Air Quality Governance in the ENPI East Countries

National Pilot Project – Azerbaijan

"Improvement of Legislation on Assessment and Management of Ambient Air"

Draft Action Plan Baku

Date: March 2014

Summary

PROJECT TITLE: Improvement of Legislation on Assessment and Management of Ambient Air

CONTRACT NUMBER: 2010/232231

COUNTRY: Azerbaijan

IMPLEMENTING ORGANIZATION

NAME   Azerbaijan Branch office of Regional Environmental Center for Caucasus

ADDRESS   100A, B.AGAYEV STREET, BAKU, AZERBAIJAN

TEL. NUMBER   +9944924173

CONTACT PERSON   IssaAliyev, director

SIGNATURE

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AUTHOR OF REPORT: AZERBAIJAN BRANCH OFFICE OF REC CAUCASUS

NAME OF KE EXPERT MONITOR AIGAKĀLA

ABBREVIATIONS

AQAM	Air Quality Assessment and Management
BAT	Best Available Technology
BCEC	Baku City Executive Committee
BMO	Baku Metropolitan Office
CC	Customs Committee
CM	Cabinet of Ministers
EIA	Environmental Impact Assessment
EMEP	European Monitoring and Evaluation Programme
EU	European Union
IPCC	International Panel on Climate Change
GEF	Global Environmental Facility
GHG	Greenhouse gas
NGO	Non-governmental Organization
NFSE	National Fund for Support to Enterpreneurship
NP	National Parliament
MAC	Maximum Allowable Concentration
MENR	Ministry of Ecology and Natural Resources
MoEI	Ministry of Economy and Industry
MoE	Ministry of Energy
MoEC	Ministry of Emergency Cases
MoEd	Ministry of Education
MoH	Ministry of Health
MoIA	Ministry of Internal Affairs
MoTr	Ministry of Transport
MoT	Ministry of Taxes
OSC	Open Stock Company
PSC	Project Steering Committee
REC	Regional Environmental Center
TSP	Total Suspended Particles
SAARES	State Agency onRenewable and Alternative Energy Sources
SCSP	State Committee on Standards and Patents
SOCAR	State Oil Company of Azerbaijan Republic
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Programme
USSR	Union of Soviet Socialist Republics
WB	World Bank
WHO	World Health Organization

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1. INTRODUCTION

1.1. SCOPE OF THE REPORT

Current National Pilot project– "Improvement of legislation on assessment and management of ambient air" is implemented within Air Quality Governance in ENPI countries project, funded by European Union. National Pilot project intends to achieve project goals through implementation of project activities in 3 directions: comprehensive overview and gap analysis of the existing legislative and institutional framework on air quality assessment and management; Draft action plan for Baku, and Draft National Strategy on Air Quality Assessment and Management.

Draft Action Plan for Baku city comprises information on climatological and geographical conditions affecting dispersion of pollutants in Baku area, overview of the air quality data available, analysis of the existing air quality monitoring data, current trends, source apportionment, emission data for Baku, pollution permits, emission data collection and storage, data validation and verification, fugitive sources.

Action Plan also provides information on air quality standards and objectives, main contributors to air pollution, and identifies target values and objectives to be reached, proposing realistic step by step objectives to be met by implementing measures listed in the current action plan.

Emission reduction measures in the current action plan are divided to technical measures, administrative and political measures, and legislative measures.

Action plan also has a chapter on recommendations on improvement of city planning, increasing public awareness and other issues related to air quality management.

1.2. BACKGROUND INFORMATION

General information

Baku city, being a capital of Azerbaijan, is situated on the shore of the Caspian Sea in the south of the Absheron peninsula. The city covers an area of 2.200 square km.

Baku and its surrounding areas in Absheron peninsula is the most industrialized region of the country and provides more than 90% of countries' whole economic production. Besides, recent raise in population number increased the level of emissions from communal and transport sector. Such rapid increase in number of population is not followed by planned legislative and institutional basis for regulating construction in the city. Baku city faces problems in terms of informal settlements and urban sprawl, as well.

At present, there are 12 administrative districts and 5 settlements in Baku city.

Demographic indicators

According to official statistics of 2013, 2,150,000 population lives in Baku city and surrounding areas, but unofficial number exceeds 4 million, taking into account huge number of temporary visitors to the capital city (traders, workers, guests etc.). Nearly 500,000 refugees as well as

Internal Displaced People from the occupied territories, currently reside in Baku. The lack of proper legislation allows the spread of illegal housing, but the deeper causes are related to migration, primarily due to employment opportunities in Baku city. More recently, people from poor rural regions have begun moving to Baku in search of better employment opportunities, while oil-driven growth has further intensified urban sprawl.

Analyzes of demographic indicators of Baku city show that there is an average increase in a number of population by 5.1% during last 4 years (according to official numbers increased from 2,045,000 in 2009 to 2,150,000 in 2013). It means population growth of 100 thousand or more every 4 years. Such tendency of increase of population leads to increase of transportation fleet, as well increase of emission from this sector and from commercial/residential and industrial sectors. Taking into account the mentioned tendency of economic and demographic increase of Baku city, it could be indicated the importance of improvement of air quality assessment and management issues and urgency of development of the Action Plan related to air quality for Baku city.

Main emission sources in Baku city

Preliminary assessments on air pollutants in Baku city show that main sources of ambient air pollution are the followings (including both stationary and mobile sources):

* Industrial facilities (including oil, non-oil, heavy and light industry) ;
* Thermal electricity production;
* Pollution from centralized heating systems of communal and residential sector;
* Autonomous heating systems (especially installed in new buildings);
* Construction sector (dust pollution);
* Transport sector (public transport, private automobiles, and ships).

This information is based on provided analysis during preparation of Second National Communication to UNFCCC, as well on expert judgement and opinion according to latest trends on statistical data related to socio-economic and demographic indicators.

