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**PERFORMANCE AUDIT REPORT**

**INSTITUTIONAL MECHANISMS FOR LEGAL ARRANGEMENT,  
MONITORING AND REPORTING ON AIR QUALITY**

**Prishtina, May 2018**

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The Auditor General has decided related to this report "Institutional Mechanisms for Legal Arrangement, Monitoring and Reporting of Air Quality" in consultation with the Assistant Auditor General, Vlora Spanca who supervised the audit.

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<sup>1</sup> Economy - The principle of economy means minimizing the cost of resources. The resources used should be available at the right time, at the right quantity and quality, and at the best price.

<sup>2</sup> Efficiency - The principle of efficiency means getting the maximum out of available resources, which has to do with the link between the resources engaged and the results given in terms of quantity, quality and time.

<sup>3</sup> Effectiveness - The principle of effectiveness means achievement of predetermined objectives and achievement of expected results.

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## List of abbreviations

AI	Administrative Instruction
AQAP	Air Quality Action Plan
DEWP	Department of Environmental and Water Protection
EO	Economic Operator
EU	European Union
HMIK	Hydro-Meteorological Institute of Kosovo
KEPA	Kosovo Environmental Protection Agency
LEAP	Local Environmental Action Plan
MESP	Ministry of Environment and Spatial Planning
WHO	World Health Organization

## Executive summary

Air pollution has significant health, economic and environmental impact. Negative impact of polluted air is particularly apparent in the health of citizens, especially of those that live in urban areas and near industrial zones. Various domestic and international sources have pointed out that recent air pollution in Kosovo caused by poor energy sources has increased to levels that are hazardous to health.

In order to improve air quality and prevent pollution, states should ensure that they have legal, monitoring and reporting mechanisms to address the approach that should be followed, in order to follow implementation of air quality standards and to control emission reductions. In Kosovo, the main responsibility of the air quality in terms of institutional system falls on the Ministry of Environment and Spatial Planning. This Ministry is responsible for drafting and implementing strategic air quality policies and documents, coordinating activities on promoting environmental policies, establishing and overseeing environmental norms and standards on environmental protection, etc. Municipalities are responsible for approval of Local Environmental Action Plans and environmental protection programs, as well as reporting on implementation of these plans and programs.

Due to the importance and impact that air quality has on the environment in general as well as on humans, the National Audit Office was motivated to carry out the performance audit "Institutional Mechanisms for Legal Arrangement, Monitoring and Reporting on Air Quality".

Objective of this audit is to evaluate activities of responsible central level entities in establishing legal framework and monitoring mechanisms and reporting on air quality, as well as in evaluating local level activities in approval of local action plans on air quality as well as their involvement in management of air quality at the local level.

Subject of this audit is the Ministry of Environment and Spatial Planning, Kosovo Environmental Protection Agency within this Ministry, Hydro-Meteorological Institute of Kosovo, within this Agency, and within the local level: Municipality of Prishtina, Mitrovica, Obiliq, Hani i Elezit and Gjilan.

This audit has covered activities of central and local level in management of air quality condition for 2016 and 2017.

### **Main conclusions**

The Ministry of Environment and Spatial Planning has not established all necessary legal prerequisites to regulate the air quality in Kosovo, and has not updated the entire necessary legal framework according to the current condition of the air quality in the country. Such a framework does not serve as a guidance that facilitates the work of institutions to take specific measures on improvement of air quality.

Current system for monitoring and reporting of air quality data has resulted being deficient as it is characterized by many irregularities. Only 17% of monitoring stations have been operational for the

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most part during 2017, while 33% of stations have been out of service for more than 7 months during the year. Moreover, these stations were relocated several times, reporting was irregular and incomplete, security and constant monitoring of monitoring stations is missing, and is also missing the central system for collection and processing of data generated by monitoring stations.

Even though there were improvements in reporting of parameters from 2016 to 2017, hazardous parameters to human health that are evident in our country, PM<sub>10</sub> and PM<sub>2.5</sub> (dust particles) have not been reported on average 4.2 months during 2017, which is not in small-scale particularly if they are winter months (months when these parameters reach maximum values). Despite the deficient monitoring and reporting, in those cases when reported, the values of the parameter PM<sub>10</sub> were exceeded up to 400%. Deficiencies identified in the monitoring and reporting system make it very difficult for decision-makers to identify specific measures that need to be taken in order to improve the quality of air.

In addition, setbacks have also been identified at the local level regarding the non-approval of local environmental plans, non-reporting on implementation of these plans and not renewing the plans when they are not valid.

### **Main recommendations**

Entities responsible at the central and local level should make sure that they have established a comprehensive and up-to-date legal framework, as well as efficient and sustainable monitoring and reporting mechanisms on air quality in Kosovo.

Ministry of Environment and Spatial Planning as the key institution in establishing necessary legal framework for improvement of air quality, should complete, update and functionalise as soon as possible key documents that arrange air quality in Kosovo such, as the Law on Air Protection from Pollution, Air Quality Strategy and the Air Quality Action Plan.

Environmental Protection Agency as a support to the Hydro-Meteorological Institute should as soon as possible fully functionalize air quality monitoring network through adequate relocation, continuous servicing and maintenance of monitoring stations, establishment of a centralized system for automated collection and processing of data, as well as real-time measurement and reporting on air quality condition.

Municipalities should ensure that as soon as possible they approve or renew their environmental action plans, and to continuously report with complete information on implementation of measures that relate to improvement of air quality foreseen in these plans.

### **Response of the parties involved in the audit**

The Ministry of Environment and Spatial Planning and the Municipalities involved in the audit have agreed with the audit findings and recommendations. We encourage the institutions involved in this audit to make every effort to address the recommendations given.

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# 1 Introduction

Air pollution is a very important environmental and social issue and at the same time is a complex problem that presents many challenges in terms of management and reduction of harmful pollutants. Polluted air has significant impact on citizens' health, especially of those that live in urban areas, and has considerable economic impact by shortening the lives of citizens, increasing medical costs, and by reducing productivity during lost business days in the entire economy.<sup>4</sup>

Legislation on air pollution helps address the approach that needs to be adopted in order to follow implementation of air quality standards and to control reduction of emissions. In addition, when the data on monitoring of air quality is reported on regular basis, it provides the base to assess exposure of a country's population to exceeded limits of air quality standards set by European countries and guidelines of World Health Organisation (WHO).<sup>5</sup>

Despite the progress made in recent years, some air quality standards are still extensively exceeded in the most densely populated areas of the European Union, particularly from pollutants such as fine particles (PM<sub>10</sub> and PM<sub>2.5</sub><sup>6</sup>), ozone and nitrogen dioxide. In Kosovo, the situation is no different as due to economic growth the levels of air pollution have increased, especially from the two old power plants and the increase of traffic. According to Reuters<sup>7</sup>, during the winter season, air pollution in Prishtina caused by poor energy sources increased to levels that pose risk to health. In a statement issued by WHO<sup>8</sup> representatives, also the data supported by World Bank<sup>9</sup> reports ascertained that air pollution in Kosovo could cause more than 800 early deaths per year.

The level of air pollution in Kosovo is higher in developed urban areas, especially in industrial areas, while the greatest impact on the environment is caused by KEK power plants and by industries (metallurgy, mining, cement factories, etc.). Pollution is also caused by individual heating facilities.<sup>10</sup> While the matter of air quality is just as important for the environment as a whole as is for human health, thus it is more than necessary to take necessary measures to address this issue.

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<sup>4</sup> European Environment Agency, no. 28/2016, Air Quality in Europe - 2016 report, ISSN 1977-8449

<sup>5</sup> European Environment Agency, SOER 2015, Country Overview - European Environment - Country and Perspectives 2015, <https://www.eea.europa.eu/soer-2015/countries/kosovo>

<sup>6</sup> Particles, 50% of which pass through aerodynamic diameter selectors of 10, respectively 2.5 micrometers.

<sup>7</sup> Reuters (February 13, 2017), air quality in Pristina, unhealthy cold winter bites, <https://www.reuters.com/article/us-balkans-pollution-kosovo/air-quality-in-pristina-unhealthy-cold-winter-bites-idUSKBN15S1MC>

<sup>8</sup> Free Europe (20 March 2016) World Health Organization: From air pollution, over 800 deaths per year, <https://www.evropaelire.org/a/27624395.html>

<sup>9</sup> World Bank (January 2013), Kosovo - State Environmental Analysis - Environmental Cost Assessment, Institutional Review and Review of Public Expenditures for the Environment

<sup>10</sup> Air Quality Strategy (2013), Air Quality Strategy 2013-2022, Department of Environment, Ministry of Environment and Spatial Planning

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## 1.1 Audit problem

There are various sources, local and international, that have identified a number of problems that currently exist in Kosovo that are linked to poor air quality. These problem indicators have also motivated the execution of this audit. Few of the most commonly mentioned problem indicators are the lack of completeness of the legal framework on air quality and deficiencies in monitoring and reporting on the air quality in the country.

According to various sources, the main indicators of the problem include:

- Failure to complete the legal framework<sup>11</sup>;
- The part of the legislative framework that has already been approved still needs to be adapted and transpose them according to the requirements of the European Union<sup>12</sup>;
- Progress reports of European Commission on Kosovo have identified that the legal framework should be completed, and the legal framework that has already been approved needs to be strengthened and implemented in practice<sup>13</sup>;
- The system for monitoring of air quality is not fully operational due to lack of real-time measurements and lack of consistent reporting on air quality<sup>14</sup>;
- There are indications that there are still municipalities (especially where the level of pollution is high) that have not approved local action plans on air quality or even those that do not have valid existing plans<sup>15</sup>.

These problem indicators lead us to formulate the audit problem as follows:

**There are indications that necessary legal framework on air quality is deficient and monitoring and reporting mechanisms are not functionalized at the right level.**

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<sup>11</sup> Air Quality Strategy (2013), Air Quality Strategy 2013-2022, Department of Environment, Ministry of Environment and Spatial Planning

<sup>12</sup> European Environment Agency, SOER 2015, Country Overview - European Environment - State and Perspectives 2015, <https://www.eea.europa.eu/soer-2015/countries/kosovo>

<sup>13</sup> European Commission (Brussels, 9.11.2016, SWD (2016) 363 final), Staff Working Document of the Commission - Kosovo Report 2016

<sup>14</sup> European Commission (Brussels, 9.11.2016, SWD (2016) 363 final), Staff Working Document of the Commission - Kosovo Report 2016

<sup>15</sup> European Commission (Brussels, 9.11.2016, SWD (2016) 363 final), Staff Working Document of the Commission - Kosovo Report 2016

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## 1.2 Audit objective

Objective of this audit is to evaluate activities of responsible central level entities in establishing legal framework as a precondition for improving the issue of air quality and also establishing the proper monitoring and reporting mechanisms on air quality. Objective of this audit is also the evaluation of local level activities in approval of local action plans on air quality as well as their involvement in management of air quality at the local level.

## 1.3 Audit questions

In order to respond to the audit objective we have posed the following audit questions:

Central level:

- 1. Has the Kosovo Government set and fulfilled necessary legal prerequisites for improvement of air quality?**
- 2. Is the condition and improvement of air quality monitored, and reported?**
  - 2.1 Are there monitoring stations on air quality established at the state level, and how functional are these stations?
  - 2.2 Are there used standardised techniques for measurement of air quality in monitoring stations?
  - 2.3 Do monitoring stations provide updated information on the air quality, and is this information reported regularly?

Local level:

- 3. Is the condition of air quality managed in local levels, if yes, through which mechanisms?**
  - 3.1 Have municipalities approved local action plans on air quality?
  - 3.2 Do municipalities produce reports on implementation of local action plans on air quality, and do they submit them to responsible entities at central level?
  - 3.3 Are municipalities involved in management of air quality monitoring stations?

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## 1.4 Audit criteria

Audit criteria used in this audit derive from international standards<sup>16</sup>, relevant European directives<sup>17</sup>, and national legislation<sup>18</sup>.

