Republika e Kosovës
Republika Kosova-Republic of Kosovo
Qeveria –Vlada-Government

Ministria e Mjedisit dhe Planifikimit Hapësinor
Ministarstvo Sredine i Prostornong Planiranja
Ministry of Environment And Spatial Planning

Strategy on Air Quality

2013

Republika e Kosovës
Republika Kosova-Republic of Kosovo
Qeveria –Vlada-Government

Ministria e Mjedisit dhe Planifikimit Hapësinor
Ministarstvo Sredine i Prostornog Planiranja
Ministry of Environment and Spatial Planning

Departamenti i Mjedisit / Department of Environment / Departament za sredinu

Strategy on Air Quality 2013-2022

Acknowledgement

The Ministry of Environment and Spatial Planning for the commitment given on the preparation of this document thanks the following:

- Working Group of the Strategy on Air Quality of MESP
- European Commission – Expert, dipl.ing of meteorology Martin Lutz
- Collaborators from;

– Ministry of Local Government Administration

– Ministry of Energy and Mining

– Ministry of Transport and Post Telecommunication

– Ministry of Agriculture, Forestry and Rural Development

– Ministry of Health

– Municipal Assembly of Prishtina

– Municipal Assembly of Mitrovica

– Municipal Assembly of Drenas

– Municipal Assembly of Elez Hanit

– University of Prishtina

- Kosovo Energy Corporation
- Trepça
- Feronikel
- Sharrcem
- Termokos

- All the participants in consultative meetings and debates
- All those who responded to the invitation and assisted on the drafting of this document.

Abbreviations	
AI	Administrative Instruction
COMEAP	Committee of the Medical Effects of Air Pollutants
ECT	Energy Community Treaty
EU	European Union
EC	European Commission
ELV	Emission Limit Values
EEA	Environmental European Agency
EE	Energy efficiency
FGD (DPF)	Diesel particle filters
HMIK	Hydro-Meteorological Institute of Kosovo
INKOS	National Institute of Kosovo
IPPC	Integrated Pollution Prevention and Controll
KEK	Kosovo Energy Corporation
KESSD	Kosovo Environment Strategy and Sustainable Development
VOC	-Volatile Organic Compounds
MESP	Ministry of Environment and Spatial Planning
MEF	Ministry of Finances
MED	Ministry of Economioc Development
NIPHK	National Institute of Public Health of Kosovo
PPA	Power Plant Kosova A
PPB	Power Plant Kosova B
RES	Renewable Energy Sources
WHO	World Health Organization

Vision

The achieving and maintaining of air quality that will increase the welfare of the population, protect human health and the environment

Mission

- Setting clear objectives
- Use of appropriate means, including new approaches
- The transmission of scientific research and use of information effectively
- Capacity building among government partners for effective implementation
- Building a good and wider partnership

CONTENT

Executive summary

The policies determined in Strategy on Air Quality, aim to develop and implement specific instruments to increase the quality of life, by providing the base to improve the air quality. To provide a framework with which will be achieved the protection and reduction of air

pollution in the Republic of Kosovo, in accordance with EU standards and principles of best practices.

Air quality in the Republic of Kosovo shows significant gaps in comparison with EU standards. By the view of the quality and quantity of investments in the rehabilitation and development of infrastructure for the protection of air quality, it can be said that it is still at a low level. Air pollution in urban areas and especially in industrial areas is estimated to be high. Currently, the major contributors to air pollution are thermo power plants, large combustion plants (metallurgy, mining, cement production), transport sector, small combustion plants, agricultural activities and waste.

The transition of market economy and the globalization processes have caused a lack of investment, modernization and maintenance of the industrial sector in Kosovo (those that are working), resulting in the reduction of efficiency of equipments and therefore we have increase of emissions in air.

Monitoring of all indicators defined by the Law on Air Protection from Pollution, is not yet complete and consequently the data are incomplete and consistent. This is a big problem to define the current level of air pollution, which among other things causes negative impacts on health and the environment and it can have a huge impact in the future, in making decisions, to improve air quality.

To identify the state policies which go toward the profitability, the protection of health, environment-air quality and sustainable development, the decision was taken for drafting of the Strategy on Air Quality, for the Republic of Kosovo.This document derives as an obligation by the Law on Air Protection from Pollution.

The basis for the drafting of this document have been taken the existing strategic documents, "the Kosovo Environmental Strategy and Sustainable Development", "Kosovo Environmental Action Plan" and all other relevant strategic documents, which contributed to clearly determine the specific objectives, measures and projects. This strategy is also based on thorough evaluation of all the achievements and remaining gaps in all relevant sectors.

The policy orientations of this document are planned for the next ten years (2013 - 2022), they are:

- Implementation of air legislation,
- Reducing emissions from individual sources
- Reducing emissions from mobile sources
- Reduce Greenhouse Gas Emissions
- Reduce Emissions from Public Activities

Identified targets will be specific, measurable and realistically achievable within the period 2013-2022.

To achieve the goals and objectives set by measures resulting from this strategy are identified actions, the implementation of which will be provided:

- Protection of the environment and human health
- Demonstrating the commitment of the Government, industry and individuals in protecting of air quality
- Provide strategic framework for initiating a clean air, in the future, in collaboration with local and international partners, scientific institutions and civil society
- Continuous effort to improve opportunities, taking into account economic performance and efficiency.
- Identification of areas and issues with special focus
- Promotion of energy efficiency through care in the design, use and reuse of materials.

The Strategy, includes: the principles and criteria for determination of goals and priorities, assessment of the state of air quality, objectives and measures to protect and improve air quality, by including priority measures, activities and dynamics of the implementation of these measures. As measures and existing instruments are, the existing legislation for air protection and horizontal legislation, which provide a number of measures and instruments with the aim of protecting and improving the air quality.

1.0.Introduction

Kosovo is strongly committed in achieving the conditions for the negotiation process for accession and full membership in EU, where the main challenge is the harmonization with the *acqui communautaire*, and its implementation in the field of environment protection. The harmonization with the *acqui communautaire* in the field of environment protection requires systematic institutional and organizational changes, and investments in the best available

techniques, in order to meet the objectives set out in relation with the reduction and prevention of harmful effects in all the components of the environment.

Drafting the Strategy on Air Quality is based on the Kosovo Government Program, a number of decisions, and a variety of relevant studies, analysis and sectoral strategies. Particular attention is given to the full compliance of this document with the European Union acquis which are legally binding to Kosovo in the framework of its membership in EU acquis which are legally binding to Kosovo in the framework of its membership in the EU.

Since most heavy industries, which have worked in the past, are not in function, nevertheless the air quality is not satisfactory. Today the main causes of the low quality of air emissions are from road traffic, when considering the number of vehicles, where a large percentage of them are old, energy capacities, other industries, district and residential households, where we know that most of the population uses coal and wood for heating and pollution from industrial activity which is carried by the wind itself. Basic an comprehensive analysis, it is clear that air pollution is caused primarily by nitrogen oxides, sulfur oxides and particulates, which are the main causes of the disease are also fact becomes even level of a low awareness on harmonization of economic development and environmental protection. Based on the fact that Kosovo aims at a higher economic development that could oppose air quality even more.

Although KESSD (2005-2015) is being implemented, and from this document are implemented and are being implemented several environmental projects in the sectors of energy, industry and mining, air quality in urban and industrial areas still remains a problem. An obvious progress is marked by the adoption of the Law on Air Protection from Pollution and sub legal acts and increas of human capacity building in central and local level. However, shortcomings are still evident in the level of implementation of the legislation.

The main challenge to reduce emissions of air emissions are financial constraints of public and private companies, to invest in their technologies for reducing of emissions. It also felt a lack of coordination and harmonization of plans and programs between subjects and the competent authorities in the implementation of the legislation.

As major contributors to air pollution are different sectors, which are monitored by the ministries and municipalities, then this strategy will specifically address the necessary measures that will be implemented by those authorities.

This document constitutes the basic framework for the reduction e prevention of air pollution, under which, after approval by the Government and by the Kosovo Assembly, will be prepared the Action Plan for Air Quality and will be implemented steps to harmonize legislation with EU provisions, implementation of legislation and standards, through determined policies, in coordination with other strategies and action plans.

1.1. Methodology

The Ministry of Environment and Spatial Planning, as the body of the Government of the Republic of Kosovo is responsible for drafting the Strategy and Action Plan on Air Quality, by providing that all other bodies and the wider community are aware for the importance of their contribution for achieving a good quality of air.

EC supported us for preparing this document through the instrument of TAIX - technical assistance with expert Mr. Martin Lutz.

The Strategy for the period 2011 - 2021, was prepared by a working group of experts, organized within MESP and participants from relevant institutions of Kosovo, University, industry and other interested organizations, they are: Ministry of Local Government Administratio, Ministry of Energy and Mining,
Ministry of Infrastructure, Ministry of Agriculture, Forestry and Rural Development, Ministry of Health, Municipal Assembly of Prishtina, Mitrovica, Drenas, Elez Han, University of Prishtina, Kosovo Energy Corporation, Trepça, Feronikel, Sharrcem, Termokos,etc.

To monitor the development of this process, the MESP has established the Steering Committee by the hierarchy structures, for which it is periodically reported, about the ongoing activities of the working group.

Since the air pollution is caused by different sources, sectorial working groups (WG) have been established which worked on analysis and evaluation of air pollution from different sources. In this case, four sectoral working groups have been established:

W.G. for the sector of small combustion- household
W.G. for the energy sector
W.G. for the industry sector
W.G. for the transport sector

1. 1.1. Consultations

The drafting of this document is followed up by the Steering Committee, the Government and interested organizations.

Four workshops were held and many meetings of Working Groups, composed by the members of the Ministry and different institutions of Kosovo as from the level of Government, Municipal, university and industry.

The consultation process is initiated by making the publishing of the draft document on the website of the Ministry and its distribution in institutions, whose representatives are part of drafting the document, including here also the organizing of public debate.
The document was completed, after reviewing the comments provided by interested party.

1.2. The role and responsibilities on the management of air quality

With the provisions of the Law on Environment Protection, Law on Air Protection from Pollution and other relevant laws, the Ministry is responsible for the management of air quality in the entire territory of Kosovo.

Specific bodies of the Ministry, perform specific tasks defined in the Law on Environmental Protection, Law on Air Protection from Pollution and other legal acts.

The measures defined in the Strategy represent an obligation for all the sectors of communities and they are responsible to carry out the actions, for achieving air quality objectives.

Air Quality Management includes: monitoring, collecting, analyzing of information and data, to carry out the process of review and assessment of air quality.

Pollution control actively contributes to reducing pollution from different sources, through the combination of law implementation, education and technical strengthening.

Control of emissions from stationary and mobile sources: Ministry with its structures is responsible for implementing the legislation, to perform air quality measurements and data processing and also control of emissions from pollution sources.

Planning of policies and development control: contributes significantly on improving air quality in the strategic and operational level, through the integration of instructions (guidelines) for planning at central and local level policies. The way of planning and arrangements, plays an important role on improving air quality, for example, through the providing of measures undertaken by the operators and the achievement of changes in the way of organizing the transport.

Energy efficiency: improving the quality of national appliances, business and administration buildings and settlements will contribute to increasing energy efficiency and improving air quality.

1.3. Institutional and Legal Framework

1.3.1. Institutional Framework

The current institutional system was developed by the end of 2002. In principle, it consists of a system of institutional distributed management,

The environmental management institutions implement the applicable legislation in Kosovo and EU standards.

The environmental management system includes:

Assembly of the Republic of Kosovo - The Assembly is the legislative body directly elected by the people. There are two important functions related to the environment namely:
the Committee for Agriculture, Forestry, Rural Development, Environment and Spatial Planning and Advisory Board on Environment.

Government of Kosovo - The Government exercises executive power in accordance with the Constitution and the law. It proposes draft laws and amendments to existing laws and Acts, and may give its opinion on draft laws that are proposed by other bodies.

Ministry of Environment and Spatial Planning – The Ministry's mandate is defined by Regulation No. 02/2011 for administrative responsibilities of the Office of the Prime Minister and other Ministries. It has the following responsibilities regarding environmental protection:

- Compiles and follows up the implementation of policies and programmes identifying and reducing environmental pollution;
- Participates in the development of strategic documents;
- Co-ordinates activities to promote policies;
- Sets environmental norms and standards and issues instructions meeting international standards;
- Oversees the implementation of these standards including inspection and other services as necessary;
- Manages the use and development of environmental infrastructure;
- Promotes community participation, initiatives and development activities;
- Develops policies, implements laws and supervises environmental protection activities, including water resources, air, soil and bio-diversity;
- Encourages and participates in developing and implementing public information campaigns and other promotional activities to raise public awareness and compliance with environmental protection standards;
- Supervises and assesses the state of the environment, particularly the impact of industrial activity, of public services and of economic activity;
- Develops policies for managing water resources and supervises their implementation.

Within the MESP:

Department of Environmental Protection (DEP) is one of the first departments created under the provisional institutions. The Activities of the Department of Environment Protection are carried out through four divisions: Division of Environmental Policy, Division of Environment Protection, Division for Nature Protection and Division for Waste Management and cemicals.

- DEP develops environmental policies and relevant legislation, instruments for implementing these policies.

Kosovo Environmental Protection Agency – provides the required information for the

administration, the Government and the Assembly of Kosovo for the implementation of environmental protection policies. Develops and coordinates the unique system of information on environmental protection related to the tracking system of environmental situation in Kosovo and collect environmental data;

Hydrometeorology Institute - Builds and maintains basic network of hydrological and meteorological stations. Measurements and observations made elements and phenomena, hydrological, meteorological, bio and hydro-biological, measurements and observations of atmospheric electricity and air pollution, water falls. Systematically monitor and assess the state of air quality, atmospheric precipitation, surface water and groundwater and soil, as well as the study and forecasting of meteorological conditions.

Municipalities - The Municipalities adopt Local Environmental Action Plans (LEAPs) and programmes for environmental protection in line with the KES and NEAP and according to their own specific interests. In designing LEAPs and programmes, the public, NGOs, professional organisations and business community are actively encouraged to participate. The Municipalities report to the Ministry about the implementation of these plans and programmes. To reduce the negative impacts upon the environment and in some cases to reduce costs, two or more Municipalities can jointly develop and adopt their plans and programmes.

1.3.2. Legal Framework

The legal framework for air is in the final stage. It is adopted the Law on Air Protection from Pollution, Administrative Instruction (AI) for the Norms of Emission from Stationary Sources, Administrative Instruction on the control of volatile organic compounds emissions during the storage, filling, discharging, packaging and transfer of fuels, and Administrative Instruction on Criteria for defining of air quality monitoring points, number and frequency of measurements, classification of pollutants which are monitored, the methodology of work, form and timing of data reporting, AI on norms of air quality, AI of Norms of air emissions from mobile sources of pollution. Until the end of 2013 it is planned the completion of legislation on air.

Law on Air Protection from Pollution categorizes the major sources of pollution, establishes the indicators and fundamental obligation for air protection and recommends the adoption of emission limit values (ELV) and norms of air quality, in conformity with EU and WHO standards. As part of the overall program for environment protection, this law initiates also the preparation of the Strategy and Action Plan on Air Quality, and then will be developed the local programs for air protection within their Municipal Development Plans.

1.4. Principles and criteria for determination of priorities and objectives

To determine the objectives of protecting and improving the air quality in the Republic of Kosovo, general and basically principles have been taken into account for protecting the environment and its components, which are determined in the Law on Environment Protection (Official Gazette No. 03/L-025):

1. The principle of sustainable development-is a development that meets the current and future needs, without touching the opportunities and capabilities that the future generations meet their needs.
2. The principle of integration of environmental protection - public authorities shall cooperate and coordinate the work among themselves for the development and adoption of any measure, standard or activity aimed for environment protection.
3. The principles of gradual harmonization with EU standards – environment protection will be based on the gradual introduction of EU standards in order to obligatory create an healthy environment for human health, on the principles of exercising an appropriate practice, adopted within the scientific community, to improve the environment.
4. Principle of vigilance and prevention –until the point of reasonable action, considering the expected environmental costs and benefits. An activity will be planned and implemented as to prevent or stop the harmful effects on the environment, without endangering the human health.
5. The principle of prevention is implemented through the Environmental Strategic Assessment, Environmental Impact Assessment and implementation of the Integrated Prevention and Pollution Control.
6. The lack of fully scientific knowledge might not be the reason for not undertaking preventive measures to prevent, prohibiting, endangering and degrading the environment, on potential or existing cases that have potential impact on the environment.
7. The principle "polluter pays" - the polluter pays compensation for environment pollution if during its activity effects loadings in environment with the production, use or putting into circulation the raw materials, semi-production or production which contains harmful substances for the environment.
8. The principle "user pays" – the user of natural resources is obliged to pay a real price for their use and re-cultivate the space, after the completion of using activities.
9. The principle of encouraging measures-the Government will promote the practices and activities with the aim of preventing and reducing pollution through the measures of encouraging and stimulating the legal and natural persons who choose the best available techniques and clean production.
10. The principle of rights protection to the court- any natural or legal person and the public in case of material damage or is in front of a risk to incur material damage that has to do with a specific activity or source of pollution that violates the provisions of this law, specific laws or sub legal acts issued under the law, has the right to proceed a plaint or request by the competent court or public authority, to protect its own rights.
11. The principle of public access to information- Any natural or legal person has right to

access the information about the environment state and to participate in decision making process.

12. The principle of the high level of protection.
13. The principle of compatibility with EU law.
14. The principle of preliminary measures.
15. The principle of covering costs.

1.5. Priorities

Priority for improving and protection of the air for the next ten years are;

- Transposition of EU directives in Kosovo legislation and its implementation
- Provide a framework for the protection of air quality, in cooperation with all communities
- Promoting the importance of air quality as a determinant of population health and welfar

2. 0. Air Pollution

When the air contains substances in quantities that could harm human health, animals and plants or may cause material damages they are called pollutants and may be in gas or solid state in the form of particles which can be distributed in nature.

Studies have shown that the pollution of atmospheric air has negative effects on human health, ecosystems and other structures. Some pollutants, present in small amounts can not have an impact, but they can be accumulated in a region and together cause health effects. These are generally called regional air pollutants, where as the higher concern are: volatile organic compounds (COA / VOCs) (e.g. gasoline or solvent smoke and a large amount of carbon and other gases, mainly with a clearly smell), oxides of nitrogen (often referred to as NOx), dust-particles (dust, especially very small particles that we breathe PM_{10}, $PM_{2,5}$, PM_1), carbon monoxide (CO - mainly from motor vehicles) and sulphur compounds in general.

Although air pollution traditionally is attributable to human activities, it also may come from the nature, sources such as dust storms, from active volcanoes, fires caused by lightning, etc. and biological activities. It is also interesting to be noted that the pollution in homes from cigarette smoke, dust, heat and cooking, can often be at higher concentrations than it is outside.

Pollutants emitted directly from sources such as the power plants, industries, motor vehicles and domestic activities, are known as primary pollutants. While substances formed when pollutants are already in the air and create chemical reactions, are known as secondary pollutants.

2.1. Effects of air pollution

It is known that air pollution can have a negative impact on the environment, health and

commodity. But it is difficult to be determined the level of effects. About the effects of air pollution, have been done a series of studies that show damages not only to health but also to the environment.

3.0. The state of air quality in Kosovo

The Republic of Kosovo is located on the Balkan Peninsula with an area of 10,887 km ². Its natural conditions are quite favourable. They make Kosovo a crossroads between the Adriatic, the Area of Pannonia and the Aegean Sea. According to many estimates that have been made it is calculated that the Republic of Kosovo has approximately 2.000.000 million people and with an average of density 192 inhabitants per km ², which represents the space with the largest density in the Balkans but also in Europe.

Kosovo is located in the southern part of the geographic middle belt of northern semi-sphere and is subject to influences the Continental-Mediterranean and the Continental-Europeans climate effects. The main climatic macro-factors that affects to the climate in Kosovo are: its position into land masses (Eurasia and Africa) water masses (Atlantic Ocean and Mediterranean Sea) air masses (tropical and arctice-maritine or continental), position of baric systems (maximum of the Azores and the minimum of Iceland). The main local factors that affect on the climate of Kosovo are: relief, water, land and vegetation

The main factors affecting the quality of ambient air are the level of emission of pollutants, climate and topography. Their interaction is very complexive.

Currently the biggest contributors to air pollution in Kosovo are the stationary and mobile sources, sources in urban areas, major areas of energy production and industrial areas. These are facilities for power generation, industrial facilities (metallurgy, mining, cement factories, etc.), transport sector, agricultural activities and locations where the waste are disposed of.

In energy production facilities mainly are used fossil fuels like coal and oil with high sulphur content. The transport sector is characterized by a large number of old cars and use of low quality fuel (in most cases). In addition, the industrial sector in most cases use old equipments.. The agricultural sector mainly contributes to air pollution by burning of the biomass. Areas where the waste are disposed of and uncontrolled burns of them represent a serious source of air pollution. Generally the low level of awareness of entrepreneurs, consumers and the general public also affects to the current situation

3.1. Where the pollution comes from

Sources of emissions of pollutants in air come from all activities of industrial and commercial categories, motor vehicles and also sources from biologic vegetation emissions.

In Kosovo, air quality is affected in developed urban areas, particularly in industrial areas. The biggest impact on the environment is caused by power plants of KEK (PPA and PPB), by

industries (metallurgy, mining, cement factories, etc..) and other small sources.Aalso pollution comes from individual heating facilities. Mitrovica with the consequences of industrial waste left over from the Trepca complex also is accounted as a major source of pollution.

In most cases the pollution is presented in the form of emissions of sulphur dioxide (SO_2), nitrogen oxides (NOx), ozone (O_3), lead (Pb) and other heavy metals, carbon monoxide (CO), dust, smoke, particles PM_{10}, $PM_{2,5}$, PM_1, volatile organic compounds (KOA / VOCs), dioxins, etc..

Sources of air pollution in Kosovo are based on data collected on emissions from specific sources. Due to the lack of reliable data, there have not been included all emissions data. However it is acceptable that these sources significantly contribute to the pollution level.

Potential sources of air pollution are considered:

- Power Plants (Kosovo A and B)
- Lignite mining
- Industrial Complex in Mitrovica
- Ferronikel in Glogovac
- Cement factory in Hani-Elezit -Sharcem
- Central heating systems (Pristina, Gjakova and Mitrovica)
- Basic heavy industry (currently not functioning) in Gjakova, Peja and Gjilan
- Production of asphalt base
- Transport, etc.

4.0. Assessment of air quality based on monitoring data

The approximate assessment of air quality in Kosovo was made based on a variety of data available, taking as a point of comparison the EU standards on air quality, of the Directive 2008/50/EC.

The analysis of these data shows the inconsistency with the determined standards of EU, which orients us to take actions to control and monitor the emissions from pollutants.

4.1. Air quality monitoring system

Based on Law for Environmantal Protection Nr.03/L-025, Law on Air Protection from Pollution, Nr.03/L-160 and Law on Hidrometorological Activities, Nr.02/L-79, MESP, respectively IHMK is obliged to conduc air quality monitoring in entire Kosovo territory.

By the end of 2009, the first automatic air quality monitoring station has begun to operate in Pristina, placed at the KHMI yard.

The number of the station for the air quality monitoring is determined based on preliminary study **for determination of monitoring points, based on criteria of Directive** 2008/50/EC (with assistance of EU expert).

In the above mentioned study, the zoning was made as well. Kosovo will have one agglomeration (Pristina), and the rest of the country will form one zone.

The number of stations is determined on the basis of criteria defined by the AI on criteria for determination of monitoring points, the number and frequency of measurements, methodology, form and timing of data reporting, Nr.15/2010. Based on this AI, the Kosovo air quality monitoring network will have 9 automatic monitoring stations, and one mobile monitoring station

The first station for automatic monitoring of air quality is located in the location of Hydro-Meteorological Institute of Kosovo Fig 1, which is equipped with automatic analysers of sulphur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO) ozone (O3), suspended particle analyzer PM10/PM2.5 as well as with the sensors of meteorological parameters.

The station which is placed at the yard of new Government's building, ex Rilindja is a donation of Slovenian government, and is in operation since 2010. This station is equipped with a three-channel optic analyser (Grim Model180), which is configured to measure particulate matters PM10, PM2.5 and PM1, also the meteorological parameters such as: wind direction, wind speed, air temperature, relative humidity, atmospheric pressure.

By the end of 2010 three automatic monitoring stations of air quality are installed: one in Mitrovica, one in Drenas and one in Pristina(fig 2., fig.3 dhe fig.4.)

During 2012 the air quality monitoring is equipped with 5 fixed automatic stations for air quality donated by the EC (IPA-MESP project,). Those stations are equipped with automatic analysers of sulphur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO) ozone (O3), suspended particle analyzer PM10/PM2.5 as well as with the sensors of meteorological parameters such as: wind direction, wind speed, air temperature, relative humidity, atmospheric pressure. These stations will be located in the following cities: Gjilan, Hani i Elezit, Shtërpce-Brezovicë, Prizren and Pejë.

In general the Air quality monitoring in Kosovo have nine automatic fixed stations of air quality, which will be distributed in 8 municipalities (fig.5) and 1 mobile station.

Two of stations placed in Prishtinë, represents the urban air quality (Rilindja) and sub-urban air quality (KHMI), whereas the 6 other stations to be located in municipalities Mitrovicë, Drenas, Pejë, Prizren, Hani i Elezit, Gjilan will represent the urban air quality. The station in Brezovicë will represent air quality in rural areas.

In the end of 2012 with the support of World Bank ,MED financed purchase of three stations for air quality monitoring in the KEK area(fig.6). In the end of December 2012 was agreed

between MED and MESP that those station to be owned by the MESP and managed by the KEPA /KHMI.Those stations are incorporated in air quality monitoring network of Kosovo.

NIPH has two the air quality monitoring stations ,which measure: sulphur dioxide (SO2), nitrogen oxides (NOx) and total suspended particles (TSP). First NIPH station is located in the yard of Ministry of Finances, which measures air pollution from traffic, but this station does not meet the criteria as defined by the directive 2008/50 EC. There are plans to dislocate this station, at a more appropriate location, in order to meet the criteria of above mentioned directive. The second station is located at the NIPH yard, in the southern partof Pristina. Location is just 1.8 air distance from the KHMI station.

In the end of 2012 was made agreement between NIPH and MESP/KEPA that two stations of NIPH to be menaged by KEPA/KHMI and to be part of national air quality monitoring network of Kosovo.

Taking in consideration the assistance of other institutions as well as realised agreements with MESP, the actual air quality monitoring in Kosovo has in total 13 stations, 12 fixed monitoring sations and 1 mobile station which are managed by the MESP/KESP/KHMI

4.2. Preliminary assessment of air quality in Kosovo

There is a lack od the data during the monitoring period 2005/2008 and are not in compliance with the determined criteria concerning methods and technical requirements for technical requirements for sampling and analyzing air pollutants, according to EU Directive 2008/50/EC. Taking into account the deficiency of data, the assessment of air quality will be done with assumptions based on functional relationships between various components and statistical parameters, which are taken from groups of data in other countries, as for instance from Germany, Berlin. It should be considered that the resulting conclusions are subject of high uncertainties until we will have more available data. For the period 2010-2012 the monitoring data of air quality are in compliance with EU Directive 2008/50/EC.

4.2.1. Assessment of pollution by particle matter (PM)

PM are generated by a range of different particles, derived from different types of resources. The concentrations of PM include mainly particles emitted directly into the atmosphere from combustion sources and secondary particles formed by chemical reactions in the air.
PM particles are categorized according to the size of the particles (particulate PM_{10}, PM_2, and PM1 with determined diameter, e.g. 10µm, 2.5 and 1µm

PM derived mainly from two sources, from those made by human hand and from natural sources. In the Republic of Kosovo the largest source of PM pollution caused by human factor are large combustion plants as power plants, Smelter of Ferronikeli Shkritoja e Feronokelit), cement production, transportation, industrial wasteland, etc.

From road transport PM emissions mainly derives from vehicles, tires and other sources of discharged emissions. Other primary sources include quarries (mining activities), construction and other mobile sources (not of transport).

Secondary particles of PM formed from ammonia emissions, sulphur dioxide, nitrogen oxides and organic compounds emissions derived from both sources, those with combustion and vegetation.

4.2.2. Measurements of total suspended particles (GTS)

Measurements of total suspended particles in air are performed only by NIPH. Location in which GTS measurements are made is the yard of MF. This station is representative for air pollution from traffic.

NIPH for this assessment, has offered a set of GTS data, from January until mid of May 2009, for the station of MF. The average concentration of GTS for nearly 5-month period is estimated at about 60µg / m³.

Based on the above data, it can be concluded that the average annual levels of PM_{10} are mainly about 50µg / m³, which exceeds the allowed limit of the EU, for PM_{10}.

4.2.3. Measurements of soot

Soot (black carbon) is part of PM_{10}. Based on measurements made in Europe can be estimated that no more than 20% of PM_{10} consists of soot. So, taking into account the average annual value of 40µg / m³, the value bigger than 10 µg / m³ of soot, implies a possible discrepancy with the limited value of PM_{10}.

KHMI conducted the tests of the soot in his yard, which is considered as a representative station of suburban pollution , also influenced by the highway Pristina-Peja in a distance of about 100 meters from the measuring point. In Fig. 7. Annex I, are presented the soot values for the period 2005-2008.

From 2005-2008, the average values of soot are between 22 and 28µg / m³.

INKOS has conducted similar tests in the surrounding of KEK, close to the power plants in Obiliq. Levels of concentration in the station of INKOS in Obiliq in 2007 and 2008 were between 13 and 16 µg / m³. While in 2010 the average level of soot has been, in Obiliq 8.64 mg / (m2d) Grabovc 3.84 mg / (m2d) Mirash 7.09 mg / (m2d).

Based on the data of hHydro-meteorological Institute of Kosovo and INKOS it can be

estimated that as a consequence the levels of soot suggest that the concentrations of PM_{10} are more above 40µg / m³, on the suburb of Pristina and in Obiliq close to the power plants of KEK.

4.2.4. Measurements of PM10

PM10- Suspended particle with aerodinamic diameter <10µm

Since 2003 the only source of data for PM_{10} in Kosovo, has been the monitoring station operated by the German KFOR, near Prizren. In September of 2009 the PM_{10} measurements have started also in Hydro-meteorological Institute of Kosovo in Pristina

German KFOR in Prizren – The Instrument for PM (ß-attenuation) is functional since the spring of 2003. The results were obtained from annual reports of the 2004 -2006, which represent an annual average of PM_{10} of about 50µg / m³, with more than 100 days exceeded up to the level of 24 hours of 50µg / m³. The limit values of PM_{10} are not exceeded with any huge margin in suburban or rural areas.

From measurements in Europe, it can be assumed that compared to suburban or rural levels, the concentration of pollution in large cities, in urban areas is 30-50% higher and 60-100% higher in "hotspots", for example near the roads with high traffic

KHMI– The instrument for PM10 (nephelometri & beta attenuation) is functional since September 2009. The results are taken from monthly reports for the period September 2009 - April 2010 from which it appears that the average concentration of PM_{10} for this period is 56.6 µg/m3, which can be considered that the year will be more than 100 days exceeded over the level of 24-hour of 50 µg/m3. The maximum value recorded for this period was 164 µg/m3. Fig. 8, Annex I.

From the data collected for PM_{10} during the period 2010-2011 (Tab.1), is seen that the number of days with daily value exceedances, within the year is accounted to 99 days in Prishtina-KHMI during 2010 and 92 days in Prishtina-Rilindja station during 2011. In Drenas station are recorded 41 days with daily exceedance (monitoring period 01.04-31.12.2011).