According to statistical data of 2012, amount of emission of mobile sources in Baku city is 555.4 thousand tons, which is approximately 72% of total national emissions from mobile sources.

Table 1: Emissions from mobile sources in big cities (source: State Statistical Committee)

By years, in thousand tons	2007	2008	2009	2010	2011	2012
Total for country	**584.0**	**642.4**	**697.0**	**742.0**	**779.1**	**849.3**
Baku	410.7	451.8	474.0	504.6	529.8	555.4
Ganca	37.2	41.0	41.8	44.5	46.7	48
Mingachevir	6.4	7.0	7.0	7.4	7.8	9.9
Sumgayıt	8.2	9.0	8.4	8.9	9.3	11.2
Shirvan	5.0	5.5	5.6	5.9	6.2	8.8

The air quality limit values are exceeded for several pollutants and the levels are overall relatively high, which has negative impact on human health. In the period from 2005 to 2012 average daily concentrations of dust, NO_2, CO, HF, and formaldehyde have been regularly exceeding national air quality limit values; annual mean NO_2 concentrations also exceed EU limit value for this pollutant. Along with this, the total number of vehicles is increasing year-by-

year and almost 70% of vehicles (from total number of 1,0370,000; *source: State Statistical Committee*) are present in Baku city.

Various measures related to air quality management inBaku city have been implementedin previous years. For instance, measures related to air pollution from vehicles, control of the technical condition of vehicles, bringing emission levels into line with European standards (EURO 2), introduction of intellectual transport management system in Baku and upgrade of transport infrastructure have been implemented.

Related initiatives

It should be noted that, several actions on the reduction of air pollutants were purported in the concept of *"Azerbaijan 2020: look for the future"* considered the main development concept of Azerbaijan approved on December 29, 2012. In this regard, it is intended enlarge road protective greeneries with the purpose of the protection of ambient air from pollution in roadside areas, as well as reduction of traffic noise in the concept document. Likewise, preparation and application of national standards on the air pollution in compliance with the European standards on the harmful substances on the atmosphere was mentioned in the concept document. It was also pointed out that, the amount of energy used for an average GDP production and carbon dioxide emission in Azerbaijan during the period covered by this concept will be approaching the certain index on the countries of the Organization for Economic Co-operation and Development.

Regarding the initiatives related to city planning that is closely related to improvement of air quality, it should be mentioned the project on development of "Greater Baku Regional Development Plan" implemented by Baku Project Institute of the State City Planning and Architecture Committee. "Greater Baku Regional Development Plan" covers period till 2030 and it is currently under preparation. The plan is going to be approved soon.

The project covers 4 main areas:

- Collection of initial data and analysis of current situation;

- Analysis of environmental situation of Absheron peninsula (Greater Baku);

- Analysis of current situation and forecasting perspectives for development till 2030;

- Preparation of scheme of regional plan till 2030.

Main important measures indicated in Greater Baku Regional Development Plan which are related to improvement of air quality are the following:

- Resettlement of Sea Port to Alat settlement (80 km from Baku city in south-westdirection);

- Resettlement of oil terminals to Sangachal settlement (70 km from Baku city in south-westdirection);

- Dismantling of non-functioning industrial units situated in "Black City" and appropriation of the area for settlement;

- Construction of new "Baku White city" with total size of 221 ha;

Another initiative related to improving air quality in Baku city is "Baku White City" project. In accordance with the order of the Head of Baku Executive Power dated June 11, 2010, it was

decided to restore and redevelop the 'Black City' area, which is crossed by Nobel Prospect - the main route connecting the capital with its international airport, named after HeydarAliyev.

- Improvement of road and metro stations network, including construction of new above ground metro lines to airport named by H.Aliyev;

Being the oldest centre of the oil industry, Baku within a short period has turned into a large modern city. This is a rapidly developing city with increasing number of population, as well industrial units and transport which shows the importance of preparation of action plan for air quality assessment and management.

Architectural diversity, ecological compatibility and a considered integration of the new development into the existing urban context of the city were identified as major themes in the forming of the project concept. As a result, it was developed a project with fascinating architecture and investment opportunities.

Baku White City is oriented toward both local and foreign investment, offering a wide range of residential and commercial buildings of various sizes. Investors will be able to select suitable units for investment and construction, from small villas to large-scale urban projects.

Figure 1: Master Plan (Baku White City)

As another example of actions implemented in Baku city that is indirectly related to emission reduction it could be mentioned "Action plan for improvement of transport system in Baku city (2006-2007). Within that action plan a number of administrative and technical measures (prohibiting entrance of big trucks to the city at the certain time of the day, improving bus route scheme, constructing new parking facilities and so on) in transport system were implemented. There is also approved new "Action plan for improvement of transport system in Baku city (2008-2013) in the framework of which it is planned to construct 17 new road junctions and parking facilities.

1.3. OBJECTIVES AND LEGAL CONTEXT

Main goal of Draft Action Plan for Baku city is to propose sets of actions or measures in order to **improve air quality and reduce exceedances in limit values taking into account relevant EU directives**. In order to reach this goal, AQAM system in Azerbijan and in Baku city need significant improvements, which can be introduced by reaching the following step-by-step objectives:

⇒ **Step 1:** Improved capacity of staff working at air quality assessment and management sector;

It will include capacity building activities for current staff working at monitoring stations, dealing with modelling and other issues related to AQAM.

⇒ **Step 2:**Optimisation and improvement of monitoring network according to development of the city;

It will include measures to increase technical capacity of the stations, increase number of stations, modernisation of existing laboratories, and selection of substances to monitor in relevance with the EU directives, etc.

⇒ **Step 3:** Improvement of emission inventory system and establishment of new units, if necessary

It will include measures to form specific structures within MENR dealing with emission inventory issues.