### Criteria related to legal framework

In order to protect the human health and the environment as a whole, it is important that local and national responsible institutions combat emitting sources of air pollutants, identify and implement the most effective measures for reduction of air pollutant emissions.

Emissions of harmful air<sup>19</sup> pollutants should be avoided, prevented or reduced by creating needed institutional and legal framework and by setting adequate objectives for air quality, always taking into account international standards, guidelines and good practices.

### Criteria related to monitoring, evaluation and reporting on the condition of air quality

Local and central level institutions, in order to reduce air pollution and minimizing adverse effects that air pollution has on human health and the environment as a whole, should improve air monitoring and evaluation activities, including identification of major air pollutants and provide information to citizens through regular reporting of monitoring and evaluation results.

Environmental air quality is evaluated in all areas and agglomerations<sup>20</sup> in accordance with the following criteria:

- *Protection of human health*: locations for air monitoring should be set in such a way that they always provide data for areas with the highest concentrations of air pollutants to which the population is likely to be exposed directly or indirectly for a certain period of time. Urban monitoring locations should be located in such a way that they include integrated contributions of all sources, meaning that the level of pollution should not be dominated by a single source of pollution unless such situation is typical for a larger urban area. When determining the monitoring location in rural background, the point for taking samples should not be affected by agglomerations or any other industrial site in its vicinity.
- *Other important factors when determining monitoring points that should be considered* are sources of interference, security, access, availability of electricity and telephone communications, visibility of the place in relation to its environment, public safety and of operators, etc.

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<sup>16</sup> INTOSAI (2016), ISSAI 5110 - Guidelines for carrying out performance audits with an environmental perspective

<sup>17</sup> INTOSAI (2016), ISSAI 5110 - Guidelines for carrying out performance audits with an environmental perspective

<sup>18</sup> Air Quality Strategy (2013), Air Quality Strategy 2013-2022, Department of Environment, Ministry of Environment and Spatial Planning & Law no. 03/L-160 for the protection of air from pollution

<sup>19</sup> Such as emissions of carbon dioxide, carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, small particles PM<sub>2.5</sub> and PM<sub>10</sub>, etc.

<sup>20</sup> An area with a population density of over 250,000 inhabitants or less than 250,000 inhabitants, per population density per km<sup>2</sup>, if justifying the need for assessment and management of environmental air quality..

- Procedures for selection of monitoring locations should be fully documented, and monitoring locations should be overseen at regular intervals to ensure that selection criteria remain valid.

In order to ensure that information collected on air quality is sufficiently representative and comparable across the community, it is important that institutions responsible for monitoring and evaluation of air quality use standardized measurement techniques and joint criteria for the number and location of measuring stations.

Institutions that are responsible for air quality should provide updated information on concentration of air pollutants in the environment and report this information on a regular basis, in order to make routinely available to citizens.

### **Criteria for responsibilities and activities of municipalities related to air quality**

The responsibilities and activities of municipalities regarding air quality should be coordinated taking into account the following criteria:

- Approval of local action plans for air quality through which is defined air quality management for a five (5) year period, and actions within the municipal territory, in line with air quality strategy.
- Local action plans for air quality should be an integral part of local environmental plans.
- Preparation of reports on implementation of plans and their review in Municipal Assemblies.
- Reporting to the Ministry on implementation of these plans and programs.

## 1.5 Audit scope

The scope of this audit will be extended in the Ministry of Environment and Spatial Planning (MESP), Kosovo Environmental Protection Agency (KEPA) within this Ministry and the Hydro-Meteorological Institute of Kosovo (HMIK) within this Agency.

These institutions have been selected, as they are responsible for the development of environmental policies, relevant legislation and instruments for implementation of these policies. In addition, these institutions are also responsible for collection of data on the environment and development and coordination of air quality monitoring network in Kosovo.

Since municipalities have the responsibility to manage air quality condition through establishment of local action plans on air quality, and are responsible to report on implementation of measures set out in the action plans, we have selected as a case study these municipalities: Prishtina, Mitrovica, Obiliq, Hani i Elezit and Gjilan. The reasons for selection of these municipalities relate to the fact that they are more exposed to different sources of air pollution. In addition, HMIK has established air quality monitoring stations in all these municipalities, thus, it is important to look into their cooperation and involvement of local level in terms of monitoring.

Within the scope of this audit are activities carried out during 2016 and 2017.

## 1.6 Audit methodology

The methodology used in this audit is as follows:

- Analysis of legal and regulatory framework on determining and regulating of air quality in two aspects: completion and update of necessary legislative and regulatory framework;
- Interviewing responsible officials in MESP, KEPA and HMIK regarding the status of completion and update of legislation framework, and management of the process for monitoring, evaluation and reporting on the condition of air quality;
- Analysis of reports and other relevant documents of KEPA and HMIK regarding the monitoring aspects of air quality - such as determining of monitoring stations, their functioning, manner of evaluation and reporting of data, frequency of their reporting, monitoring coverage of areas exposed to environmental air pollutants, etc.;
- Observation of air quality monitoring stations in municipalities that have been selected as audit study cases, as well as comparison of the data reported in HMIK reports with current situation of these stations;
- Interviewing of responsible local level officials of selected municipalities, regarding municipal strategies and plans on addressing the issue of air quality;
- Analysis of local action plans on air quality (if these plans are now approved by the municipality) and analyse these plans whether they are in line with the air quality strategy. Analysing reports on implementation of air quality action plans and their reporting to the Ministry;
- Evaluation of HMIK cooperation with the municipalities in which monitoring stations are located to see whether the municipalities are involved in any form in the monitoring process that these stations carry out and the data they report.

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## 2 Responsibilities of key institutions and relevant documentation

Current institutional system for air quality has been developed around the end of 2002. In principle, it consists of a distributed institutional management system. Environmental management institutions apply Kosovo's applicable legislation and EU standards. The environmental management system includes:

**The Assembly of the Republic of Kosovo** - Assembly is legislative institution in Republic of Kosovo directly elected by the people. It has two following important bodies that handle environmental issues: the Committee on Agriculture, Forestry, and Rural Development, and the Committee on Environment and Spatial Planning.

**Government of the Republic of Kosovo** - The Government proposes to the Assembly the necessary legal framework, in this case concerns the environment as a whole and air quality in particular, makes decisions and issues legal acts or regulations that are necessary for implementation of these laws, proposes the required budget for implementation of laws or regulations, guides and oversees the work of administration bodies, and exercises other executive functions that are not assigned to other central or local level bodies.

**Ministry of Environment and Spatial Planning** - The mandate of the Ministry is defined under the Regulation No. 02/2011 on the areas of administrative responsibility of the Office of the Prime Minister and Ministries. Has the following responsibilities in relation to environmental protection:

- Drafts and follows implementation of policies and programs related to identification and reduction of environmental pollution; Participates in drafting strategic documents; Coordinates activities to promote environmental policies; Sets norms and standards and issues guidelines for the environmental protection sector, while adhering to international standards; Supervises implementation of these standards, including inspection and other services, as needed; Manages use and development of environmental infrastructure; Promotes community participation, initiatives and development of activities; Creates policy, applies laws and oversees environmental protection activities, including water resources, air, land and biodiversity; Encourages and participates in the development and implementation of public information campaigns and other promotional activities to increase public awareness and conformity with environmental protection standards; Supervises and evaluates the condition of the environment, in particular the impact of industrial activity, public services and economic activity; Establishes policies for water resource management and oversees their implementation.

**Department of Environmental and Water Protection** (DEWP) is one of the first departments established within the interim institutions. DEWP develops environmental policies, relevant legislation and instruments for implementation of these policies.

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**Kosovo Environmental Protection Agency** - provides adequate information to the administration, Government and the Assembly of Kosovo on implementation of environmental protection policies. Develops and coordinates the unique environmental information system related to the monitoring of environmental system in Kosovo and collects environmental data;

**Hydro-Meteorological Institute of Kosovo** - Builds and maintains the basic network of hydrological and meteorological stations. Makes measurements and observations of elements and occurrences: hydrological, meteorological, bio-meteorological and hydro-biological, measurements and observations of atmospheric electricity and pollution of air, water, and precipitations. Systematically follows and evaluates the condition of air quality, atmospheric precipitation, surface water, groundwater and soil, as well as study and forecast of hydro-meteorological conditions.

**Municipalities** - Municipalities approve Local Environmental Action Plans (LEAPs) and environmental protection programs, in line with the Environmental Protection Strategy and the Kosovo Environmental Action Plan, according to its specific interests. In drafting of LEAPs and programs, are encouraged to participate public, non-governmental organizations, professional organizations and the business community. Municipalities report to the Ministry on implementation of these plans and programs. To reduce negative impacts on the environment and in some cases to reduce costs, two or more municipalities can jointly develop and approve their plans and programs.

## 2.1 Relevant documentation

**Law on Air Protection from Pollution No. 03 / L-160** - categorizes the main sources of pollution, establishes basic obligations on air protection and recommends approval of limited values of emissions and norms of air quality conform European Union (EU) and WHO standards. As part of the general environmental protection program, this law also initiates preparation of the Strategy and Action Plan on Air Quality, based on which municipalities draft local programs on air quality.

**Administrative Instructions (AI)** - which have derived from the abovementioned law, are: AI on the Rules and Standards of the Discharges on Air by the Stationary Sources of Pollution; AI on Control of Volatile Organic Compounds Emissions During the Storage, Filling, Discharging, Packaging and Transfer of Fuels; AI on the criteria for assigning monitoring points, number and measurement frequency, classifications pollutants that shall be monitored, work methodology as well as form and time of data reporting; AI on norms of air quality; AI on the Allowed Norms of Discharges in Air From Mobile Sources of Pollution.

**Air Quality Strategy 2013-2022** - Policies set out in the Air Quality Strategy are intended to develop and implement certain instruments in order to enhance the quality of life, by ensuring the base for improvement of air quality, a framework under which will be achieved protection and reduction of air pollution, in line with established EU standards and best practice principles.

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## 3 Findings

In this section of the report have been presented audit findings related to establishment of the legal framework, and to mechanisms for monitoring and reporting on the condition of air quality in Kosovo. This chapter initially addresses the status of establishing, updating and strengthening of legal prerequisites for improvement of air quality. This chapter constantly presents findings related to monitoring and reporting of air quality. This part of the report is finalized with findings that relate to municipal responsibilities and activities concerning air quality.

### 3.1 Status of establishing, updating and strengthening of legal prerequisites for improvement of air quality

Establishment of legal prerequisites is more than necessary in order to set appropriate objectives for avoidance, prevention and reduction of emissions of harmful pollutants to the air. Legal prerequisites should be defined by taking into account international standards, guidelines and best practices. In addition, in order to achieve the adequate effect, it is important that the framework that defines legal preconditions is complete, updated when and when applicable and applicable.

Establishment of legal prerequisites for improvement of air quality in Kosovo is characterized by few shortcomings. Currently, the legal framework is not entirely complete in order to respond to all requirements that are needed for improvement of air quality. Legal prerequisites already established are not fully updated to enable easier and more comprehensive implementation.

The key document in the area of air quality in Kosovo is the Law on Air Protection from Pollution. This law serves as a document that regulates air quality condition since the beginning of 2010, but has not been updated since. MESP has identified that this Law needed updating due to deficiencies that were encountered during its implementation. During the audit we have been informed that a revised/updated version of this Law has been prepared but has not been submitted yet to the Government for approval due to requirements for review of financial impact assessment that derive from its implementation. Amendment and supplement of this law is planned to be submitted for approval in the second quarter of 2018.

Secondary legislation has been prepared and approved, whilst the revised version of the AI on the Rules and Standards of the Discharges on Air by the Stationary Sources of Pollution, is prepared and foreseen to be submitted for approval in the second quarter of 2018.