The majority of days with exceedance of average daily values were during the winter months. Taking into consideration the existing measurements of suspended particles in the air for the period 2004-2006 and soot for the period 2005-2008 can be concluded that even in the outskirts of Pristina and in rural and suburban areas outside the big cities, the limit values for PM_{10} is exceeded. . It is clear that the situation in the city centre, on the streets with heavy traffic is even worse. Thus, the annual average of PM_{10} concentrations in Kosovo could be expected to reach the levels above 60µg / m³.

The diagram presented in Fig 9.shows that in the three monitoring stations, the annual limit

value (40µg/m3). is exceeded during the monitoring period 2010 and 2011. Representative station for traffic pollution in Pristina reaches the highest annual average value, for up to 75.74 µg/m3, which means that there is an excess of 1.9 times, more than the annual limit value (40µg/m3). While the data provided by the mobile station in Drenas, the PM10 pollution has a slight
exceedance (45.35 µg/m3) of the annual limit value 40µg/m3.When comparing the data obtained between representative stations for pollution in urban/suburban areas, the highest concentration of PM10.

As a result of this situation, there is a great need for actions that will reduce the concentration of PM10 to achieve EU standards, especially in urban and industrial locations.

4.2.5. Measurment of $PM_{2.5}$

$PM_{2.5}$ - particulate matter with aerodynamic diameter <2.5µm

The table nr. 2 .represents the annual average values of $PM_{2.5}$ measuredat Prishtina-Rilindja station during 2010 and 2011. This table shows that there is a slight increase of PM2.5 concentration, from 37.34µg/m3 as it was in 2010, to 40.04µg/m3 during 2011, whichmeans that the annual limit value (25µg/m3) is exceeded.

In fig.10. are represented the annual average values of $PM_{2.5}$ measured at Prishtina- in the area of Rilindja building, station during 2010 and 2011. The graph shows that the maximum values were achieved mainly in the winter season. . Another important aspect that emerges from the analysis of the available data is the comparison of annual values $PM_{2.5}$ and PM10 measured at the monitoring station Pristina-Rilindja (Fig.11).
On annual average, the ratio between the $PM_{2.5}$ and PM_{10} in this monitoring station varies from 49.3% in 2010 to 61.62% in 2011.

Referring to the monthly average, the ratio between the values of PM_{10} and $PM_{2.5}$ for 2011, was between 82.3% and 31.6%, with a higher percentage in the winter season, while the lowest percentage in July. In 2010, the number of data has been valid for half a year only, and based on this data, the ratio was between 78.7% and 26.7%. Also, in 2010, the maximum rate is reached in the winter season, while the lowest percentage of report $PM_{2.5}$ /PM_{10} was in June.

The trend of the ratio, percentage between the two fractions in the sampling points that measures the urban / traffic pollution, reflects to be comparable between the two years for the months with available measurements, with a quite stable trend, with no major changes from year to year, (fig.12).

In the study of air pollution, measurement of fractions smaller that $PM_{2.5}$, in the content of PM10 particles is of considerable importance, due to the impact on health.

4.2.6. Assessment of pollution with sulphur dioxide (SO2)

Compared with data for PM_{10}, the sources of data for SO_2, are few. In particular, the time series of continuous measurements with solutions of time, an average of 1-hour, as required by EU Directives and covering the entire calendar year, are still missing.

To allow a calculation of probable compliance with the limit values of SO_2 according to EU Directive (the average within 24 hours and the average within 1 hour), based on annual average values, are taken for example: multi-year data series from the monitoring network in Berlin and were analyzed with the aim of extracting statistical relationship between the annual averages and the respective levels in equivalent percentage with the limited value for 24 hours and 1 hour for SO_2.

It appears that the annual average concentrations of more than 25µg / m^3, the limit value for 24-hour of SO_2 is likely to be exceeded, while 1-hour standard is not very strict. Non-compliance is likely up to the annual average concentration of 47µg / m^3.

4.2.6.1. Measurements of sulphur dioxide (SO_2)

The measurements of sulphur dioxide (SO_2) in Kosovo were conducted by the Ministry-HMIK, NIPH, INKOS and German KFOR. The measurements of SO_2, performed by the HMIK during the period 2005-2009 and INKOS, are classical measurement methods (method acidimetric with H_2O_2 as digestion absorption) while from September 2009 HMIK conducts continual automatic measurements, in the same way as NIPH and the German-KFOR.

HMIK performs measurements of SO_2 at the location of HMIK in Pristina, which considered as suburban backgrounds. From the measurements realized with acidimetric method with hydrogen peroxide as the absorbent, it is noted that the average concentrations are from 31 to 18µg/m^3, with a trend digression since 2005.

From September of 2009, HMIK has started the measurements of SO_2 with the system of automatic continuous measurements, the average time 1 hour and 24 hours.

The similar analysis (acidimetric method, absorption of hydrogen peroxide) are performed also by INKOS, in Kastriot, close to the power plants (KEK.). In 2007 and 2008, the average levels in Kastriot were between 18 and 29µg / m^3, NW while in 2010 31.39 mg/(m^2d)[1].

Based on the above data it can be noted that the annual average levels higher than 25µg / m^3 have the risk of exceeding the limit value of 24 hours, of the SO_2. Regarding the pollution of $SO_{2,\ the}$ limit values are likely to be achieved in rural and suburban areas, far away from major industrial sources. This is important for the protection of

[1] Environemtnal Annual Report -2010 (KEK)

ecosystems.
It is also possible that in situations with stagnant weather conditions in winter season, the warning threshold for SO_2 can be exceed in central urban areas.

Unlike classical measurement method (acidimetric method with H_2O_2) in HMIK the measurements conducted in automatic monitoring station, located at the location with suburban background show a lower level of concentration of SO_2.

During the monitoring period September 2009 - April 2010, the maximum recorded level is 98.5µg/m3, for one hour average, while the average value of the concentration of SO2 for 24 hours average is 6.5µg/m3, the maximum of 24-hour averages is 23µg/m3 , which means that there is no exceeded the limit values in this monitoring location, presented in Fig. 13, Annex I.

The monitoring station operated by German KFOR, close to Prizren, also records the SO_2 with an automatic instrument, in the resolution limit of 1 hour. Unfortunately, time series show considerable gaps, so that in the first range the annual averages will be taken as a basis for assessment.

The results obtained from annual reports of 2004 - 2006, show that the annual average levels of SO_2 measurements around Prizren are between 6-7µg / m^3. Thus, based on data outside Prizren, it can happen that the SO2 limit values to be met in rural and suburban areas, without any significant industrial source.

NIPH, from January 2009 performs automatic monitoring of SO_2 in two locations in Pristina. It should be taken into account that due to the lack of calibration of instruments, the quality of data is uncertain. During the control of unelaborated data, the values which are seen as wrong are eliminated from the series of data.

The average concentration from the beginning of January until the end of March 2009 is 16µg / m^3 in urban location close to MEF. The percentage level, from 99.73 of the average annual values for that period is 161µg / m^3 and can be noted that it is under the respective values of the EU that is 350µg / m^3.

The level of the percentage of 99.18 calculated from average concentrations from 24-hour is about 102µg / m^3 and is below the associated value of the limit of 125µg / m^3.

However, taking into account the suburban location of the monitoring site can be expected that the levels of SO_2 in downtown of Pristina could exceed the limited value of 24 hours, especially during the years with poor weather conditions.

While in the monitoring period 2010-2011 ,the fig.nr. 14 shows that the SO2 concentration in the air, in both monitoring stations, Drenas and Pristina, is within the standards set out by the Directive 2008/50/EC on air quality At the Drenas monitoring station,for monitoring period

during 2011, the SO2 concentration is higher compared to the concentration of SO2 at monitoring station in Pristina in 2010.

The fig.13.shows the monthly average values, it is seen that there is no exceedance of SO2 daily limit values, in any of the monitoring stations, since the average maximum value is 23 µg/m3.

Diagram of SO_2 monthly average values shows that the trend of SO2 concentration was the same in Prishtina and Drenas station.

From measurements carried out with background suburban location, close to Pristina, it is noted that the values of SO_2 can be fulfilled for this area.

4.2.7. Assessment of nitrogen dioxide pollution (NO_2)

The assessment of nitrogen dioxide pollution is based on measurements made by the Ministry, HMIK, NIPH and German KFOR in Prizren. The Stations of Measurements in HMIK, German KFOR (Prizren) and NIPH (suburb of Pristina) are representative for pollution with suburban backgrounds.

From measurements carried out during the period September 2009-April 2010 in the station of automatic continuous measurements in HMIK , the NO_2 annual average levels for this area are 28µg/m3. The maximum value recorded during this period of monitoring is 145.1µg/m3, but the number of the exceeding the limit values (200µg/m3) for the average of 1 hour, is never exceeded, Fig. 15, Annex I.

From this it can be concluded that the annual limit value 40µg/m3 in the area of urban background is not exceeded.

The Annual average levels of NO_2 outside Prizren were between 13 and 15µg / m^3 during 2004 and 2005. The monthly average of 26µg / m^3, reflects the highest levels during the year. It can be concluded that the annual limit value of NO2 from 40µg / m^3 is not exceeded in suburban and rural areas.

Regarding the data of the station on the suburb of Prishtina (NIPH) the average between January and May of 2009 is about 30µg / m^3, which is also under the limit values.

While in the table.3, Anex 1, are presented the measurements at monitoring stations in Pristina-KHMI, and Drenas-near municipality (mobile station), during the monitoring period 2010, and 2011 the annual average values of NO2 concentration, againstin in comparasion with the annual average limit value.

The table shows that at both monitoring stations the annual average value is below the annual limit value (40µg/m3).

At the monitoring station in Pristina-KHMI, the annual average value recorded in 2010 is 20.82 µg/m3, while in Drenas is 11.26 µg/m3 during the 2011.

The annual average value for the two stations is calculated from a very low percentage of data collected. At monitoring station in Pristina, only 68% of the data collected are valid data, while at the monitoring station in Drenas, the percentage of valid data collected during the year is 60%. This means, the rest of the data are not compliant with the requirements of Directive 2008/50/EC.

From these data we can conclude that the concentration of NO_2 in KHMI-Prishtina monitoring station during 2010 is higher in comparasion with the monitoring station in Drenas during 2011. The trend of differences between 2010 and 2011 can not be assessed, as there is data insufficiency at both stations fig.16.

From the analysis of monthly average values, for both stations, it is indicated that during the winter months, the NO2 concentration value inthe air is higher compared to the summer months (fig.17), however, these are low values and within the standards of the Directive 2008/50 on air quality. During monitoring, it is recorded that there is no exceedance of 1h limit value (200 µg/m3).

However, considering a typical norm between the sub urban levels of NO_2 and those in the downtown, near the "hot spots", the concentrations of NO_2, close to the heavy traffic roads at the centre of big cities like Pristina, exceed the limit value of 40µg/m³. It can be estimated that the non-compliance with the limit values of NO_2 could be presented along the heavy traffic roads in the city centres. The level of urban and rural background should be below the respective standards.

4.2.8. Evaluation of benzene pollution

Unfortunately, the measurements of benzene have not been conducted in Kosovo. However, an estimate could be made compared to a database of air quality as for example in Berlin and elsewhere in Europe, which show that there is a stable rate between the levels of NOx and benzene levels. This norm has changed over the time because the concentrations of benzene have declined faster than the levels of NOx, due to the introduction of catalytic converts in the vehicles with gasoline and because of the increased number of diesel vehicles which release NOx (estimation of German expert from the EC).

Regarding the assumption, that the types of vehicles in Kosovo are similar to the types and characteristics of vehicles in Germany (before 5-10 years), a norm of benzene versus NOx for about 4% could be assumed, for locations with urban background such as monitoring locations of NIPH, were have been recorded the concentrations of NOx.

The average levels of NIPH station, in the period from January to May 2009, achieve the value up to 40µg / m³ of NOx. In the station of NIPH in the squares of Pristina, the application of above norm results in similar concentrations of benzene from 1.5 to 2µg/m³.

The levels of benzene close to the stations with traffic, intended to be a factor two times higher than in urban surroundings. Thus, the levels of 304 µg / m³ can be expected in locations of hot spots of traffic.

In conclusion, it can be noted that, based on a very proximate estimates of possible benzene concentrations in urban areas in Kosovo, the limit value of benzene is likely to be fulfilled in the most frequented streets.

It should be noted that the uncertainty of this trial is very high considering the lack of data for benzene in Kosovo. In any case, it can be expected that as a result of undertaking measures to reduce the traffic and certain emissions of NOx to be reduced also the benzene emissions, so as not deemed necessary the undertaking of additional measures to control the benzene pollution from traffic.

4.2.9. Assessment of pollution with ozone (O_3)

From measurements made from HMIK in location with suburban background near Pristina, the average value of ozone (O_3) during the monitoring period September 2009 - April 2010 is 50.2µg/m3, while the maximum value is 113.6µg/m3 so there is not exceeded the limit values for this monitoring period, Fig. 18, Annex I.

The tab. 4 Annex I shows exceedances of the information threshold and alert threshold as well as the exceedance of the daily average in Pristina- KHMI station, and Drenas (mobile station) during the monitoring period (2010, 2011).

The table nr.4 . shows that during 2010 and 2011 are recorded four (4) cases of the information threshold exceedance for ozone (O3) in urban monitoring station located in Drenas (mobile station). Exceedances were recorded during the summer season, namely 2 times in July, and 2 in August, where the maximum value of 1h average (180µg/m3) 17 was recorded in August, which reached the value of 196.8µg/m3. While at the station aimed to measure the air quality at suburban area, Pristina-KHMI, there has been no case of information threshold exceedance. Also, there are no cases of exceeding the daily average value, in either of these two monitoring stations.

The table nr.5 shows that the annual average value (40 µg/m3) 18 for protection of materials is exceeded at two monitoring stations. At both monitoring stations in Pristina-KHMI and Drenas (mobile station), the annual average value was exceeded during the two years 2010 and 2011, but these exceedances were not so significant.

If we compare the annual average values given at fig.19, it is obvious that at the monitoring station in Pristina - KHMI, in 2011, there is a decrease in the value of the concentration of ozone, in comparison with 2010, from 63.19 µg/m3 to 49.41µg/m3. The highest annual average value achieved at monitoring station in Pristina is 63.19 µg/m3, which is increased by 57.97% of the annual average value allowed for protection of materials. While at Drenas monitoring station (mobile station), the highest annual average value is 56.92 µg/m3, which means there is an increase for 40% of the annual average allowed value (40µg/m3).

The chart of monthly averages analysis shows that during the summer months, there is an increase of concentration of ozone pollution, as a result of higher sun radiation during these months, (fig.20). This is confirmed by the observation of meteorological data for the same period, when the ozone level is higher, the quantity of radiation is higher as well.

Data for the Prishtina municipality included in this report are reported at EIONET.

From the data of the German KFOR near Prizren, it seems that ozone tends to be higher among urban and rural areas than in urban centers and during the summer season. The highest level of average per hour during the summer of 2004 was 181µg / m^3, with an excess day of the threshold of information.

Since the levels of ozone pollution in rural areas show a homogeneous distribution in space, the data from Prizren can be taken as representative for sub urban and rural areas among all over Kosovo.

Such statistical correlations for example in the suburb of Berlin between exceeding the threshold of information and excessive numbers of days for average 120µg / m^3, for 8 hours, which is base for the value of the EU target for ozone, shows that it is not likely that the exceed of the threshold information be associated with the simultaneous exceeding of the value determined for the health and also for the value determined for the vegetation (the assessment of EC expert).

Also during the summer season, may be occurred several exceeding of threshold of information, during the high temperature and sun radiation.

4.2.10. Assessment of pollution with heavy metals and benzo-a-pyrene in PM_{10}

Unfortunately there are not still existing measurements of such components in Kosovo. The exceeding of certain values usually occurs in the areas around the industrial plants, especially metallurgy.

The content of metal in PM_{10} in ambient air strongly depends on the emissions. Thus, due to the lack of data from air quality monitoring, it is impossible to be issued any conclusion from

other countries.

However, it should be noted that due to the existence of relevant issues, it is not excluded the possibility for inconsistency with standards for heavy metals.

The data for benzo-a-pyrene in PM_{10} also missing. As known sources of this component are burning of the wood and coal, and the traffic.

In conclusion, it can be noted that in Kosovo the excess of the determined value of benzo-a-pyrene is very much possible due to the extensive use of wood and coal for domestic heating. Thus, non-realizing can be expected in urban locations and even more in heavy traffic points in the city centres.

4.2.11. Assessment of pollution from Carbon monoxide (CO)

CO is an odourless, colourless and tasteless gas, lighter than the air,and flammable. CO is a widespread air pollutant, which appears by the burning of fossil fuels.

Main sources of CO air pollution are:
- Vehicles (largest CO emitters)
- Fuel Burning (combustion of coal, liquid fuels, natural gas and wood)
- Industrial processes (the refineries, furnaces, paper factories and facilities for production of construction materials).

The presence of CO in lower layers of the atmosphere, by atmospheric circulation can pass on higher layers, and transferred to CO2. One of the possibilities of elimination of CO from the atmosphere is throughsome plants and microorganisms that use carbon monoxide as food.

Large concentration of CO may cause many pathological changes in humans (blood, nerves, etc.) and can cause death. The data have shown that the concentration of CO in the air between 7.8 ppm to 13.9 ppm increases the number of deaths caused by infarct.

4.2.11.1. Mesaures of Carbon Monoxide (CO)

Carbon monoxide is monitored at the monitoring stations in Pristina-KHMI, and Drenas, while further in this report, data from Drenas station are presented only.

The data collected at the monitoring station in Drenas, shows that during the monitoring period 04 April -31 December 2011, there are no exceedances of daily limit values of the maximum average 8h (10mg/m3), fig 21. Percentage of valid data collected during the year is 60%, it means that doesn't fulfil the criteria of Directive 2008/50/EC.

4.3. Acidification, eutrophication and troposferic ozone

Geneva Protocol for the reduction of acidification, eutrophication and troposphoric ozone of Convention on transboundary air pollution on long distances (NTALM 1979), entered into force in May 2005. Protocol aims to reduce emissions of SO2, NOx, BAO and ammonia from power generation, industrial sources, motor vehicles, and agriculture products.

Burning of fossil fuels and agriculture are the main human activities that cause acidification, eutrophication and tropospheric ozone. Impacts are more visible on forests and aquatic ecosystems, but they also damage buildings and cultural monuments. Ozone is created by VOC and NOx under the influence of sunlight and has a negative impact on plant growth.

Kosovo still lacks a system for monitoring of acidification, eutrophication and tropospheric ozone formation and is not a signatory to the Protocol. As a result, in the past, but now, in Kosovo was not paying proper attention to these problems.

It is expected that after the full functionality of industrial facilities, impacts on the environment to multiply. This will require specific activities and well organized to solve the problem.

5.0. Economic and social impact

All human activity has an impact on the environment and continuously is affected by it. The capacity to control this interrelationship conditions ,the follow-up of various forms of activities and the potential economic and social development.

In economic and social development of the Republic of Kosovo, long-term success will depend on the viability of certain policies in the field of industry, energy, mining, transport, agriculture, etc., but each of these policies, whether viewed separately or jointly with others, is dependent on the environmental carrying capacity.

Achieving the desired balance between human activity and environmental protection-air quality, requires the division of responsibilities, which fairly and clearly define the reference consumption and behavior towards the environment and natural resources. This includes the integration of environmental issues in the formulation and implementation of sectoral economic policies, the decisions of public authorities in the running and development of the production process and individual behavior. It also includes effective dialogue and joint actions between partners who may have different short-term priorities.

It is clear that "sustainable development" is not something to be achieved for a short period as it is foreseen in the current strategy, but must always take steps to ensure that

- discharge of substances in various stages of processing to be in much lower level,

- production and consumption of energy, be based on clear energy policy which integrate environmental issues;

- changes in society, and consumer behavior, to be achieved through inclusion of gjithëkomunitetet, including public administration, public and private enterprises and the general public

The impact of air pollution on the economy can be felt in many sectors and is often a result of the impact of the titles listed above.Some of the effects that can be identified include:

- Reduction of property values;
- Obstacle to the development of new industries and new settlements;
- Loss of tourism potential, etc..

Having in consideration the air pollution, efforts should be made significantly in terms of identifying the impact of air pollution assessment and community costs.

6.0. Ojectives

The Strategy determine the objectives for air quality and alternative policies for further improvement of air quality, to provide important benefits for quality of life and contribute to environment protection and sustainable development.

Objectives and measures identified in this document, for each subsector are intended to establish a good base to identify actions in Action Plan for Air Quality, document which will be prepared after the adaption of this strategy.

For each sector which is the cause of air pollution are set specific objectives and measures that will contribute to reduce air pollution.

OBJECTIVE : Implementation of air legislation
- The highest priority is determined by the provisions applicable is the construction of air quality management more effective. Although air legislation is almost complete and in accordance with EU Directives, in the future there will be certainly a need for review, with a view to tracking the changes that can be made in EU legislation. Implementation will commence a program of action proposed low-cost and no-cost to be taken to improve the existing system. This is supported by studies and short-term projects and medium-term

improvement, institutional and legal framework, integrating air issues in development planning.

Measures and actions to reduce air pollution from small combustion plants are presented in tab. 10.1. Measures to reduce air pollution from Energy, are presented in tab.10.2. Measures to reduce air pollution from industri are presented in the tab10.3. Measures to reduce air pollution from transport in the tab. 10.4.

OBJECTIVE: Reducing emissions from individual sources
- Emissions of NOx, SO2 and particulates in our State are mainly high, due to the special resources. The state will seek to support the necessary controls in power plants and other large combustion plants, through partnerships and support of legislative action.
In this regard are planned investment in the monitoring of pollutants, improving technologies in eneretic sector, research on fuel replacement with cleaner fuels (contents of S-lower).
Measures and activities to reduce air pollution from the energy sector are elaborated in the tab. 10.2. Also distinct sources of emissions are also Industry, which measures were identified sector in tab. 10.3.

OBJECTIVE-Reducing emissions from mobile sources
- Encouragement of decreasing vehicle emissions by promoting activities such as non-motorized transport, improved of road infrastructure and public transport,elaborated on the tab. 10.4. for measures to reduce air pollution from transport.

OBJECTIVE Reduce Greenhouse Gas Emissions
- Further development and implementation of the Climate Protection Program, which will decrease greenhouse gas emissions.For this purpose , measures and actions foreseen in the energy and transport sector will contribute to the above program

OBJECTIVE Reduce Emissions from Public Activities
- Outreach campaigns are necessary to decrease emissions and promote behavioral changes of the general public. This will include: data management for air, to improve the assessment and analysis, decision-making and public awareness, the implementation of training programs for raising awareness for groups / stakeholders through environmental education and training and through various activities. Better Information for clean air, raise public awareness that assists in addressing the key problems by increasing government attention to provide a strategic framework for conducting initiatives for clean air in the future, in collaboration with partners local, interstate, research institutions, civil society, etc..

7. 0. Assessment of air pollution from particular sectors

The important factors that affect the ambient air quality is the degree of pollutant emissions, climate and topography. Separate sectors as small combustion plants, energy, industry and transportation, are the main cause of air pollution. Their interaction is more complex. This pollution is causing the deterioration of the health and environmental degradation. In the

following sections is elaborated the action of these sectors and the effects on health and the environment under which specific targets have been set for the sector and measures.

7.1. Air pollution from small combustion plants

In small combustion plants is used a diversity of fuels and different technologies are applied for combustion. Small combustion plants used in household activities, especially the plants produced during previous years are of a very simple performances, while in the products of recent years of the plants of all capacities their performance is improved significantly.

A large number of inhabitants in rural and urban areas in Kosovo use for heating solid fuels (biomass and coal).

For burning gaseous and liquid fuels, the technologies used are similar to those for thermal power generation in large combustion plants, with the exception of household heating equipment (stoves).

The technologies used for burning solid fuels and biomass differ because of their characteristics and technical opportunities.

Emissions depend heavily on fuel used by combustion technology and operational practices and maintenance of equipment.

Emissions from the combustion of solid fuels in general are much higher for small combustion plans than in large combustion plants, due to the incomplete combustion of solid fuel materials[2].

Emissions of gas and liquid fuels are not such higher to the combustion on fireplaces (hearth) and stoves in comparison with stoves or industrial level boilers due to the quality of fuels, designing of flamethrower, stoves and simple organizing of combustion[3].

Emissions caused by incomplete combustion, are as result of inadequate mixing of air for combustion and carburant in stoves.

The sector of pollution from small combustion plants-household is a complex problem that affects the quality of ambient air, indoor air and in general environmental degradation.

Laws and strategic documents that regulate different issues in this area are the following:

* Law on central heating, no. 03/L-116,

[2] (*Corinair , non-industrial combustion plants, 2006*)

[3] (*Corinair , non-industrial combustion plants, 2006*)

* Law on Energy No. 2004 / 8,
* Law on Electricity No. 2004/10,
* Law on Energy Regulator No. 2004 / 9,
* Administrative Instruction for the labelling of-household electrical appliances,
* Administrative Instruction for Use of Energy by Final Consumers
* Kosovo Energy Strategy for the period 2009-2018.

7.2. Environmental impacts

Small Combustion Plants though compared with large combustion plants are considered as small sources of pollution, however, are contributors to ambient air pollution and the creation of photochemical smog.

Small combustion plants are used for production of heating energy, which is used in households, public services and for performing activities in small businesses. The fuel used in Kosovo for the production of heating energy is primarily wood, coal and mazut .

Relevant pollutants that are emitted from these fuels are: sulphur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), suspended particles in air (PM_{10}, $PM_{2.5}$), non-methane volatile organic compounds (NMVOC), heavy metals, Hexachlorobenzene (HCB) and polychlorinated dibenzodioxin and dibenzofuran (PCDD / F). These pollutants affect negatively on the reduction of ambient air quality, indoor air, in ecosystem and considerably to human health, by reducing also the quality of life.

Analysis of epidemiological studies show that indoor air pollution caused by the use of biomass and coal is a causal of the large number of early deaths. The situation became more worst by the fact that emissions mainly occur during the winter season due to the heating at home and because of frequent cases of stagnation of meteorological conditions.

It is difficult to be given a realistic assessment of air pollution from small combustion plants, since there is no monitoring emission from these sources of pollutants. Lack of reliable statistical data on energy consumption, quality of fuels in this sector as well as the exact number of families and small businesses connected to the central heating system.

- Potential sources of air pollution from small combustion plants are considered:

  - Household
  - Public services and small businesses (schools, health care centres, kindergartens, catering and tourism, vocational services, trade, other services)
  - Public heating

7.2.1. Household

The energy consumed in households is used for space heating, air conditioning, heating the water in the household, cooking, lighting and using of the electrical equipment for individual and family needs.

Based on the facts on the amount of household energy consumption, this sector contributes significantly to air pollution.
The major part of the population in Kosovo, provides the heating energy individually, while in the central heating system are connected only 11% of households.

Due to the lack of information about the types of heating equipment used, their exact number and their ideal distribution, the level of air pollution from household sector is calculated on the basis of data on type and energy consumption[4], in this sector (Tab 1. Annex II).
The consumption of energy from biomass in the household sector has a relatively high increase in 2008 compared to previous years. The average consumption of wood for household needs is 9.7m3 per year for a household. According to the data until 2007 it is estimated that for household needs is consumed 2.41m3 wood per year for a household. Also, the consumption of energy from coal is increased (Fig.1 and 2, Annex II).

The total energy consumption in household sector is 619.85ktoe[5], energy from biomass is consumed 59%, electricity 30%, petroleum products and coal 5%, heat gain (Termokos) with 1% and solar power with 0.01% (Fig. 3 in Annex II).
From the above mentioned data it is shown that the energy resources consumed in Kosovo in the household sector are biomass (wood), electricity and coal.

The household sector consumes 45% of the total energy consumed in all sectors. Given this fact, and the other fact that in Kosovo the equipments used for wood and coals burning in the household sector are not in conformity with the required standards, it can be concluded that the household sector contributes significantly to air pollution.
Although the amount of emissions from activities in the household is lower compared to emissions from industrial sources, the highness of the smokestack of the houses is down compared to industrial smokestacks, it also affects to the high concentration of pollution at the levels near the surface land (where is the live) so that this sector is considered a contributor to ambient air pollution.

The application of practices of replacing the energy sources with renewable energy sources (solar and geothermal) has just started in the private sector, where in the total energy consumption from this sector is an unconsidered percentage.

7.2. 2. Public services and small businesses

[4] *(Data from the energy sector of the Republic of Kosovo and Riinvesti)*
[5] *(ktoe –Energy unit- , kilotonekuivalent energj)*

Based on data on energy consumption and types of energy consumed, the public service sector and small businesses, are contributors to air pollution.

As to the household sector also in the services sector, the energy is used for space heating, air conditioning, heating the water, lighting and electrical equipment.

The service sector in itself contains a wide number of sub sectors where are included: schools, health care centres, kindergarten, catering and tourism, vocational services, trade and other services. This categorization is made, to provide data more easily and more accurately, on demand of energy consumption to be spent by this sector, from which also will be based on the analysis of air pollution.

Due to the lack of information about the types of heating equipment used, their exact number and their distribution, the level of air pollution from the sector of public services is calculated based on the data on the type and energy consumption (Table 2. Annex II).

Consumption of energy from biomass in the service sector has a drastic decline in 2008, compared to previous years. The consumption of energy from biomass is replaced with the consumption of energy from coal, where there is an increased consumption of energy from coal and electricity (Fig.4 and 5, Annex II).

If it is seen the participation of energy sources in energy consumption in this sector the highest percentage is the electricity consumption with 39%, energy consumption of petroleum products with 25%, coal with n 23% biomass with11%, solar energy with 0.15% and heating from Termokos with 1% (Fig. 6, Annex II).

From the fact that in Kosovo there is a very high percentage of energy consumed by primary energy sources which are considered as major emitted pollutants in the air, then the service sector has also a high potential of air pollution.

Although recently it is noticed a phenomenon of applying the renewable energies such as solar energy, wind and geothermal, this participation in the general energy consumption is almost unconsidered.

The increase of level to use the renewable energy in Kosovo will significantly impact on the reduction of air pollution.

7.2.3. Public Heating

In Kosovo, for a relatively long time have been operating three public heating, in Pristina, Gjakova and Mitrovica. These heatings have covered a significant part of households, public services and small businesses. The heating operated during the period of six months (winter season).

In Kosovo, the public heating is functioning in Pristina, Gjakova and Mitrovica. The Public Heating in Pristina, covers in the heating system a small part of the city of Pristina, about 11% of households and public services.

It is more than necessary to be expanded the public heating system throughout Kosovo, because in this way can be controlled the amount of pollutants emitted by the household sector activities and public services, also more easily might be implemented the measures to reduce the pollution.

The power generation capacity in the heating system, consumption of fuel and the number of customers connected to the central heating system are shown in Tab 3, 4 and 5 of Annex II.

Measurements of Emission in Termokos - In the enterprise of Termokos have been made the measurements of gases emission in Block 1 and 2. From these measurements it is indicated that the level of emission of SO_2 and NOx is high and exceeds the allowed limit values (Tab.6, Annex II) [6].