⇒ **Step 4:** Identification of main emission sources and emission factors

This is very important for provision of sectoral assessments in order to indentify emission sources by sectors such as oil and gas sector, commercial and residential sector, transport and so on.

⇒ **Step 5:** Application of appropriate air pollution dispersion modelling system

It will include measures for application of modelling system for the whole Baku city.

⇒ **Step 6**: Effective monitoring data flow and reporting system established;
⇒ **Step 7:**Air quality limit values harmonized with EU standards and statistical reporting/verification systems compliying with EU standards are established;
⇒ **Step 8:** Increased public awareness on air quality issues
⇒ **Step 9**: Legislative basis in the field of AQAM approximated to EU directives

In order to achieve the objectives listed above there is a need for designing a detailed action plan taking into account current initiatives in this field, relevant stakeholders and time frame.

Legal context

Environmental policy of Azerbaijan is focused on improvement of ecological condition throughout the country, paying particular attention to various areas, including water, land, air quality, protected areas and so on. Azerbaijan has ratified3 international conventions that are directly related to protection of air quality: The Convention of Long Range Transboundary Air Pollution, the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer and the United Nations Framework Convention on Climate Change.

Along with this, the government has strict policy towards integration to EU. In this regards, the government has adopted action plan on approximation of legislative basis to EU directives 2010-2012. There are measures related to improvement of legislation of air quality management and its approximation to EU directives.

Current report provides Draft Action Plan for Baku city aiming to assess present situation in air quality, data available, and sources of emissions and propose sets of actions, definition of long and short term air quality objectives for Baku and recommendations on increasing public awareness on air pollution.

2. AIR QUALITY IN BAKU CITY

2.1. CLIMATE AND GEOGRAPHICAL CONDITIONS

Baku is situated in the South of Absheron peninsula, on the coast of the Caspian Sea, on the 40° parallel. Baku territory is stretching along the sea bay for approximately 20 km and has total area of 2,2 thousands km^2.

Baku city is located at depression zone of Absheron peninsula in amphitheatre form with the altitude starting from minus 27 m and continuing to 110 m. It has dry subtropic climate. Most days of the year are cloudless days. Local circulation of air affects the climate of the area. Meteorological and geographical conditions affecting dispersion of harmful substances in Baku city are calculated according to the indicators provided below:

Table 2: Meteorological characteristics and coefficients affecting dispersion of harmful substances in the ambient air of the city

Name of characteristics	Amount
1. Coefficient depending on atmospheric stratification, A	200
2. Relief coefficient of the city area	1,0
3. Maximum ambient temperature of the hottest month	28,3
4. Maximum ambient temperature of the coldest month	3,8
5. Wind distribution (mean value), %-	
North	38
North-East	3
East	19
South-East	2
South	12
South-West	7
West	2
North-West	17
6. Wind speed according to multiannual mean values (repeated positive error 5%), м/s	
	14

Baku has dry subtropic, semi-arid climate (Köppen climate classification) with warm and dry summers, cool and occasionally wet winters, and strong winds all year long. However, unlike many other cities with this climate, Baku does not see extremely hot summers. This is largely because of its northerly latitude and the fact that it is located on a peninsula on the shore of the Caspian Sea. Baku and the Absheron Peninsula on which it is situated, is the arid part of Azerbaijan (precipitation here is around or less than 200 mm in a year). The majority of the light annual precipitation occurs in seasons other than summer, but none of these months are particularly wet.

At the same time Baku is noted as a very windy city throughout the year, and gale-force winds, the cold Northern wind Khazri and the warm Southern wind Gilavar are typical here in all seasons. Indeed, the city is renowned for its fierce winter snow storms and harsh winds. The speed of the Khazri sometimes reaches 144 kph (89 mph), which can cause damage to crops, trees and roof tiles.

The daily mean temperature in July and August averages 26.4 °C, and there is very little rainfall during that season. During summer the Khazri sweeps through, bringing desired coolness. Winter is cool and occasionally wet, with the daily mean temperature in January and February averaging 4.3°C. During winter the Khazri sweeps through; driven by masses of polar air; temperatures on the coast frequently drop below freezing and make it feel bitterly cold.

Winter snow storms are occasional, snow usually remains only for a few days after each snowfall.

2.2. OVERVIEW OF THE AIR QUALITY DATA AVAILABLE

Air quality monitoring

Monitoring of pollution of ambient air in the territory of the country, as well in Baku city, is conducted by the National Monitoring Department for Environment in accordance with the statute "On the rules of implementation of state monitoring of the environment and natural resources" prepared by the Ministry of Ecology and Natural Resources, and approved by the resolution No.90 of the Cabinet of Ministers of the Republic of Azerbaijan dated 1 July, 2004.

There are 3 categories of observation and control stations in order to determine concentration of sulphur dioxide, carbon monoxide, nitrogen dioxide, dust, phenol, and other noxious substances: on-site observations, one-time observations under smoke and gas torches, and stationary monitoring stations. It is purposed for performing regular observations, taking air samples, and conducting meteorological observations via measuring instruments in areas requiring mobile stations. During the process of sampling nitrogen dioxide, dust, soot, hydrogen sulphide, sulphur dioxide, carbon monoxide, and furfural samples are taken from the ambient air through aspirator. Samples are taken at a height of 1.5 m above ground level within twenty minutes.

On-site observations and monitoring are carried out in the vicinity of railway station, National Park (boulevard), "Azneft" square, Baku Executive Power, area called "beshmartaba", and US embassy. These observations and monitoring are carried out via automobile in different periods of each month (it should be noted that, special vehicle supplied with devices and equipment is not available for use as a laboratory due to the lack of its equipment with spare parts because of financial shortage).

