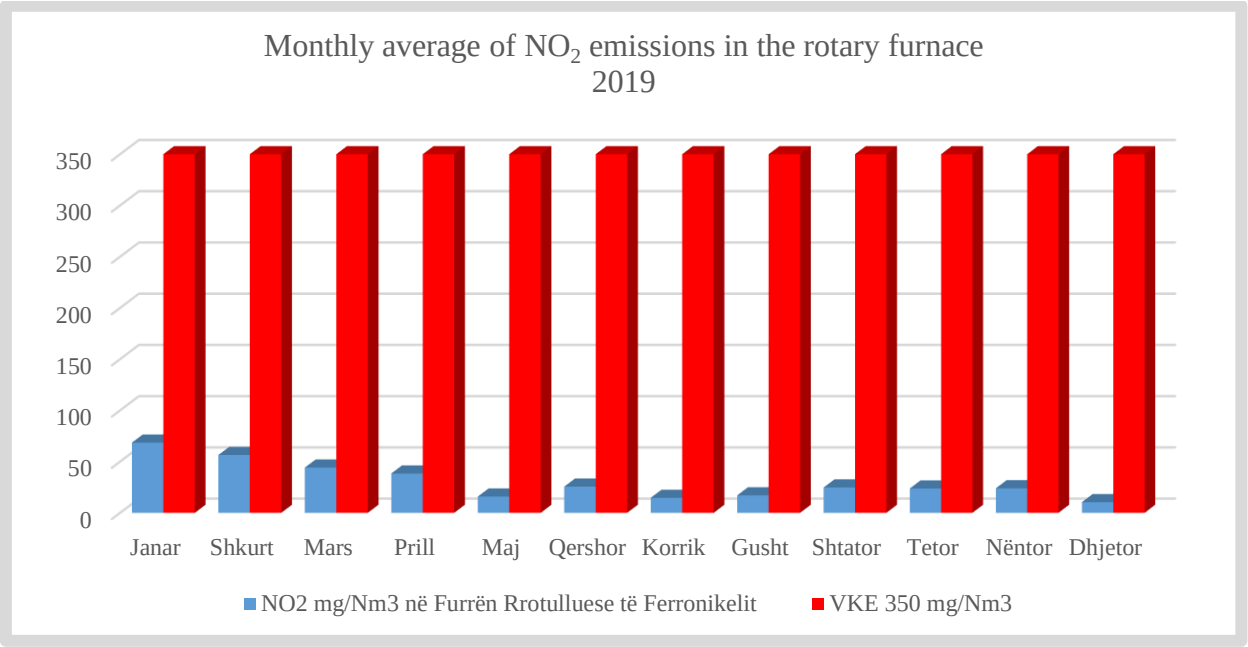


Fig.41. NO2 emissions in the rotary furnace January - December 2019.

Dust emissions in conveyor

The average monthly values of dust in conveyor have not exceeded the allowed values for 2019, (Fig. 42).