7.3. Air pollution from small combustion plants

From available data, it has been done a calculation of emissions from small combustion plants sector -household and public services, using CORINAIR manual - (*Corinair, non-industrial combustion plants, and 2006).*

Based on the calculated data of emission from fuels, biomass, coal and petroleum products, consumed in the household sector and public services (Fig.7 and Tab. 7, Annex II) it has been made a comparison of the emission of pollutants: PM_{10} particles, sulphur dioxide (SO_2) and nitrogen oxides (NOx).

The highest pollution with particles PM_{10} and nitrogen oxides (NOx), is caused by the use of biomass (wood) in these sectors, which has a percentage of 95% of the total emission of PM, since the consumption of biomass (wood) has been higher compared to other fuels in these sectors.
The highest pollution with sulphur dioxide (SO_2) is caused by the consumption of coal with 70% participation of the total SO_2 emission.

The measurements realised during the air quality monitoring in Kosovo, show that the highest concentrations are those with PM_{10} particles.

7.4. Specific objectives

- Exact implementation of high standards in building new capacities for production of energy consumed in households and small businesses (public services) and the achievement of obligations arising from the KYOTO Protocol.

[6] *(Report by the measurement of emmisions of gasses in the central heating "Termokos",Prishtinw)*

- To create the database, for the calculation of the pollutants emitted into the air from small combustion plants and the database on air quality in the entire territory of Kosovo.

- Providing adequate financial resources and efficient management of investments, with particular emphasis on providing attractive conditions for production of energy from renewable sources which will be used in household and public services.

8. 0. Assessment of air pollution from energy

Sustainable development means improving the quality of life with the rational use of natural resources and reduction of pressures on the environment. The quality of our life will be greatly increased by the use of energy and services that it provides. The main source for electricity generation in Kosovo is lignite. The issue lies in how you can use existing energy resources in a sustainable manner and how to replace them with renewable sources.

The energy sector represents one of the most important sectors of the economy of Kosovo, but also the sector that causes the most pollution in the environment.

The main source for electricity production is lignite for 97% production of electricity while 3% of the electricity is produced by hydropower.

The main sources of electricity in Kosovo consist of two major lignite basins, Kosova and Dukagjini, with usable lignite deposit, estimated that they exceed 11.55 billion tons. The reserves of Lignite have low sulphur content and relatively good concentration of lime that absorbs a portion of sulphur during the combustion process.

The integrated system of electricity consists of two lignite mines, in Bardh and Mirash and two Power Plants Kosovo A and B, with total effective capacity of 645 to 870 MW from 1478 MW of the installed capacity, using approximately 7 million tons of lignite per year.

The only important central outside KEK, is the hydropower Ujmani / Gazivoda (2 X 17.5 MW = 35 MW), which is administered by the Public Company Hydro-System Iber-Lepenc (ILE).

Blocks A1 and A2 of PPA, are not functioning and it is not foreseen their reactivation. They will be de-commissioned. KEK carried out capital investment for improving environmental situation such as:

Repairs in blocks PP A3 and PP A4 and PPA 5, which directly affect the emission reduction

- Revitalization of electrostatic filters PP B1 and PP B2;
- Provision of firefighting equipment from coal ashes, and training of staff;

- Setting up equipment to reduce dust in temporary coal dumps in PPA and PPB (investment of ERA);
- Shaping and greenery of of ash dump of TPP Kosovo A and reclamation of degraded lands;
- Project of Hydraulic transmission of ash from TPP Kosovo B and Kosovo A in passive holes of Mirash surface mining is underway;
- Project of monitoring of air emissions from stacks of TPP Kosovo B at the cost of 57.2 Mil. €.

Current production capacities in Power Plant Kosovo A are: A3 - 115 MW, A4 - 115 A5 MW - 125 MW. With all capital repairs in these three blocks, they are unsafe even further during the operation. Three units of Power Plant Kosovo A and 2 units of Kosovo B give a capacity of about 870 MW. The availability of units in Power Plant Kosovo A is not sufficient, while in Kosovo B the situation is better. The Hydro production is mainly provided by Ujman hydropower with capacity 35 MW and HC Lumbardhi with capacity 8.3 MW. Thus, the available production capacities are around 900 MW (Table 1 in Annex III, includes the data on the thermo-electro- generation capacity existing in Kosovo).

In general the energy efficiency is quite low. In the energy sector dominates an old technology from 60s and 80s years which is a clear indicator for environmental problems.

- Legislation and strategic documents in the energy sector

* Law on Energy No. 2004 / 8;,
* Law on Electricity No. 2004/10,
* Law on Energy Regulator No. 2004 / 9,
* AI and decisions that regulate various issues in this area and,
* Laws: on Energy Efficiency,
* Law on Natural Gas
* Law on Mines and Minerals.

Kosovo Energy Strategy for the period 2009-2018 (The review of the Energy Strategy for the Period 2005-2015), was approved in April 2010, presents a review of Kosovo Energy Strategy, based on the analysis and reflection of the current situation.

This document pays particular attention to the compliance with the EU *acquis,* which is an obligation for the Kosovo energy sector based on the membership of the Energy Community Treaty (ECT).

The aim of the abovementioned strategy is to stimulate the rational use of energy and increase the efficiency of its use, the use of renewable energy, introducing new technologies and implementing environmental standards, as set out by the law.

Kosovo is a signatory of the ECT for Eastern Europe, which entered into force on July 1, 2006. In this context, the Kosovo Government is substantially committed to develop the energy

sector in accordance with the requirements of ECT , as the creation of a stable regulatory framework and market that could stimulate the investment in gas networks, power generation and transmission and distribution network of electricity and the implementation of Directive 2001/80/EC until 31 December 2017 of the European Parliament and Council, on the limitation of emissions of certain pollutants into the air from large combustion plants, which have to be subject of the obligations under the Law on IPPC.

This Treaty obliges the implementation of the '*Acquis Communautaire*' of EU by each Contracting Party, according to a schedule to implement the required reforms. Implementation of the obligations of ECT will continue to be primary priority for the energy sector and its local stakeholders.

The Ministry and MEM have worked together in developing an action plan for fulfilment of the obligations coming out from the ECT in terms of environment for which are made the concrete steps.

The current state of the environment in the energy sector requires clear addressing and implementation of programs and projects for reducing environment pollution.

8.1. Environmental impacts

The energy sector is one of the biggest polluter of the environment in Kosovo, especially in the region of Pristina. The emissions of gases from power plants with large concentrations of acidic substances, dust and self combustion of coal causes high air pollution. It is evident that the energy sector in Kosovo is also the biggest contributor of greenhouse gas discharge.

Additional problems are also the ash landfill that accumulating more than 40 million tons of ash, including about 150 ha of arable land, and open craters in the surface mining of coal exploitation.

Pollution sources- Due to poor technical conditions of electrostatic precipitation, poor quality of lignite and other problems during the combustion process, the emissions of pollutants into the atmosphere, especially the dust -ash are much higher than the ELV acCording to the national and European standards.
Dustemissions are measured only in power plant B, while the other parameters (SO_2, NOx and CO_2) are calculated[7]. This air pollution caused by emissions of Power Plants changes the natural composition of air, due to the presence of smoke, soot, dust, aerosols and smell.

Dust emissions measured in 2007 for Power Plant B are shown in Table 2. of Annex III.
Annual energy productions in 2007 in the Power Plant A was1,251,113 MWh and in Power Plant B 301.5512 MWh, in total 4,266,625 MWh, while the annual energy production in 2008 at the Power Plant A was 1,372,558 MWh and in Power Plant B 3,622,822 MWh .

[7] *(Environmental Report of Environmental Department within KEK*t)

Dust emissions measured in 2008 for Power Plant B are presented in Tab. 3 of Annex III.

From Tab. 2. illustrated in Fig.1 results that the dust emissions from the block B2 are higher than those of Block B1 (2007).

Other emissions (SO_2, NOx and CO_2), as discussed above are just calculated.

The values of specific emissions monthly average of dust, SO_2, NOx, CO_2, calculated for Power Plant A and Power Plant B for 2007 are presented in Tab. 4. of Annex III.

According to calculations, presented in Tab. 4. and illustrated in Fig. 2 results that during the September, emissions (t / month) of dust, SO_2 and NOx for the Power Plant A were the highest.

The situation in Power Plant B presented in Tab. 4. and illustrated in Fig. 3, appears different. Emissions calculations for this plant show that emissions of dust (505.50 t / month) of SO_2 (583.39 t / month) and NOx (1337.03 t / month) were higher during the winter season, resulting with the highest levels of air pollution due to the influence of meteorological conditions during the winter season.

The average monthly emissions of dust, SO_2, NOx, CO_2, in blocks of Power Plant A and Power Plant B calculated for 2007 are presented in Tab. 5 of Annex III and in Fig. 4 and 5.

Total annual average of specific emissions of dust, SO_2, NOx, CO_2, in the block of Power Plant A and Power Plant B calculated for 2008, are presented in Tab. 6 of Annex III, as in Fig. 6 and 7.

According to the Memorandum of Athens (ECT), for the establishment of the Union of Energy, signed by Kosovo on 25 October 2005, the requirements of Directive 2001/80/EC, should be fulfilled by December 31, 2017. In following in Tab. 7. and Fig. 8a, 8b, 8c of Annex III, are represented the actual emissions of power plants and limit values in the Directive 2001/80/EC.

As presented in Tab. 7 of Annex III, emissions of dust (Fig. 8a), compared with limit values under the Directive 2001/80/EC, are much higher, especially by the Power Plant A. Also, the emission of NOx according to calculations is above the ELV (Fig. 8c). The emissions of SO2 (Fig. 8b) although according to the calculations appear lower in 2007 than the limit values of the Directive, is required to be verified the real situation through the continuous measurements.

For 2008 (Tab. 7 and Fig. 8a, 8b, 8c of Annex III) shows that dust emissions, compared with limit values, according to Directive 2001/80/EC, are much higher, especially by the Power Plant A. Also, the emission of NOx and SO_2 according the calculations is above the required levels. In figure 9.and 10 are represented the calculated dust emission for TCA and TCB (mg/Nm^3) for the period 2007-2011. The fig.9 and 10 presented presented in annex III shows

that during the period 2007-2011 the maximum allowed value (50mg/Nm^3)[8], is exceeded, especially at the TPP where are evidenced enormous dust exceedances.

Calculate emisions of (SO_2) from TCA and TCB for the period 2007/2011 are presented in fig.11 and 12. from shows that during 2010 and 2011 in TCA are registered exceeded maximum allowed values (400 mg/Nm^3)[9], while in 2007, during the entire year, concentration of SO_2 emitted was below the maximum allowed value, with the exception of September. While for TCB, that during 2010 and 2011 are registered exceedances of maximum allowed value. A better situation was recorded during 2007, while in 2008 exceedances were recorded during the months of April, June, July, October, November and December .Calculatet emission of (NOx) for TC Aand TC B for the period 2007 – 2011 are presented in fig 13 and 14.of Annex III. From the presented figures in annex III exceedances are indicated during all years, in both thermal power plants.

8.2. Air quality

INKOS Institute, in some point also carries out the measurements of the concentration of main pollutants in the air. Here it is included the concentration of SO_2 and soot (Obiliq and Bardhe), sediments (in 6 taken -place) and suspended particles. In December 2012 with the investment of MED for air quality monitoring there are located three monitoring station within KEK area, which are managed by MESP/KHMI, by which are monitored pollutant as: PM10/$PM_{2.5}$, SO_2, CO, NO_2 and O_3.

The concentrations of SO_2 and soot for 2007 in taken – place mentioned above are presented in Tab. 8 of Annex III. According to the rough assessment made in chapter four of this strategy, may be concluded that the limit values of SO_2 can be exceeded, even if not exclusively because of emissions from KEK. In Chapter 4 it is mentioned that the higher concentrations than 25µg/m3 SO_2 (as annual average value) are not in compliance with EU standards. From Fig. 15. it can be shown that the concentrations of SO_2, in Bardh mainly exceed the value from 25µg/m3 whereas in Kastriot during the end of year months it is clearly shown the non-compliance with EU standards. From this comes that, there is the problem of SO_2 pollution around the power plants within KEK. Also the same conclusion can be noted about PM (Fig.16) because the value of soot in Kastriot and Bardh is more than 10µg/m3, which indicate the excesses of the PM_{10} limit values. In Fig. 15 and 16 of Annex III, are presented the comparisons of concentrations of SO_2 and soot in Kastriot and Bardh. In Tab. 9 of Annex III, are presented the monitored values of average annual sediment since 2006-2008, in the area of Generation and in Tab. 10 of Annex III, in the area of Mining.

- **From the above elaboration it can be concludet that:**

PPB

[8] Administrative Instruction on the rules and regulations of air emissions from stationary sources of pollution
[9] Administrative Instruction on the rules and regulations of air emissions from stationary sources of pollution

- Allowed criteria for total dust of 300 mg / (m2d) are exceeded during 2006.2007.
- Inorganic and solvent substances are component part of the total dust;
- pH according to the WHO should be 7 and is exceeded during 2006, 2007, 2008

Obiliq
- Allowed criteria for total dust of 300 mg / (m2d) during 2006.2007 and 2008 have been exceeded.
- Inorganic solvent substances are component pars of the total dust;
- pH according to the WHO should be 7 and is exceeded during the 2006 and 2007.

Separation
- Allowed criteria for total dust of 300 mg / (m2d) during 2007 and 2008 have been exceeded

Bardh
- Allowed criteria for total dust of 300 mg / (m2d) during 2007 and 2008 are not exceeded;
- Inorganic and solvent substances are component parts of the total dust;
- pH according to the WHO should be 7 and have not been appeared deviations.

Bardh (fuel station)
- Allowed criteria for total dust of 300 mg / (m2d) during 2007 and 2008 are exceeded;
- Inorganic and solvent substances are component parts of the total dust;
- pH according to the WHO should be 7 and is exceeded in 2007.

Dardhishte
- Allowed criteria for total dust of 300 mg / (m2d) during 2006, 2007 and 2008 are exceeded (all year);
- Inorganic and solvent substances are component parts of the total dust;
- pH according to the WHO should be 7 and is exceeded in 2006 and 2007.

In Fig.18 of Annex III, the dust concentrations are presented in three sampling sites (Power Plant B, Kastriot and Separation) in 2007, while in Fig. 19 of Annex III, the dust concentrations are presented in three sampling sites (Bardh , Bardh, Dardhishte) in 2007.

In table 11 and Fig. 19 of Annex III, are presented the concentrations of particles suspended in air for 2007

8.3. Specific objectives

- Remediation of the environmental consequences created by the energy sector, which impact on air pollution with SO_2, suspended particles, NOx, CO, heavy metals, and also the aim of achieving the obligations by the agreement of Kyoto Protocol
- Establishment of the effective network of monitoring the pollutants discharged into air and air quality

- Reduction of emissions from Power Plant Kosova through the control of energetic plants based on the applicable legislation
- Providing stimulations and investments for the production of energy from renewable source
- Restructuring and development of energy sector in accordance with ECT: the energy legislation in Kosovo must be coordinated with the EU *Acquis communautaire* on energy and environment, and the timetable set out by the ECT.
- Promotion of awareness on environmental protection from energy sector, according to ECT. Kosovo is decisive to implement the EU *Acquis communautaire* on Environment in terms of energy resources exploitation and construction and operation of infrastructure of electricity
- Ensuring efficient use of energy and promotion of the use of renewable energy: Kosovo has made plans to promote the energy efficiency and using of the renewable energy sources as the two options related to sustainable development which contributes to the overall security of supply and environment protection.
- Development of gas infrastructure network: It is important for Kosovo in the medium term period to be connected to a regional network of gas through investment. This will increase the diversity of energy sources and contribute significantly on the reduction of electricity consumption in households and services sector. [10].

9.0. Assessment of air pollution from industry

Compared with central Europe countries, Kosovo can be accounted as a state with many environmental problems. The Lack of environment protection in the past, in the Industrial Complexes of Kosovo are the major sources of environmental problems in Kosovo.

Natural resources are the wealth of nature, where the unsustainable use of them has as consequence on breaking of the ecological balance environment-human-nature.

The Republic of Kosovo as a basis for economic development has the natural-mining resources, which represent important potential of development of society. The Mining-exploitation Industry, separation and processing of these resources contributes very much on environment pollution.
In order that this pollution be controlled and managed with as low as possible impact on the environment, the operators should fulfil the all legal obligations and to obtain the necessary permits which shall be issued under the applicable legislation.

During the operation the majority of operators who perform the separating and crumble activity of stone lime, sand and gravel and operators of concrete and asphalt bases do not

[10] (Strategjia e energjisë së Kosovës për periudhën 2009-2018, faqe 13, kapitulli 3.4. Gazi natyror dhe derivatet e naftës)

fulfil the requirements of the environmental consent for the operation, as: installation of the system for air protection from dust and from other pollutions, industrial water treatment system, waste water and atmospheric water which collected in operational areas during the precipitation (sediment wells, separator for separation of fuels and oils from water and septic tanks), the system of continuous monitoring of emissions on land, air and water, rehabilitation and re-cultivation of degraded areas.

A specific phenomenon is that the biggest degradation in the field are derived from exploitation and separation of sand and gravel from illegal operators who affecting on discouragement of all legal operators who respect their state and laws.

From legal and illegal operators are caused major negative impacts on the environment such as: changing of the important features of the environmental situation, changes of the landscape, impacts of discharges into land, air and water, noise and vibration impacts, changes in microclimate, impacts on flora and fauna, geology and natural heritage, which affect the human life and health.

In Kosovo, currently it s not completed the air quality monitoring system. Industries in Kosovo still don't have an adequate system for environmental management, although data are not quantified, the information reflects serious environmental problems that must be resolved urgently.

In Kosovo there are over 200 industrial facilities, of which some have been privatized and not working or working with reduced capacity

Major environmental problems arising from the industrial sector are: pollution of water, air and soil, the problem of industrial and urban waste as well as measurement and hazardous waste. The level of emissions of many pollutants in the atmosphere exceeds the accepted international standards, especially in the region of Pristina and Mitrovica. Sources of air pollution are not derived only from KEK and Trepca but also from heating and other industries such as food industry, chemical industry, metal processing industry, etc.

- The legal framework for controlling air pollution from industries - Plants who their activities may cause emissions that polluting the air, water and land, are obliged before the construction or operation of the plant respectively after changes or reconstruction of facilities, to obtain integrated permit, according to law on Integrated Prevention Pollution and Control.

Integrated conditions are defined, in order to better protect the environment, prevent and eliminate as much as possible the pollution, mainly from its source and to ensure the management of natural resources, pollution control and creating a stable equilibrium between human activity and socio-economic development on the one hand and natural goods and regenerative capacity of nature on the other hand.

Plants for which are necessary the integrated conditions and way of making an Integrated Permit for new and existing plants, shall be determined by the Law on Integrated Prevention

Pollution and Control. No. 03/L- 043, adopted in 26.03.2009 and sub legal acts arising from this law.

9.1. Potential sources of air pollution from industry

Potential sources of air pollution from industry are considered:
* Cement factory in Hani-Elezit- Sharcem
* Industrial Complex in Mitrovica
* Ferronikel in Glogovac (Drenas)
* Chemical industry, foodstuff, metal processing
* Exploiting activities, crumbling and separating of limestone, sand, gravel, concrete and asphalt bases

Due to the inapplicable of the legislation on air, lack of adequate technical equipments, currently are not carried out the proper monitoring activities in all the sites potentially contaminated. So it is the lack of the relevant data for detailed analysis. Also the exclusion for a long time of environmental issues has created a number of problems with which Kosovo environment is facing today. The biggest impact on the environment is inflicted by the industry of Ferronikel, -Sharcemit, and small industries

Mitrovica with the consequences of industrial waste left over from the Trepca complex also is noted among the major sources of air pollution. In most cases the pollution is presented in the form of emissions of sulphur dioxide (SO_2), nitrogen oxides (NOx), ozone (O3), lead (Pb) and other heavy metals, carbon monoxide (CO), dust, Smoke, insoluble particles and dioxins.

- Factory for cement production "Sharrcem" - The main environmental impacts from the cement factories are, the impacts on air from the stove chimney, as a result of physic-chemical decomposition of raw materials and the process of fuel combustion in the stove during the high temperatures up to 1450 0 C. Other potential sources of pollution from the factory of cement are the mills for cement gridding clinker warehouse, packaging and transport system of available products. All these sources which are producers of dust pollution are controlled through the system for filtration of dust through mechanical filters with sacking, the efficiency of which is 20mg/m3. Whereas the filtration system of the discharged gasses of the stove, from the chimney is controlled through electrostatic filter, whose efficiency is below 50mg/m3.
The main pollutants in cement industry with a negative impact on the environment, respectively in air quality of the environment and the possibilities of controlling and reducing their emissions will be in the following: Dust, fling dust, Nitrogen oxides (NOx), **Sulphur dioxide (SO_2), Volatile organic compounds (VOC),** Dioxins and heavy metals that may be as a potential pollution on environment may be emitted into the atmosphere from cement kilns, **Greenhouse-gas-** CO_2, about 65%, then 20% methane CH4, CFC 10% and nitrogen oxides with 5%. **Carbon dioxide (CO2) – it** can be noted that although the absolute values of CO_2 emissions shown an increase, they are smaller for 9% from the increase of cement production compared to previous years (Sharrcem), Fig. 1, Annex IV.

Effective use of energy for production of clinker is an important indicator for reducing CO_2 emissions (Fig. 3, Annex IV, shows that specific energy consumption for production of clinker in Sharrcem since 2003 has been reduced significantly).For monitoring the effects of reducing these emissions, periodical tests have been conducted directly to the kiln chimney from third specialized parties (Fig. 4, Annex IV). Reduction of emissions, taking into account the above mentioned factors is presented in chronological order in Tab. 1, Annex IV

- Industrial Komplex Mitrovica- Inherited and current pollution in the city of Mitrovica
Mitrovica City as an area with biggest pollution arising from industrial activities has been the city with the highest level of environmental pollution in Europe. The consequences of pollution are present even today although Trepca does not work.

In order to reduce the pollution a number of projects have been carried out, starting from the assessment of environmental pollution in Trepca, from a Swedish expert, financed by the governmental organizations Swedish -SIDA-,all the environmental problems are identified and is compiled a list of priorities, then the project "Assessment of health risk from lead pollution", funded by the Dutch Government, and implemented by the WHO. The results of this project indicate the high presence of lead in blood of the population, living close to the landfills with special emphasis on children and pregnant women. This assessment has helped the city to be given a greater importance in undertaking various actions to reduce the pollution in this region.

As projects which to some extent have influenced the reduction of pollution are: rehabilitation of the landfill in Zhitkovcit, cleaning of the smelter and refinery district in Zvecan, cleaning the district of Mitrovica Industrial Park (MIP), environmental assessment of mining wastelands in Artana and Stantrg, which resulted with partial rehabilitation of wasteland (the building of protective walls of wasteland), donated by the Dutch Government, which is implemented by UNDP. Another project is the Environmental Assessment of the Westland of Mitrovica Industrial Park (MIP), donated by the Czech Government. It is expected to be undertaken the actions based on the assessment made.

Mines within the complex Trepca are subject of IPPC and should proceed to obtain the integrated permit.

The reports of average values of total deposited dust (aero-sediment) at monitoring points in Mitrovica, for the monitoring period 2005-2009[11], are given in Tab. 2. and in Fig. 5 of Annex IV.

The aero-sediment sampling method, laboratory processing and calculations are performed according to the German standard VDI 2119 Blatt 2.

Feronikel - The capacity of Ferronikel is about 5000 t / y, Ni in Ferronikel.
In the mineral dump in which the mineral is prepared , large amounts of dust released which is

[11] *(Monitoring Report of aerosediment in Mitrovica ,HMIK)*

dangerous for the environment and worker's health who work in this department because the mineral of Fe-Ni, has over 50% SiO2. This unit possesses vacuum filters (filters with sacks). Replacement of filters with sacks is made in early 2007 (before the resumption of the smeltery at work). In order to reduce the amount of dust in this unit it is spraying with water.
Rotary ovens during the frying process release large amounts of dust and gases. In this unit are installed electrostatic precipitators-PES (4 total PES), which are functional. It can be mentioned that in each production line has to be installed by 2 PES, where one is always in function, while the second one serves as reserve in case of discontinuation for repair or for any other reason can be activated to work, to reduce the emissions.

9.2. Environmental problems of the industries that pollute the air

- Lack of a concrete development environmental policy on environment protection and sustainable development for exploitation activities, separation and crumbling of limestone, sand and gravel and asphalt and concrete bases, etc..
- Lack of legislation and not full harmonization of legislation adopted between Ministries
- Non harmonization of sub legal acts arising from the Local level wth applicable laws.
- Lack of coordinated inter-institutional cooperation.
- Lack of funds for the improvement of technologies and rehabilitation of polluted environments.
- Large presence of the operators that operate illegally and in contradiction with applicable legislation.

9.3. Specific objectives

- Improving plants technologies by replacing with clean technology
- Provide legal requirements and implementation of obligations arising from environmental legislation
- The creation of conditions for implementation of IPPC Directive
- Demonstration of commitment of the Government, industries and individuals for air protection
- Ongoing effort to improve the opportunities, taking into consideration the economic performance and efficiency
- Identification and rehabilitation of contaminated industrial areas
- Raising the awareness of population about the impacts of environmental pollution from industrial activities

10.0. Assessment of air pollution from transport

The transport sector is very specific in relation to the environment, as presents serious negative impacts during construction and operation. Transportation affects the overall quality

of the environment in Kosovo (particularly in urban areas), because the source of emission is close to the residential areas, by polluting the air, water and land. Transport also contributes to climate change, noise, landscape changes and land use, including here the possible degradation of habitats and cultural heritage. Unusable vehicles also present a serious risk to the environment.

An efficient and flexible transport system is essential to the economy and better quality of life. The current transport system presents a growing of risk to human health and the environment, due to the increased number of the transporting means in our streets as the only form of transport.
Access to good transport infrastructure is vital for the free movement of people and goods and this is essential for economic recovery of Kosovo.

Kosovo covers an area of approximately 11,000 km ² - with an extension of 190 km North / South and 150km East / West. The territory of Kosovo served by a network of 1700km, with two-way street, main and secondary (regional) street, 330km one rail railway system in North / South and North-East / West of Prishtina, Prishtina International Airport (civil and military flights) and Gjakova Airport (military flights).

The network is relatively low, approximately 0.35km/km ². All these roads are in urgent need of repair to bring them to an acceptable standard, along with transportation vehicles. This situation today is even worst, because we inherited a destroyed road infrastructure from the last war and lack of investments and inadequate maintenance during recent years.

The majority of road network is maintained, but with very low standard. 25% of the network of main and regional roads needs urgent rehabilitation.

The Road Transport – according to the annual report of the technical control centres in 2008, approximately 206,358 vehicles are registered[12]. Participation of public transport is very small. Many of the vehicles in Kosovo are older than 20 years and a considerable number of them are technically out of order. Also here are present the phenomena as the use of low quality fuels and vehicles without catalytic system.
In Tab. 1 and 2, Annex V, show the number of registered vehicles during 2006 according to municipality and centres[13].

Following, in Tab. 3, Annex V, it is presented the registration of vehicle for 2000-2006. The total number of vehicles registered from 2000 to 2006 is 332. 378, while Tab. 4, 5, 6, and in Fig. 1 of Annex V, are presented the data on the level of Kosovo, for all types of vehicles for 2006, 2007, 2008.

The quantity of the import of fuels in Kosovo in 2009, according to the data from the Ministry of Trade and Industry is as following:

[12] *(Data from the Ministry of Transport and Post Telecomunication)*
[13] *(Data from the Ministry of Interior Affairs)*

- Diesel - 289.milion lit.
- Gasoline - 123.2 million litv
- Combustion oil (mazut and solar) - 112.5 million lit
- Kerosene - 14.3 million litv
- Gas - 79.3 million lit.v

In Fig. 2 of Annex V it is presented the cumulative import for the periods January to July of 2009 and 2010.

Railway Transport – The Railways of Kosovo are operating with a length of 333.451 km open railway line and a length of 105.784 km stations and 103.4 km industrial lines.

In 2009 Kosovo's railways have transported 374,504 passengers, while in 2008 399,221 passengers, from this it comes that in 2009 were transported 6% less passengers[14].

The quantity of goods transported in 2009 was 911,930 net tons, which represents an increase of 10.8% of the amount of goods transported, compared with 2008.

The railway traffic has an impact on the environment through emissions discharged from locomotives, railway carriages, oils, etc. encountered in each nodule and railway line.

Air Transport - Pristina International Airport in recent years has had a rapid development in all aspects. In 2008 the number of civilian passengers was 1,137,000 and approximately 100 thousand military[15]. While in 2006 the number of passengers was 882,731, presented in Fig. 3 of Annex V.

From services taken from the International Airport of Pristina, it is shown that the spending of fuel for the needs of Pristina Airport in 2006 were 18,916,413 litters, while in the period from January to June 2007 were 9,213,625 litters. This figure shows that the spending by the end of 2007 were approximately the same as those of 2006, presented in Tab. 7. of Annex V.

Air transport with the emitted emissions has major impact on the environment, particularly in the area of areal corridors.

10.1. Assessment of air pollution from the transport

Based on available data (and by the lack of other necessary data), it has been done a roughly estimation of emissions from transport, using CORINAIR manual 2007 (Emission Inventory Guidebook), chapter 070 100 "Road Transport", Section 4 (Simpler methodology ", page B710-

[14] *(Data from the Raiways of Kosovo –Anual Report 2009)*
[15] *(Data from the International Airport of Prishtina)*

17).
It is made a comparison of emissions from vehicles with emissions from KEK, although emissions from KEK for PM_{10} are 10 times higher than the ELV, and two times higher for NOx so it can be expected that the impact of PM, NO_2 and benzene, from road transport to be high because of the very short distance between vehicles - the releaser and the receiver (Fig.3. Annex V).
Calculation models of dispersion for large combustion plants and emissions from transport for example in Berlin, indicates that the emissions from vehicles are 6 times more important for the concentrations of pollution, than those of emissions from chimneys 100m on the ground.

PM_{10} emissions from transport also contribute to the suspension of road dust which is thought to be high because of the unlearned roads and sidewalks without asphalt in many cities of Kosovo.

10.2. Specific objectives

- Completion of legislation and economic instruments
- Rapid replacement of old vehicles with new ones, through investment,
- Replacement of different modalities of transport with cleaner means of transport, less motor traffic, more public transport, cycling
- Control of the growth of road transport demand through economic instruments and planning
- Traffic Management, to improve the efficiency of existing infrastructure through investments, legislation and planning instruments.
- Other methods to reduce the emissions as for example, road cleaning, use of clean fuels and inspection of vehicle.
- Public awareness campaign

11.0. Climate change

Climate change is the dominant global environmental problem of the 21st century. The effects of climate change are becoming more visible, which are shown in a range of phenomena: change of temperature, amount of rainfall, water resources, extreme frequencies of climate conditions, changes in ecosystems and biodiversity, agriculture, forestry, health, economic damages, etc.

Rio Declaration (1992) which promotes the sustainable development, and the Convention on Climate Change (KKBNK 1994, aiming to reduce the release of greenhouse gases into the air. Kyoto Protocol (1997) is an important step to limit these emissions.

The scientists and Intergovernmental Panel on Climate Change (IPCC) predict that in the future climate change will be be more emphatic, it is necessary to make efforts to reduce the pressures. in order to alleviate the consequences of Climate Changes.

There are lack of data for Climate change.The only data based on which it can be made preeleminary assessment are those from the period 1985-1989.Afeter this period there are no measures.
Kosovo has low economic development and belongs to the developing countries.
Since the main energy source is coal, with economic development are expected emissions increases of green houses gases.
There are on-going activities on compiling legal acts in this area. With support of UNDP, MESP prepared the greenhouse gases inventory, a project supported by UNDP for period 2008-2010.