Under-torch posts are intended for one-time observations under smoke and gas torches. Currently, under-torch observations are conducted at the "Oil refinery" and "Azerneftyag" plants named after H.Aliyev in spring once a year. Taking of air samples is carried out by taking three samples in the direction of wind at a distance of 0.2, 0.5 and 1 km from source of contamination.

Observations on the pollution of ambient air are carried out at stationary and mobile stations. Stationary and mobile stations on national scale are supposed to be arranged by taking into account the area, landscape, industrial development, mobile waste sources, and number of population of each city (settlement) as follows:

⇒ 50,000 inhabitants - 1 monitoring station;
⇒ 50,000-100,000 inhabitants - 2 monitoring stations;
⇒ 200,000-500,000 inhabitants - 2-3 monitoring stations,etc.

Monitoring and observation of pollution of ambient air in Baku city is conducted at 9 observation stations located in Baku city on the basic polluting ingredients (dust, sulphur dioxide, nitrogen oxide and carbon monoxide), and specific harmful substances (soluble sulphates, hydrogen sulphide, soot, solid fluoride, hydrogen fluoride, mercury, ammonia, chlorine, sulphuric acid, formaldehyde, phenols, furfural) on working days only at 7 am, 1 pm, and 7 pm.The number of stations is not compliant with above-mentioned criteria, as according to official statistics of 2013, number of population is 2,150,000, but unofficial number exceeds 4 million.

Table 3: Monitoring stations situated in Baku city

Station #	Address	Analysed substances
No 5	Sabail district, GurbanAbbasov 16 (40°20'50.02"N, 49°50'12.66"E)	Sulphur dioxide, nitrogen dioxide, carbon monoxide, soot, hydrogen sulphide
No 15	Nizami district, G.Garayevave. 71(40°25'4.51"N, 49°55'53.61"E)	Nitrogen dioxide, carbon monoxide, soot, hydrogen sulphide, furfural
No 17	Narimanov district, HeydarAliyevave. 66(40°24'43.96"N, 49°53'50.33"E)	Dust, soluble sulphates, nitrogen dioxide, nitrogen monoxide , carbon monoxide, soot, sulphuric acid, formaldehyde, furfural
No 19	Binagadi district, micro-district No 9 Mir Jalal str. 127 (40°24'59.73"N, 49°48'29.65"E)	Nitrogen dioxide, hydrogen fluoride, solid fluoride, chlorine, formaldehyde
No 38	Khatai district, NZS sett.,Babakave. 66. (40°23'24.78"N, 49°54'4.39"E)	Dust, sulphur dioxide, nitrogen dioxide, hydrogen sulphide, ammonia, formaldehyde, furfural
No 39	Sabail district, Bibiheybatsett., Maktabli str. 40 (40°20'17.99"N, 49°50'1.96"E)	Dust, sulphur dioxide, nitrogen dioxide, carbon monoxide, hydrogen sulphide
No 40	Sabunchu district, Mammadaliyev str. 6, (40°26'37.66"N, 49°56'35.38"E)	Dust, sulphur dioxide, nitrogendioxide, carbon monoxide, hydrogen sulphide, furfural
No 48	Yasamal district, Sharifzadeh str. 174, (40°24'14.90"N, 49°48'11.40"E)	Dust, sulphur dioxide, nitrogen dioxide, carbon monoxide, soot, formaldehyde, furfural
No 49	Khatai district, KhuduMammadov str. 3, (40°22'11.17"N, 49°57'7.62"E)	Nitrogen dioxide, sulphur dioxide, carbon monoxide, soot, hydrogen sulphide

Map of monitoring stations situated in Baku city, as well google view is provided in figure 2 (Google view of all stations is provided in Annex 1; a Google map with detailed info on all monitoring stations is also available at https://mapsengine.google.com/map/edit?mid=zEueWpTTY60k.kqOoievyrSiQ):

Figure2: Map of monitoring stations located in Baku city
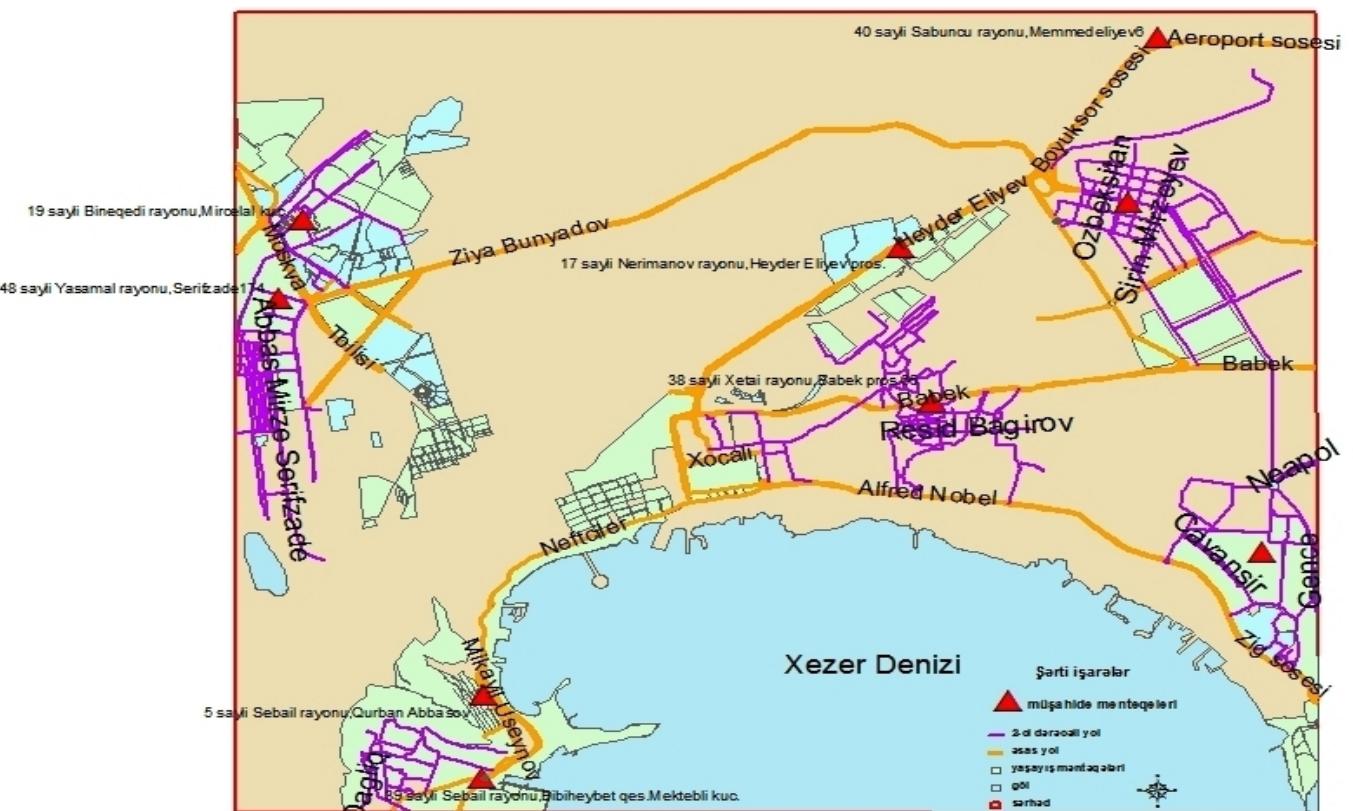
As Figure 2 demonstrates, 9 monitoring stations in Baku are located in different regions of the city. Below information on polluting sources around the monitoring stations (MS) is provided:

1. MS-5: "Bibiheybetneft" Oil-Gas Extraction Office, Thermal electric station, Transport, Residential sector;
2. MS-15: Baku Oil Refinery Plant named by H.Aliyev, Transport, Residential sector;
3. MS-17: Baku Oil Refinery Plant named by H.Aliyev, Baku Electrostamp plant, Baku cast-iron plant, Baku tire plant, Iodine Plant, Baku Biscuit Plant, Transport, Residential sector;
4. MS-19: Baku cast-iron plant, Engineering Plant named by B.Sardarov, "Binagadi Oil" Oil-Gas Extraction Plant, Transport, Residential sector;
5. MS-38: Baku Oil Refinery Plant named by H.Aliyev, "Azerneftyag" Oil Refinery Plant, Baku IEM-1, Khatai gas distribution area, Transport, Residential sector;
6. MS-39: "Bibiheybetneft" Oil-Gas Extraction Plant, Ship repair plant of SOCAR, "Tekfen" Construction Company, Transport, Residential sector;
7. MS-40: "Balaxanıneft" Oil-Gas Extraction Plant, "Azgerneft" Oil-Gas Extraction Plant, Zabrat engineering plant, Baku rubber-technical ware products plant, railway transport, Transport, Residential sector;
8. MS-48: Ozone and Ulduz Plants of the Ministry of Defence, Transport, Residential sector;
9. MS-49: "Bibiheybetneft" Oil-Gas Extraction Office, Thermal electric station, Transport, Residential sector;

The following methods for determining concentrations of different pollutants are used at the monitoring stations:

- Dust is determined with gravimetric method;
- Sulphur dioxide, nitrogen dioxide, nitrogen oxide, hydrogen sulphide, solid fluoride, hydrogen fluoride, chlorine, ammonia, formaldehyde, furfural are determined with colorimetric method;
- Soluble sulphates are determined with turbid metric method;
- Ambient air phenol is determined with photometric method;
- Carbon monoxide is determined with electrochemical method.

Above-mentioned methods are inherited from former Soviet times. According to decision #147 of Cabinet of Ministers approved in 1997, all norms and methods applied in former Soviet Union stay in force until approval of new norms and methods.

Samples are analyzed at the laboratory of monitoring of pollution of ambient air of the Center of Monitoring of Environmental Pollution, and handed over the National Monitoring Department for Environment. All data obtained as a result of monitoring are collected in the database, and systematized by the Department of Calculation of the Center of Computation pursuant to the statute of the National Monitoring Department for Environment.

Samples of dust, soluble sulphates, and sulphuric acid are taken with vacuum cleaner through filter, while samples of other pollutants are acquired with aspirator via sorption pipes and Richter absorbent receptacles within 20 minutes. Apart from these indicators meteorological parameters such as pressure (with barometer), temperature and relative humidity (with psychrometer), wind speed and direction (with anemometer) are measured at all stations occasionally.

Based on the results of observations, daily bulletins concerning ambient air pollution are drawn up, forwarded to the relevant bodies, and posted on the website of the MENR.

Seven monitoring stations assess urban background pollution of the city.2 monitoring stations provideinformation about pollution coming into the city from outside. These are the following stations:

1) Monitoring station #19 located at 9th micro-district, MircalalStreet, 127 for assessment ofpollution coming fromSumgayit city;

2) Monitoring station #39 located at West entrance of the city for assessment of pollutioncoming from Garadag Industrial Complex.

Polluting substances such as NO_2, hydrogen fluoride, solid fluoride, chlorine, and formaldehyde are identified at those stations, as well.

Control analysis is conducted to elaborate quality of analysis. Quality certificate for the data is provided only after ensuring quality of data according to assessment of multi-year monitoring data. Present quality control procedures are insufficient and need improvement or revision.