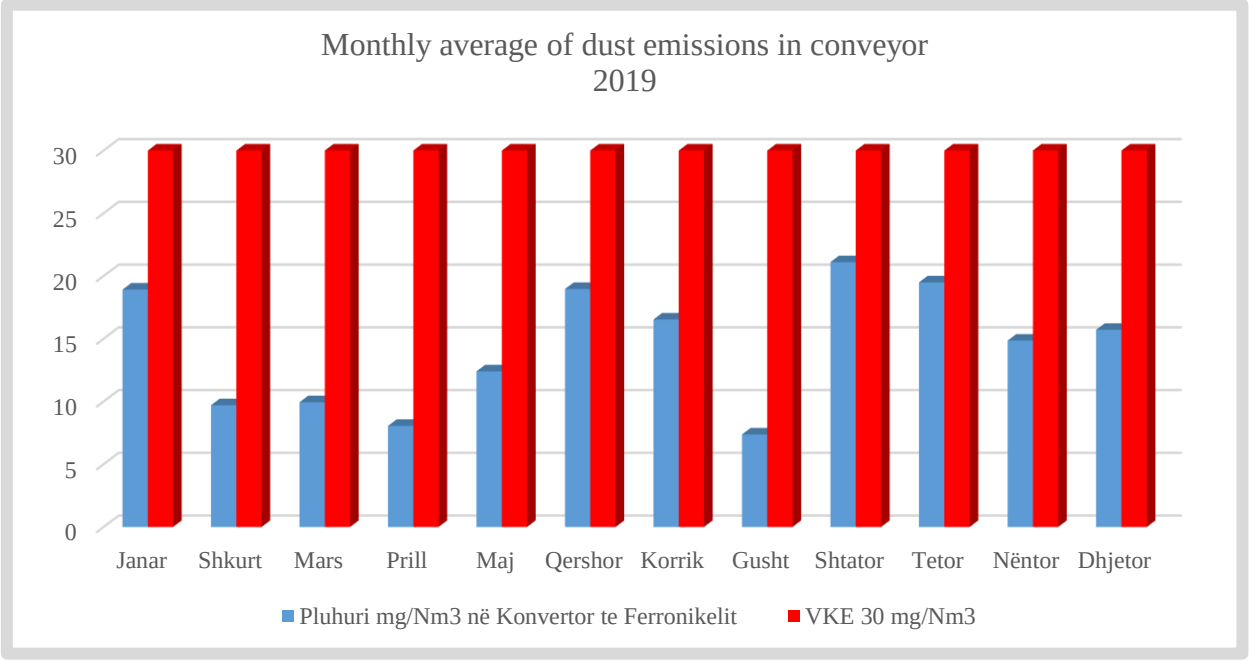


Fig.42. Dust emissions in conveyor January – December 2019.

CO emissions in conveyor

Figure 43 shows the average monthly values of CO in the conveyor, and it has been estimated that that there are no exceedances of allowed values during 2019.

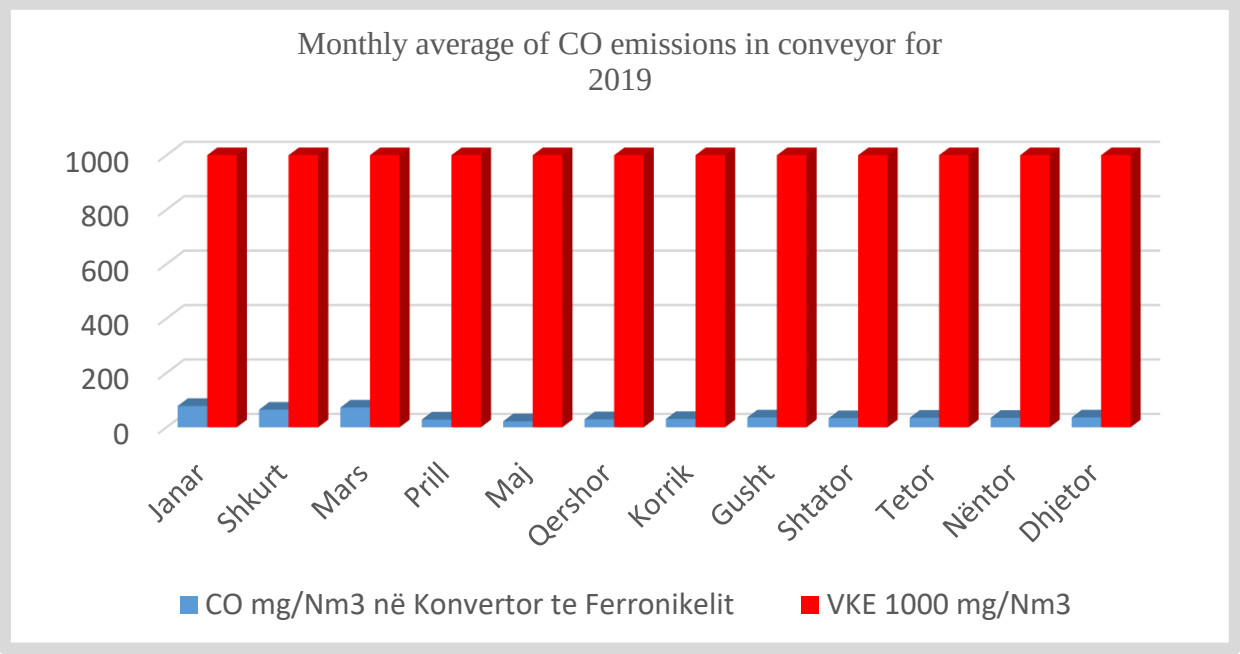


Fig.43. CO emissions in conveyor January – December 2019.