Specific Objectives

- Gradual decrese of climate change in compliance with the general aims of KKBNK (1994);
- Establishment of the sistem for assessment and selection of apropriate mesures for reduction ogf green house gases.
- Buliding of legal capacities,institutional and technical for sistematic solutions for climate change issues.

Priorities

- Clarification of legal status of Kosovo to be member and actively participate in international convention for climate change.
- Increasment of institutional capacities for climate change;
- Preparation of green house inventory;
- Assesment of emissions of pollutants in the period 1985-1990, in accordance with the requirment of Kyoto Protocol, according the PKIN methodology for 6 economic sector;;
- Use of financial opprtunities and rules of market for green house gases;
- Spatial planning taking in consideration adaption with climate change (ex.flood)

12.0. Measures

To achieve certain goals and objectives, it is necessary that through measures derived from this strategy to ensure:
Protecting the environment and population health
Demonstrate the commitment of the Government, industry and individuals in protecting air
Provide strategic framework for conducting initiatives for clean air, in the future, in collaboration with local partners, interstate, scientific institutions and civil society
Ongoing effort to research the possibilities, taking into account economic performance and efficiency
Promoting energy efficiency in the design and use of energy

Determined Measures

- Reducing air pollution from small combustion plants, are presented in tab.10.1.

- Reduce air pollution Energy, are presented in tab.10.2
- to reduce air pollution from industry, are presented in tab.10.3
- to reduce air pollution from transport, are presented in tab.10.4

10.1. Measures for reduction of air Pollution from Small Combustion Plants

No.	Measures / Activities / Projects	Expected effects in air quality Low / middle / High	Priority Low / i medium/ High	Framework Conditions, Comments	Assessment of Cost	Main Activities	Timetable for implementation
H1	Using of cleaner fuels, replacing coal and heavy oils (mazut) with light oils containing less sulphur, natural gas and Biogas. Developing state programs that would establish specific regulations and economic measures (ex. Different taxes for different fuels, depending on their quality). As part of the program will assess the potential of biogas production and extended accordingly.	High for PM and SO_2	High	The natural gas supply is currently limited and expensive and biogas production is still in initial phase, using the gas as a cleaner fuel depends on the plan and construction of the system (network) of gas within the Energy Community Treaty and capacity building for the production of biogas. The last one is also desirable with regard to fighting the climate change and increased use of renewable energy. Before the installation of gas pipeline infrastructure, it can be considered within the process of national development program and to be pronounced the use of LPG to homes and services sectors through economic subsidies. LPG may also be an option for use in heating the greenhouses instead of using the mazut (EN3-activity in the energy sector).	Low for the development of state program	MED, MESP, MTI and Municipalities	State program from 2016 - 2021

H2	Investments in heating and Co-generation of energy in the context of existing capacity using in Power Plant Kosova B and further extension.	High for PM, SO_2, NOx, PAH	High	A significant number of self heating systems oriented s on polluting fuels like coal and wood can be replaced, which would result in a visible decrease of emissions of particulates and SO2 in. (Activity EN4).		MED, KEK Termokos, Municipality,	The review of feasibility to be completed in 2013, Implementation in 2013
H3	Drafting of the AI on the prohibition of open fires and burning of waste, fertilizers and increasing the administrative capacity of the local inspectorate. Organize a campaign for awareness and informing the public to change the habits.	Medium for urban areas, high for local environment for the levels of PM	High	The proper implementation of regulations depends on the sufficient police forces therefore the municipalities should hire necessary human resources to better cope with this task.	Low	MIA, MESP (inclusion on the control of municipal inspectors) Municipalities	2013
H4	Survey of the scope for drafting an AI for setting out the emission limit values from small combustion plants (<1 MW) for new installations and provisions for the operation of new and existing units, with the possibility of gradual replacement of old installations.	High in residential areas	Medium	There is no regulatory framework on control of emissions from small combustion plants (stove, ovens, and boilers). Making of a long term scheme of inventory for old equipments (ex> 25 years) including here economic subsidies for the owners of polluting facilities, inefficient plants, to buy new sophisticated equipment.	Low for the development regulative framework	MESP and MTI	Preparation of a Regulative Framework from 2015-2017

H5	Drafting of AI for setting out emission limit values from small combustion plants (<1 MW)	High in residential areas	High	The regulation ensures the inspectors to regularly control the condition of the small combustion plant including a simple control of emissions discharged (measurement of CO and measurement of flowing in the flow (the chimney), and using the right type of fuel in accordance with technical standards set out in reregulation under H4 activity; The AI also should determine the responsibilities for inspecting facilities for household combustion. (It is important that the competent authority in charge of the inspection to have a proper staff).	Costs of the work for the required personnel according to the work dynamic	MESP	2017
H6	Increasing energy efficiency in new buildings by reviewing the existing regulatory framework, improve its implementation and establish a program of investments to increase the energy efficiency system in existing buildings, starting with public buildings.	High	Medium	As an initial stage, the improving of insulation of existing buildings, it can be performed an audit of energy efficiency, to identify the potential of energy savings. Preparation of the program for investment opportunities to increase energy efficiency in public buildings such as schools, offices, collective and private	Low for the development program ; Costs for the investments on energy efficiency will be estimated as part of development programme	MESP, MED, MLGA, for reweaving the legislation and for drafting the investment Municipalities, for conducting the audit	From 2014 Review of regulative framework 2015-2016 Draft of the investment programme

				housings, etc.. This measure is also an objective of climate change.			
H7	Drafting of a regulation that requires the emplacement of valves that regulates the temperature of radiators in buildings with central heating systems, collective housing and offices, and billing of consumption depending on the amount of energy consumed by the radiators with valves in houses, collective apartments with central heating.	Low	Medium for the air quality. High for climate change	As the initial stage, it should be applied to new constructions, it can also be part of H6 activity, resulting from the review of regulatory framework As a precondition for consumer billing, depending on the amount of energy consumed by the radiator valve in houses, collective buildings with central heating, need to be measure the energy used by each radiator. The regulation should encourage the installation of heating meters for each radiator in the buildings where individual apartments and offices are conect3ed with the existing central heating system.	Law for the drafting of the regulation s 10 euro per measuremen t plus costs for installation in radiator	MED, MESP Municipalities	From 2014 Drafting of the regulation from 2016 implementation
H8	Promotion of renewable clean energy, such as biogas, hydropower, wind energy, photo -voltage panels and solar panels for heating the water	Low	Medium for the air quality. High for climate change	As the initial stage, it should be invested in solar panels for water heating. Once this is simple technology, such investments can be made easily in public and private sectors. This activity should be an	Middle in short term, Low in long term, due to amortization to save the costs of energy	MED, MESP	2014 starting of the research for providing the financial means for investments in solar panels The time of state program should

				integral part of the climate change strategy, which should be developed in close cooperation between MEM and MESP. This may be part of the state program defined by H1 activity.	consumption		be in accordance with the strategy of climate change (see also in H1)
H9	Drafting the regulations for the introduction of energy efficiency labelling of electric appliances in accordance with EU directive	Low	Low	The activity should be an integral part of climate change strategy, which should be developed in close cooperation between MEM and MESP. This activity should be supplemented with information and public awareness.	Low	MED, MESP, MTI	2015 Drafting of the regulation

10.2. Measures for reduction of air pollution from energy

No.	Measures / Activities / Projects	Expected effects in air quality Low/Middle /High	Priority Low/Medium /High	Framework conditions Comments	Financing	Key responsible acters	Timetable for Implementation
EN 1	Decommissioning of Power Plant Kosovo A	Medium in the urban areas High in local areas around IDM For PM, SO_2, NOx	High	Part of the Energy Policies of Kosovo within the framework of the Energy Treaty and goals in order to ensure full compliance with the EC Directive on IDM's until 2017	To be provided by the operator IDM	MED Operator IDM	Until 2017
EN 2	Measures to control emissions in IDM – Power Plant Kosovo B a) Purchase and installation of automatic monitoring system for SO2 emissions (priority), NOx and dust b) Conducting a study for identifying and selecting of cost-effective technology for controlling SO2 emission to fulfil the limit values from the Directive on IDM and then installation of the selected technology for controlling emissions. c) Survey of the advanced	Medium in the urban areas in Prishtina High in local areas around IDM For PM, SO_2, NOx	High	Part of the Energy Policies of Kosovo within the framework of the Energy Treaty and goals in order to ensure full compliance with the EC Directive on IDM's until 2017 These measures are part of the investment for the best available technologies to control emissions of IDM, which will be required with the operation permit which must be issued by the competent authority for inspection of large installations (MESP) in accordance with Directive the	To be provided by the operator IDM	MED, Operator IDM	Monitoring of emissions and the beginning of the study in 2013 Issuing of the compatible permit with IPPC, up to 2017, by defining the installation of technology at the latest by 2017.

	technologies to control emission of dust and installation of more efficient electro-filters, in order to meet the emission limit values of 50 µg / m³ of IDM Directive d) Improving the selected technology for controlling NOx emissions. e) Measures to control the distribution of ash from the ash deposition			IPPC and reference document of BAT for IDM			
EN 3	Review of the replacement of fuel with natural gas in particular in the central heating and transport, to replace the polluting fuels such as coal, wood and Diesel.	High	High	Part of the Kosovo Energy Policy within the ECT, which foresees the construction of pipeline infrastructure to enable the import of larger quantities of natural gas.	See the respective sector	See the measures in the respective sector	Long-term Once gas pipes to be constructed, there should be consistent with the strategy of energy-2009-2018 and Program for the implementation of the Energy Strategy for the period 2009-2011.

EN 4	Investment for the expansion of central heating and heating - energy co-generation in respect of plans for renewed generation capacity - power plants in Kosovo.	High	High	The Recommended measures of the Technical Assistance Project for Central Heating of the World Bank in 2002, should be reassessed with the aim of renovation and extension of the network of central heating to be replaced the heater and lighters and reduction of dust and SO2 emissions from the burning of the coal and wood (See H2 measures in heating sector).		MED, KEK, Termokos and Municipalities	Implementation in 2013-2015
EN5	Implementation of measures for energy efficiency	Medium	Medium			MED, ERO MESP, MTI, KEK, Heating	2014-2016

10.3. Measures for reduction of air pollution from Industry

No	Measures / Activities / Projects	Expected effects in air quality Low/Medium /High	Priority Low/Middle /High	Framework conditions Comments	Financing	Key responsible acters	Timetable for Implementation
IN 1	a)Initiation of negotiations with the operators of large plants in order to achieve the standards of Best Available Technologies -BAT. Objective: Issuing of the integrated permit – IPPC, compatible operation permit b) Measures for controlling emissions in installations that are subject of IPPC in Kosovo. Purchasing and installation of automatic monitoring system for SO2 (priority), NOx, dust and heavy metals. Study and selection of cost-effective technologies and installation of the selected technology of emissions control.	Medium in the urban areas High in local areas around the industries For PM, SO2, NOx, heavy metals	High	Applied to several plants in Kosovo, as Sharrcem, Feronikeli (Trepca) a) Starting with a pilot project for a plant b) These measures are part of the investment in the best available techniques to control emissions of large installations. Integrated permit will be issued with the application of BAT, which is issued by the MESP in accordance with the Directive of IDM, and IPPC and referring documents of (BREFs) for industrial plants.	To be provided by the operators of the plant	MESP operators of the plant	a) In 2011 open of the dialog regarding operators options: starting the process with a pilot project. b) Issuance of the integrated permit begins with 2012.

10.4.Measures for reduction of air pollution from transport

No.	Measures / Activities / Projects	Expected effects in air quality Low/Medium /High	Priority Low/Middle /High	Framework conditions Comments	Financing	Key responsible Acters	Timetable for Implementation
	T1: Rapid replacement of pollution vehicles with clean ones						
T1.1	Reducing emissions of public vehicles, especially buses and taxis a) Developing a program to modernize the busses b) Exploring the potential for diesel vehicles with filters set (filters for diesel particles (FGD). c) For operators of busses and taxi services to be determined the environmental criteria that must be met (based on Euro emission standards, FGD). d) Establishing a uniform criteria for taxi: Euro 2 to fuel vehicles, Euro 3 plus FGD for diesel	Medium in urban areas High in roads with high frequenting, busses and taxis	High	Due to the small budget of municipalities, it is needed to be provided funds to modernize the parking of vehicles, to provide low prices of tickets, in order to be maintained or increased the attractiveness of public transport. Funding may be needed to taxi drivers, who can not afford the investment for better car	Researching of the ways for financial support from EU funds	Ensuring the increase of financing: MF, MI For practical implementation the Municipality	a) 2014- Development of the program, for modernization and emplacement of standards b)/ c) Enforcement phase 1 until 2014, phase 2 until 2017 d) enforcement until 2014

T1.2	Vehicle taxes emission (based on emission standards, Euro, filters for particles of diesel (FGD) for petroleum. On the amendment of the Law on taxies, the vehicles that do not meet Euro 1 (later Euro 2) should pay more than those with Euro 3, 4 (and vehicles with FGD) that pay less.	Medium	High	In order to partially be compensated the high financial obligations for owners of old vehicles, it will be explored the ways for financial reward for old vehicles (Euro 0), if iit will be bought the new vehicles (Euro 4, if the Diesel with DPF). The highest income from taxation of vehicles can be used for this purpose	Low	MF, MI, MIA	2015
T1.3	Restricted access to polluted urban areas for vehicles with high pollution. Determination of space in the city center areas with high pollution from traffic, where access is prohibited traffic signs for vehicles that do not meet at least Euro 1 (or first year of entry into service before 1993).	High in heavy traffic urban roads	Medium	Enforcement requires the application of adequate staff of the police to check the vehicle documents and have access to real time in the register of vehicles in order to check parked vehicles		Establishing the legal base: MI, MESP MIA For practical implementation on the Municipality of Prishtina	Legal base until 2013, Implementation after two years of the transitional period ex. Until 2015
T2: Replacement of different modalities of transport with cleaner means of transport							

T 2.1	**Presentation of areas for managing the parking in urban areas** Determination or the expansion of the downtown areas where the parking fees is larger	Medium	High	It is needed the personnel, or ticket machines to collect parking fees the needs of strict enforcement of parking regulations and penalties in order to avoid illegal parking. Fees should be comparable to fees for public transport tickets, so that public transport to serve as an attractive alternative	Incomes from the taxes of parking can be used for financing the public transport	Municipality	2014
T 2.2	**Improving the quality of public transport services** This includes: - Increase of the frequency and quality of services - Better information for passengers about schedules -Attractive and available tickets for all the residents -The Tickets will be valid for all independent buses of the services of operators - Setting high standards of quality for bus services as part of the service contract to private operators -Improvement of the combined use of road transport, by putting parking / bike and travel tools in a determined form, parking areas on the outskirts of the town with good connection to the network of buses	Medium	High	The increase of the funding for public transport services is a precondition for the growth of municipal financial resources It should be considered inter cross-funding from the income of taxes and tax management of vehicle parking It should be combined with parking in city centres, so that the use of public transport becomes more attractive	Considering the inter financing from the income of parking management taxes from vehicles, and fuels. To be researched the way of financial support by EU funds.	Providing of financing means: MF, MI For practical implementation Municipalities	2014 pilot project for Prishtina, by representing the concrete steps for the required financing for 5 next years

T 2.3	Making more attractive the driving the bicycle and walking in urban areas Development of a municipal strategy on cycling, by including: - Establishing additional lines for bicycles - Creation of bicycle parking, in front of public buildings such as schools, offices, bus stations etc. - Encourage private sector in particular during the construction of new facilities to implement the option to regulate the bicycle parking	Low for short term, medium for long term	Medium	Additional budget lines are needed to ensure a continuous financial investment base that is needed Requires changing the priorities in the planning of traffic far away from the motor traffic Should be encouraged with information campaigns and awareness		Municipalities supported by MI	Starting from 2015 with the pilot project for Prishtina, by representing the concrete steps for the required financing for 5 next years
T 2.4	**Improvement of railway infrastructure with the aim of providing a greater capacity and quality of services for railway transport passenger** Starting with Pristina, to connect the city with the station in Fushe Kosova in the main line in North-South, including the expansion to the airport	Medium	Medium	Re-establishing and expanding the railway network is defined by the Action Plan for railway transport		MF, MI, Municipalities	2014- with concrete plans Implementation until 2018
T 2.5	**Improving the medium and long lines of goods transport by rail** The launch of a feasibility study to explore the possibility, including the	Medium	Long term	The focus might be brought on the services between Kosovo and Macedonia		MF, MI,	Study until 2016

	establishment of goods terminals that allow easy loading / unloading between the railway and the road						
	T3: The control of the increase of demands for road transport						
T 3.1	**Reducing traffic demands through better urban planning ("compact city")** Improving the legal framework of planning, seeking an urban transport plan for the largest cities in Kosovo Administrative capacity building at municipal level to ensure that the demands for motor traffic is minimized during the planning of new buildings, commercial buildings, commercial facilities, etc.	Low on short term and medium on long term	High	Should be taken in order to direct the continuous development of the business and services sector		MESP and MI	2015 2014-2016
T 3.2	**Gradual increase of taxes for vehicle fuels**	Low on short term and medium on long term	High	Using a percentage of funds collected from taxes to support small businesses to purchase efficient vehicles and clean fuel	The income should be mainly used for the financing of measures given in T.2	MF, MTI, MI, MESP, Municipalities	2013-by starting with a modern tax increase

	T4: Management of traffic						
T 4.1	Planning and construction of circular roads to keep transport of goods with long distance outside the town	High in urban roads with high traffic	Medium	Should be concentrated in cities with heavy traffic: These measures should be combined with the traffic stoppage for heavy vehicles, except those with local destination Extended road capacity may attract more traffic road, this can be avoided with a parallel reduction of urban road space and other measures in favour of cleaner modes of transport	High	Municipalities MI	2014 –starting of the planning process
T 4.2	**The concept of road for heavy goods vehicles in urban areas**, possibly **combined with a stoppage in sensitive areas**	High in the areas of dwellings with high traffic	Medium	Determination of specific roads for easy access to commercial areas for heavy goods vehicles, with the aim of keeping the unnecessary traffic outside the sensitive areas with a high density of pedestrians and / or residents, where could be presented a stoppage for such vehicles	Low	Municipalities, MI	2014 starting of the planning process

				Along the determined roads the number of inhabitants must be low For trucks in sensitive areas should be made the reinforcement of rules by the police			
T 4.3	**The reduction of the circulation of the traffic to avoid the invasion** a) The prohibition of parking vehicles in the traffic belts in important artery roads b) Prohibition of the circulation of traffic in dense areas through coordination with traffic lights	Low	Long term	a) the need of implementing rules by the police, will increase the road capacity b) investments are with high cost, suitable for major cities like Pristina, where should begin a preliminary study	a) Low b) High	Municipalities	a) 2015 b) 2014- Preliminary study for Prishtina
T 4.4	**Determining the speed limit (**30 **km / h**) **in** main **urban streets with high pollution**	Low for air quality	Short term	It can be applied the speed restriction of narrow sections of main roads with high frequency of pedestrian and density of inhabitants, where road accidents and noise levels are also high the need for application of the rules by the police through the	Low	Municipalities, MIA	

				measures to regulate the speed and re-design of road space (eg. with the determination of road space for parking and pedestrians) in order to narrow the space for road circulation			
T5: Other Measures							
T 5.1	**Reduction of deposition of soil on the road by the road traffic** a) Adoption of the surface of the said walk and footpath to reduce the deposit of soil on the road and subsequent suspension by the road traffic b) the addition of street cleaning with efficient equipments	Medium	Medium	a investment in building sidewalks and side surfaces) are necessary, where they are not closed yet, so the dust will not be removed in lines of traffic (ex by rain.) b) to increase human resources for manual cleaning of streets, the long-term purchase of machinery that allows effective cleaning to reduce – suspend PM Taking into account the limited financial resources of municipalities, it should be develop a long-term financing concept to increase the budget for the improvement of municipal roads and roads cleaning services	a) High b) middle with manual cleaning of roads	Ensuring the increase of financing: MF, For practical implementation, Municipalities	a) Until 2013-2015 setting of long term programs for investments b) 2014-frequently manual cleaning of the roads and investments on the machinery for cleaning the roads

T 5.2	Enforcement of inspection including the emission control	Medium	High	Enforcement of existing regulations for controlling the vehicle. As an alternative, more frequent inspections should be conducted for older vehicles	Middle for purchasing the equipments for monitoring and technical control	MI	2014 drafting of the regulations if it is needed Until 2012 regular control
T 5.3	Introduction of the implementation of taxation reduction for clean fuel: - naphtha on the base of sulfur content - Gasoline on the base of benzene content - for natural gas	Medium	High	Strengthening control measures and fuel quality monitoring is necessary Viability of this measure depends on the structure of supply, ex. in the potential of cleaner fuels available Given the need to increase tax revenues, any tax scheme dependent should not result in reduced overall tax	Neutral	MF	2014
T.5.4		Medium on		In school curricula should be			

	Information campaigns and public awareness Information regarding the harmful effects of pollutants from traffic emissions, promote clean transportation means (public transport, cycling, walk) Promoting the efficient use of driving karburantev	long term	High	included the issues of air pollution Organization of public debates with civil society and stakeholders Organizing the cycling day	Low	MESP, MEST Municipalities	2013-2014

Annex I

Introduction

Fig. 1. Existing Stations of Air Monitoring in Prishtina

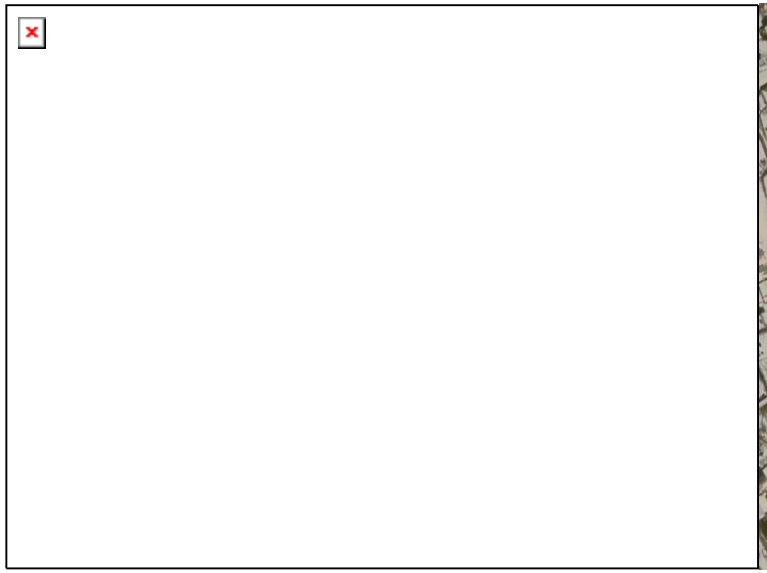


Fig. 2. Location of the Station in Mitrovica

Fig 3. Location of the Station in Drenas

Fig. 4. . Lotion of the Station in – Rilindja

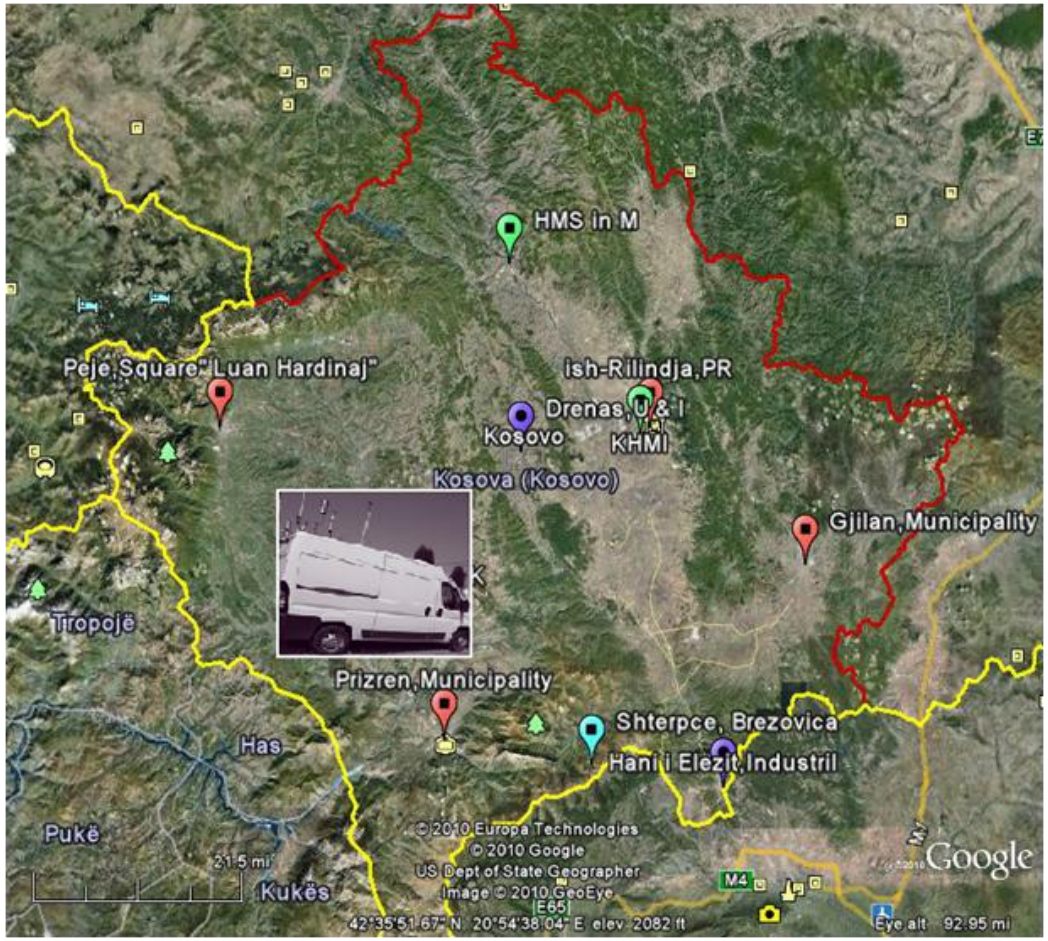


Fig 5. Air quality monitoring network in Kosova

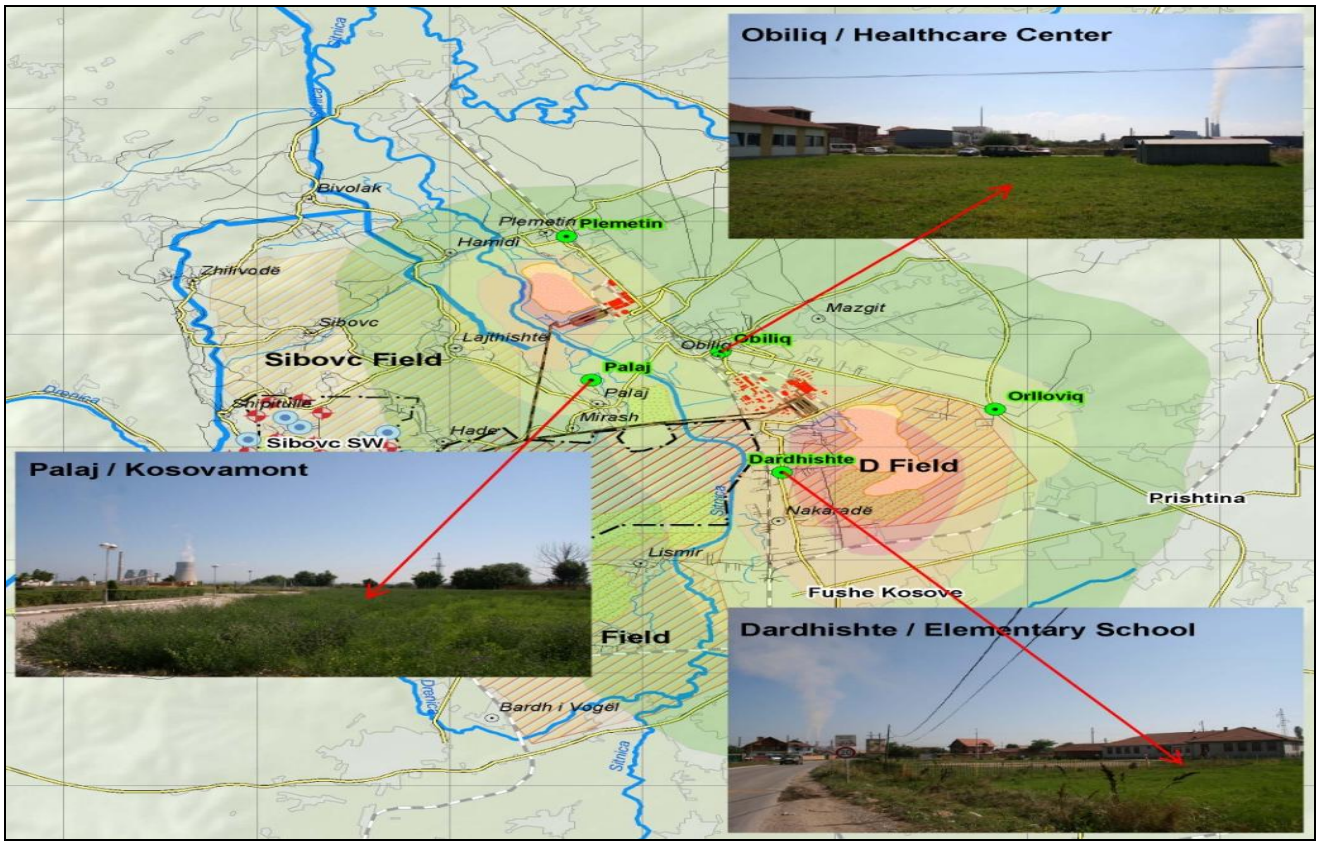


Fig.6.Location of monitoring station in KEK -area

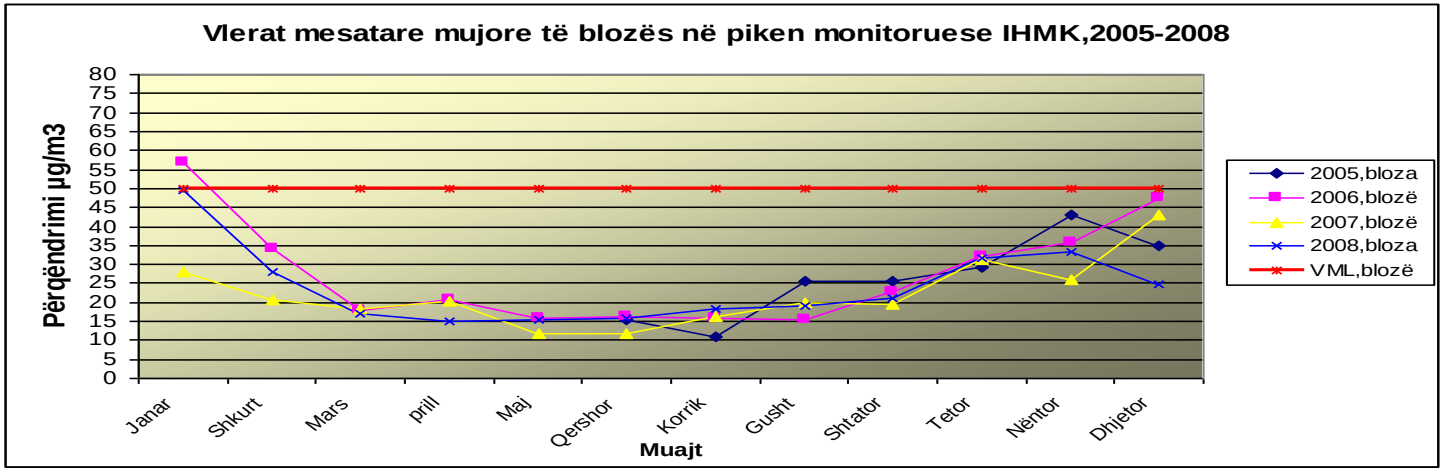


Fig. 7. Monthly Average Values of the Soot for 2005-2008 in the Monitoring Point in HMIK