Preparation of the Air Quality Strategy (hereinafter Strategy) is an obligation under the Law on Air Protection from Pollution. MESP has prepared the Air Quality Strategy in 2013, in cooperation with other relevant stakeholders and covers the period 2013-2022. After the approval of this Strategy, had been foreseen preparation of the Air Quality Action Plan (AQAP) for the purpose of implementation of strategy. A draft AQAP initially prepared by the MESP was foreseen to support implementation of the strategy and measures identified during the period 2013-2017, however such document has not been approved and is no longer relevant. Consequently, any measure that may have been implemented, it has been made based on measures foreseen in strategy and not based on AQAP.



Since the timeframe 2013-2017 covered by the Strategy has already passed without an action plan, currently efforts of MESP relate to the approval of AQAP that is expected to cover the timeframe 2018-2020, as the Government has recommended that the Action Plans for Implementation of the strategy should only cover a three year timeframe. Currently there is a draft of AQAP for 2018-2020, but has not been sent to the Government for approval due to requirements for review of financial impact assessment that derive from implementation of measures identified therein. During the audit we identified that despite the existence of this draft plan, MESP finalised the financial impact assessment for this document however this document remains un-approved in the Government.

Due to lack of these preconditions for implementation of the Strategy, MESP has undertaken measures for preparation of emergency plans on improvement of air quality. In December 2016, was drafted and approved the "Plan of measures for improvement of air quality and the condition of the environment in Kosovo". This plan was approved at the end of 2016 and covered a one-year period until the end of 2017. The plan was prepared due to lack of AQAP 2013-2017, well as to respond to the severe situation created during the winter season 2016/2017. This plan is no longer valid and regarding the implementation of measures foreseen therein, there is no official report by the MESP.

In November 2017, MESP has prepared the document "Plan of activities for improvement of air quality autumn-winter 2017-2018". This plan is a continuation of the previous emergency plan 2016-2017. While analysing this plan and comparing it to the preliminary emergency plan it was found that nine out of 12 measures foreseen to be undertaken for improvement of air quality were carried over from the previous plan (as they were not implemented).

Below have been summarised deficiencies that relate to the status of establishing, updating and strengthening of legal prerequisites for improvement of air quality:

**Law on Air Pollution Protection** - Revised old version. Financial impact assessment is missing. Not approved yet.

**Secondary legislation** - Complete, with the exception of the revised version of the AI on the Rules and Standards of the Discharges on Air by the Stationary Sources of Pollution, which needs approval.

**Air Quality Strategy (2013-2022)** - Approved, but with deficiencies in implementation due to lack of Action Plan.

**AQAP 2013-2017** - Draft. Not approved

**AQAP 2018-2020** - Draft. Not sent for approval yet.

**Emergency Plan 2016-2017** - Approved. No reporting on implementation of measures identified therein.

**Emergency Plan 2017-2018** - 9 out of 12 identified measures carried over from the previous emergency plan.

## 3.2 Monitoring and reporting on air quality

Responsible central level institutions with the intention of reducing air pollution and minimising harmful effects of air pollution on human health and the environment as a whole, should improve air monitoring and evaluation activities. All this is achieved by providing updated information on concentration of air pollutants in the environment and make this information available on regular basis and use of standardized measurement techniques and common criteria for the number and location of measuring stations.

Main responsibilities that relate to monitoring, informing and reporting of air quality data in Kosovo fall on KEPA, and HMIK, which is an institute that exercises its activity within the KEPA.

There are two channels through which KEPA, with the support of HMIK, collects data on air quality:

**Emission data**<sup>21</sup> - this data is reported by Economic Operators (hereinafter EO), activity of which relates to air pollution. EOs report on monthly basis to KEPA regarding the emissions released into the air from their activity. Normally, monitoring of emissions is done by a company contracted by the EO. The company selected to conduct monitoring of emissions and compile a report with generated data, conducts monitoring over a single day of the month that they decide (the company). This methodology results in indicative and unrealistic data, as the day selected by the company to

<sup>21</sup> Emission means the release of substances from any source in environmental air. In the case of reporting emission data from the EO, each OP makes reporting of substances that are released (discharged) in the air only from their activity.

be monitored may not be representative to the real condition of emissions released by the activity of the EO.

The Inspectorate within the MESP is responsible for verification of reports produced by these companies for each of the EOs, but we have found that verifications are not done, as their work is solely based on reviews of reports generated by the companies with air measurement equipment that EOs may own, and not on any measurements done by inspectors, as inspectors do not have portable air measurement devices, especially to conduct such an activity constantly.

Emission data<sup>22</sup> - this data is generated by monitoring stations located in several locations throughout Kosovo. The data generated by these stations report the integrated condition of air quality that is a result of substances discharged by all possible air pollutants. Therefore, through this data cannot be determined what percentage was caused by the activity of economic operators (e.g. power plants), transport (e.g. release of substances in the air by vehicles), household (e.g. release of substances into the air from use of coal by households for heating purposes), etc.

### 3.2.1 Establishment of air quality monitoring stations at state level

Currently in Kosovo, are located 12 air quality monitoring stations<sup>23</sup>. Three of these stations are located in the Municipality of Obiliq - in the yard of the Family Medicine Centre, Dardhishtë - in the yard of the primary school, and Palaj - in the KosovaMont Park. These stations are affected by the pollution discharged from power plants A and B, traffic, burning of heating materials, exploitation of coal mine, etc. These stations were donated to the Ministry of Economic Development by the World Bank, while at the end of December 2012 this Ministry has been transferred into the ownership of MESP, and under the management of KEPA/HMIK.

In the city of Prishtina are located two air monitoring stations. One of these stations is located in the yard of "Rilindje" building as frequency of population is higher, while the other is located in the HMIK yard/location. These two stations are affected by various air pollutants caused by KEK, traffic, burning of heating materials, etc.

Other stations are located in: Drenas (1), Hani i Elezit (1), Mitrovica (1), Gjilan (1), Prizren (1) and Peja (1). Stations located in Drenas, Hani i Elezit and Mitrovica are generally affected by the pollution caused by industrial complexes, cement factories or erosion of landfills generated by processing of ores. Meanwhile, stations located in Peja, Gjilan and Prizren are generally affected by various sources of pollution, such as traffic or burning of materials used for heating.

Stations are located throughout the country, and what is most important is that they are located in locations that are characterized with higher air pollution as they are close to various pollutants that are harmful to the air such as power plants, factories, mines, quarries, etc.

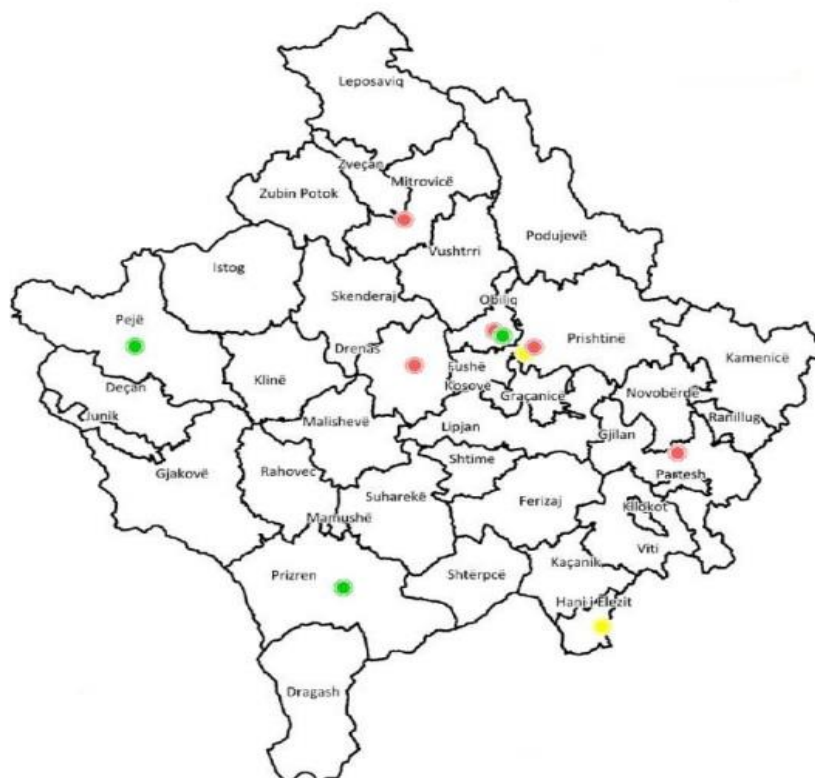
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<sup>22</sup> Immission means the reporting of the integrated state of the substances released into the air from some sources of air pollution (i.e. immission is the state of the air quality that is created by taking out the substances discharged into the air from power plants, factories, transport, households, etc.

<sup>23</sup> With the exception of the station located in Brezovica (Shterpce) which is out of function since due to the strong winds the station (container) slipped from the base and the power supply was damaged.

The figure below visually shows locations of these stations in the Kosovo region.

**Figure 1:** Locations of stations for air monitoring in the territory of Kosovo



**Source:** Ministry of Environment and Spatial planning, Kosovo Environmental Protection Agency, Annual report on the environment in Kosovo, 2017

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### 3.2.1.1 Determining the locations of air quality monitoring stations

Institutions responsible for determining locations of air quality monitoring stations should consider a number of criteria at the time they localise stations.

Aspects that need to be considered when determining locations of these stations include:

- generating data for zones with high concentrations of air pollutants (where the population is exposed to these pollutants),
- not be positioned in such a way that the level of pollution is affected only by a particular source of pollution, but by an integrated contribution of all possible sources of pollution (with exception of single source of pollution that is typical for a given area),
- protection of vegetation and of natural ecosystems, as well as
- consider important factors such as sources of interference, security, access, availability of electricity and telephone communications, visibility of the place in relation to its environment.

After analysing the data and documents provided by KEPA and HMIK, we have understood that as a base for determining monitoring locations have been the criteria given in the Directive 2008/50/EC on ambient air quality and cleaner air for Europe, presented in Annexes III, IV and V of this Directive, and AI No.15/2010<sup>24</sup>.

Through this audit have been identified several problems that have characterized the location of some of the air quality monitoring stations. Officials of KEPA/HMIK acknowledge that despite the fact that the European directive was the base when determining locations of stations, there are monitoring stations that do not meet the criteria for establishment of stations as required or as foreseen under the EU Directives. Deficiencies relate not only to determining of the initial location, but also to their relocation (when was decided to do so). It should be stated that starting from the abovementioned problems, in December 2015, with the initiative of MESP was proposed to do "Review and Redesign of the State Network for Monitoring of Air Quality in Kosovo", and a work group designated by this Ministry has drafted the document for addressing of this issue.

Initially, there were problems with determining air quality monitoring stations in Mitrovica and Gjilan.

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<sup>24</sup> AI on criteria for determining air quality monitoring points, number and frequency of measurements, classification of measurements, pollutant classification monitored, working methodology, form and timing of data reporting.



The monitoring station in Mitrovica was considered to be suitable to be placed at the location of the meteorological station of this Municipality, but during 2013 this station was relocated as the Municipality of Mitrovica asked them to move away from the area as it turned out to be a private property. Furthermore, HMIK has obtained the Municipality's permission to place the station in the yard of the primary school Eqrem Qabej as it was considered that that location meets the required criteria. Current position of this station is said

to be located near the previous location and meets the criteria required under the European Directive.

The air quality monitoring station in Gjilan since April 2012 has been located in the yard of the Municipality where the frequency of population and traffic is high, but during 2013, the Municipality has requested to remove the station from its yard, and then it was relocated to the city park on the road Idriz Seferi.

After the review and redesign to the state air quality monitoring network, it was proposed to relocate Gjilan's station again, as in its current location the station is affected only by air pollution that comes from traffic and not from other sources of pollution. In addition, it was proposed to relocate stations of Peja and Brezovica to new monitoring locations within the cities where they are currently. At the same time, it was proposed that the Brezovica station, besides relocating, should also secure new analysers.