SO_2 emissions in conveyor

Average monthly values of SO_2 in the conveyor are estimated to be low and the allowed values for 2019 have not been exceeded (Fig 44).

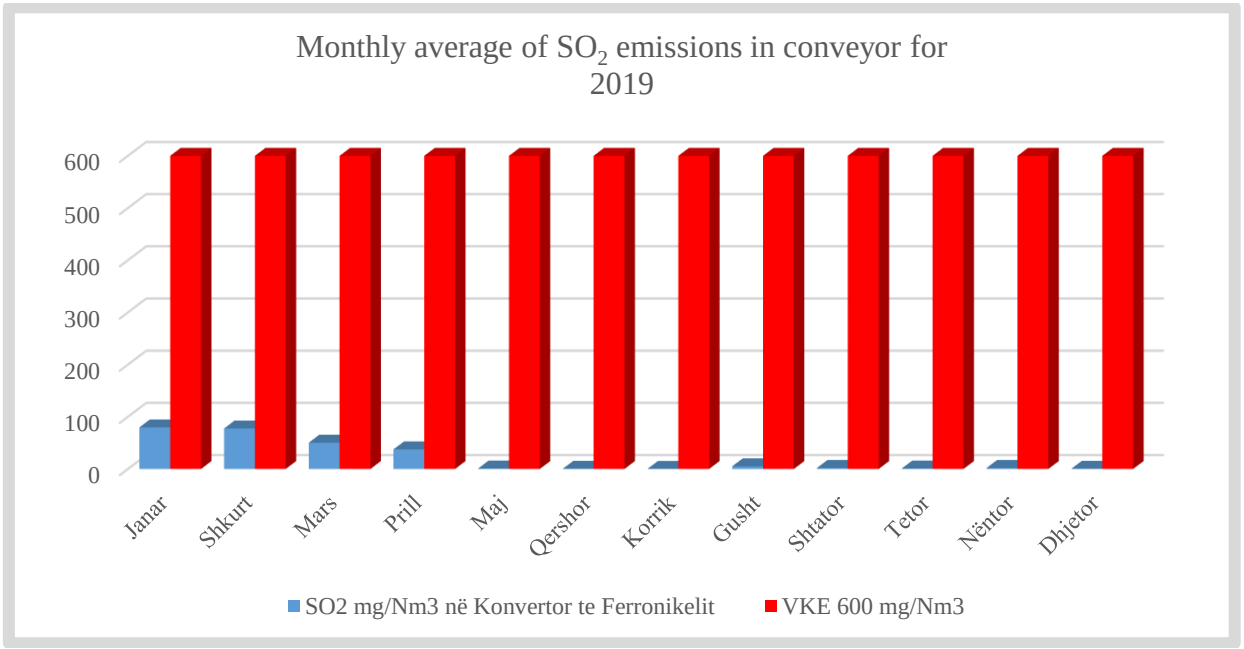


Fig.44. SO2 emissions in conveyor in January - December 2019.

NO_2 emissions in conveyor

Figure 46 shows the average monthly values of NO_2 in the conveyor, showing that the allowed values have not been exceeded for 2019.