A brief overview of the situation with the most important air pollutants in Baku city is provided in Table 4:

Table 4: Average annual concentrations of harmful substances in ambient air of Baku city (data range from 9 monitoring stations)

Ingredients	Annual mean concentrations ($\mu g/m^3$)								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dust	139-188	31-61	34-61	26-75	32-72	34-131	35-116	48-91	322.3-407.3
SO_2	18.2-23.6	18.3-21.9	16.6-20.2	13.6-16.5	13.7-16.1	13.1-21.0	13.3-19.0	13.4-16.4	8.9-11.0
CO (mg/m^3)	1.3-1.8	1.5-2.5	1.2-2.5	1.9-2.9	1.5-2.3	1.8-2.9	2.2-3.1	2.2-2.4	2.4-2.9
NO_2	27.7-79.5	33.1-60.8	33.5-58.0	25.5-75.3	31.6-71.7	34.3-130.7	34.5-108.3	48.4-91.0	35.9-76.9
HF	3.4	2.6	3.8	6.8	6.2	6.2	6.5	5.4	8.5
formaldehyde	2.6-3.9	2.6-3.5	2.4-3.6	2.2-3.7	1.9-5.4	3.3-4.9	3.6-3.7	3.7-4.0	5.5-5.9

Tables, containing daily average concentrations for the main pollutants at 9 stations in Baku, together with the basic statistics on data capture, annual mean values, exceedances of Azerbaijani and EU limit values, and general trends for the period 2005-2013, are included as Annexes 2–7 to this Report.

Current results of monitoring on concentrations (prognosis for the current day and the results of monitoring of the previous day) in ambient air are placed at the web page of the MENR (www.eco.gov, in both Azerbaijani and English version).

Figure3: Information on forecast of air pollution in big industrial cities placed at web page of MENR

Forecast of contamination condition of
weather in big industrial cities of the Republic for 22.01.2014

Relation of maximum turbidity to admissible turbidity level					
Ingredients	Dust	Sulphur oxide	Carbon monoxide	Nitric oxide	Soot
Admissible turbidity level (mg/m^3)	0.5	0.5	5	0.085	0.15
Baku	0.4-0.9	0.0-0.3	1.2-1.7	2.9-3.4	0.1-0.6
Sumgayit	0.3-0.8	0.0-0.3		1.1-1.6	`
Ganja	0.2-0.7	0.0-0.3		0.5-1.0	
Mingachevir	0.3-0.8	0.0-0.3	0.3-0.8	0.1-0.6	
Nakhichevan	0.0-0.5	0.0-0.3		0.5-1.0	
Shirvan	0.2-0.7	0.0-0.3		0.5-1.0	
Shaki	0.0-0.5	0.0-0.3	1.0-0.6	0.2-0.7	

Prognosis on anticipated concentrations is based on monitoring data of previous day and hydro-meteorological prognosis for next day. Thus, such prognoses are not based on any specific modelling system.

The prognosis scheme uses observation data on different harmful substances in big industrial cities, as well asdata on calculated concentration of various harmful substances. For this methodology inherited from Soviet times named "Guideline on control of air pollution" РД52 04.186-89 developed by State Committee on Hydrometeorology of USSR (Госкомитет СССР погидрометеорологии) is applied.

In order to acquire complete and qualitative information on the air pollution, there is a need to place monitoring stations in residential areas, in central part of the city and in the districts with high level of pollution with harmful substances. On the other hand, there are problems in this field such as:

⇒   mostly obsolete instrumentation is used at the observation points, no automated monitoring system;
⇒   lack of qualified staff and lack of capacity of current staff;

$\Rightarrow$ measurements take place on working days only; average data capture is between 60 and 70%, though in some cases can be as low as 30% or as high as 80%; meteorological data capture is even lower;

$\Rightarrow$ non-existence of modern vehicles allowing to properly and timely transport taken samples from the stations to the laboratories (this problem will be solved by installing automated monitoring stations);

$\Rightarrow$ absence of hourly measurements of CO, NO_2 and SO_2 does not allow comparing concentrations of these pollutants to the EU limit values;

$\Rightarrow$ concentrations of a number of substances, which are defined as priority pollutants in the EU – ground-level ozone, benzene, lead, dust particles PM_{10} and $PM_{2.5}$ – are not being measured at all.

Additional available information on air quality:

Regards separate studies and scientific publications on air quality in Azerbaijan, as well in Baku city, have been assessed in different studies listed below:

$\Rightarrow$ Improvement of ecosystem in Absheron economic region and efficient organization of productive forces (1997-2000, author I.Nadirov);

$\Rightarrow$ Assessment of impact of fuel and energy industry to the environment and preparation of ecological expertize projects (2003, author R.Aliyev);

$\Rightarrow$ Ecology of Caspian Sea and surrounding areas (2005, author – Ch.Ismayilov);

$\Rightarrow$ Ecological-chemical evaluation of changes in biosphere of Absheron peninsula (2007, S.Isayev, F.Babayev, A.Rahimzade, R.Sultanov);

$\Rightarrow$ Impact of air pollution of Baku city with photochemical oxidants and its products of synthesis on functional conditions of organisms and children diseases (2009, Azerbaijan Medical University, S.Ahmedova);

$\Rightarrow$ Monitoring of ambient air and emissions to ambient air in Azerbaijan Republic: problems and perspectives (MENR, 2007);

$\Rightarrow$ Ecology and protection of environment (A.Sadigov, I.Khalilov);

$\Rightarrow$ Ecology and environment (G.Mammadov, M.Khalilov);

$\Rightarrow$ Ecological monitoring (Sh.Ahmedov, Sh.Mammadova, Baku, 2012);

$\Rightarrow$ Aerospatial monitoring (A.Mehdiyev, J.Mehdiyev, Baku, 2005);

$\Rightarrow$ Basis of meteorology and climatology(A. Mehdiyev, Sh. Ahmadov, Baku, 2008);

$\Rightarrow$ Ecology – pollution of ambient air (Sh.Ahmadov, N.Muradov, Baku, 2008);

$\Rightarrow$ Ecology of ambient air (educational tool) (M.Mirbabayev, 2005);

$\Rightarrow$ "Method of identification of background concentration in the cities", lectures at the Academy of Sciences of Azerbaijan Soviet Socialist Republic, #3, 1986.