During the audit we have found that the monitoring station in Peja was relocated and the relocation process has taken a long time due to some procedures that should have been followed, and currently the station in Peja is located at the meteorological station of this city. For the relocation of the station in Peja, HMIK has received a request from the director of school "League of Prizren" (in the yard of which the station was placed) to remove it due to the need of this school to build a sports court near the station. The location of the monitoring station on the schoolyard according to the HMIK had met the required criteria but it was an obstruction to the school.

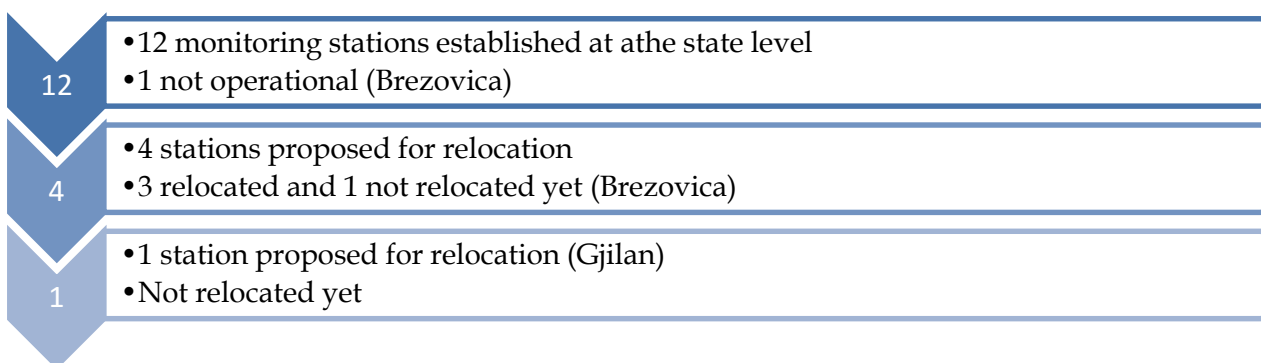
Proposals for relocation of Gjilan and Brezovica stations have not yet been followed through, due to lack of budget resources needed to carry out relocation activities. Since the Gjilan station was not relocated to a more representative monitoring location within the city, it was invested in maintenance and servicing of the station in order to make it operational, as the station was not operational for a while.

Proposal for relocation of the monitoring station in Brezovica was due to difficult access to this station. We have understood that this station has not been operational as the foundation of the station has slid from the base and as a result the power supply was damaged. The station is not operational yet, and has not yet been relocated due to lack of budget and lack of a new location. Since some of the analysers of this station are relocated to the Drenas air quality monitoring station, this station needs to secure new analysers, but this has not happened yet.

HMIK should follow some steps during the relocation process, and usually such a process takes time. Steps that should be followed are:

- conduct field research to determine a suitable location for establishment of station;
- obtain permits from respective Municipal Assemblies for use of location where the station is going to be placed;
- conduct research to secure financial funds;;
- execution of works for building of infrastructure (constructing foundation of the station, installation of protective fence, extending cables for electricity supply and internet); and
- configuration of analyzers.

Below are summarized main issues that relate to the process of determining locations at the country level and their relocation process:



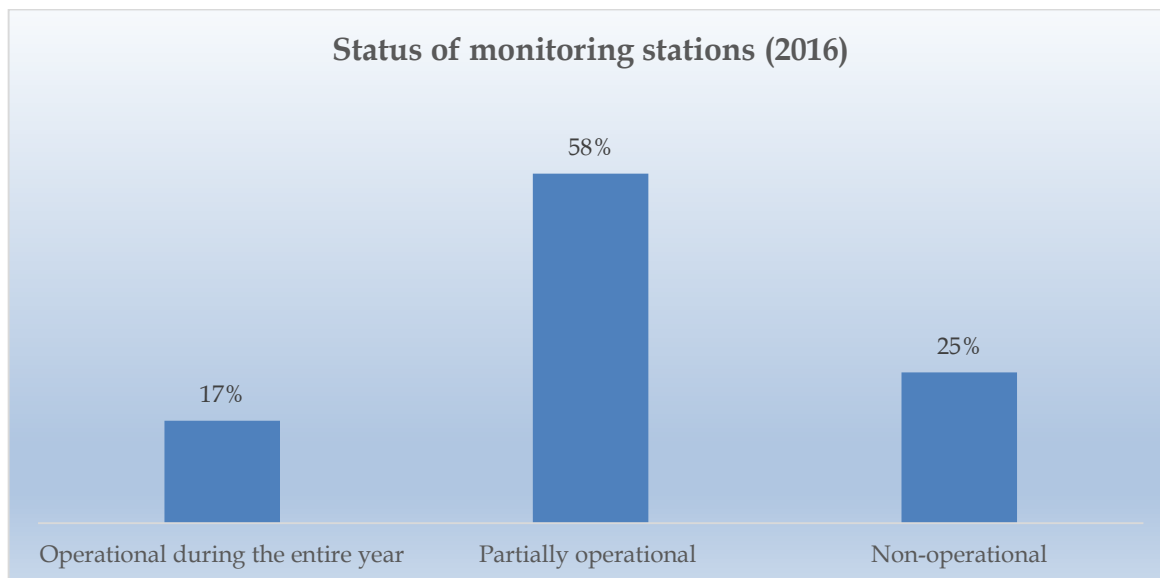
### 3.2.1.2 Functionality of air quality monitoring station

The main purpose of monitoring stations is to collect and generate data on air quality at different locations. For data generation purposes, it is crucial for monitoring stations to be constantly operational, and not be characterized by problems that may hinder generation of data for a certain period of time. In this section are presented audit findings that relate to the functionality of stations during 2016 and 2017.

In order to arrive at representative and reliable findings, this audit has taken into account the following methodology:

- we initially received information and following reports on functionality of the stations from responsible officials at HMIK; and
- In preparation of the following percentages, as not operational or partially operational stations are considered were not considered only those stations that are characterized with problems of different nature that have led to a non-operational station, but also stations that based on annual reports (2016 and 2017) had not generated any data.

The diagram below shows the functionality of monitoring stations in 2016. As can be seen from this diagram, a very small number of stations have been operational throughout the year (17%). The majority of stations have been either partially operational (58%) or non-operational (25%).



The only stations that were operational during the entire year was the station in Prishtina in the HMIK yard and the Drenas station. These two stations have generated data year-round on parameters of air pollution that they have, and they have not encountered any problems.

The largest number of stations (58%, namely 7 stations) during 2016 have been partially operational due to various problems encountered. The smallest obstructions were failures of set air pollution parameters, for a short period of time. Bigger problems in stations during 2016 have occurred due to lack of communication between the station's software and data logger<sup>25</sup>, or the parameters for measurement of air quality have not communicated with station's computer/laptop. In the photo below are illustrated each of these issues through observation of some of the monitoring stations that the audit team has carried out.

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<sup>25</sup> Data recorder (also known as datalogger) is an electronic device that records data over time through an instrument or internal sensor or by means of external instruments and sensors.



**Photo 2:** Data logger, parameters for measurement of air quality and PC/laptop (for collection of generated data)

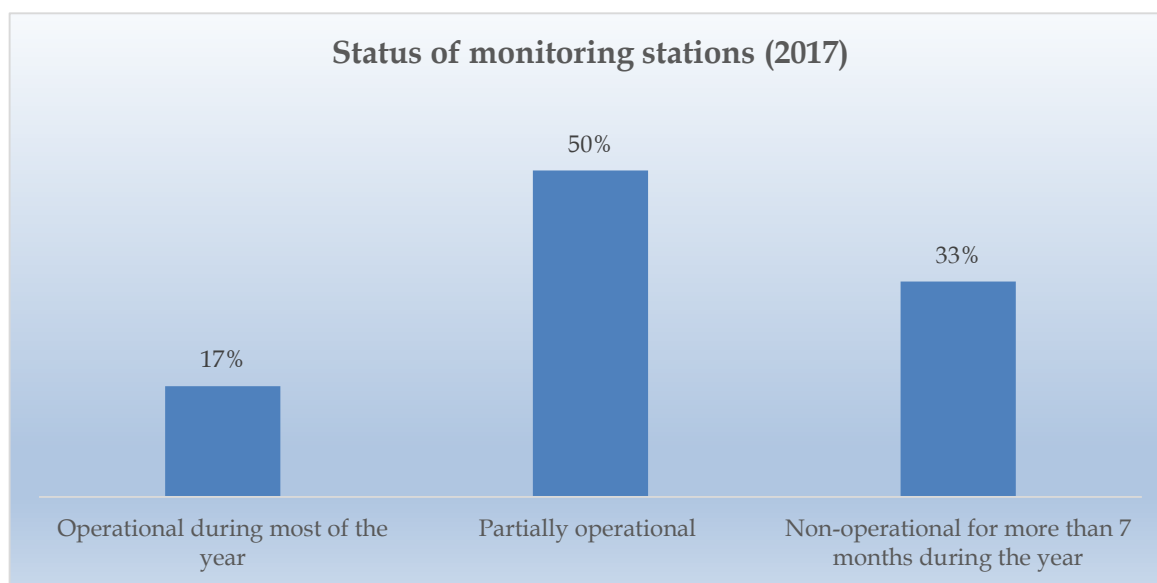


Furthermore, even more concerning issues that have led to a non-operational monitoring stations relates to the damage or theft of stations by the human factor. The station located in Dardhishte of the Municipality of Obiliq has been non-operational, as station's most vital part has been stolen. Similar thing happened with the station located in Mitrovica, where due to the damage done to the air conditioner by the human factor, this station has not generated any data for 2016. From observations done by the audit team to some of the monitoring stations, they noticed that beside the iron fence, there are no other security measures that would prevent damage or theft of the stations. The only step taken by the HMIK in this regard is by reporting the cases to the police, but no specific measures have been taken to secure these stations. Two other stations that were not operational during 2016 was the station in Peja due to the proposal for relocation, and the station in Brezovica for the same reason and since three of the parameters of this station were relocated to the station in Drenas.

According to HMIK officials, main factor that had impact to the abovementioned problem is lack of maintenance and servicing of stations. In November 2016 HMIK had signed a contract with the selected economic operator for "maintenance of network of air quality monitoring stations".

During the audit we have found that due to insufficient budget to service all stations, HMIK was obligated to prioritize only 4 stations, namely the station of Dardhishte, Hani i Elezit, Drenas and the station of Mitrovica. The reasons behind the selection of stations relate to the fact that HMIK has considered that these 4 stations had more problems during the period when the contract was concluded and because the locations where the stations are located are industrial areas and pose problems in terms of air quality. Despite the lack of financial means to service all stations, we have found that prioritization of 4 stations by HMIK, in the functional aspect was not done properly, particularly in the case of Drenas station, which was prioritized for servicing, while as it is seen on the diagram above, this station is among the two stations that have been operational throughout 2016. HMIK officials have given the justification that this station is prioritised in order to ensure the continuity of data generation from an air pollution area such as Drenas.

Functionality of monitoring stations during 2017 is presented in the diagram below, and as can be seen is not that much different from that of 2016.



We continue to have a high number of stations that have been partially operational. Only 17% of stations have been operational during most of the year, while 33% of stations have been non-operational for more than 7 months during the year.

In addition, problems encountered during 2017 are similar to those of 2016. There were deficiencies in software communication with the data logger, problems with inoperable air conditioner, power supply, even lack of internet. Furthermore, there are stations among partially operational stations whose parameters have not operated well for most of the year (such as Drenas and Mitrovica), and as a result of these problems, these stations have not generated data for such parameters for a certain period of time during the year. The cases of damages and trespassing into stations by the human factor was evident even during 2017, where HMIK informed us that that there have been other cases that during this year were presented to the police and after the police examination was sent to the office of municipal prosecutor, where the station is located.