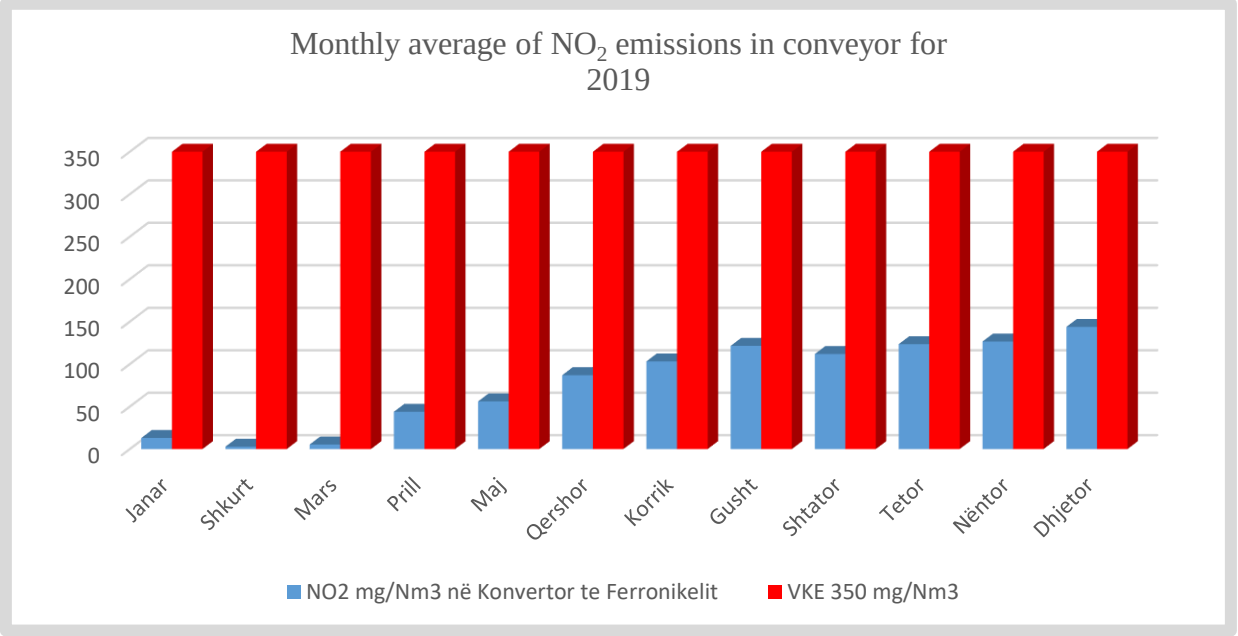


Fig.45. NO_2 emissions in conveyor January - December 2019.

Dust emissions in electric furnace no. 1

Dust emissions in electric furnace 1 did not exceed the allowed values for 2019 during all months, with the exception of September where allowed values were exceeded (Fig.46).

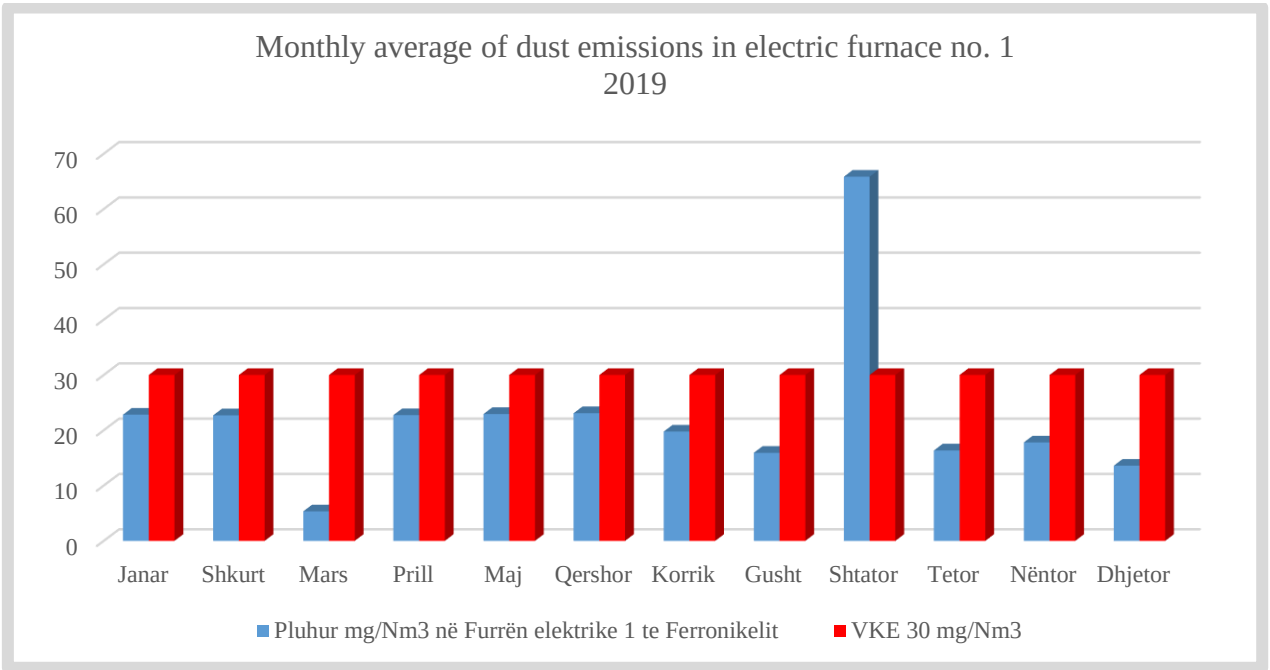


Fig.46. Dust emissions in electric furnace no.1, January – December 2019.