Along with above-mentioned studies, there have been published several articles related to problems of air quality monitoring and management in Azerbaijan, as well in Baku city. Some of articles are listed in below:

$\Rightarrow$ Industrial pollution of Ambient air of Sumgayit city, A.Ahmadov/ Q.Ahmadov, "Azerbaijan" newsletter, January, 2007;

$\Rightarrow$ Ecological monitoring at the Balakhani area and emerged problems, F, Xalafov, "Azerbaijan" newsletter, July, 2008;

$\Rightarrow$ Juridical basis of protection of ambient air, A.Manafova, "Azerbaijan" newsletter, January, 2001;

$\Rightarrow$ Azerbaijan joins international ozone programme, "Xalqqezeti" newsletter, February, 1999.

Above-mentioned studies and literature have been identified during assessment provided within the project and it was not noted any additional publication or study. Available documents provide initial view on current air pollution system, legislative basis and describe existing gaps and problems.

2.3. ANALYSIS OF THE EXISTING AIR QUALITY MONITORING DATA

2.3.1. Current trends

The following analysis of current ambient air pollution trends in Baku is based on the data from 9 monitoring stations for the period from 2005 to September 2013 (please refer to Annexes 2 to 7 for more detail).Itfocuses on the pollutants, which are regulated in the EU (NO_2, SO_2, CO) and are measured in Baku, as well as on other pollutants (dust, HF, formaldehyde), which show noticeable exceedances of the national limit values (MAC_{AD}).

By far the highest levels of pollution in Baku are caused by NO_2. Daily NO_2 concentrations exceeded national limit values (MAC_{AD}, 40 $\mu g/m^3$) during the entire period at all 9 monitoring stations (56% of days with exceedances on the average), also annual mean concentrations exceeded EU limit value (40 $\mu g/m^3$) at all stations. Particularly high levels have been measured at the monitoring stations number 17, 38, and 48, recently also 5 and 49. NO_2 concentrations show growing trend, though highest annual mean values were achieved in 2010 and have shown a slight decrease since. However, comparatively low concentrations in the first 9 months of 2013 most likely can be explained by the fact, that data for the three cold months – October, Novemeber, and December – were not available at the time of writing. Figures 4, 5, and 6 illustrate the above analysis. Please refer to Annex 2 to this report for the complete data set.