It should be stated that 33% of stations that were not operational for more than 7 months during the year, according to the methodology followed in this audit, are those stations that apart from the problems they had, they had not reported data for more than 7 months during the year. In February 2017 was made another request by the HMIK to the KEPA for servicing of stations, but the service contract was not finalized until June 2017. The request for another maintenance servicing contract was made to service stations that were not included in 2016 contract (as mentioned in the contract signed in November 2016, was prioritized only servicing of 4 stations). The service contract finalized in June 2017 has reached the value of about €150,000. These funds have been sufficient for servicing of stations compared to those of the contract signed in November 2016 (about €60,000). All stations that needed maintenance/servicing were serviced but this was finalized at the end of 2017. It should be understood that also servicing is among the reasons why a significant number of stations has not generated data (as at the moment they are sent in for service, all or a considerable number of parameters that are being serviced are out of order).

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### 3.2.2 Techniques of measurement, collection, and processing of data on air quality

Use of standardized techniques for measurement of air quality is indispensable to ensure that the information collected on air quality is sufficiently representative and comparable across the entire community.

Most of monitoring stations have installed analyzers/parameters that measure the level of air pollution with NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> (See annex 1 for more).<sup>26</sup> Therefore, the technique for measurement of air quality in stations is standardized in terms of supplementing these stations with the number and the type of same parameters. As mentioned earlier, the station located in Brezovica is currently not operational with necessary parameters as it was not relocated yet. For the station in Peja was proposed to continue with the indicative method<sup>27</sup>, namely, to continuously monitor parameters that have been problematic, which are PM<sub>10</sub> and PM<sub>2.5</sub>. In addition, two parameters (SO<sub>2</sub> and O<sub>3</sub>) have been relocated from Peja station to Mitrovica station, as it was considered necessary.

In addition to what was elaborated above, some of these parameters may not be operational for a certain period of time as a result of damage, malfunction or simply lack of servicing, it is important that the stations possess these parameters. Notwithstanding, the aspect of air quality measurement which is standardized in most of the stations, we have found that there are various problems in terms of collection and processing of data generated from these measurements.

Currently there are only three stations that are connected through a local software. The stations are located in Obiliq/FMC, Obiliq/Dardhishte and Obiliq/Palaj are stations that transfer data to the local software located in the HMIK, but this software does not have the options for data processing and generation of reports. From this software, HMIK has the possibility to obtain data and monitor from the distance the functionality of parameters established therein. Data from other monitoring stations are collected with USB by HMIK officials, which means that HMIK officers should physically visit the location. The collected data is processed before being reported to the public. The process of data processing takes a while in HMIK as this is done by a single official, and the data has to be processed individually in Excel without the support of any advanced program or advanced processing system.

HMIK officials need to apply several steps during the data processing process. As soon as data is extracted with the USB from stations, officials have to convert received data to a format acceptable in Excel, and then check each given data.

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<sup>26</sup>NO<sub>2</sub> - nitrogen dioxide; SO<sub>2</sub> - Sulfur dioxide; CO - carbon monoxide; O<sub>3</sub> - Ozone; PM<sub>10</sub> and PM<sub>2.5</sub> - fine particles. While all the parameters are detrimental to our health, PM<sub>10</sub> and PM<sub>2.5</sub> particles are very harmful and this is because even as parameters are more apparent in our country. PM<sub>2.5</sub> consists of particles with diameters less than or equal to 2.5 microns. PM<sub>2.5</sub> is even more serious health concern than PM<sub>10</sub>, as smaller particles can travel deeper into our lungs and cause more adverse effects.

<sup>27</sup> Semi-automatic equipment is installed and passive sampling of only some pollutants, which in the case of Peja are PM<sub>10</sub> and PM<sub>2.5</sub> monitoring. Indicative method also implies that only these parameters are reported and not during the whole year.

**In order to process data should be done the following:**

- Validation of data;
- Identification of current data which may have been incorrectly reported, or of particular values that are not relevant for the parameter out of which are generated; and
- Checking identified values one by one.

The large amount of data that is received and processed by only one official at HMIK has caused delays in updating data, generating reports, and publishing them timely for the public. HMIK officials explained that approximately 1400 values for a parameter are collected for a period of one month and these values have to be checked in order to generate monthly reports. Officials should initially process this data per hour, then per day, and then per month. The manual method of data processing increases the possibility of errors upon presentation of data.

From June 2017, HMIK has engaged three officials to collect data from each of the stations. According to the information received at HMIK, officials collect data twice a month.

Below are summarized main findings that relate to techniques of measurement, collection and processing of air quality data:



All stations are equipped with the same number and type of the main parameters that determine air pollution with NO<sub>2</sub>, CO, SO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. The metering techniques are standardized.



Data collection is done manually (with the exception of three stations located in Obiliq) through USB by HMIK officers. Data collection in stations is done at least twice a month.



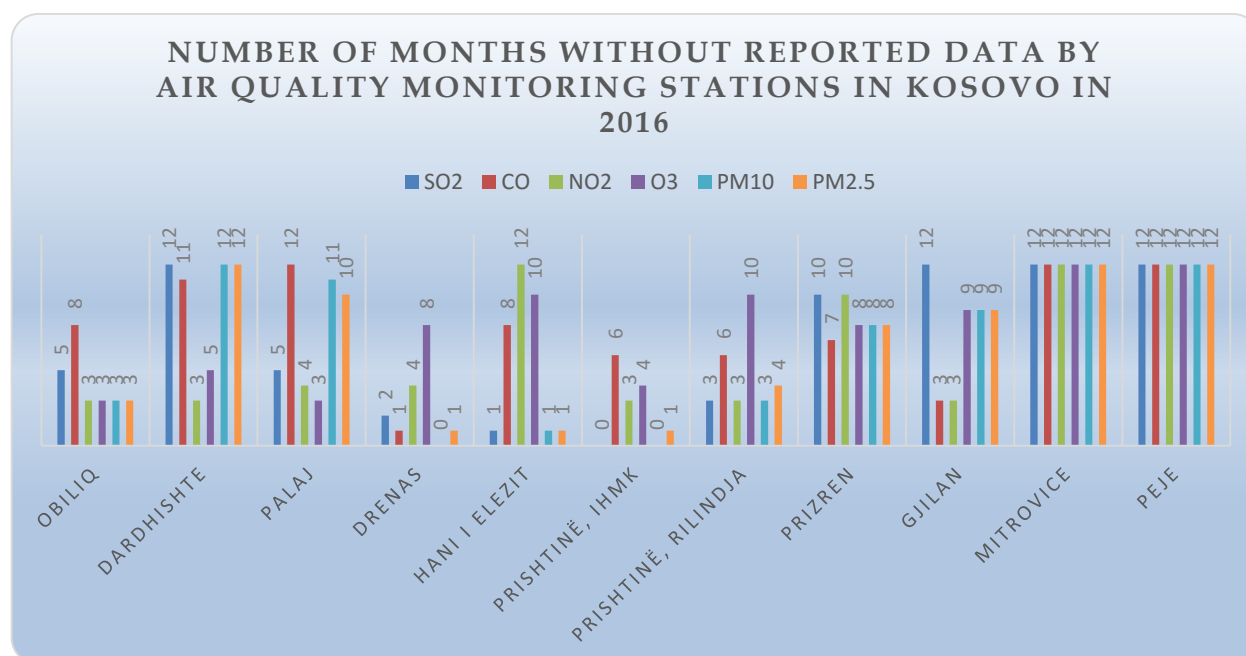
In the absence of a central system that would collect and process data automatically, as well as generate reports, data is currently processed by one of the HMIK officers. A process that takes a lot of time and causes delays in reporting.

### 3.2.3 Reporting of data on air quality

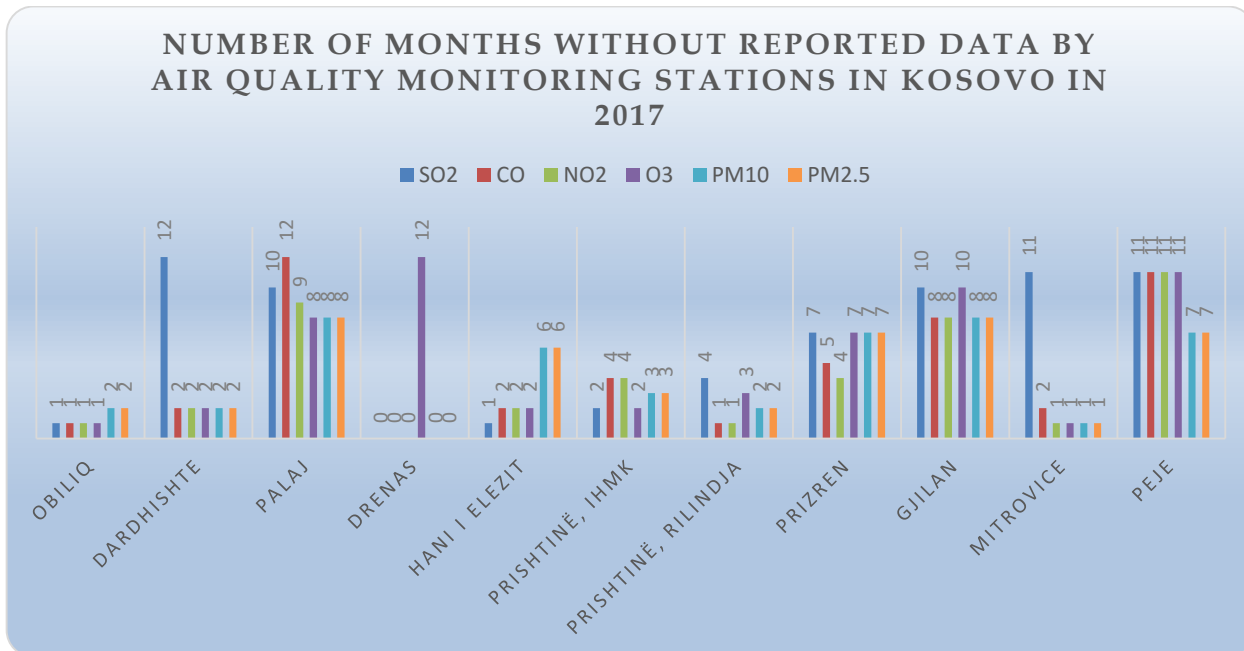
Data reporting process was followed by numerous deficiencies that related to completeness of data in reports published by HMIK. Several monitoring stations have not reported data on some of air quality parameters. Diagrams below show audit findings related to completeness of data reported in 2016 and 2017. In particular, analysis carried out shows the number of months without reported data in by each monitoring station in Kosovo during 2016 and 2017.

2016 has been characterized by major deficiencies in data reporting as a result of problems mentioned above, such as lack of station maintenance or servicing, their damage, delays in data collection, delays in processing of data, etc.

As seen in the diagram below, two monitoring stations have not reported data on any of parameters throughout the year due to their malfunction. It is also concerning that lack of data reporting was evident for most of the year even in the rest of the stations (with the exception of Drenas and the station located at HMIK that have a better reporting status). Even more problematic is the fact that the most problematic air pollution parameters in our country, PM<sub>10</sub> and PM<sub>2.5</sub>, do not have reported data for more than six months in 6 out of 11 stations shown in the diagram.