5.3. Evaluation of air emissions from Feronikeli

Find below the graphical representation of dust, SO_2 and NOx from Sharrcem operator.

Dust emissions

Dust emissions for 2019 have been estimated from raw material furnace, clinker cooler and cement mill.

Dust emissions in the furnace - raw material furnace

The basis used in the monitoring and evaluation of dust emissions from the raw material furnace is the Emission Limit Value (ELV): January – September with 50 mg/Nm^3 and October – December with 30 mg/Nm^3.

Figure 48 shows the average monthly value of dust emissions in the furnace – raw material furnace, which indicates that the values are very low compared to the allowed emission limit value.

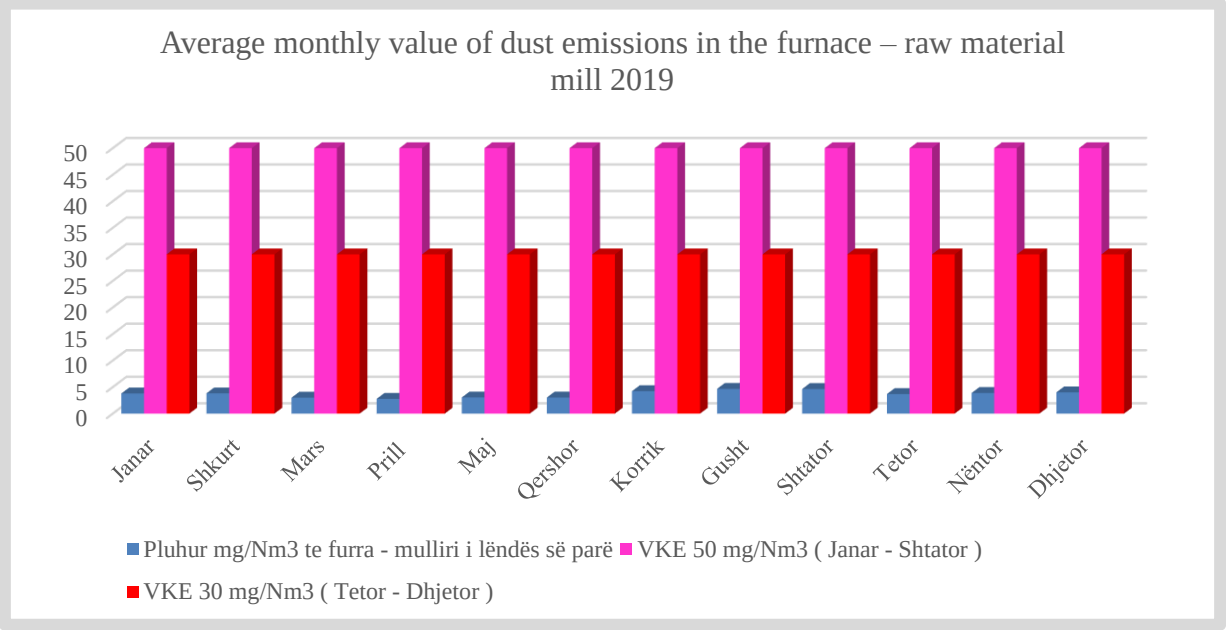


Fig.47. Dust emissions in the furnace – raw material mill, January – December 2019

Dust emissions in clinker cooler and cement mill

In dust emissions in clinker cooler and cement mill, Emission Limit Value (ELV) in 20 mg/Nm^3 is taken as a basis.

In figure 48 , average monthly value of dust emissions in the clinker cooler and cement mill are very low compared to the Emission Limit Value (ELV).