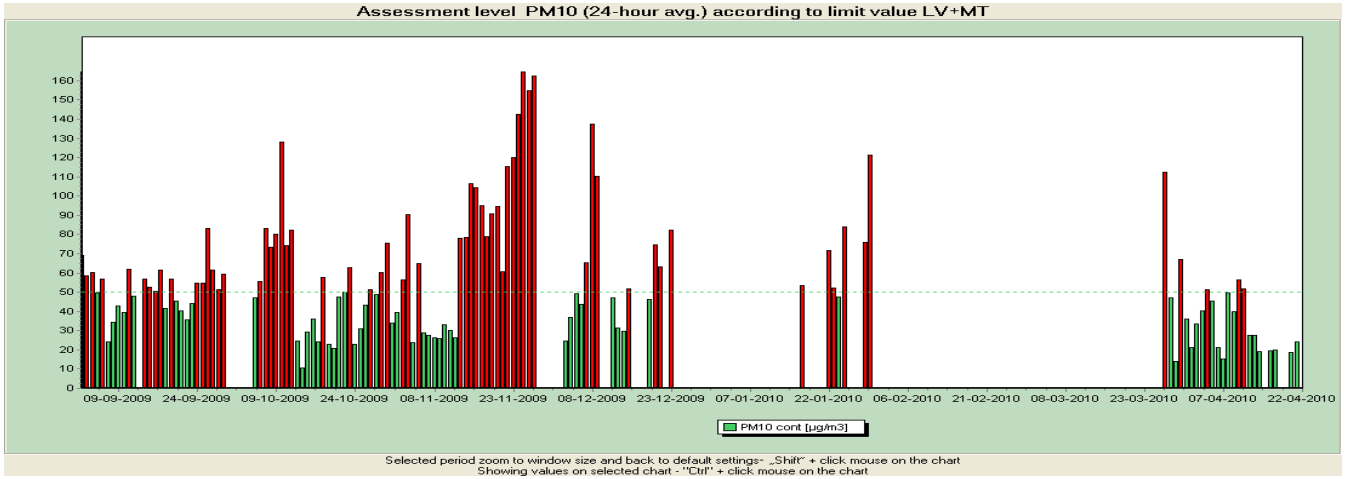


Fig. 8. Monitoring of PM10 in HMIK, during the period September 2009 April 2010

PM_{10}-numri i ditëve që tejkalon vlerën kufitare ditore për 2010, 2011		
	2010	2011
Vlera kufitare ditore	50µg/m3	
Numri i lejuar i ditëve të tejkaluara brenda vitit	35dite	
Prishtinë - IHMK	99	68*
Prishtinë- Ish- Rilindja	69*	92*
Drenas- Komuna	S'ka matje	41*

Tab.1 Number of days with exceeded limit values of PM10

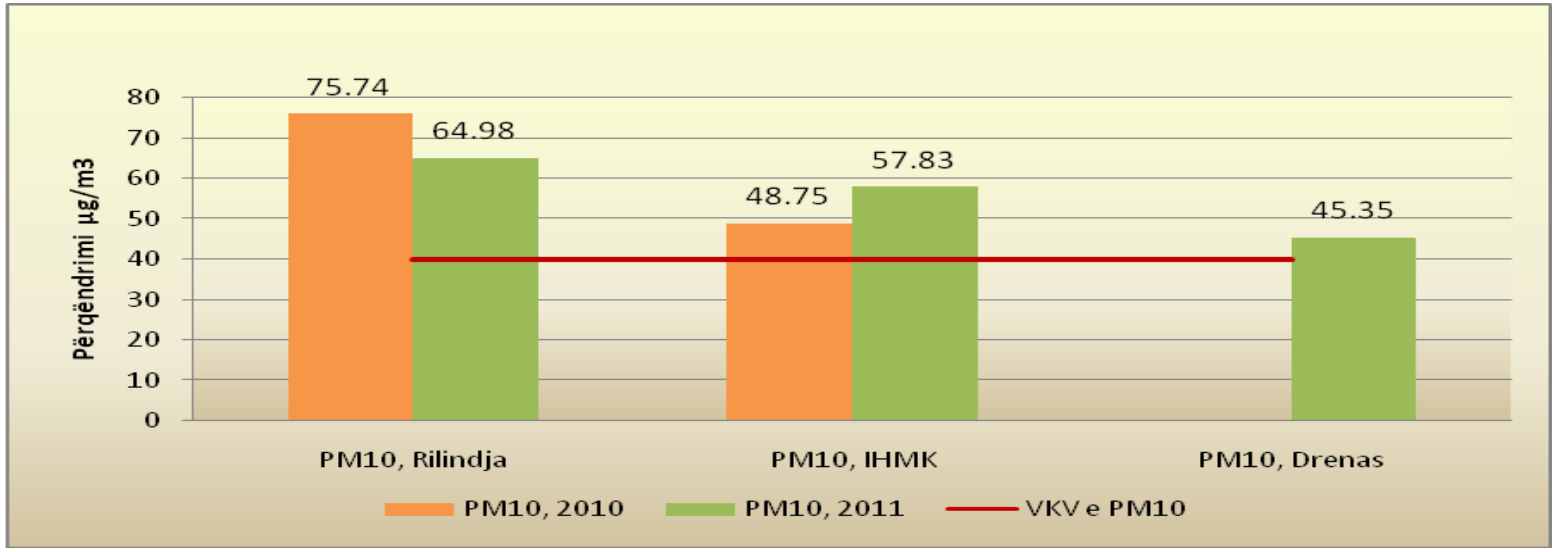


Fig.9. Annual average values of PM10 in three monitoring stations

PM2.5- Mesatarja vjetore		
	2010	2011
Vlera kufitare vjetore /Niveli për mbrojtjen e shëndetit të njeriut	25 µg/m^3	
Prishtinë - Rilindja	37.34	40.04

Tab.2. Annual average of PM2.5 at monitoring station Rilindja-Prishtinë

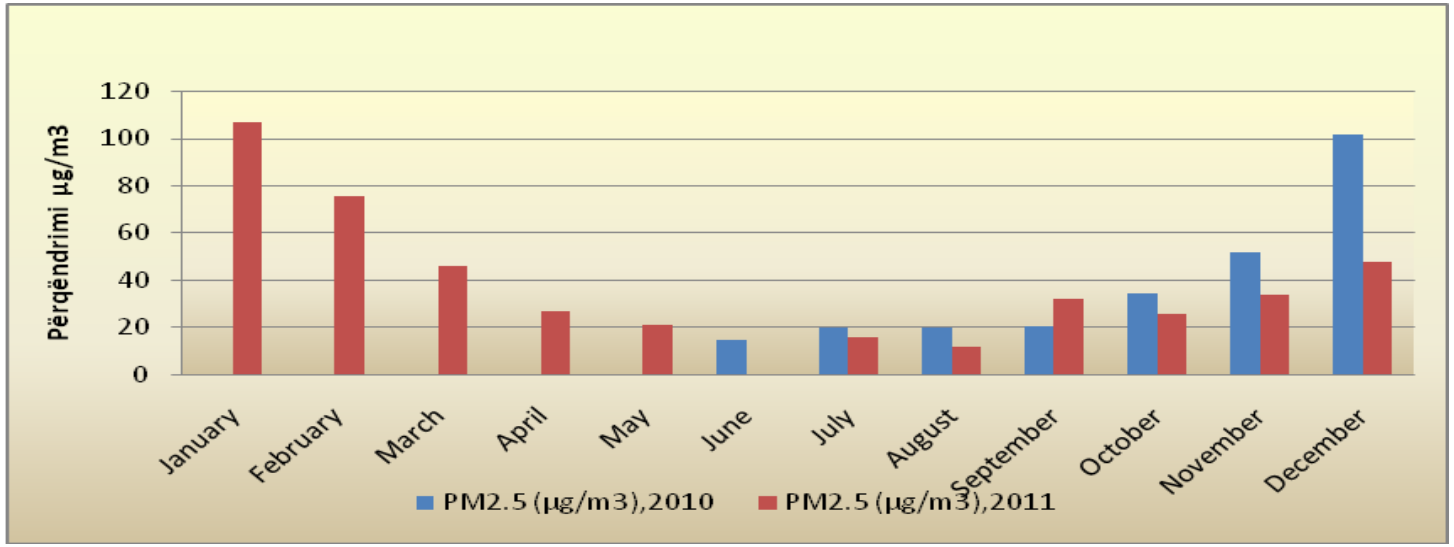


Fig. 10. Monthly average values of monitoring station in Prishtinë –Rilindja, 2010 and 2011

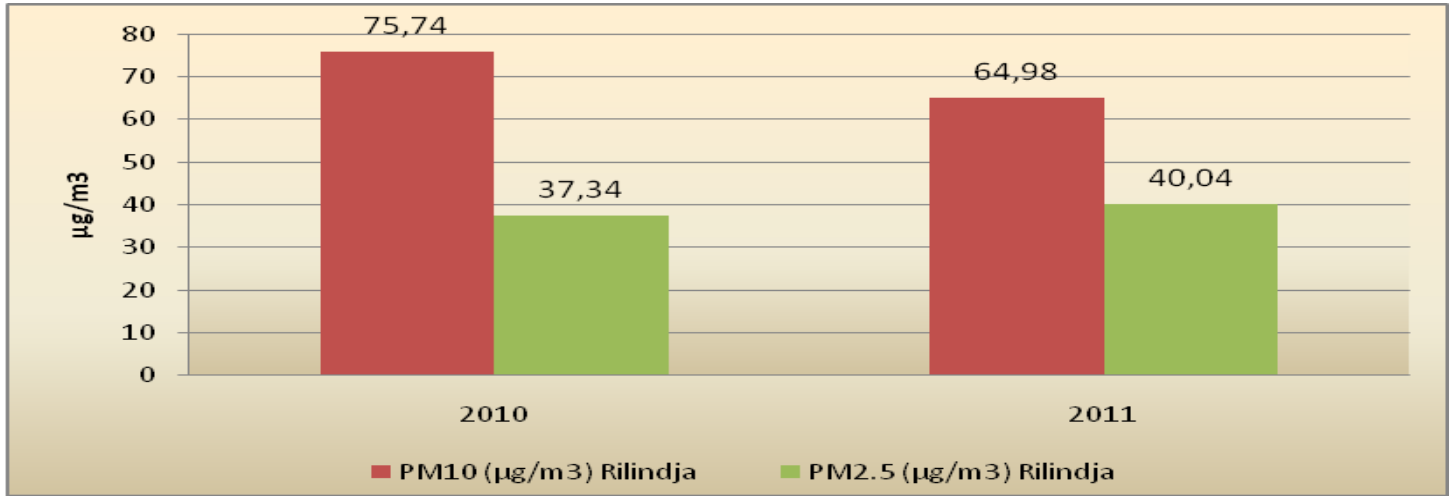


Fig. 11. Annual average values for PM10, PM2.5, 2010 and 2011 Prishtinë (Rilindja)

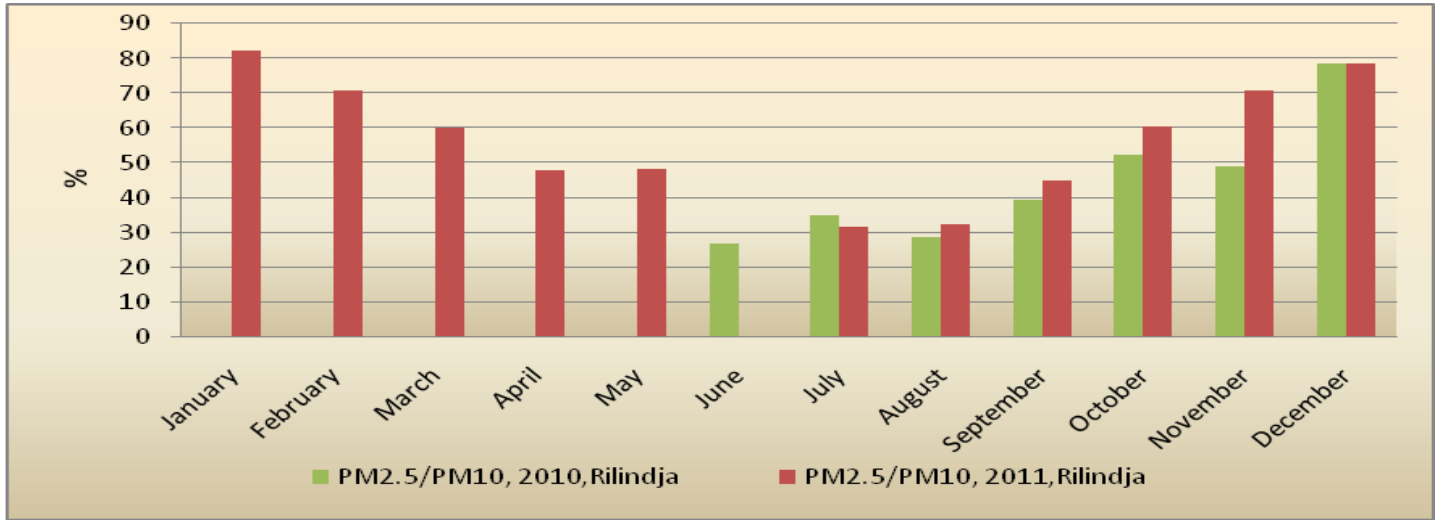


Fig.12. Ratio PM2.5/PM10 according to monthly average values, 2010 and 2011

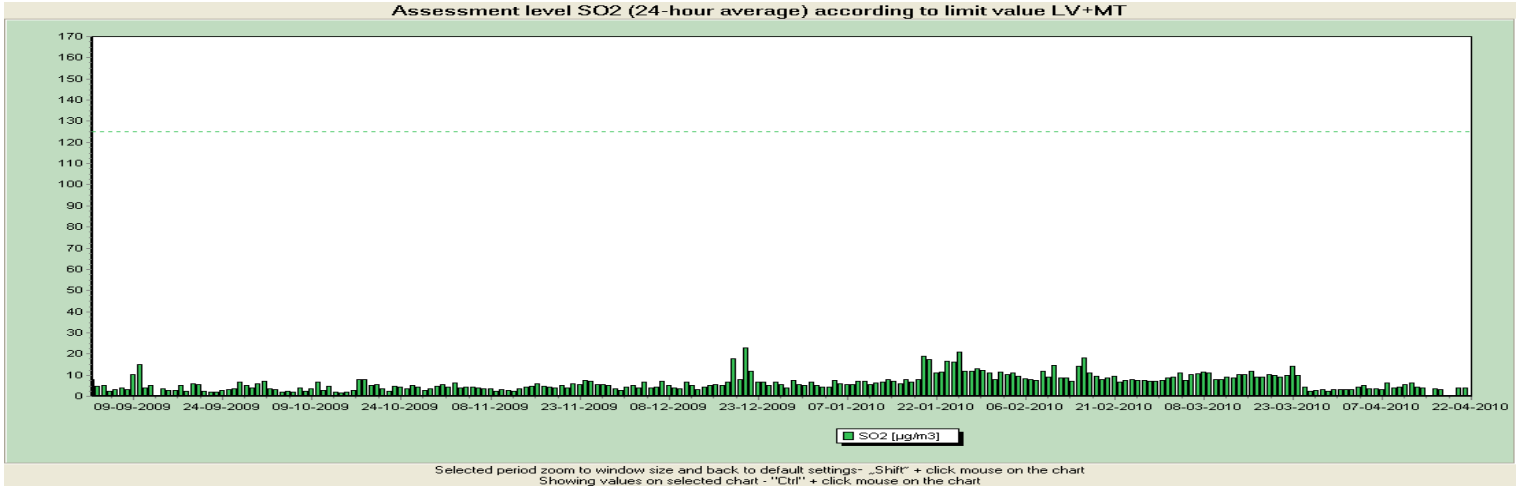


Fig. 13.Monitoring of SO2 in KHMI,during period September 2009- April 2010

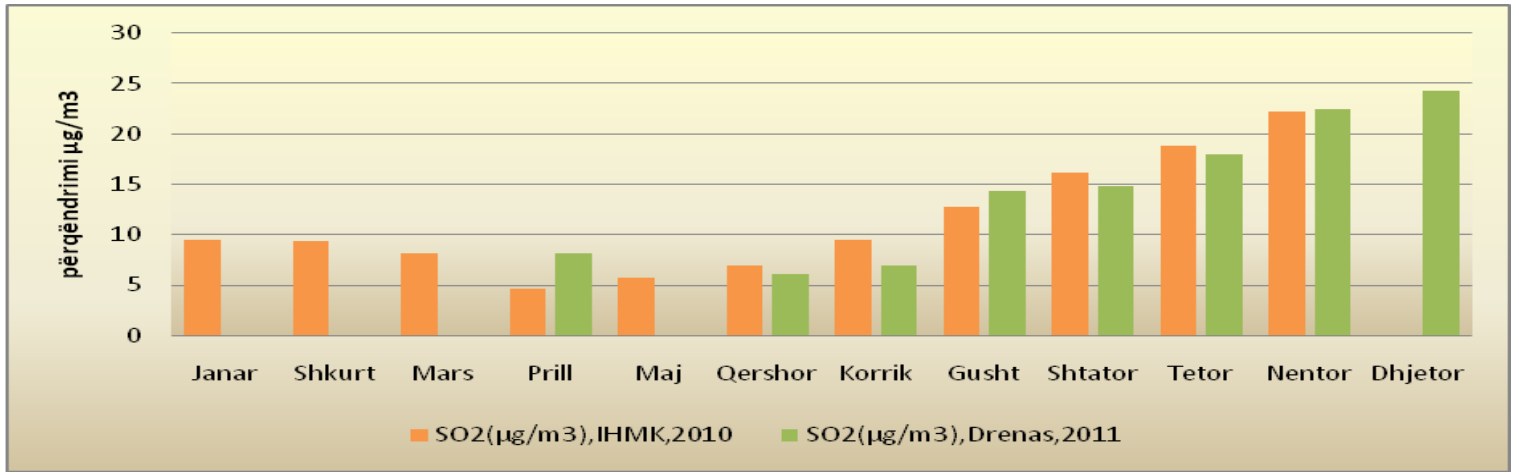


Fig.14. Monthly average values of SO2 in Prishtinë and Drenas, 2010 and 2011

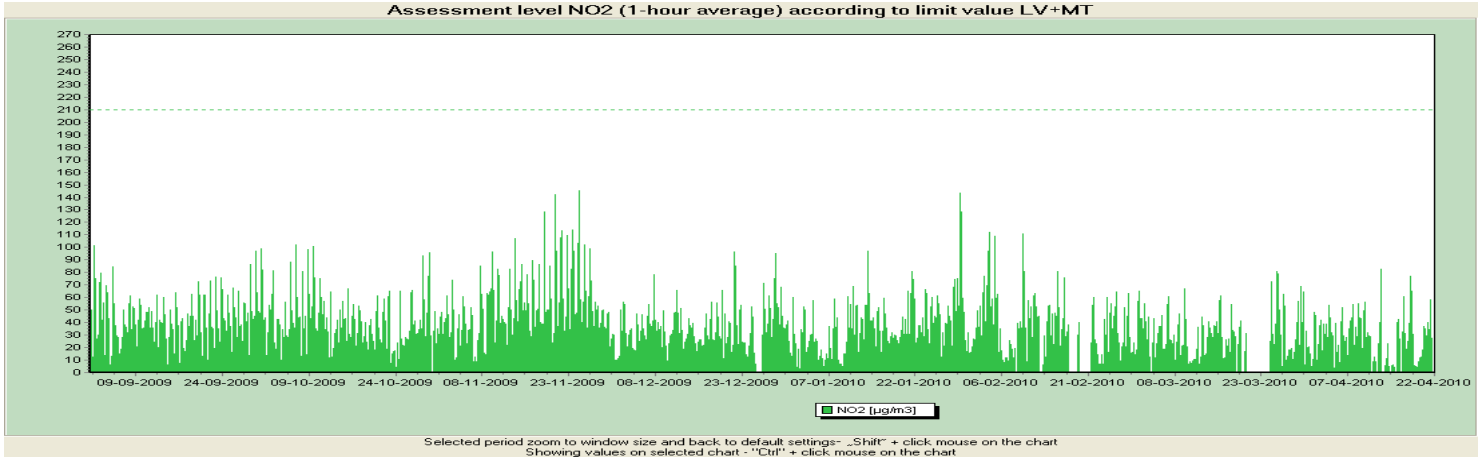


***Fig*. 15. Monitoring of NO2 in KHMI during period September , 2009-April 2010**

Dyoksidi i Azotit (NO_2)- Mesatarja vjetore 2010 dhe 2011		
	2010	2011
Vlera mesatare vjetore Niveli i lejuar për mbrojtjen e materialeve	40 µg/m^3	
Prishtinë - IHMK	20.82	-
Drenas- Komuna	-	11.26

Tab.3. Annual average of NO2 (μ g/m3) at monitoring stations in Drenas and Prishtinë

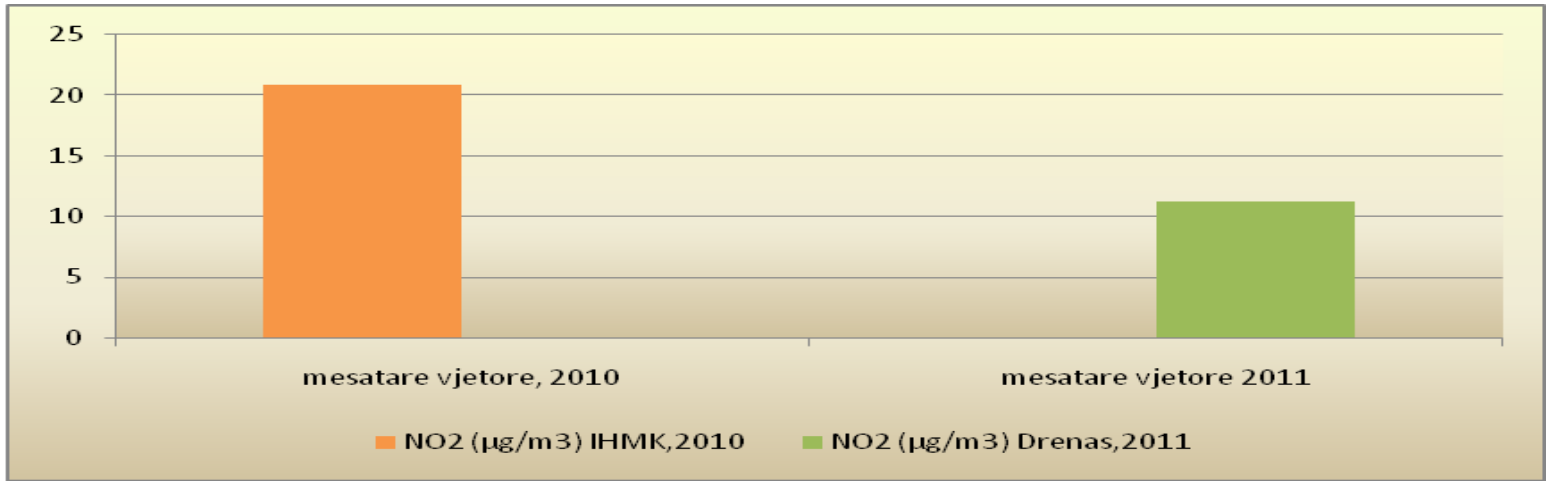


Fig.16. Annual average values of NO2

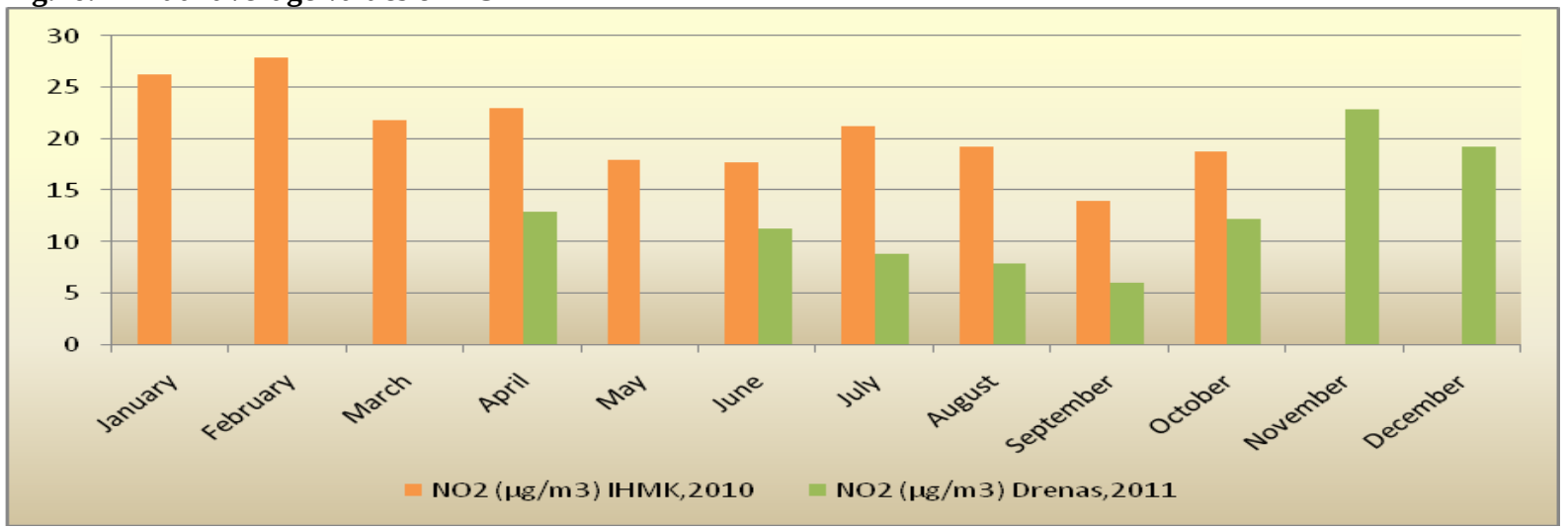


Fig.17. Monthly average values at Prishtina station-KHMI and Drenas, 2010 and 2011

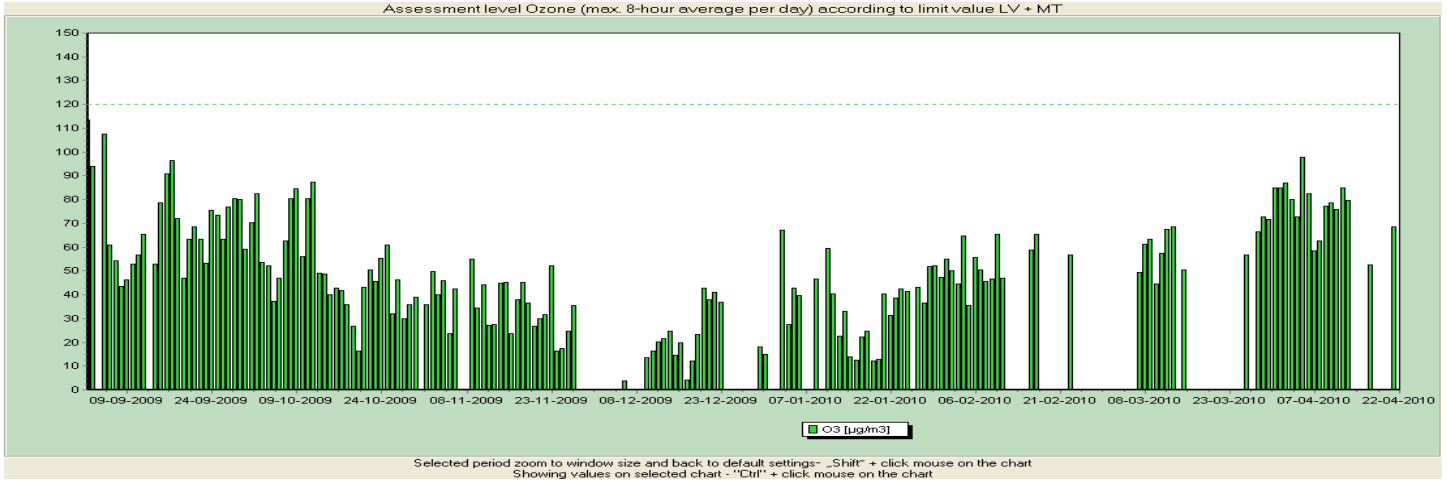


Fig.18. O3 Monitoring in KHMI during period September 2009-April 2011

Ozoni O3 - Numri i tejkalimeve			
	Objektivi afatgjatë, për mbrojtjen e shëndetit të njeriut mesatre ditore 8 orëshe, d.m.th brenda vitit kalendarik	Pragu i informacionit , mesatare një orëshe	Pragu i alarmit, mesatare një orëshe
	>120 µg/m^3	>180 µg/m^3	>240 µg/m^3
Prishtinë - IHMK	-	-	-
Drenas- Komuna	-	4	-

Tab.4. The number of exceedances of the daily average, information threshold,and alert threshold

Ozoni (O_3)- Mesatarja vjetore		
	2010	2011
Niveli për mbrojtjen e materialeve	40 µg/m^3	
Prishtinë - IHMK	63.19	49.41
Drenas- Komuna	-	56.92

Tab.5. Annual average of Ozone (μ g/m3) at monitoring stations in Drenas and Prishtinë