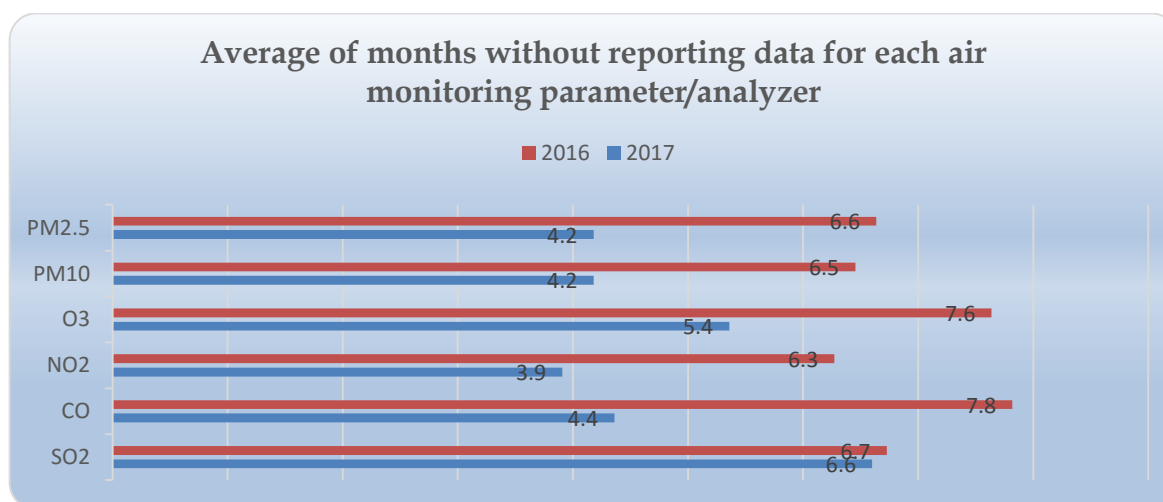
During 2017 we see an improvement in terms of completeness of the data reported by HMIK. Despite this improvement, there were reporting deficiencies by most of the stations.



What is concerning during 2017 is the fact that there are still monitoring stations that are situated in areas that are characterized by high air pollution (such as Palaj in Obiliq, Hani i Elezit, Gjilan) which had no data on some of the parameters for over 6 months during the year. The station located in Palaj of Obiliq is important to have data reporting throughout the year, as it is located in the vicinity of the air polluter Power Plant B. While in 2016 and 2017, this station has been characterized by major shortcomings in data reporting. In the photo below is shown the proximity of the monitoring station in Palaj of Obiliq with the Power Plant B.



The diagram below show the analysis carried out based on deficiencies in reporting of data according to parameters established in monitoring stations.



We can see that there are improvements in reporting of parameters from 2016 to 2017 (with the exception of SO<sub>2</sub> reporting where the difference is very small). However, as mentioned earlier, parameters are problematic and evident in our country, PM<sub>10</sub> and PM<sub>2.5</sub>, have not been reported on average 4.2 months during 2017, which is not insignificant, especially if they are winter months (months when these parameters reach maximum values).

Based on analysis of documentation, as well as meetings held with responsible HMIK officials, we have identified critical months in terms of air pollution. The period during which air is more polluted (parameter values show values way over the limit) is from September until March (i.e. generally winter months). During meetings held with HMIK officials we have been informed that this institute during the period of alarming air pollution is mobilised to increase monitoring and reporting capacities. HMIK also states that as a result of mobilisation during these months they prepare daily reports and publish them on the official website of KEPA.

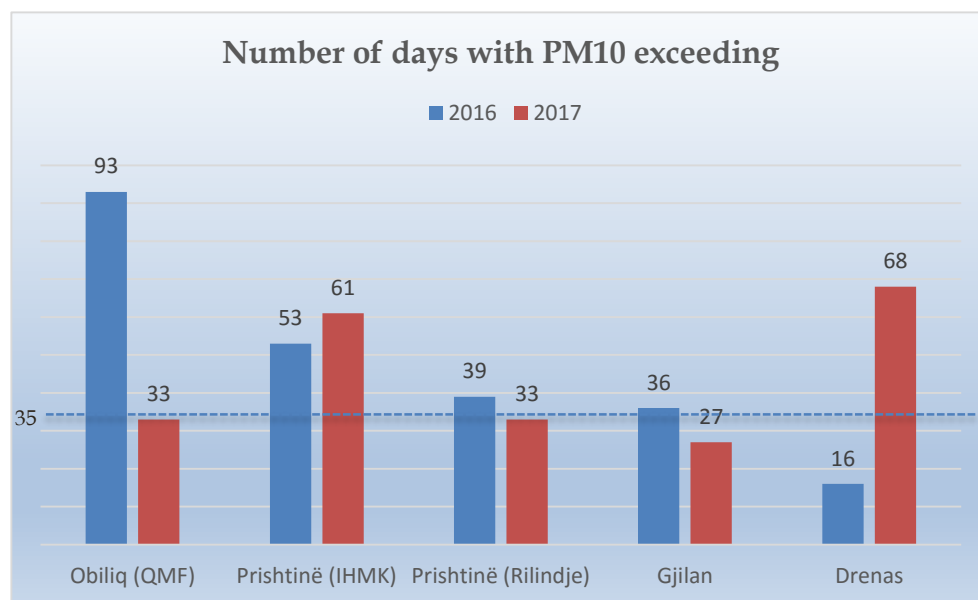
**Despite these declarations from the HMIK, we have identified the following deficiencies**

- During 2017, the monitoring station in Peja, Prizren, Hani i Elezit, Gjilan and Palaj (Obiliq) did not have any reported data on PM<sub>10</sub> and PM<sub>2.5</sub> during critical months of January, February and March;
- The Prishtina monitoring station, and Hani i Elezit station have no reported data for PM<sub>10</sub> and PM<sub>2.5</sub> during September;
- There is no real-time data reporting on air quality;
- HMIK from middle of October 2017 reports daily only for two stations located in Prishtina, while for three stations located in Obiliq has started daily reporting from 12 January 2018. Are reported only particles PM<sub>10</sub> and PM<sub>2.5</sub>.

### 3.2.3.1 Values of particles PM<sub>10</sub> and PM<sub>2.5</sub> over the limit during 2016/2017

Considering the alarming situation created in the country regarding the air pollution, it is important to present exceedings of permitted values of PM<sub>10</sub> parameter, permissible values during the year, and the maximum values reached by the parameter PM<sub>2.5</sub>. Starting from preliminary findings that data reporting was not complete by all stations, while for a considerable part of 2016 and 2017, exceedings of values presented in this section of the report are based solely on the reported data (so it is possible for exceedings to be even higher, as if the data reporting would be complete and general and would be seen the overall view of values exceeded throughout stations).

According to HMIK reports, which in fact based on the criteria set out in European Directives, the limit value/permitted for 24 hours, for protection of human health for the PM<sub>10</sub> parameter is 50 µg/m<sup>3</sup><sup>28</sup>, and the maximum number of limits exceeded allowed within the year is 35 days. Regarding the PM<sub>2.5</sub> parameter, the annual limit value permitted for protection of human health is 40 µg/m<sup>3</sup>, while the maximum number of exceedings within the year is not foreseen. For the purpose of this audit, below we will present days with exceedings during the year for those stations that have exceeded the PM<sub>10</sub> parameter, while for parameter PM<sub>2.5</sub> (since is not foreseen maximum number of exceedings during the year) we will present the maximum values recorded during the year.



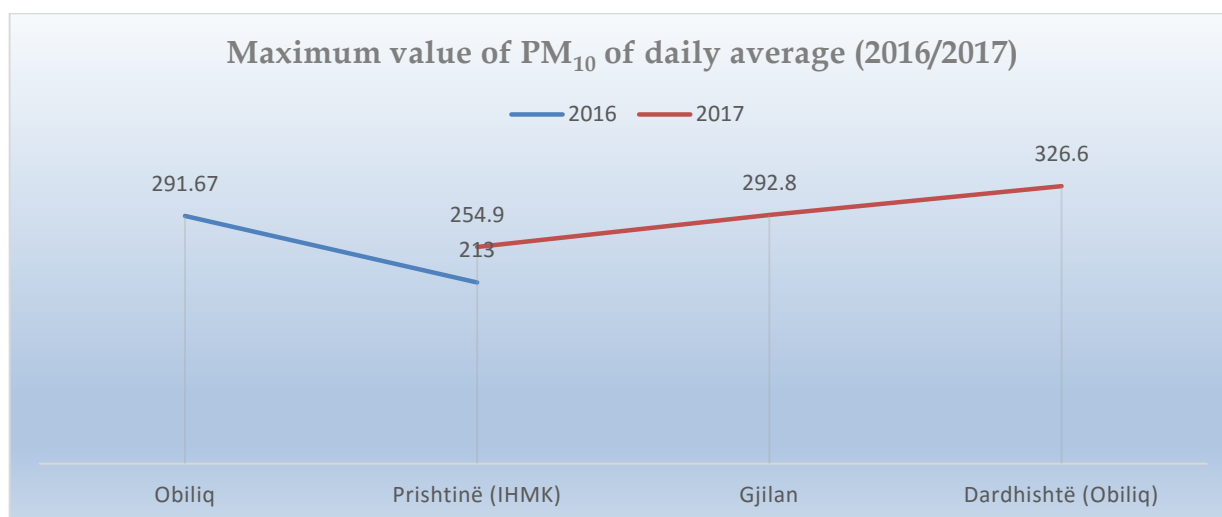
The station with the most days exceeding the PM<sub>10</sub> during 2016 was that of Obiliq, where 93 days were recorded exceeding the values of PM<sub>10</sub>. Compared with 35 days which is the maximum number of days allowed within the year, the number of

days recorded exceeding this parameter at the Obiliq station has been by 165% or 58 days more than allowed. During 2017, the station that recorded the most exceeded values of PM<sub>10</sub> is that of Drenas, in which PM<sub>10</sub> values have been exceeded by 68 days within the year, or 33 days above allowed values for days exceeded. The Station with many exceeding within 2016 and 2017 is also the Prishtina station located in the HMIK yard, where during 2016, PM<sub>10</sub> values have been exceeded by 53 days or 51% more than allowed, while during 2017 these values have been exceeded over 61 days

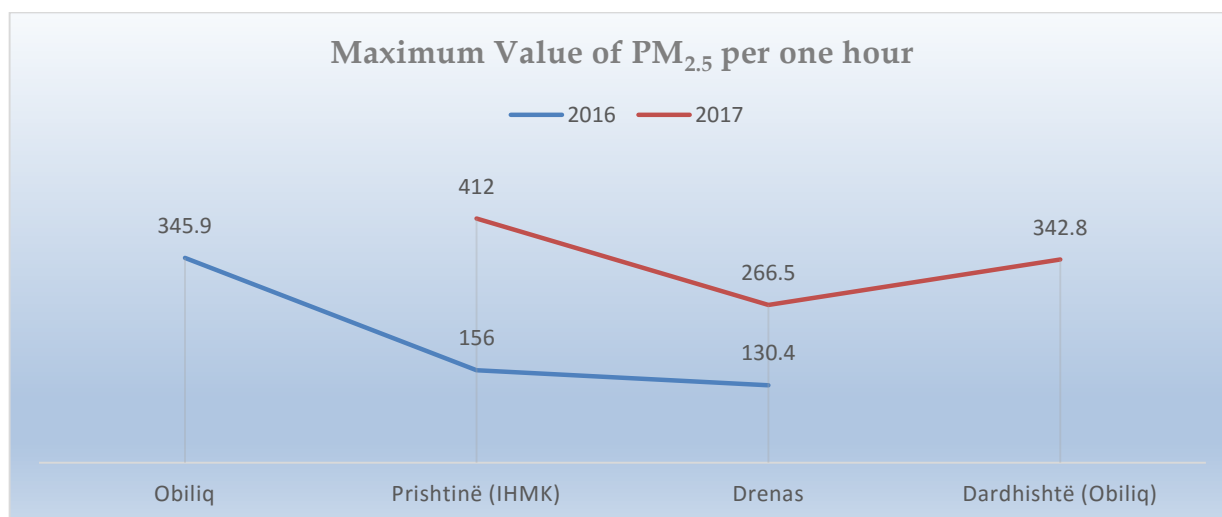
<sup>28</sup> PM<sub>10</sub> metering unit is microgram per cubic meter.



per year or 74% more than the allowed value. Other stations that have exceeded are Prishtina (Rilindja) and station located in Gjilan.