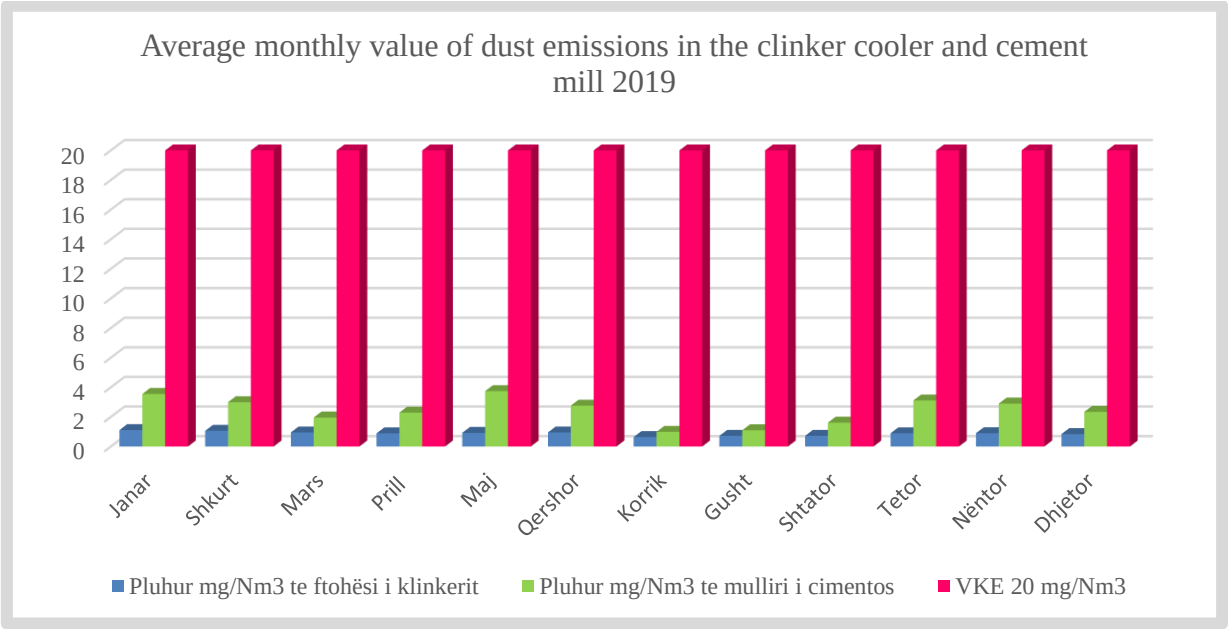


Fig.48. Dust emissions in clinker cooler and cement mill January - December 2019.

SO_2 emissions in the furnace - raw material mill

Average values of SO_2 emissions in the furnace – raw material mill in Sharrcem, during 2019 are very low compared to the emission limit values (Fig.49).

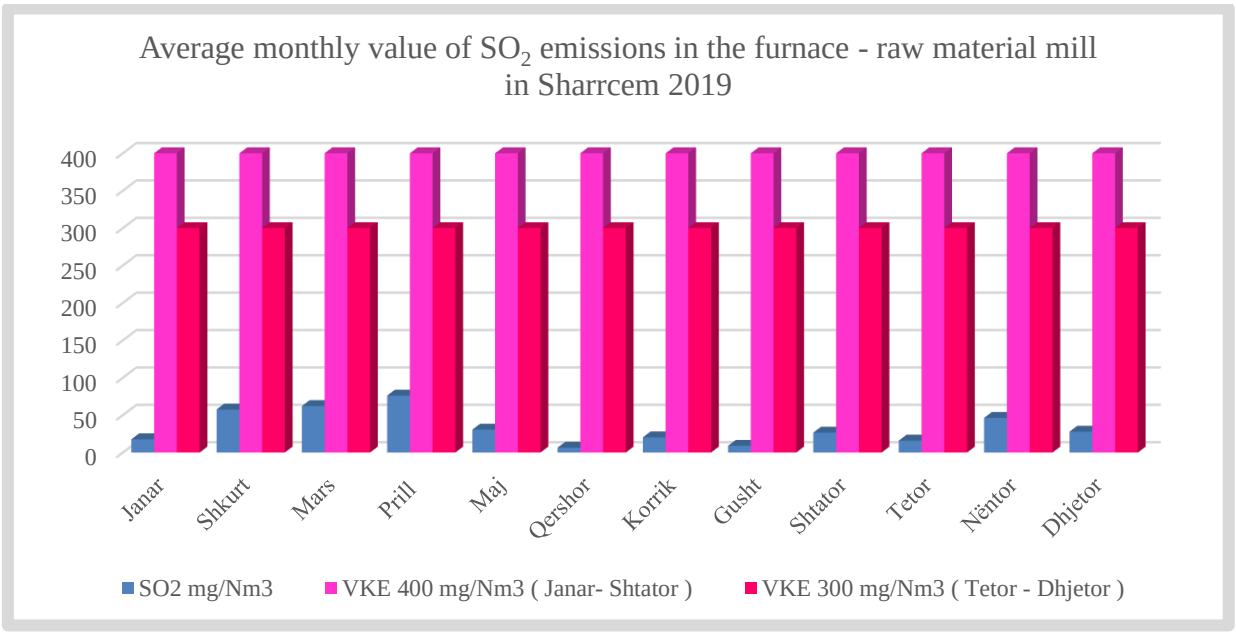


Fig.49. SO_2 emissions in the furnace – raw material mill in Sharrcem January – December 2019.