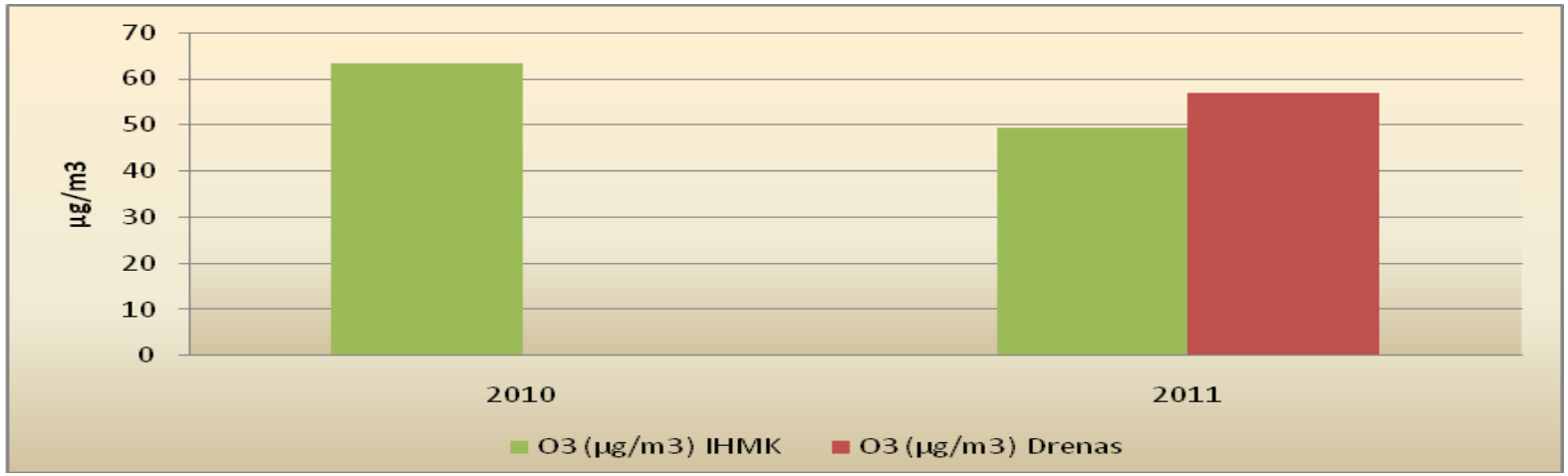


Fig.19. **Annual average of O3 at Prishtinë-KHMI and Drenas, 2010 and 2011**

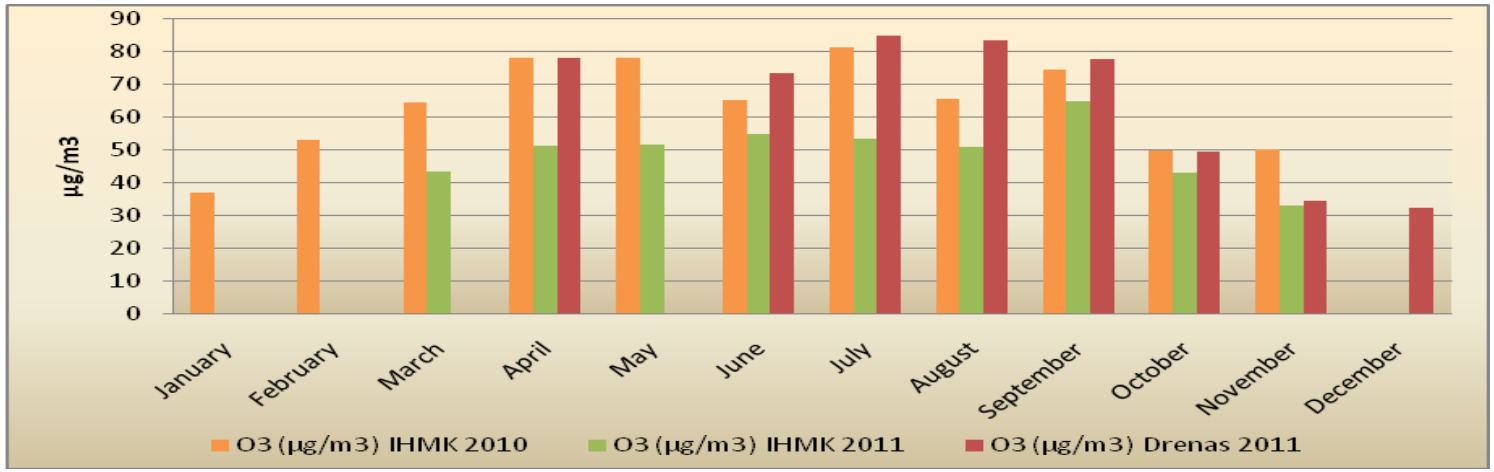


Fig.20. Monthly average values for O3 in Prishtinë-IHMK and Drenas, 2010 and 2011

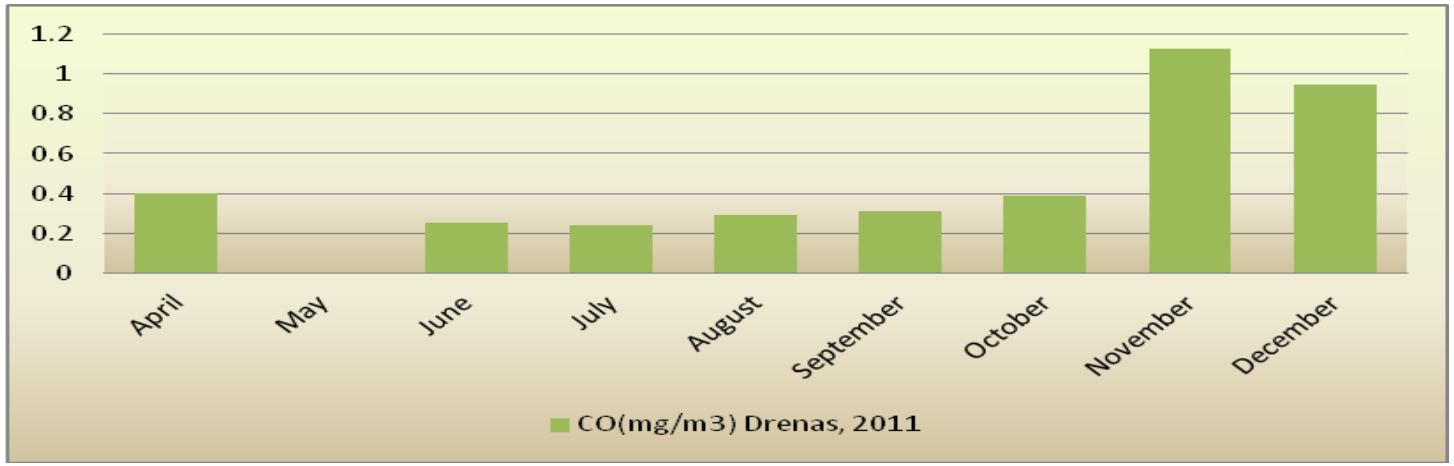


Fig.21. Monthly average values of CO mg/m3 at monitoring station in Drenas, 2011

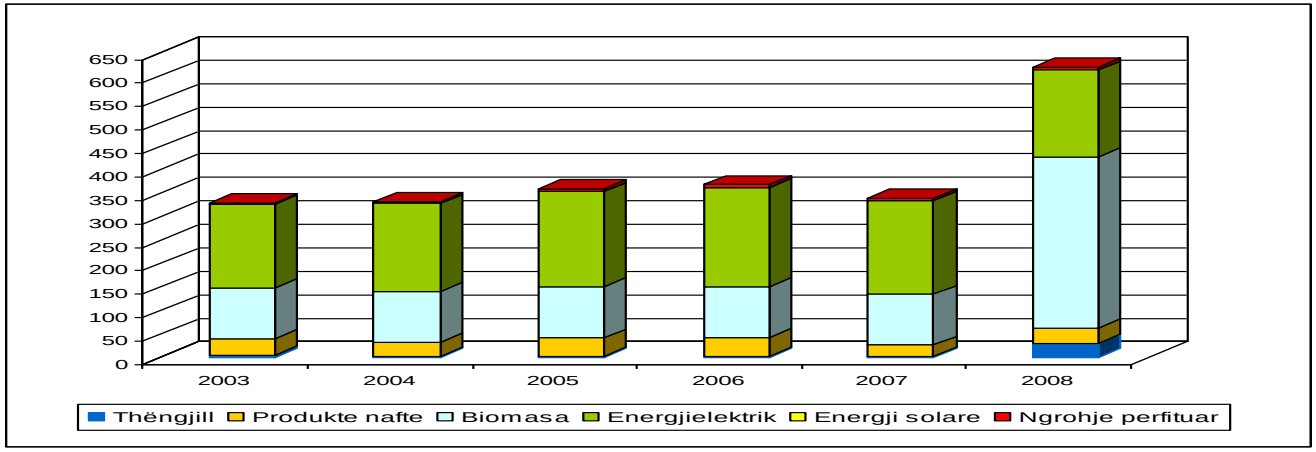
Annex II

Household

	2003	2004	2005	2006	2007	2008
Coal	4.63	2.19	3.87	3.57	2.16	30.84
Natural Gas						
Naphtha Products	35.42	30.13	38.40	39.73	24.96	33.020
Biomass	108.16	108.16	108.16	108.16	108.16	365.025
Electricity Energy	178.47	188.19	203.30	211.06	198.90	183,908
Solar Energy	0.05	0.05	0.06	0.08	0.09	0.11
Gained heating (Termokos)	4.07	4.66	5.96	6.26	5.11	6.947
Total	330.80	333.38	359.75	368.85	339.37	619.85

Tab. 1.[2] Types of energies (ktoe)[3] consumed in the household sector

Fig.1. The consumption of energy (ktoe) from biomass (wood) in the household sector compared to other energies



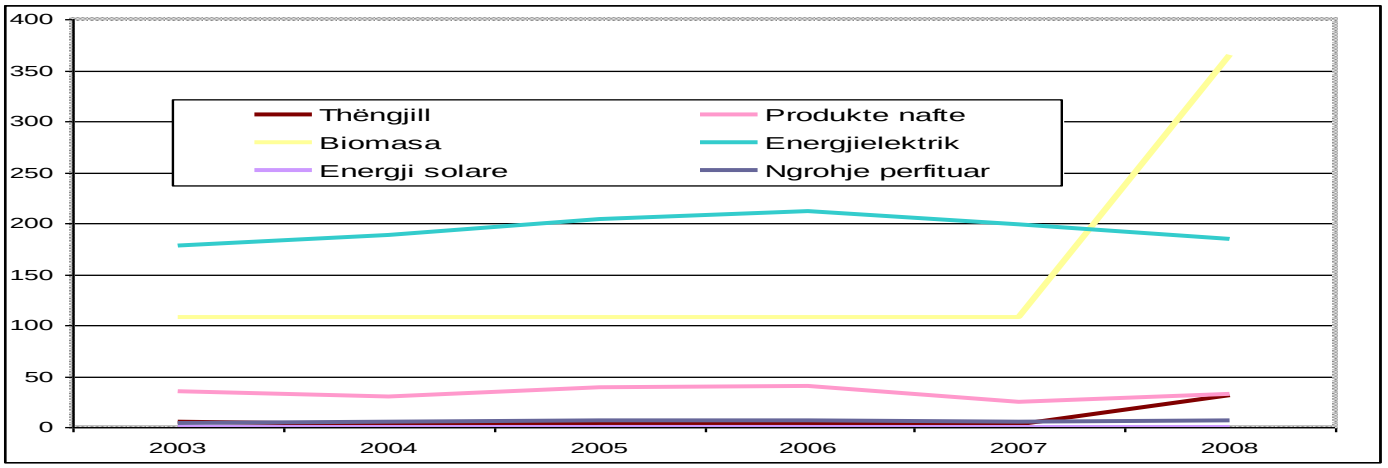


Fig. 2. Consumption of the energy per years in household sector

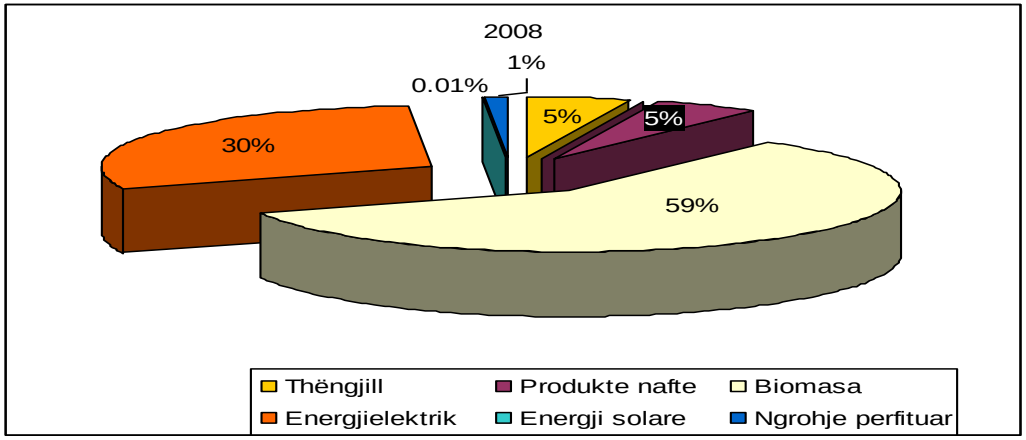


Fig. 3. Concentration of energy sources in the consumption of the energy in household sector for 2008

	2003	2004	2005	2006	2007	2008
Coal	6.17	2.92	5.16	4.76	4.32	30.23
Natural Gas	40.48	34.43	43.89	45.4	39.93	33.8
Naphtha Products						
Biomass	54.08	54.08	54.08	54.08	54.08	14.543
Electricity Energy	34.23	36.09	38.99	40.48	28.34	52
Solar Energy	0.02	0.03	0.03	0.04	0.04	0.2
Gained heating (Termokos)	2.71	3.11	3.97	4.17	3.41	1.73
Total	137.69	130.66	146.12	148.93	130.12	132.849

Tab. 2. Types of energies (ktoe)3) consumed in the public services sector

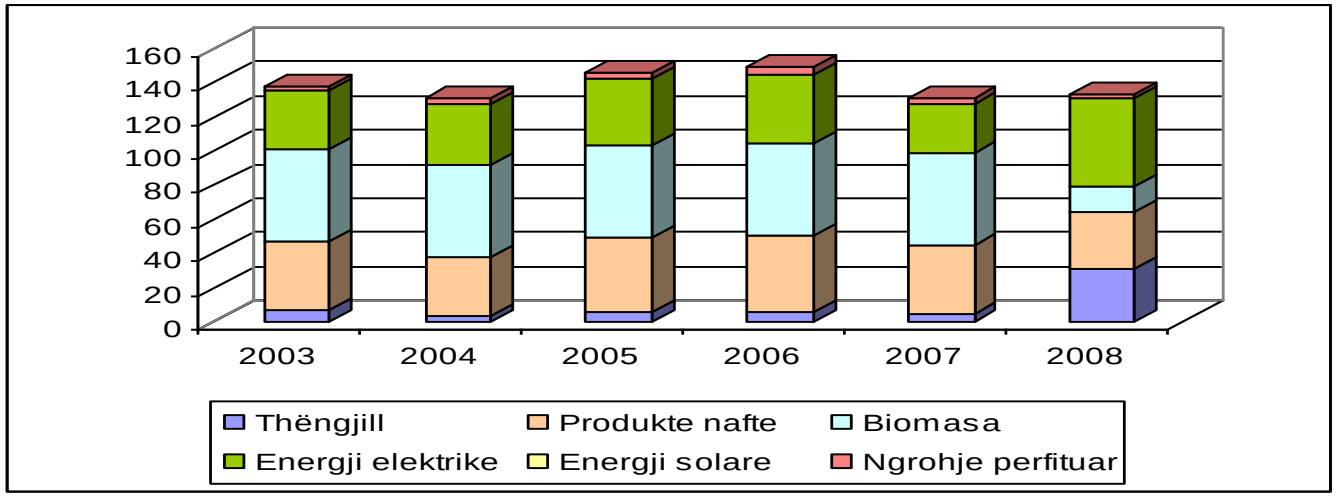


Fig. 4. Types of energies (ktoe)[3)] from biomass in public service sector compared to other energies

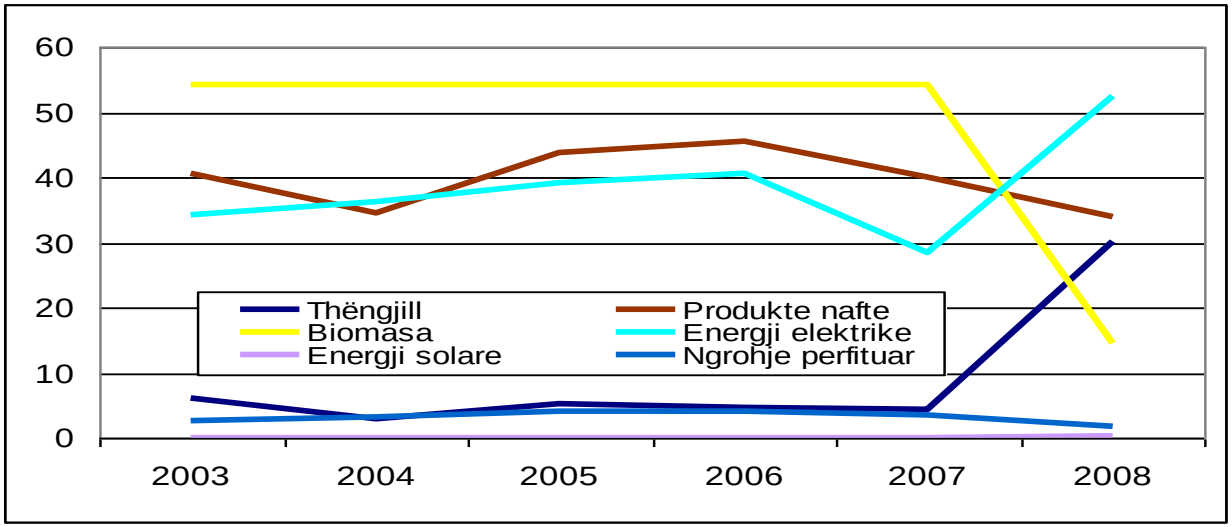


Fig. 5. Consumption of the energy per years in public service sector

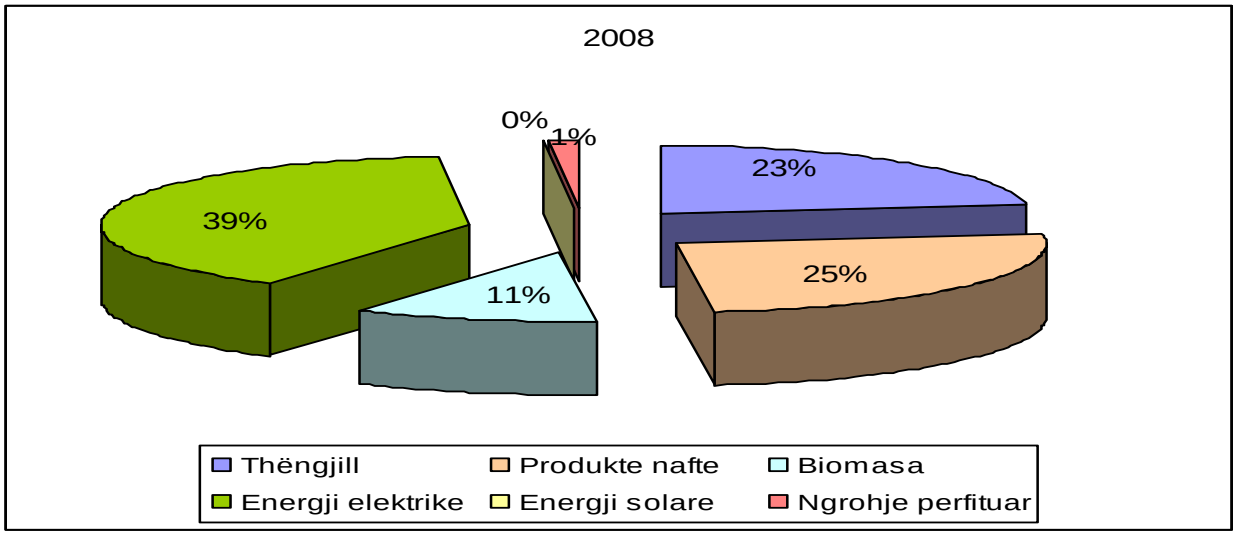


Fig. 6. Concentration of energy sources in the consumption of the energy public service sector for 2008

Furnace No.	Fuel	Foreseen capacity	Year of putting in the function
1	Mazut	58 MW	1978
2	Mazut	58 MW	1978
4	Mazut	4 MW	Used only for heating needs
Furnace to the hospital heating	Naphtha	2x7= 14 MW	1999/2000, not functioning

Tab. 3. Installed capacity of heating

Year	Consumption of the fuel for heating season 2008/2009	Production of heating for the heating season 2008/2009
Month	Total [t]	
October	25.13 t (for testing the equipments)	0, No production
November	1,534.2 t	14,631.247 MWh
December	2,300.8 t	23,045.465 MWh

January	3,084.19 t	28,520.179 MWh
February	2,494.33 t	24,732.754 MWh
Mars	2,168.57 t	24,622.80 MWh
April	536.12 t	5,965.014 MWh
Local furnace K-4		8,000.00 MWh
Total	12,143.34 ton	129,517.464 MWh

Tab.4. Quantity of the consumed fuel for the production of the heating for heating season 2008/2009

Number of consumers	**11,676.00**
Household consumers	10,848.00
Business consumers	697.00
Institutional consumers	131.00

Tab.5. The number of consumers connected in the heating system N.Q. "Termokos" sh.a Prishtina

	Parameters	Measurement unit	March 2009, Emission measured values				2007, Calculations of emissions
			Block 1		Block 2		Termokos
	Measurement time	h: min	11:41	11:58	12:53	12:59	
	Recalculated measurement						
10	Oxygen O2	%	5.43	5.23	2.82	2.74	
11	carbon monoxide i CO	mg/m3	1 . 4	0.0	4.9	2.5	
12	Carbon dioxide t CO_2	%	10.47	10.67	13.08	1 3 . 1 6	CO_2 , 38.130 t /year
13	Nitrogen oxides NOx	mg/m3	528	643	510	675	
16	Sulphur dioxide SO_2	mg/m3	2784.5	3172.6	3684.3	3627.5	SO_2 ,492 ton/year
31	Consumption of mazut max.	t/h	6	6	6	6	
32	Real consumption of mazutit	t/h	1 . 8	1.8	1.5	1 . 5	
33	Real loading of the block	%	30.00	30.00	25.00	25 .00	
34	Quantity if the gasses	m3/h	245115 .71	234120 .37	156011 . 97	157388.95	
35	Quantity if the standard gasses	nm3/h	19 9215 .80 1 8951s.85		13020. 70	132328.87	
	Remark: -Emission of SO_2 above the allowed values 400mg/Nm3), -Emission pf Nox above the allowed values (400mg/Nm3), -Quantity CO within allowed limits -use of mazut fuel with sulphur content 2%. -Termokos works with two furnaces -it is recommended to be used liquid additives with mazut for reduction of emission $S0_2$ from gas, - installation of filters for reduction of emissions of gasses into atmosphere						

Tab.6. Measured and calculated emissions of N.Q."Termokos",Prishtina

	Coal	Natural gas	Naphtha products	Biomass
Emission of SO_2	2324.4	0.0	387.1	611.4
Emission of NOx	283.3	0.0	188.0	2277.3
Emission of PM	1043.6	0.0	10.2	21254.1

Tab. 7. Emissions (t/year) form the household sector for small combustion plants in Kosovo 2008

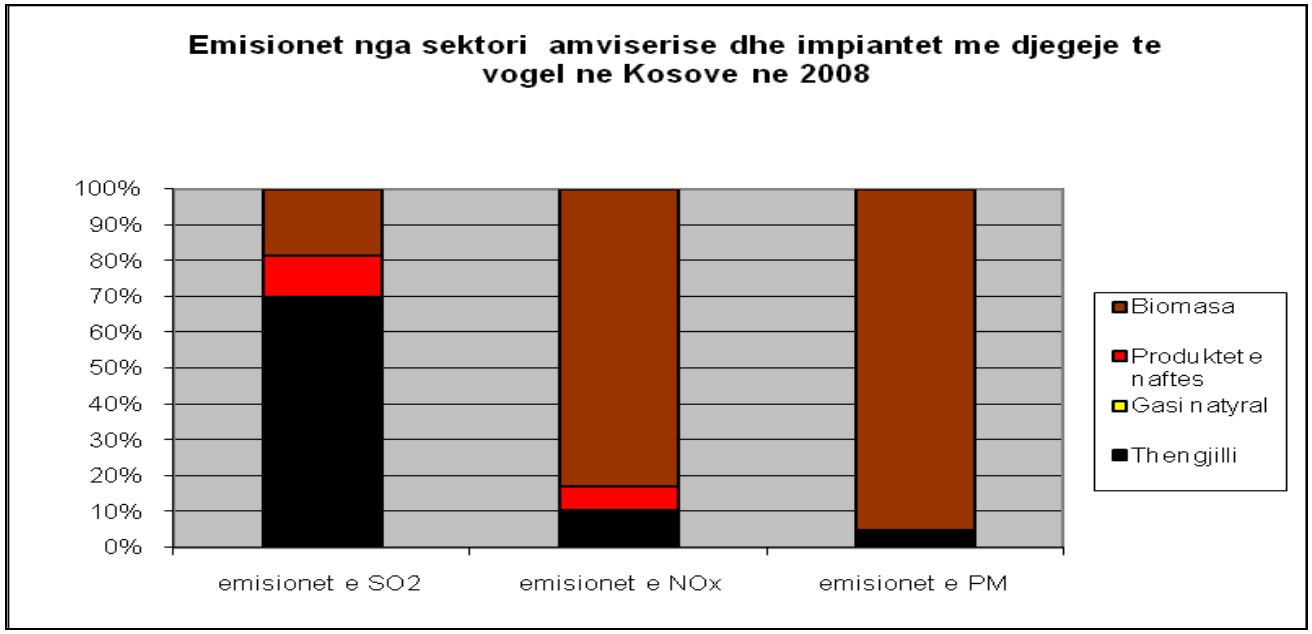


Fig.7. concentration on %, of the polluter emissions SO2, NOx and PM from biomass, naphtha products and coal

Energy

Power Plant block	Capacity of the Power Plant block (MW)			Type of fuel	Starting year of the work (oldness)
	Installed	Net	Available /Net		
Power Plant Kosova A					
Block A1	65	58	0	Lignite/Naphtha	**1962 (46)**
Block A2	125	113	0	Lignite/Naphtha	**1964 (44)**
Block A3	200	182	110-120	Lignite/Naphtha	**1970 (38)**
Block A4	200	182	110-120	Lignite/Naphtha	**1971 (37)**
Block A5	210	187	125-130	Lignite/Naphtha	**1975 (33)**
Power Plant Kosova B					
Block B1	339	309	240–260	Lignite/Naphtha	**1983 (25)**
Block B2	339	309	260 – 280	Lignite/Naphtha	1984 (24)

Tab. 1. Thermo-electro-generation existing capacities in Kosovo

Dust emission, 2007				
Month	**B1**		**B2**	
	(t/month)	(mg/Nm³)	(t/month)	**(mg/Nm³)**
1	157.70	103.13	787.80	**508.70**
2	184.93	104.95	373.20	**241.03**
3	169.70	141.00	124.60	**103.50**
4	128.00	95.00	183.20	**136.00**
5	212.60	136.00	319.00	**204.00**
6	168.00	141.50	181.70	**153.00**
7	122.50	150.00		
8	79.00	106.60		
9				
10	33.90	43.50	86.60	**111.00**
11	166.20	102.00	177.60	**109.00**
12	211.70	135.60	250.20	**160.20**
Average	**148.56**	**139**	**275.98**	**191.82**

Tab. 2. Measured emissions of the dust during 2007, for Power Plant B

Emissions of the dust during **2008**				
Month	**B1**		**B2**	
	(t/month)	(mg/Nm^3)	(t/month)	(mg/Nm^3)
1	211.50	130.60	246.80	152.40
2	370.60	137.80	367.00	156.70
3	196.80	168.00	114.90	64.60
4	250.20	64.60	180.30	111.00
5	279.70	259.00	103.70	96.00
6	-	-	52.60	68.00
7	272.20	216.00	113.40	90.00
8	192.00	175.00	297.30	271.00
9	315.90	202.00	351.90	225.00
10	347.60	233.10	356.90	239.30
11	272.70	158.00	428.00	248.00
12	285.30	159.30	441.10	248.00
Average	**272.22**	**173.04**	**254.49**	**164.16**

Tab. 3. Measured emissions of the dust during 2008, for Power Plant B

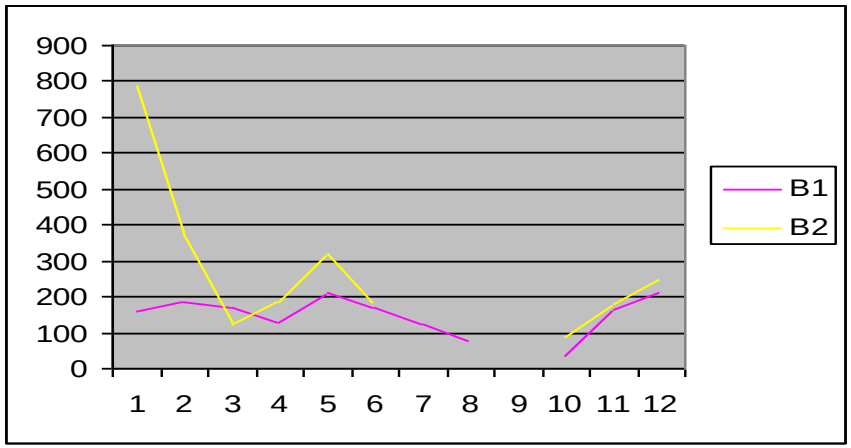
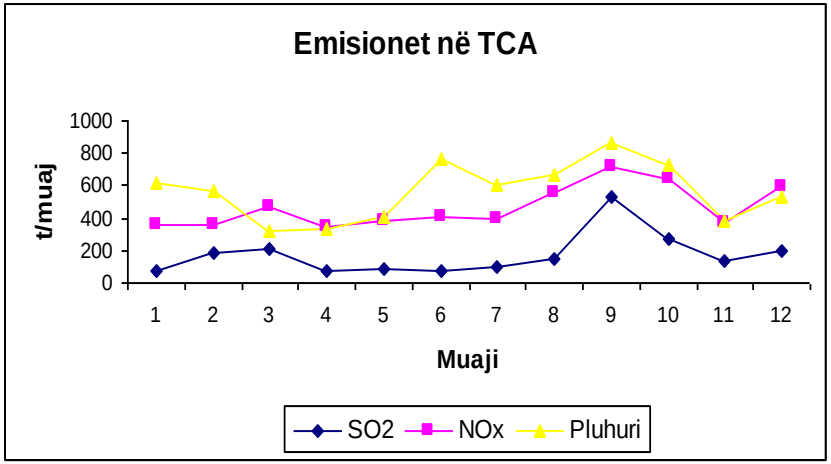


Fig. 1. Emissions of dust from Power Plant B,(t/month)