Based on the analysis of data reporting over two years, we have found that there have been several cases when registered PM<sub>10</sub> values (based on daily averages) exceeded the allowed value of 50 µg/m<sup>3</sup> more than 400% which in fact is very disturbing when we consider the impact that this parameter has on human health. The monitoring stations in which the maximum values are recorded during 2016 are that of Obiliq (291.67) and Pristina at HMIK (213). Meanwhile, in 2017, the station with the highest PM<sub>10</sub> value is the monitoring station in Dardhishte of Obiliq Municipality (326.6), followed by Gjilan (292.8) and Prishtina at HMIK (254.9).



Small particles PM<sub>2.5</sub>, as mentioned earlier in the report, are very dangerous to human health as particles with a very small diameter and as such can travel deeper into our lungs and cause harmful effects.

Based on the reported data, it appears that the maximum PM<sub>2.5</sub> values over an hour have reached extremely high levels and this is still more alarming in terms of human health. While the permissible limit value of PM<sub>2.5</sub> is 40 µg/m<sup>3</sup>, during 2016 the highest value was observed in Obiliq monitoring

station (345.9). Further on, high values of  $PM_{2.5}$  were recorded during 2016 at Pristina monitoring stations at HMIK (156) and Drenas (130.4). During 2017, the maximum  $PM_{2.5}$  value was noticed even worse than in the previous year. The data recorded by the monitoring station in Pristina within HMIK have shown that over one hour  $PM_{2.5}$  values have reached 412. Other high  $PM_{2.5}$  values during 2017 were also recorded at the monitoring station in Dardhisht within the Municipality of Obiliq (342.8) and Drenas (266.5).

Exceeding  $PM_{10}$  and  $PM_{2.5}$  values shown in the diagram, both for 2016 and 2017, were recorded during November-January.

### 3.3 Role and management of air quality at the local level

The main responsibility of Municipalities in relation to air quality is the adoption of local Environmental Action Plans (LEAPs), which defines air quality policies and management for five years as well as actions within the municipal territory, in line with the Air Quality Strategy. Local action plans for air quality are an integral part of LEAPs. The implementation plan report is reviewed by municipal assemblies and municipalities have an obligation to report to the Ministry on the implementation of these plans and programs.

#### 3.3.1 Approval of Local Environmental Action Plans

The table below summarizes the findings of this audit regarding the approval of LEAPs in the municipalities selected as case studies, drafting reports on the implementation of these plans, their reporting to the Ministry, and the status of the validity for current LEAP in municipalities.

Municipality	Have Municipalities approved local environmental action plans?	Do Municipalities draw reports on the implementation of local environmental action plans?	Do Municipalities report on the implementation of action plans or air quality in MESP?	In case when the Municipality has adopted the Local Environmental Action Plan, is the plan still valid?
Prishtina	NO	NO	YES	NO
Obiliq	YES	NO	Ad-hoc basis	NO (2012-2017)
Mitrovica	YES	YES	Ad-hoc basis	NO (2011-2016)
Hani i Elezit	YES	YES	Ad-hoc basis	NO (2012-2017)
Gjilan	YES	NO	NO	NO (2009-2015)

All the above mentioned municipalities have approved the LEAPs with the exception of the Municipality of Prishtina. Approved LEAPs included LAQAPs as well. LEAP of the Municipality of Prishtina is a document drafted by the Municipality under the financing of GiZ, but still has the status of the draft document as it has not been approved in the Municipal Assembly. The LEAP of Prishtina currently being as draft covers the period 2016-2020, while the municipality approved an environmental/air quality plan before this period.

##### 3.3.1.1 Drafting reports on the implementation of local environmental action plans

A problem related to current LEAPs of Municipalities is that to a large extent reports on implementation of the activities foreseen to be undertaken in these plans are not drafted, especially those activities related to improving air pollution. Municipalities that have not drafted LEAP implementation reports are Prishtina, Obiliq and Gjilan. The municipalities of Mitrovica and Hani i Elezit have compiled reports on the implementation of LEAPs. The reason that has led municipalities to compile reports on the implementation of LEAP measures is largely the result of

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the requests submitted by the REC<sup>29</sup>. It should be emphasised that REC also supported municipalities in compiling LEAPs.

Several areas of environmental improvement have been identified in the LEAPs of the Municipalities, and a number of measures are foreseen to address those areas. The following are the main findings of this audit regarding the areas prioritized by the audited municipalities in their LEAPs:

- 5 environmental priorities have been identified in the LEAP of Obiliq Municipality. The first environmental priority is air pollution and within this area 5 problems have been identified, while 17 measures are planned to address these problems.
- 3 environmental priorities have been identified in LEAP of Gjilan Municipality. Air pollution is not among the priorities identified in the LEAP of this Municipality.
- 8 environmental priorities have been identified in LEAP of Prishtina Municipality. The main priority in the LEAP of this Municipality is air pollution. Within the air pollution, 3 problems have been identified, while 11 measures are planned to address these problems. While the municipality continues to have unapproved LEAP, every measure taken is implemented on an ad-hoc basis.
- 4 environmental priorities have been identified in LEAP of Hani i Elezit Municipality. This Municipality has also given priority to air quality management. Within this area, 3 problems have been identified, while 9 measures have been identified to address these problems.
- 6 environmental priorities have been identified in LEAP of Mitrovica, where the main priority has been given to the issue of air quality. Two measures have been identified to address the problems of air pollution in this Municipality.

### 3.3.1.2 Validity of Local Environmental Action Plans

Since the LEAPs mainly involve a five-year implementation period, a problem that characterises the local level is the validity of the current LEAPs. All LEAPs of selected municipalities as case studies are currently unavailable. LEAPs of the Municipalities of Obiliq and Hani i Elezit were valid by the end of 2017. LEAP of Mitrovica was valid until the end of 2016, whereas the one of Gjilan only until 2015. Issues to be concerned except the lack of drafting reports on the implementation of these plans is the lack of activities to renew these plans for another period of time. This especially applies for the municipalities of Gjilan and Mitrovica, whose LEAPs were not valid for quite some time. The main reason used by municipalities for not renewing plans, as for the lack of implementing some of the measures foreseen in the plans, is the lack of budget. In this regard, municipalities are expected to support REC since such an organization as mentioned earlier has assisted the municipalities in drafting the initial LEAPs.

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<sup>29</sup> Regional Environmental Center for Central and Eastern Europe, Office in Kosovo

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### 3.3.2 Reporting by Municipalities in Ministry

A problematic issue is the lack of regular reporting by Municipalities to the Ministry. Despite the absence of an approved LEAP, the Municipality of Prishtina reports on a regular basis to MESP on the state of the air quality in general, or an activity carried out in this regard (even if such activities are carried out on an ad-hoc basis). The municipalities of Obiliq, Mitrovica and Hani i Elezit report on ad hoc basis and rarely. Meanwhile, the Municipality of Gjilan stated that it does not report to MESP. The reasons for these shortcomings in reporting are attributed to lack of accountability and will by municipalities, but also the lack of reporting requirements by MESP.

### 3.3.3 Cooperation between the local and central level

Further on, there was also a lack of co-operation between the central and local level in managing air quality. Given that the monitoring stations that we have elaborated above are located in all the municipalities that have been part of this audit, we have found that in general these municipalities have no access to these stations and are not included by HMIK in any way in terms of managing with stations, since management with these stations is centralised.

Municipalities are informed about data on air quality which are generated by the monitoring stations located in their territory, through reports published on the HMIK website. Shortcomings have been identified even in this case. There have been cases when there was no reporting at the HMIK website for the period January-August 2017 on the status of air quality in the Obiliq municipality (no from monitoring station were reported in Obiliq, Dardhishte and Palaj). Regarding this, the environmental officer of this Municipality addressed the HMIK with an email requesting data from Obiliq monitoring stations. The email was sent on 9th of October 2017, but during the audit period (November 2017) we noticed that the Municipality did not receive any reply on this issue. Reflection for publishing monthly reports on Obiliq was made at the moment this issue was addressed by us while auditing HMIK. The reasoning used by HMIK officers on this issue relates to many engagements and the lack of officials to make timely data processing.

The only municipality that has undertaken an initiative to conduct its own air quality monitoring is Prishtina. This municipality with self-initiative and donation received installed six monitoring equipment. Four of them are placed in the interior of the neighborhoods, while the other two are located on the busy streets. The purpose of these monitoring equipment is to present the state of the air quality on the main roads and how they can vary inside the neighborhoods. If we compare these devices with air monitoring stations at national level managed by HMIK, these devices, among other things, from important parameters for our country, measure the PM<sub>2.5</sub> particles, while they do not measure the PM<sub>10</sub> particles. The municipality does not have direct access to the data generated by the six monitoring points. The data on a monthly basis are reported to the Municipality by the contracted company. The Municipality does not verify the reported data, and relies only on those data reported by the Company (the contracted company in this case is responsible for data interpretation, reporting, and maintenance of monitoring points). The shortcoming identified during this audit is the lack of coordination between Prishtina Municipality and HMIK when it comes to data on air quality reported by the monitoring points established by the Municipality itself

as well as two monitoring stations managed by HMIK. The data reported on both sides of the monitoring points often have different results, and as such have caused confusion among the citizens.

Large air pollution sources, such as KEK power plants and Sharrcem factory, are located in the Municipality of Obiliq and Hani i Elezit. In this regard, the Municipalities of Obiliq and Hani i Elezit have shown and demonstrated with different documents that they have repeatedly made requests, warnings and pressures on these air pollutants, but they show that in this respect they have not achieved results since often their requests have been ignored, and the situation has continued to be the same.

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## 4 Conclusions

This audit, based on detailed analysis of all data and information received by the responsible entities, has arrived at a conclusion that air quality management in Kosovo is inefficient as it is characterised by numerous deficiencies. The air quality in Kosovo is not fully supported and empowered by the necessary legal framework, and the monitoring and reporting system is not fully functional. Further on, there are various irregularities at local level in terms of adopting local environmental plans, reporting on the implementation of these plans as well as renewing the plans when they are not valid.

### *Lack of completion and updating of the legal framework as a key prerequisite for improvement of air quality*

Given that the legal framework is a prerequisite for regulating the overall system of responsibilities and actions for air quality, it can be concluded that Kosovo is facing numerous deficiencies and particularly with delays in completing and updating this framework. The law on Air Protection from Pollution, as a key document is very old and does not correspond to the current situation of the air quality in Kosovo, while its reviewed version has not yet been finalized due to the requirement to prepare the financial impact assessment and did not undergo the approval. The lack of an action plan has affected the air quality strategy to be difficult to implement. Emergency plans for addressing the alarming air pollution especially during the winter; despite being compiled do not have reports of the implementation of their measures to reach a conclusion on how effective they were in achieving their goals. The existence of the deficient legal preconditions, incomplete and not fully updated according to the existing condition of air quality, does not serve as a guide, which would facilitate the work of the institutions to undertake concrete measures in the direction to improve the air quality.

### *Ineffective system of air quality monitoring and reporting*

Monitoring and reporting of air quality is also characterized by numerous deficiencies. Air quality monitoring stations are located in the vast majority of the country, and currently the air quality monitoring network managed by HMIK counts 12 stations. The stations are generally located at sites where they are influenced by various sources of air pollution. When determining the locations HMIK has encountered some problems, since initially, in some cases, it had to dislocate them due to requests from the municipality and school, the fact that in some cases is placed on private property, etc. One of the stations is still not dislocated and as a result is out of function.

One of the main deficiencies of the monitoring stations is the fact that a considerable part of them, for a short period of time, both during 2016 and 2017, have been ineffective and as such have not reported data on air quality for months. The main reason for the failure of the stations is the lack of maintenance and continuous servicing of the stations. A significant part of the monitoring stations do not have the necessary security, and as a result of the lack of ongoing oversight they have been part of damages that were caused in most cases by the human factor.