NOx emissions in the furnace - raw material mill

Figure 50 shows average monthly values of NOx emissions in the furnace - raw material mill and from the assessment it is noticed that there have been no exceedances of the allowed limit values during 2019.

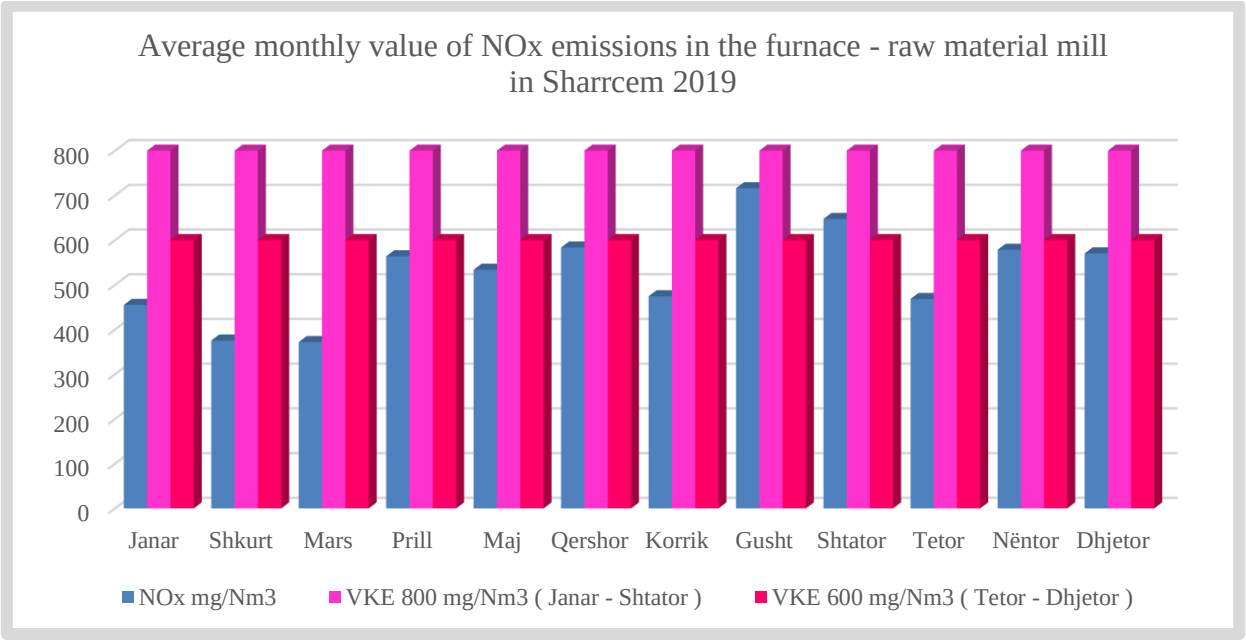


Fig.50. NOx emissions in the furnace - raw material mill January – December 2019

6. Air pollution and its impact on health

Air pollution is a threat to the lives of citizens. The high values of pollutants discharged into the air during 2019 and especially during the autumn-winter season have posed serious problems in the health of the citizens of Kosovo.

The air quality data for 2019, which are presented in this report, in particular from regions such as; Prishtina, Obiliq, Fushë Kosova, Drenas, have often been alarming and, according to estimates, they also indicated an impact on health.

The high level of pollution has been reflected in the large number of patients with respiratory and cardiovascular diseases. The data obtained from MFMC (Main Family Medicine Centre) for respiratory and cardiovascular diseases from 4 regions of Kosovo that includes AKS1 agglomeration have shown an increase in the number of patients with these health problems in the autumn-winter period (Tab. 24).

Table 25. Data on respiratory and cardiovascular diseases obtained from MFMCs for Prishtina, Fushë Kosova, Obiliq, Drenas, for 2019.