Calculated emissions for Power Plant A												
	Dust			SO_2			NOx			CO_2		
	t/month	mg/Nm³	kg/MËh	t/month	mg/Nm³	Kg/MËh	t/month	mg/Nm³	kg/MËh	t/month	mg/Nm³	kg/MËh
1	687.40	1386.00	7.54	66.76	136.00	0.74	354.12	723.00	3.94	129092.20	263739.00	1435.40
2	540.20	1058.00	6.06	195.75	383.00	2.19	350.77	687.00	3.94	134558.50	263544.00	1510.40
3	509.00	730.00	4.41	192.93	277.00	1.67	519.24	745.00	4.50	185480.20	266137.00	1607.50
4	325.90	672.00	3.78	104.04	214.00	1.21	346.80	715.00	4.03	128263.00	264422.00	1488.60
5	407.70	760.00	4.73	87.78	164.00	1.20	378.80	707.00	4.39	141606.20	264150.00	1643.50
6	752.70	1279.00	7.38	95.58	162.00	0.93	404.10	687.00	3.96	155052.00	263442.00	1520.60
7	585.40	966.00	6.07	90.69	150.00	0.94	388.98	642.00	4.03	149255.60	246174.00	1548.00
8	713.30	911.00	5.19	148.94	190.00	1.10	552.52	706.00	4.02	206639.00	263938.00	1505.30
9	872.60	886.00	4.93	544.67	553.00	3.10	711.78	723.00	4.02	260868.30	264829.00	1475.20
10	738.60	825.00	4.65	258.64	289.00	1.63	639.23	714.00	4.02	236723.20	264517.00	1490.60
11	362.90	696.86	3.93	138.68	266.00	1.50	371.97	714.00	4.02	139589.00	268045.00	1510.40
12	549.70	658.00	3.74	194.92	233.00	1.32	590.28	706.00	4.03	220811.10	264163.00	1505.70
Mes	**587.12**	**902.32**	**5.20**	**176.62**	**251.42**	**1.46**	**467.38**	**705.75**	**4.08**	**173994.86**	**263091.67**	**1520.10**
Calculated emissions for Power Plant B												
1	505.50	326.40	1.29	379.31	244.90	0.96	1323.20	854.40	3.37	419209.60	270700	1069.26
2	173.80	144.70	0.58	257.66	214.60	0.86	1003.90	835.90	3.37	317096.50	264039	1066.06
3	171.50	142.50	0.53	111.43	277.00	0.34	1094.10	909.10	3.40	320932.10	266669	999.06
4	190.10	141.10	0.57	233.35	173.20	0.71	1111.20	824.90	3.37	355973.80	264265	1081.17
5	315.10	201.60	0.83	170.93	109.30	0.45	1282.00	819.90	3.37	412588.50	263884	1086.21
6	217.40	183.00	0.77	194.45	163.70	0.69	972.20	818.70	3.46	313366.40	263873	1115.778
7	146.00	178.70	0.73	139.68	171.00	0.69	675.10	826.40	3.37	217605.30	266377	1087.81
8	85.40	115.30	0.48	133.54	180.30	0.76	590.10	796.70	3.37	194969.70	263222	1115.07
9	-	-	-	-	-	-	-	-	-	-	-	-
10	71.08	91.20	0.36	107.11	137.40	0.55	653.17	837.60	3.37	206228.30	264458	1064.36
11	148.06	90.88	0.37	405.69	249.01	1.02	1337.03	820.67	3.38	429947.40	263902	1085.30
12	163.20	104.50	0.42	583.39	373.60	1.50	1314.28	841.60	3.37	413088.00	264536	1060.79
Mes	**198.83**	**156.35**	**0.63**	**246.96**	**208.55**	**0.78**	**1032.39**	**835.08**	**3.38**	**327364.15**	**265084**	**1075.53**

Tab. 4. Monthly average values of specific emissions for Power Plant A and Power Plant B for 2007



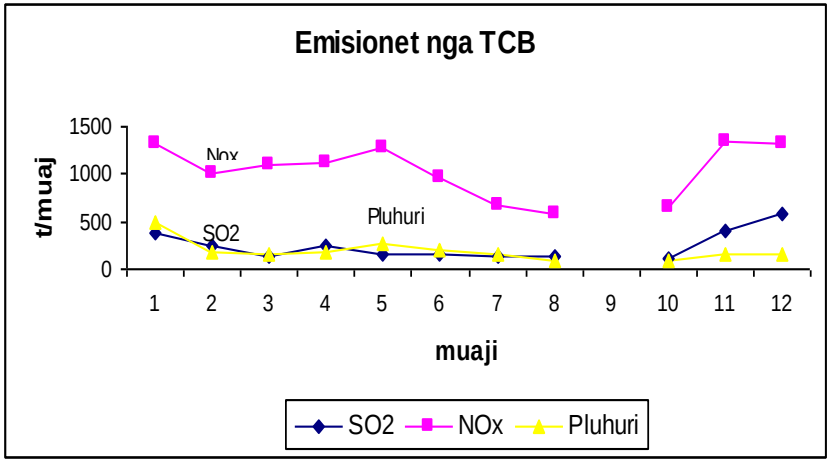
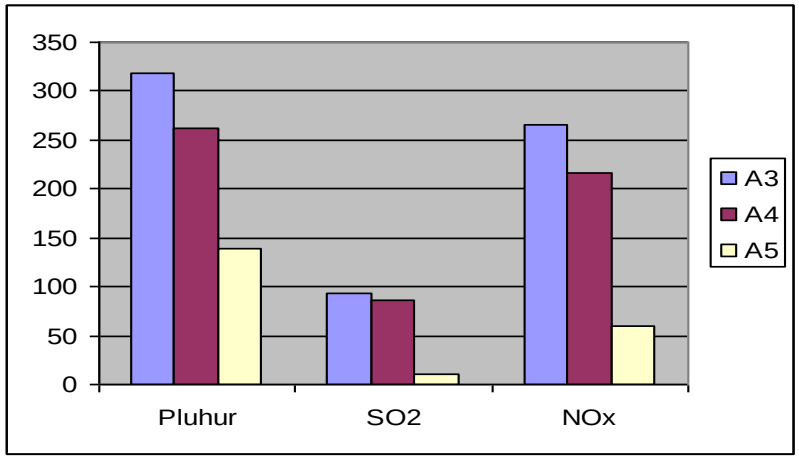


Fig. 3. Calculated emissions (t/month) during 2007 for Power Plant A and B

Tab. 5. Monthly average emissions calculated per blocks for 2007



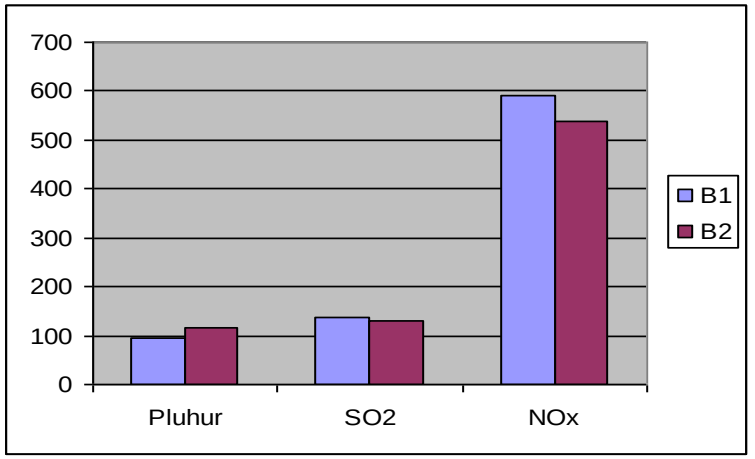


Fig. 4. Monthly average emissions (t) per blocks of Power Plant A

Fig. 5. Monthly average emissions (t) per blocks of Power Plant CB

Calculated emissions for Power Plant A													
	Production (MWh)	Dust			SO_2			NOx			CO_2		
		t/year	mg/Nm^3	kg/MWh	t/year	mg/Nm^3	kg/MWh	t/year	mg/Nm^3	kg/MWh	t/year	mg/Nm^3	kg/MWh
A3	813966	3952.40	863	4.73	2490.50	570	3.11	3149.30	709	3.86	1188911	267435	1458
A4	493304	2711.90	1002	5.52	1337.20	510	2.79	1908.30	709	3.91	725581.1	267517	1476
A5	65288	340.20	1036	5.60	316.00	963	5.21	249.00	705	3.81	93704.3	264113	1430
∑A	**1372558**	**7004.50**	**967**	**5.28**	**4143.70**	**681**	**3.70**	**5306.60**	**707**	**3.86**	**2008196**	**266355**	**1455**
Calculated emissions for Power Plant B													
B1	1654215	2138.50	287	1.35	3804.60	476	2.25	6312.90	817	2.70	2057069	265217	1235
B2	1968607	2852.70	360	1.59	5100.60	550	2.47	6987.80	815	3.67	2280942	267157	1198
∑B	**3622822**	**4991.20**	**323.50**	**1.47**	**8904.20**	**513**	**2.36**	**13300.70**	**816**	**3.18**	**4338011**	**266187**	**1216**

Tab.6. Monthly average total specific emissions calculated per blocks for 2008

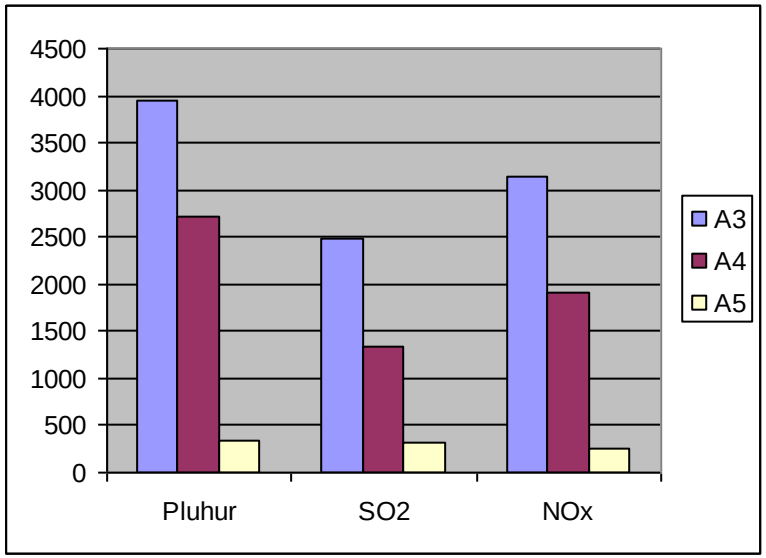


Fig. 6. Annual average emissions (t) for Power PantA

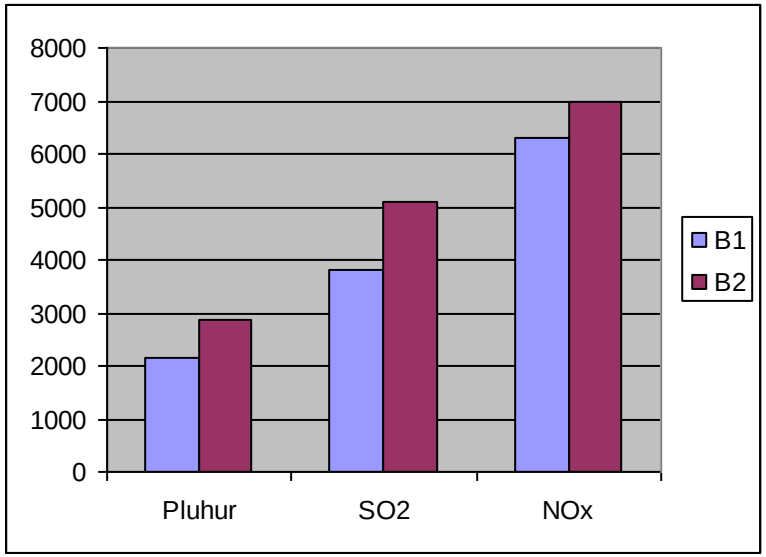


Fig. 7. Annual average emissions (t) for Power Plants B

Polluter	TCA		TCB		Limit	To be achieved
Dust	2007	2008	2007	2008	50	31 December 2017
	902.32	967	156.35	323.50		
SO_2	251.42	681	208.55	513	400	31 December 2017
NOx	705.75	707	835.08	816	500	31 December 2017

Tab. 7. Actually emissions (mg/Nm^3 6%O_2 dry) and limits according to the Directive 2001/80/EC

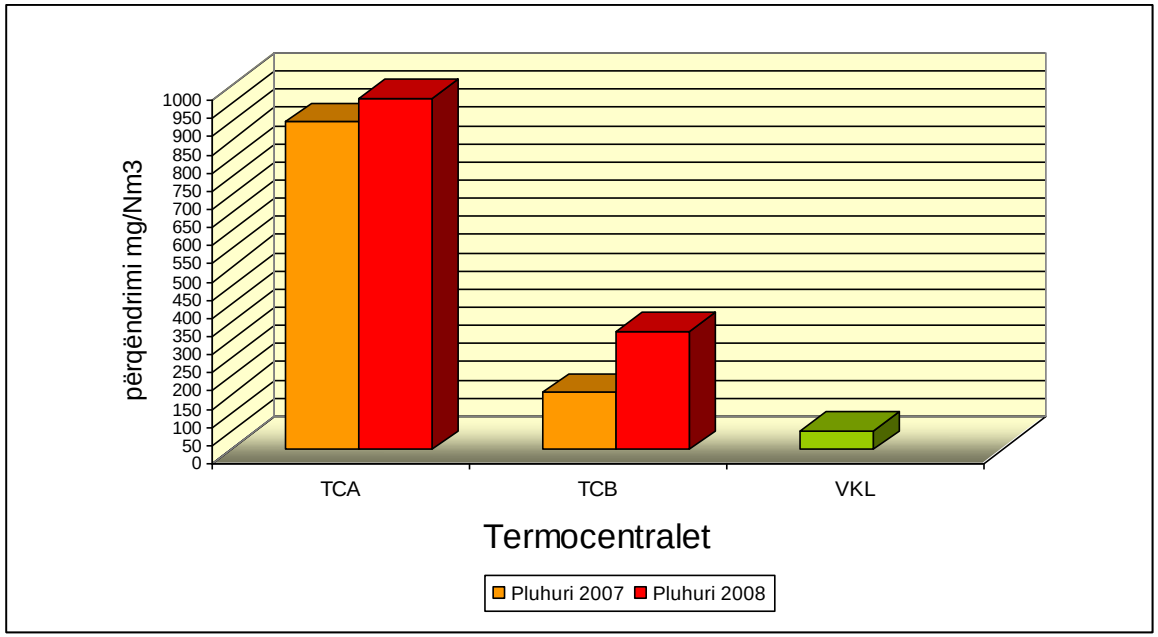


Fig 8a. Actually dust emissions (mg/Nm^3 6%O_2) for Power Plants (2007,2008)

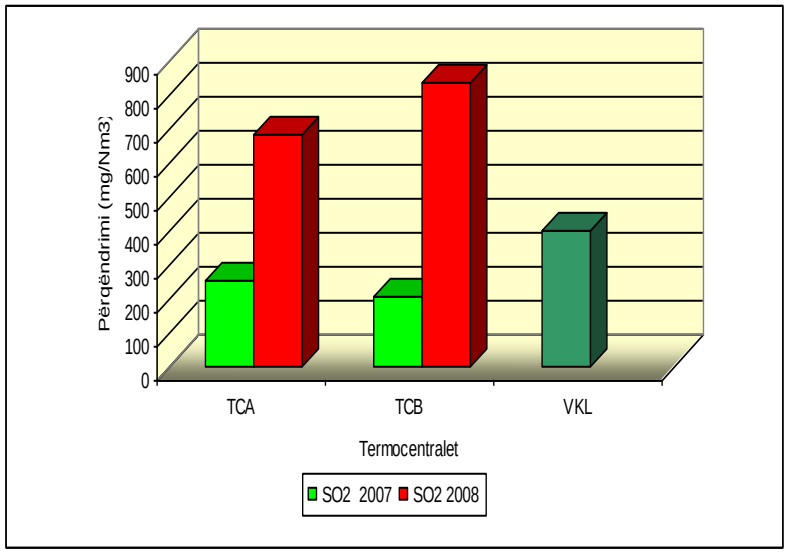


Fig. 8b. Actually emissions of SO_2 (mg/Nm^3 6%O_2), 2007, 2008

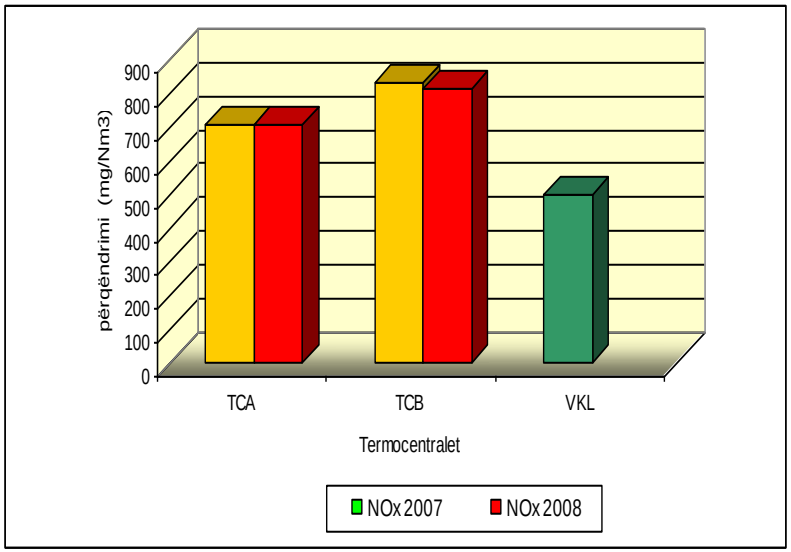


Fig. 8c. Actually emissions of NO_x (mg/Nm^3 6%O_2), 2007, 2008

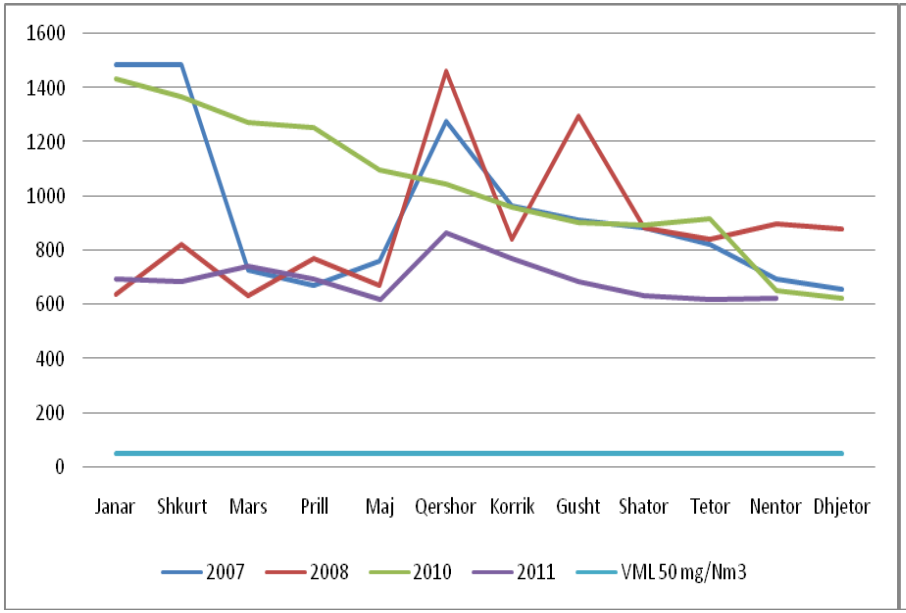


Fig. 9. Calculated emission od dust in mg/Nm3 for PPA during 2007-2011

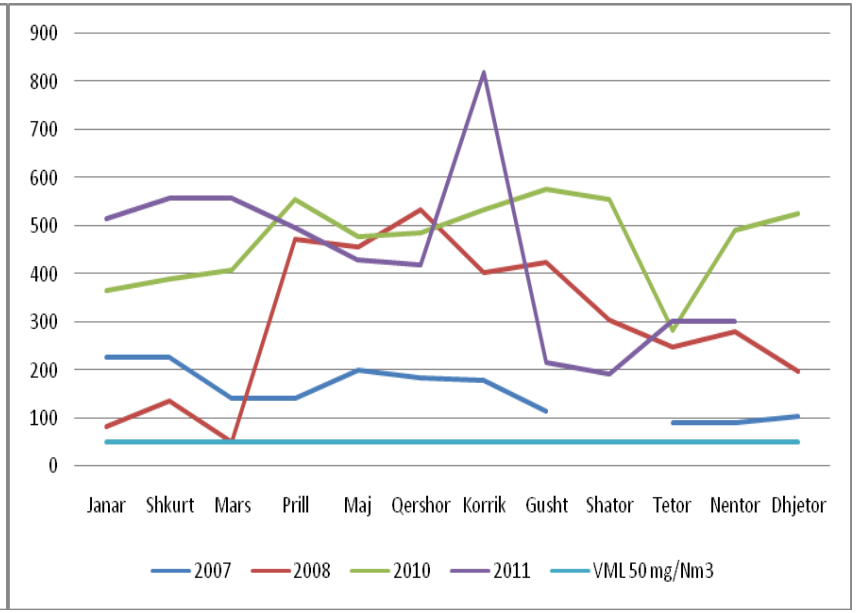


Fig. 10. Calculated emission od dust in mg/Nm3 for PPB during 2007-2011

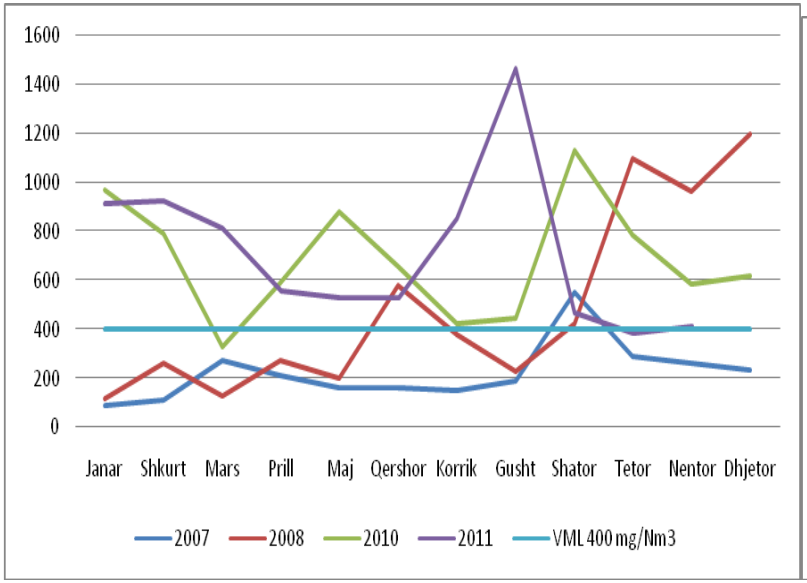


Fig.11. Calculated emissions of SO2 in mg/Nm3 for PP A during 2007 till 2011 [14]

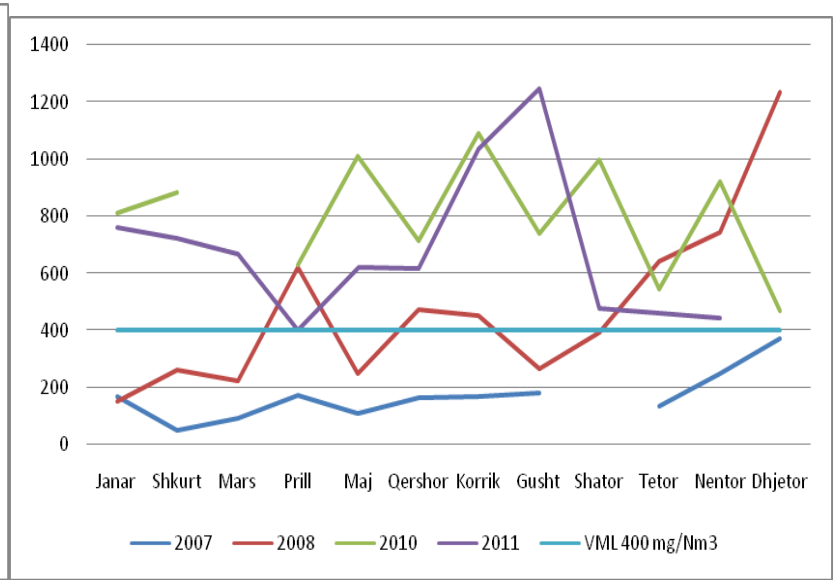


Fig.12.Calculated emissions of SO2 in mg/Nm3 for PP B during 2007till 2011 [16]

[16] Raportet vjetore dhe mujore të DMM-KEK

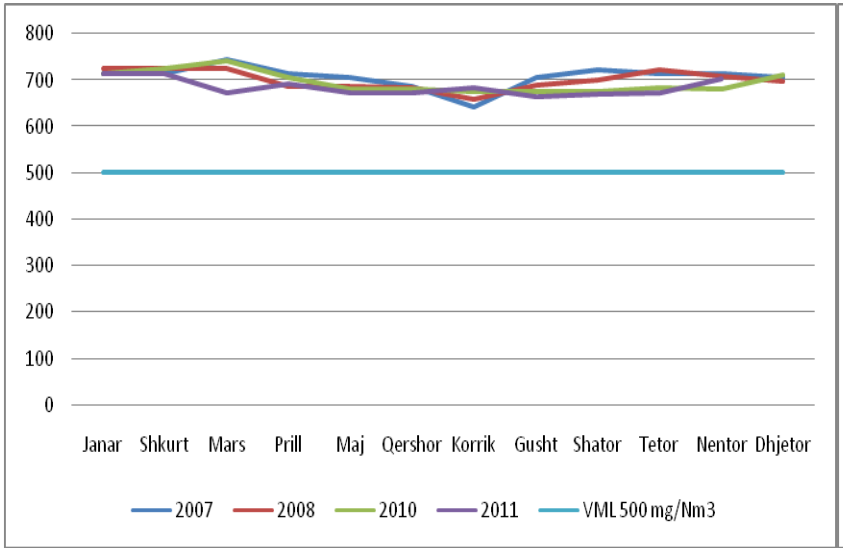


Fig 14. Calculated emissions of NOx in mg/Nm3 for PPB during 2007-2011

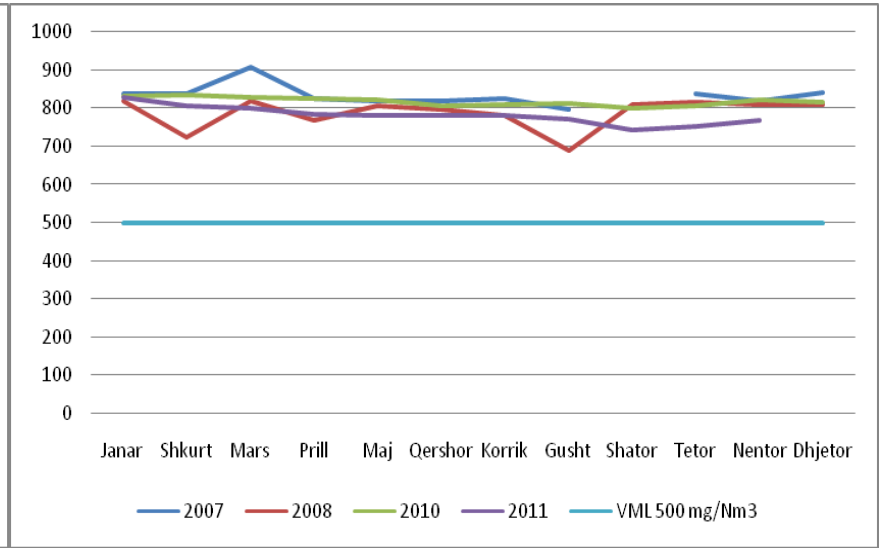


Fig13. Calculated emissions of NOx in mg/Nm3 for PPA during 2007-2011

Average concentration of SO_2 and soot				
Month	**SO_2 (µg/m³)**		**Soot (µg/m³)**	
	Kastriot	Bardh	Kastriot	Bardh
1	35.60	25.11	17.45	6.58
2	17.80	19.91	19.83	5.04
3	23.77	32.20	12.95	3.91
4	24.40	31.05	7.47	3.61
5	21.75	27.31	19.21	2.28
6	24.36	57.89	6.70	1.94
7	24.40	41.97	10.08	2.96
8	22.30	28.75	9.37	4.74
9	46.11	33.61	7.89	2.86
10	39.86	39.79	32.87	5.44
11	36.72	32.50	28.34	7.37
12	36.72	38.34	28.34	10.40
Average	**29.48**	**34.03**	**16.70**	**4.76**

Tab. 8. Monthly average concentration SO2 and soot during 2007

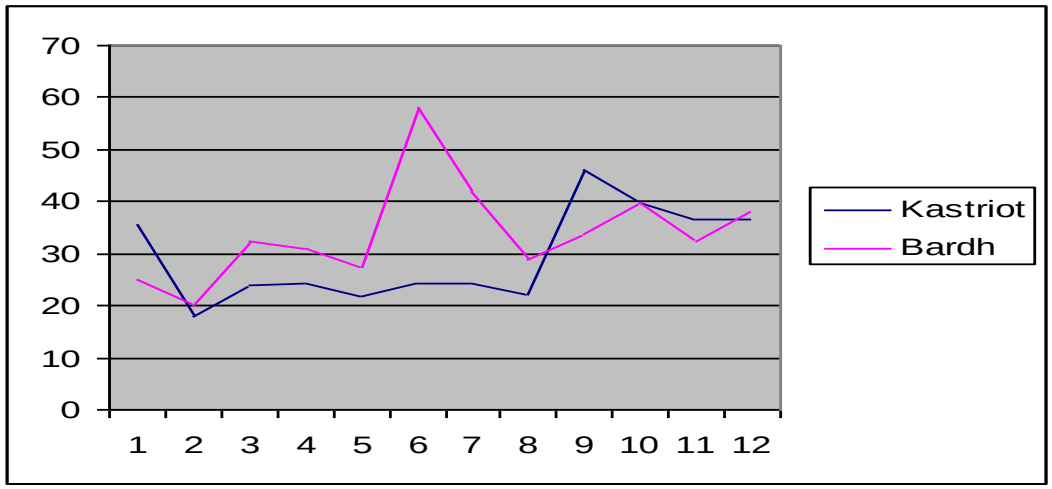


Fig. 15. Comparison of concentration of SO_2 in Kastriot and Bardh

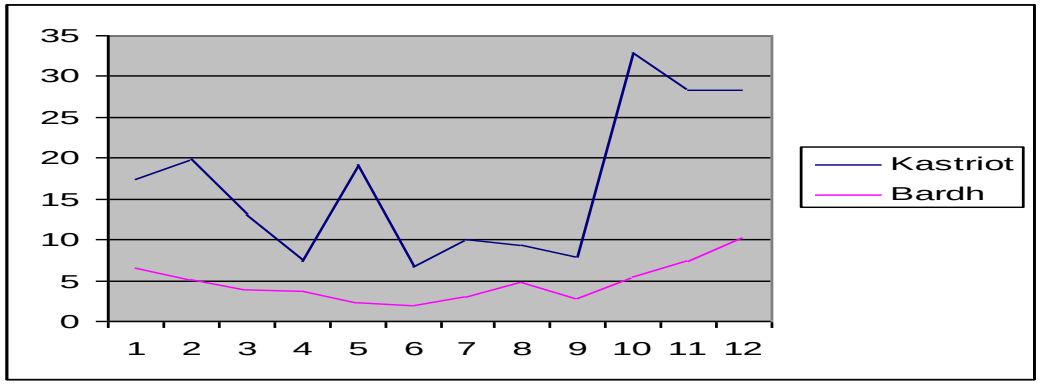


Fig. 16. Comparison of concentration of soot in Kastriot and Bardh

ANNUAL AVERAGE SEDIMENTS [mg/(m^{2}d)]																		
Year	Power Plant B						Kastriot						Separation					
	Total dust	Inorganic matters	Digestible matter	pH	Chlorine	Sulphate	Total dust	Inorganic matters	Digestible matter	pH	Chloride	Sulphate	Total dust	Inorganic matters	Digestible matter	pH	Chloride	Sulphate
2006	455	333.9	121.6	7.47	1.95	2.63	478.4	376.4	101.99	7.46	1.9	1.6						
2007	392.4	315.6	79.1	7.5.	1.90	4.1	385.4	313.12	72.3	7.31	2.28	2.46	1843.7	1695.1	148.8	7.9	2.8	**10.5**
2008	**245.70**	**172.93.**	**72.76**	**7.06**	**2.8**	**10.3**	**469.3**	**392.19**	**77.1**	**6.99**	**2.89**	**8.13**	**1.668.5**	**1510.8**	**157.7**	**7.3**	**3.o**	**8.4**