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Air Quality Measurement Techniques are standardized since all stations are equipped with the same number and type of key parameters that make determination of air pollution with NO<sub>2</sub>, CO, SO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. Despite this, data collection in stations is done manually, with the exception of three stations located in Obiliq for which data is obtained from the local software that receives the data from them. In the absence of a central system that would collect and process data automatically, as well as generate reports, data is currently processed by one of HMIK officers. This way of data processing takes a lot of time and as such, causes major delays in reporting air quality data.

Significant deficiency is also incorrect and incomplete reporting of air quality data. As during 2016 as well as during 2017, there are many stations that have not generated data for various parameters for months. Even more problematic is the fact that even during 2017 there are still monitoring stations that are located in areas that are characterized with high air pollution and which have lacked data for some of the parameters for more than 6 months during the year. Further, the most problematic air pollution parameters in our country, PM<sub>10</sub> and PM<sub>2.5</sub>, have not been reported for months. During 2016 these two parameters were not reported on average 6.6 months, while during 2017 the same parameters were not reported on average 4.2 months during the year, which are not few especially if they are winter months, when these parameters reach maximum values.

Reports are mainly on a monthly basis, as well as lack of real-time data reporting on air quality. After a very long time, starting from the middle of October 2017, the HMIK reported daily on only two stations located in Pristina, while for the three stations located in Obiliq started with daily reports from January 12, 2018.

The condition of air quality is also worrying if the recorded exceedances of PM<sub>10</sub> values are taken into account. Given that the maximum number of permissible exceedances within the PM<sub>10</sub> value year is 35, this audit found that during 2016 there were stations that exceeded this parameter for about 93 days as well as during 2017 up to 68 days. Meanwhile, since the maximum values of PM<sub>10</sub> of the daily average were analyzed, there were days when PM<sub>10</sub> values reached around 91 (2016) and 326 (2017), compared to the maximum value allowed of 50. On the other hand, the maximum values of PM<sub>2.5</sub> over an hour have reached extremely high levels and this is still more alarming regarding the human health. While the allowed limited value of PM<sub>2.5</sub> is 40 µg/m<sup>3</sup>, during 2016 the highest value recorded was 345.9, while during 2017 PM<sub>2.5</sub> reached 412.

Both PM<sub>10</sub> and PM<sub>2.5</sub> particles are very dangerous to human health, as particles are with very small diameter and as such can travel deeper into our lungs and cause harmful effects on our health. The possible effects that can be caused by these particles are: the increase in the number of patients with bronchial asthma, chronic bronchitis, chronic lung disease at deferred ages, increased number of cardiovascular and respiratory diseases, cancer, shortening of life and growth of the mortality rate.

With this system of monitoring and reporting, citizens are not given a realistic picture of the situation of the air quality in the country, especially not in real time, and such system poses the risk of being ineffective and, without data particularly in those cases when air pollution in the country is too heavy and citizens can be not aware at the right time to take the necessary measures to avoid exposure to such air pollution. Further on, such irregularities in the system of monitoring and



reporting of data make it difficult for decision-makers to identify concrete measures to be taken to improve the situation of the air quality.

### *Inappropriate Air Quality Management at the local level*

Air quality management from the local level is inadequate for many reasons. The responsibilities for drafting the LEAP have been taken into account in the majority of the municipalities that were part of the audit, but the same can not be said for the compilation of implementation reports of the measures foreseen in the LEAP. The lack of reporting of the implementation of the measures prevents any interested party to know exactly what measures were taken, whether the measures have been taken as planned, the level of implementation of the measures, the effect they have achieved, etc. another gap is also noted in communication and co-operation between the local and central level. In this aspect, negligence has been present on both sides. The MESP efforts to obtain information from municipalities were insufficient and reporting requirements were rare, but municipalities were not able to report voluntarily or as required but, reported on an ad-hoc and only when requested by the Ministry or any other party of interest.

Another deficiency is the conclusion of the validity of the LEAPs in all municipalities. Related to this, very few attempts were made by the municipalities to renew LEAP for the next five years.

Poor cooperation between central and local level is also noted in terms of air quality monitoring which is centralized. The local level except that it does not have access to this process, is not involved in any way and often it takes long to report the data generated by the station/s located in the territory of the municipality. Directly included in the monitoring of air quality is only Pristina Municipality which, besides receiving data from HMIK stations, it has on its own initiative installed 6 monitoring devices that measure air quality in the 6 main neighborhoods of the municipality. Unfortunately, these devices measure only the problematic parameter PM<sub>2.5</sub> in our country and not the PM<sub>10</sub>. Pristina Municipality and HMIK have no coordination related to air quality data reported by the monitoring points established by the municipality itself as well as two monitoring stations managed by HMIK. The lack of coordination has often resulted in different data presentations, and this has caused confusion among the citizens.

Often remarks made by municipalities to large air pollutants such as power plants of energy production or cement factories to us, were ignored and as a result of this ignorance the situation has continued to be the same.

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## 5 Recommendations

The recommendations given below are intended to ensure that the responsible entities, respectively MESP, KEPA, HMIK and municipalities are implementing effective management practices of the air quality situation in the country.

*We recommend MESP, KEPA and HMIK, to:*

- Finalise as soon as possible the financial impact assessment of the Law on Air Protection from Pollution and to approve the new version of this Law;
- Complete secondary legislation, giving priority to the approval of the revised version of AI on air emission rules and rates from stationary sources of pollution;
- Functionalise the Air Quality Strategy through the approval of AQAP 2018-2020 within a short period of time;
- Draft reports on the implementation of foreseen measures in the emergency plans 2016/2017 and 2017/2018;
- Monitor and inspect continuously the activity of economic operators which are considered as large air pollutants. To not be based only in the reports generated from them, but to conduct frequent inspection visits to verify their reportings on air pollution caused by their activity;
- Fully functionalize the air quality monitoring network by servicing all stations, dislocating those stations that are not yet dislocated at adequate locations, continuous maintenance throughout the year as well as improving the safety of stations to avoid potential damages;
- Establish a centralized collection and processing system of data generated from the monitoring stations, as well as a system that is able to automatically generate summary reports for each of the monitoring stations;
- Provide in real time measurement and reporting of air quality for each of monitoring stations as well as for all parameters that contain these stations;
- Monitor continuously, in particular the overrun of the limit values of the parameters that pollute air (especially PM<sub>10</sub> and PM<sub>2,5</sub>), and to take adequate and immediate measures to improve the situation;
- Intensify co-operation with the local level in terms of their monitoring, reporting and informing about the situation of the air quality, which is generated from the centralized air quality monitoring network.

*We recommend Municipalities to:*

- Approve the LEAPs as soon as possible (in this case the Municipality of Pristina), and for the rest of the municipalities that have passed the validity of the LEAPs, to renew them as soon as possible for another five-year period.
- Compile reports on the implementation of the measures foreseen in the LEAP, especially those measures intended at addressing air pollution. Reports to include the number and type of measures implemented, the degree of their implementation, the costs involved for their implementation, and the expected effect in the improvement of air quality.
- Report on quarterly basis, not only for the implementation of the measures foreseen in the LEAP, but for each activity performed by the municipality that directly or indirectly affects the improvement of air quality. Further on, to signal the central level continuously about the problems that can be caused to the municipality by air pollution from the activity of large air pollutants.

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## Annex 1

### **Pollutant monitoring parameters and effects on health and environment**

**SO<sub>2</sub> (Sulphur Dioxide)** – is a toxic gas with acidic features, colorless and strong smell. The main sources from where this gas is produced are energy capacities and heaters, transport, which use low-grade oil and coal which contain sulphur.

**Impacts on health and environment.** Effects on the reduction in lung volume, increased respiratory resistance, and symptoms such as breathing difficulties, chest tightness, and reduction of breathing rhythm. It can cause headache and irritation of nose. Sulphur dioxide is one of the major causes of so-called acid rains, which accelerates the corrosion of construction objects and acidification of soil, lakes and streams of rivers.

**NO<sub>2</sub> (Nitrogen Dioxide)** – NO<sub>2</sub> represents around 80% of NO<sub>x</sub>). NO<sub>2</sub> is a toxic gas, which mainly comes from burning in cars, heaters and power plants.

**Impacts on health and environment.** Nitrogen oxides have significant effects on the lung but also on other organs such as the liver and spleen. In blood has the ability to create hemoglobin defects, which does not allow oxygen transport. Nitrogen gases in the air can be converted into acid rains. Further on, NO and NO<sub>2</sub> are contributing to the ozone layer dilution.

**CO (Carbon Monoxide)** – is very poisonous and combustible gas. It is mainly a product of incomplete combustion of fuels. Tobacco consumption in residential facilities, office, car and restaurants increases the concentration of carbon monoxide.

**Impacts on health and environment.** Prolonged stay in environment where CO is present may reduce the amount of oxygen for breathing to the extent the person loses consciousness due to lack of oxygen (asphyxia). Carbon monoxide contributes to the effect on Greenhouse Gasses and global warming.

**O<sub>3</sub> (Ozone)**- is a substance with high toxicity and with corrosive features, that are known as common pollutants. Ozone is formed in the atmosphere by the reaction between nitrogen oxides, hydrocarbons and sunlight. Many of the electrical appliances such as televisions, photocopiers and electric motors (using brushes), produce such quantities of ozone that people can easily smell like a scent.

**Impacts on health and environment.** Acute effects include symptoms in the respiratory system, changes in the functioning of the lung system, increase of respiratory sensitivity and respiratory inflammation. Ozone damages vegetation and forests (the effect of photo oxidation), disruption of the appearance of cities, national parks and recreative areas.

**PM<sub>10</sub>/PM<sub>2.5</sub> (dust particles)** – this two types of particles are not individual compositions, but the concentration of suspended mass in the air having a diameter less than 10 µm (PM<sub>10</sub>) or a diameter smaller than 2.5 µm (PM<sub>2.5</sub>). Especially in high-traffic locations where these parameters exceed allowed thresholds or VML, for the public and population are of particular importance.

**Impacts on health and environment.** A large number of studies show short-term impacts in cardiovascular system, which are related with PM, whereas direct impacts on a number of heart attacks are argued that are caused by PM presence in the air. Long-term effects are considered PM dust particles, which have toxicological features that attack the respiratory system and reduce immunity due to PM penetration deep in the lungs and in the bronchial parts especially PM<sub>2.5</sub>.

#### Air quality standards according to Administrative Instruction no.02/2011

Parameter	Limit Values	Metering unit	Limit Value(boundary) $\mu\text{g}/\text{m}^3$	Permissible exceedings per day within the year
NO <sub>2</sub>	Limit value for 1 hour, for the protection of human health	$\mu\text{g}/\text{m}^3$	200	18
	Annual limit value, for the protection of human health	$\mu\text{g}/\text{m}^3$	40	Not foreseen
	Annual limit value, for the protection of vegetation	$\mu\text{g}/\text{m}^3$	30	Not foreseen
SO <sub>2</sub>	Limit value for 1 hour, for the protection of human health	$\mu\text{g}/\text{m}^3$	350	24
	Limit value for 24 hours, for the protection of human health	$\mu\text{g}/\text{m}^3$	125	3
CO	The limit value for daily average of 8-hour maximum, for the protection of human health	$\text{mg}/\text{m}^3$	10	Not foreseen
PM <sub>10</sub>	Limit value for 24 hours, for the protection of human health	$\mu\text{g}/\text{m}^3$	50	35
	Annual limit value, for the protection of human health	$\mu\text{g}/\text{m}^3$	40	Not foreseen
PM <sub>2.5</sub>	The calendar year	$\mu\text{g}/\text{m}^3$	25	Not foreseen
O <sub>3</sub>	Long-term objective, for the protection of human health	$\mu\text{g}/\text{m}^3$	120	Not foreseen
	The information threshold	$\mu\text{g}/\text{m}^3$	180	Not foreseen
	The alarm threshold	$\mu\text{g}/\text{m}^3$	240	Not foreseen