	Respiratory diseases (J00-J99) January - December 2019				**Cardiovascular diseases (I00-I99) January - December 2019**			
Month	Prishtinë	F. Kosova	Obiliq	Drenas	Prishtina	F. Kosova	Obiliq	Drenas
January	14249	2275	1221	1670	4668	1004	705	460
February	18167	1222	1801	2456	4815	2848	785	678
March	23380	3944	1822	2847	5357	1729	701	610
April	10894	2608	1247	1413	4556	1216	756	551
May	10522	2745	1234	1937	3981	1291	737	605
June	8754	2324	854	1021	2662	1409	579	505
July	12536	2425	996	2074	4238	1688	635	439
August	10424	2098	991	1965	4895	1480	720	639
September	12155	1403	1169	2023	6134	2385	681	781
October	19636	2850	1787	2342	5949	1690	896	315
November	11881	2866	1394	3377	5638	1700	750	1186
December	14952	2762	1617	4827	1891	1891	807	1676
Total	167550	29522	16133	27952	54784	20331	8752	8445

In the region of Prishtina, the number of citizens with respiratory diseases has resulted in 167550 cases, while 54784 cases have been recorded having cardiovascular diseases. In Fushë Kosova, 29522 cases of respiratory diseases were recorded, while 20331 residents were recorded having cardiovascular diseases. Even in the Obiliq and Drenas region, a high number of cases of respiratory and cardiovascular diseases has been recorded (Tab.25).

Conclusions and recommendations

After evaluating the data on air quality and polluting emissions for 2019, the following conclusions and recommendations are issued:

It has been found that the main air pollution sources for 2019 in the territory of Kosovo are:

- Thermal power plants Kosova A and Kosova B
- Other economic and industrial operators
- Road transport
- Urban waste landfill
- Households, etc.

During 2019, the autumn and winter season is estimated to be with the highest pollution, especially with particulate matter (PM10/PM2.5). The NO_2 parameter appears with some values with exceedances of LV (40 µg/m^3) in Hani i Elezit and less exceedances in Gjilan and Prizren. Other parameters such as SO_2, CO, O_3 were below the maximum allowed values.

Days with exceedances for PM10, from all air quality monitoring stations, amounted to 517 days.
Polluting emissions from the Thermal Power Plants Kosovo A&B are worrying. Airborne dust emissions are very high, especially from Thermal Power Plant Kosova B, values which reach up to 15 times higher than the allowed standard. The discharges of SO_2 and NO_X from the two thermal power plants throughout 2019 have been above the allowed values according to the standards.

Dust polluting emissions, SO_2 and NO_X from Feronikeli, have been below the allowed values throughout 2019, while from the Sharrcem operator, emissions of pollutants into the air such as dust, SO_2 and NO_X, throughout 2019, have been below the allowed values according to standards.

Recommendations

From the evaluation of the data on the state of air during 2019, the recommendations that will affect the improvement of the state have been given:

- Implementing the local legislation and ensuring compliance with standards for air discharges,
- Implementing fair and sustainable development policies to improve the state of air at country level,
- Implementing an Air Quality Strategy and Action Plan,
- Implementing more specific projects in order to improve air quality (as is the case with JAIC, MCC, GIZ),
- Further strengthening the functionalization of national air quality monitoring system,
- Strengthening technical capacity and strengthening cooperation with international institutions in order to gain experience in air quality monitoring,
- Stimulating and obliging other operators to send data on air emissions, as a legal obligation.
- Ensuring maximum reduction of the use of combustible fossils with large discharges in the air such as coal,
- Utilizing urban transport and removing from traffic the old vehicles not meeting the standard,
- Implementing permissible norms of air discharge from vehicles,
- Rehabilitating existing road infrastructure and ensuring maintenance thereof,
- Ensuring better waste landfill management and ensuring elimination of illegal and industrial landfills,
- Creating new green areas in urban areas and ensuring maintenance of existing ones,
- Prohibiting the burning of urban waste, forests or even agricultural fields, etc.

The report was drafted by:

Tafë Veselaj *- Head of Monitoring Sector,*
Sabit Restelica *- Official for Air and Noise Quality*
Ajet Mahmuti *- Official for Air and Noise Monitoring*
Filloreta Berisha *- Official for Assessing the Impact of the State of the Environment on Public Health*