Tab. 9. Annual average sediments for 2006-2008-zona of generation

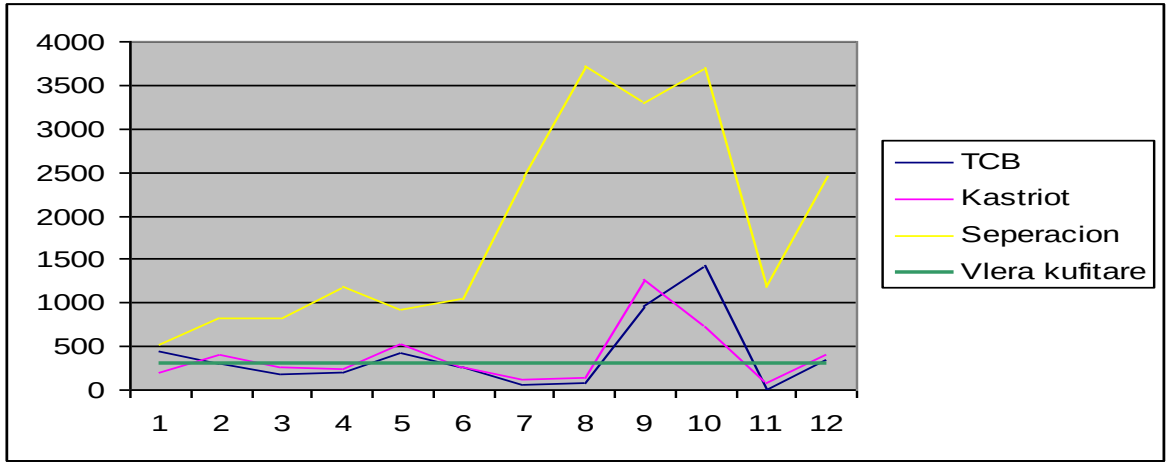


Fig. 17. Concentration of dust in three settlements during 2007

ANNUAL AVERAGE SEDIMENTS W[mg/(m^{2}d)]																		
	Bardh						Fuels station (Bardh)						Dardhishtë					
year	Total dust	Inorganic matters	Digestible matter	pH	Chlorine	Sulphate	Total dust	Inorganic matters	Digestible matter	pH	Chloride	Sulphate	Total dust	Inorganic matters	Digestible matter	pH	Chloride	Sulphate
2006													916	736.3	199.7	7.58	2.49	7.25
2007	88.56	45.88	42.68	7.04	2.20	3.20	376.20	272.7	103.4	7.62	2.33	3.59	328.8	218.2	110.6	7.64	2.05	3.97
2008	178.4	107.48	70.98	6.53	2.97	7.71	425.38	354.7	70.6	7.00	3.00	6.64	564.2	429.5	135.70	6.92	3.76	10.12

Tab, 10.Annual average sediment from 2006-2008- mining area

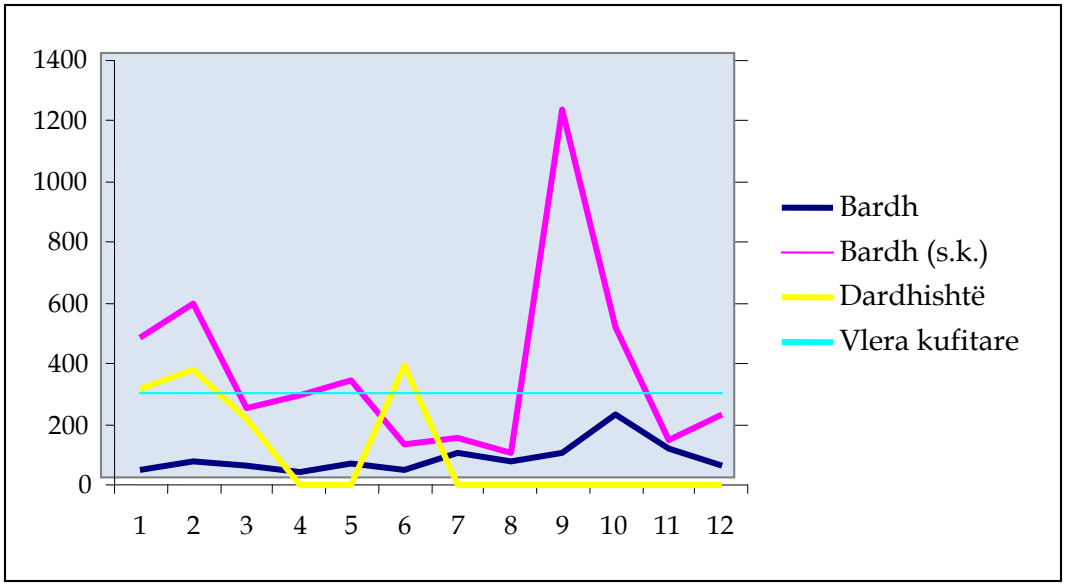


Fig. 18. Concentration of dust in three settlements during 2007

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Mes
(μg/m³)	73.68	80.54	44.22	38.46	54.05	47.44	92.50	65.08	80.47	75.92	79.55	242.59	81.16

Tab. 11. Average concentration of the suspended particles in the air (μg/m^3) in INKOS during 2007

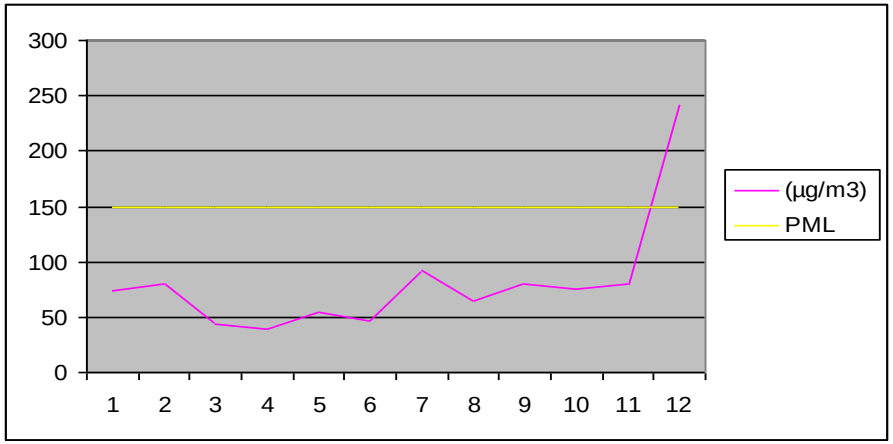


Fig 19. Concentration of the suspended particles in the air during 2007

Annex IV

Industry

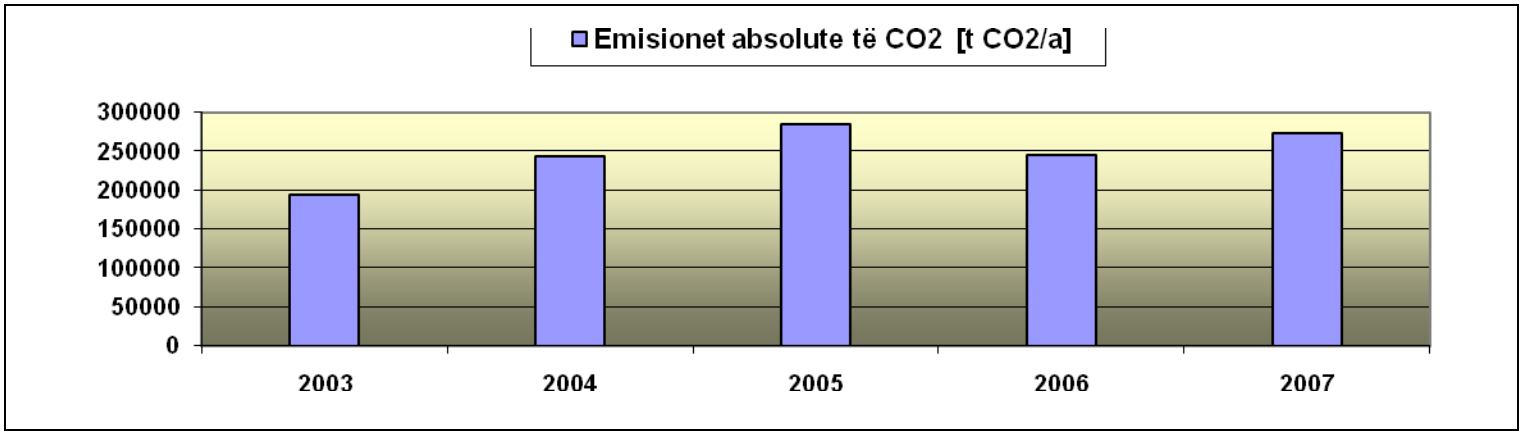


Fig. 1. Absolute emissions of CO_2

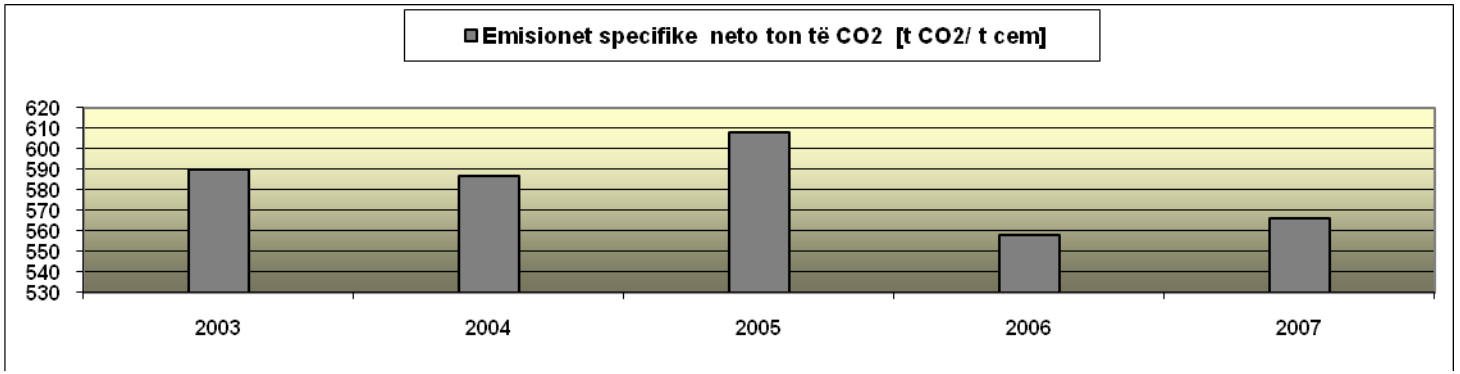


Fig. 2. Specific emissions of CO_2

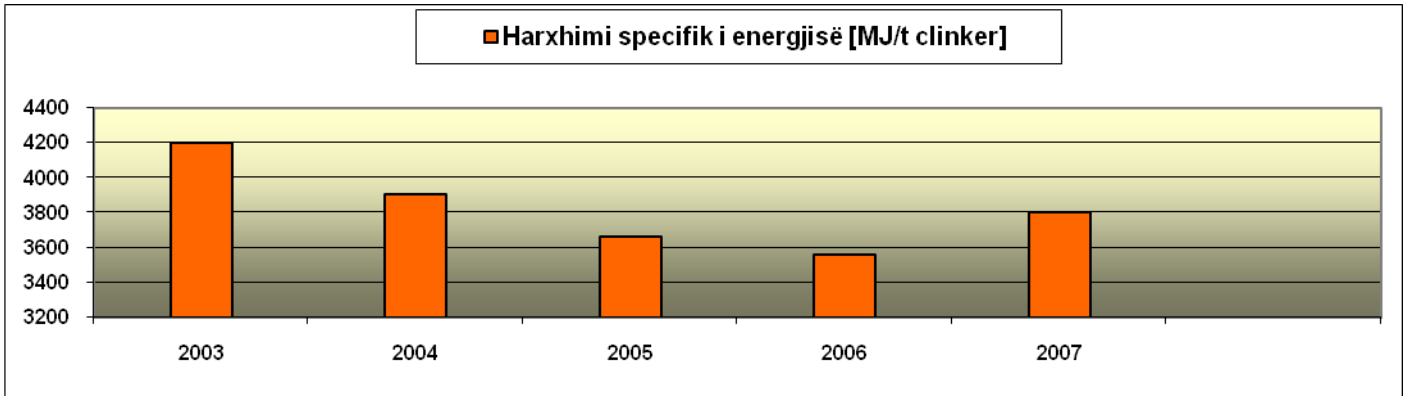


Fig. 3. Specific consumption of energy [MJ/t clinker]

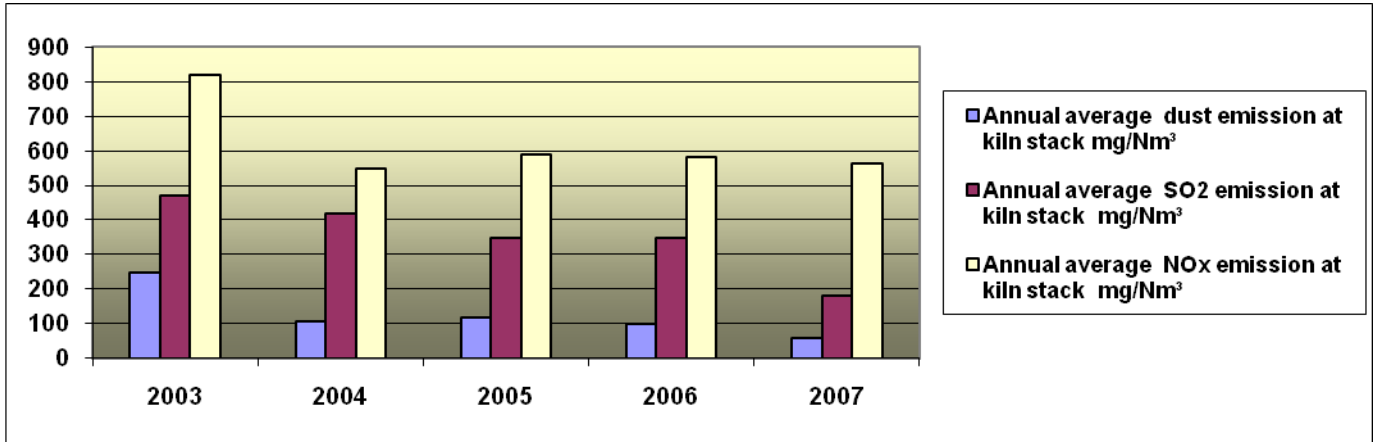


Fig. 4. Results of effective following of emission reduction

Production of clinker	Meas. unit	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007
Clinker production	ton/year	350,728	418,670	479,405	449,413	456,923
Cement production	ton/year	221,630	227,619	327,648	288,422	317,985
Flour Matter consumed	ton/year	378,558	462,723	555,498	489,612	529,778
Factor of clinker	%	71	69,23	70	66	65.01
Specific consumption of the fuel	Mj/tklink.	4,204	3,910	3,666	3,558	3,806
Specific consum. of electricity	Këh/tcem	116.36	115.23	114.25	104.78	105.17
Combin. consumption of furnace	%	88	95	93	98	98
Absolute CO2 emissions	t CO_2/year	1914,128	244,403	285,463	246,135	274,162
Specific net CO2 per ton cl.pro.	KgCO_2/tcl.	876	880	871	853	862
Specific net CO2 per ton cem. Pr.	KgCO_2/tcem	590	587	608	558	566
Annual aver. Val. Of emiss. of dust	mg/Nm^3	250	108	120	100	60
Annual aver. Val. Of emiss. SO2	mg/Nm^3	470	420	350	350	182
Annual aver. Val. Of emiss. Ox	mg/Nm^3	820	548	590	580	564
Noises during the day	dB	90	70	74	70	70
Noises during the night	dB	70	60	65	55	55

Tab. 1. Production of cement and emissions (2003-2007)

Sampling site	Code	2009	2008	2007	2006	2005
HMIK	*AM0*	197.816	195.871	155.587	207.932	205.601
Primary School "Bedri Gjina",	*AM10*	177.626	249.755	1248.054	130.225	120.345
Primary School. "Migjeni",	*AM11*	111.013	134.812	127.907	103.712	125.542
Shupkovc ,	*AM12*	222.723	328.78	213.197	273.773	301.23
Smerkovnica,	AM13			120.471	183.117	129.512
Primary School."Elena Gjika"	AM14	162.808	210.489	119.914	137.65	159.18
Industrial park "Trepqa"	AM15	187.515	1030.792	2898.926	125.336	142.021
OSBE,	AM16	180.882	769.76	2263.313	107.422	106.238
Tobacco factory,	AM17	88.637	78.559	1336.365	102.135	121.012
Water factory ,	AM18	66.468	104.272	79.21	97.682	132.279

Tab. 2. Annual average values of the total deposited dust (aero-sediment), in Mitrovica, for 2005-2009

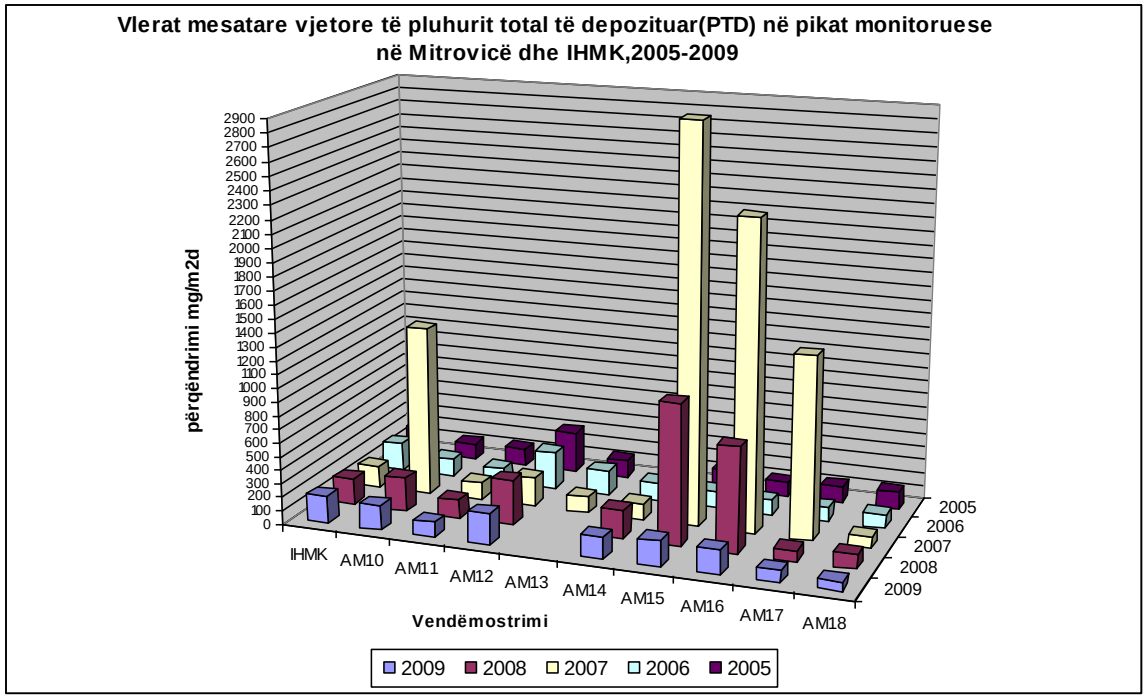


Fig.5. Annual average values of the total deposited dust in Mitrovica for 2005, 2009

Annex V

Transport

Kaçanik	Shtime	Fushë Kosova	Viti	Podujeva	Shtërpca	Prishtina	Lipjan	Gjilan	Kamenicë	Suhareka	Dragash	Malisheva	Rahovec
961	3927	5427	7763	5751	1590	53953	2159	16717	4756	11507	4629	8716	**12346**
Gjakova	Klina	Prizren	Feizaj	Mitrovica	Vushtrri	Skenderaj	Zveçan	Gllogoc	Obiliq	Novobërda	Istog	Leposaviq	**Zubin Potok**
21935	**5610**	**32143**	**20351**	**8303**	**7479**	**5484**	**228**	**7588**	**3791**	**286**	**4003**	**232**	**144**

***Tab.* 1. Statistics of the Vehicles Registration of Municipalities according to the data of the Ministry of Interior Affairs**.

Ferizaj	Fushë Kosova	Gjakova	Gjilan	Grcanica	Malisheva
32764	**5056**	**30087**	**30785**	**10836**	**5214**

Mitrovicë	North Mitrovica	Obiliq	Peja	Prishtina	Prizren	Rahovec	Suhareka
26826	**2230**	**3396**	**37839**	**86810**	**38818**	**11435**	**10279**

Tab. 2. Registration of vehicles according to the centres

2000	2001	2002	2003	2004	2005	2006
78965	53939	20539	23077	37376	46470	58548

Tab. 3. Registration of the vehicles per years

Year	Total	Vehicle	SUVs	Busses	Small busses	Truck	Lorry	Motorbike	Trailer	Other
2006	157729	120931	5136	817	11930	2921	7561	934	1100	6399

Tab. 4. Data on the level of Kosovo for 2006

Year	Total	Vehicle	SUVs	Busses	Small busses	Truck	Lorry	Motorbike	Trailer	Other
2007	188124	144610	6466	1063	13527	3490	9412	1307	1539	6710

Tab. 5. Data on the level of Kosovo for 2007

Year	Total	Vehicle	SUVs	Busses	Small busses	Truck	Lorry	Motorbike	Trailer	Other
2008	211301	159522	7346	1242	15095	4234	10630	2817	3344	7071

Tab. 6. Data on the level of Kosovo for 2008

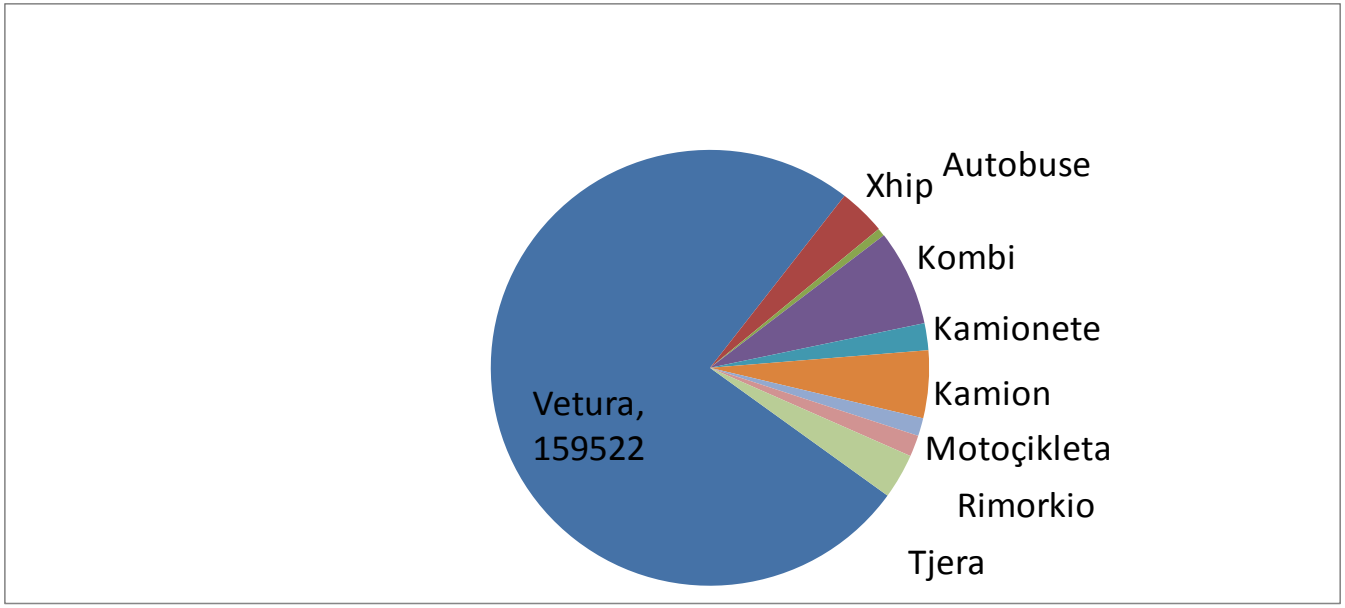


Fig. 1. Type of vehicles

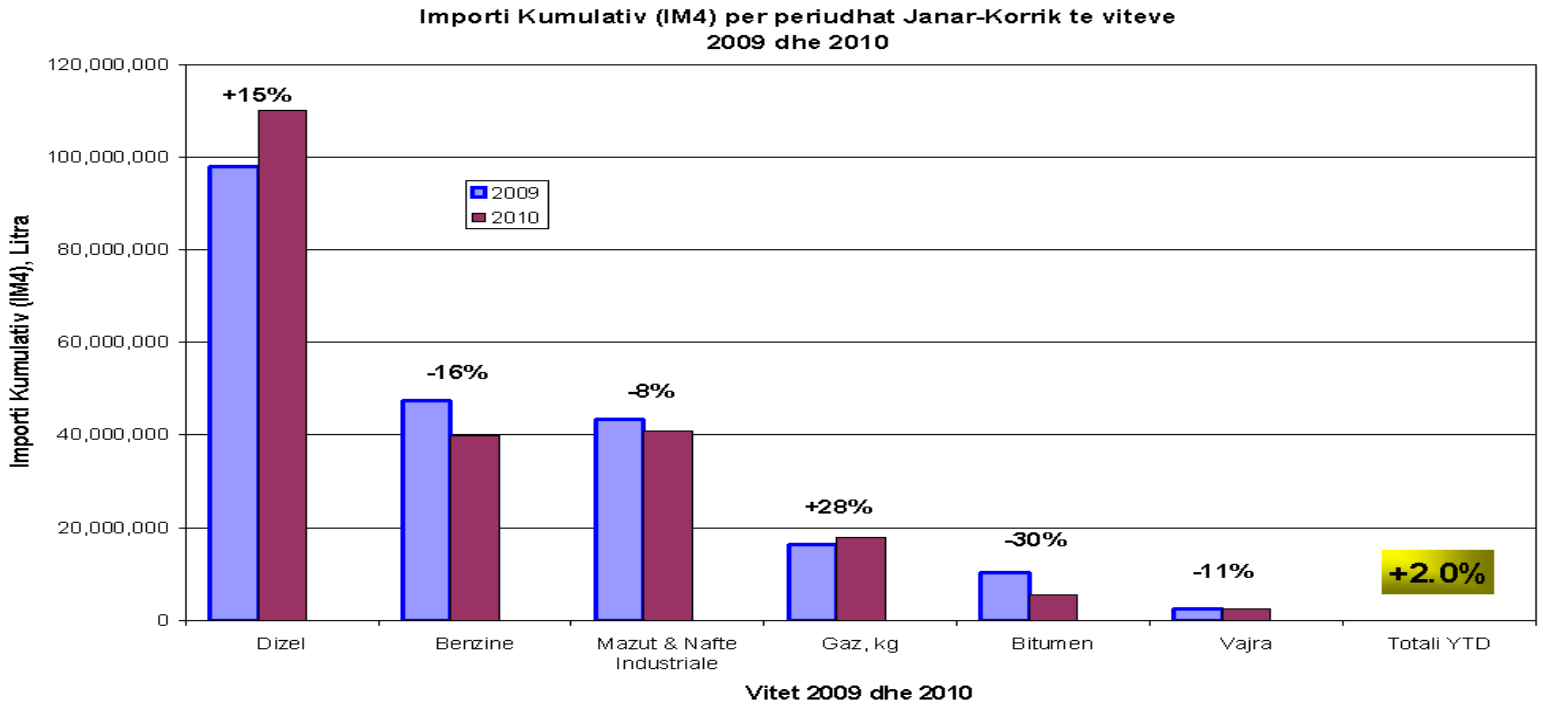


Fig.2. Cumulative import for January- July 2009-2010

Fig.3 presentation of increase of passengers' number in Prishtina Airport

Year	Aeroplane fuels / Litre	year	Antifreeze (litre)
2006	189 164 13	2006	54.383
2007	92103625	2007	30.203

Tab 7 . Consumption of fuel for the needs of Pristine Airport for 2006 and 2007

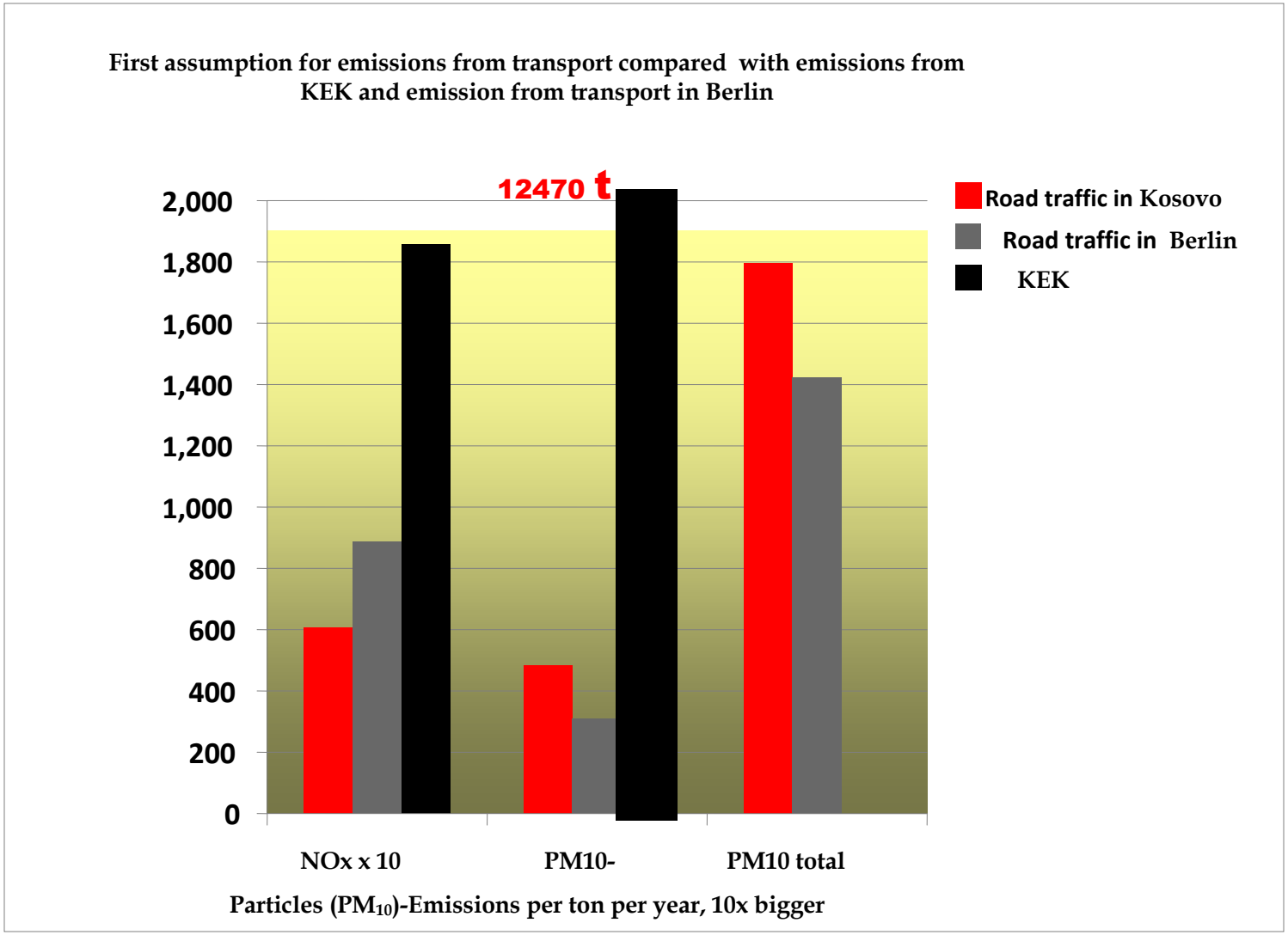


Fig.2. Emission from transport from KEK and emissions from transport in Berlin