Figure 5.Annual mean NO_2 concentrations in Baku, $\mu g/m^3$
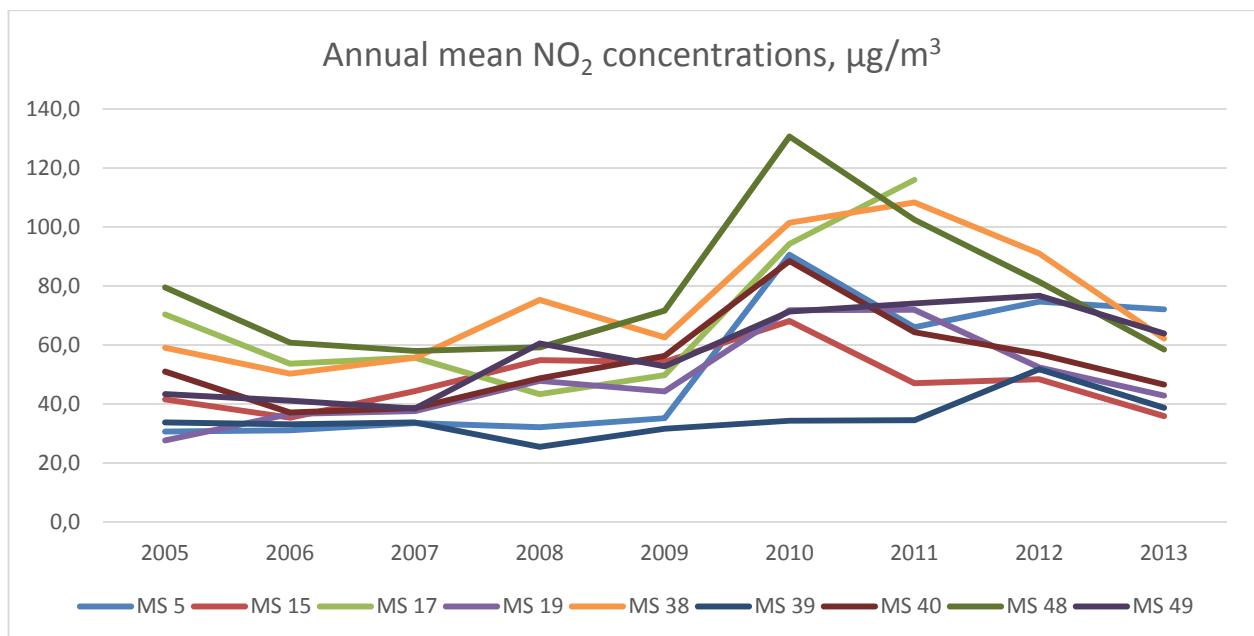
Figure 6. % of days when MAC$_{AD}$ (AZ) for NO$_2$ was exceeded in Baku
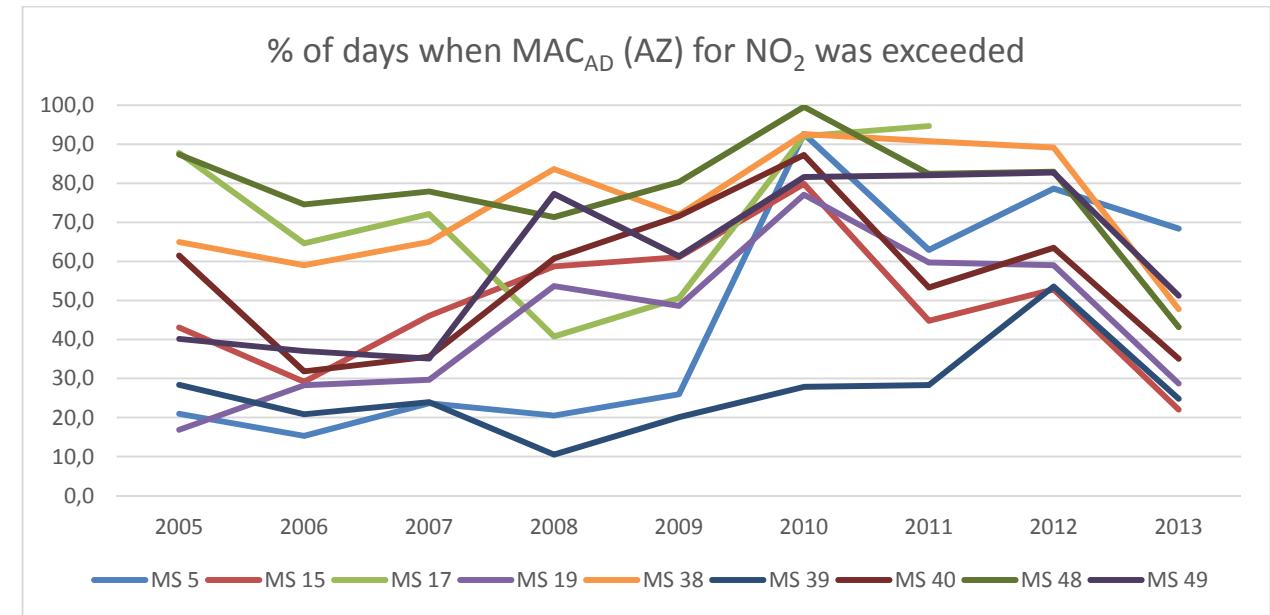
Figure 7. % of monitoring stations in Baku, where annual EU limit value was exceeded
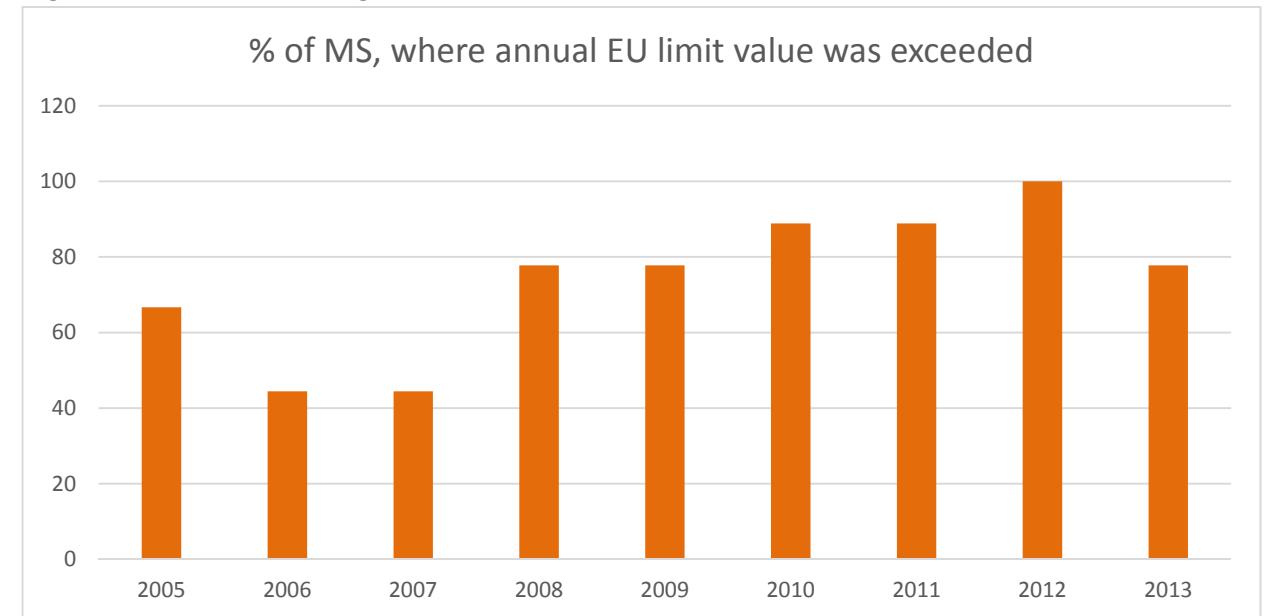
The only other two pollutants, which are regulated by the EU legislation and which are measured at ambient air quality monitoring stations in Baku – SO$_2$ and CO – do not appear to pose immediate threat. SO$_2$ daily concentrations have never exceeded EU limit value (125 µg/m^3) since 2005 and have been gradually decreasing during the entire analysed period, while exceedances of MAC$_{AD}$(50 µg/m^3) are insignificant. CO concentrations are higher, and the concentrations at all stations show a tendency to increase, so MAC$_{AD}$(3 mg/m^3) exceedances have been reported during the last five years at all stations (Figure 7), which pollution levels being the highest in 2011 and-2013. Due to different averaging periods it is not possible to directly compare CO measurement results (3 times a day, averaged to 24-hour period) with the EU limit value (8-hour rolling average), but, as the EU limit value is 10 mg/m^3, exceedances are most unlikely. Still, due to its increasing trend CO levels have to be watched closely.

Figure 8. % of days when MAC$_{AD}$ (AZ) for CO was exceeded in Baku
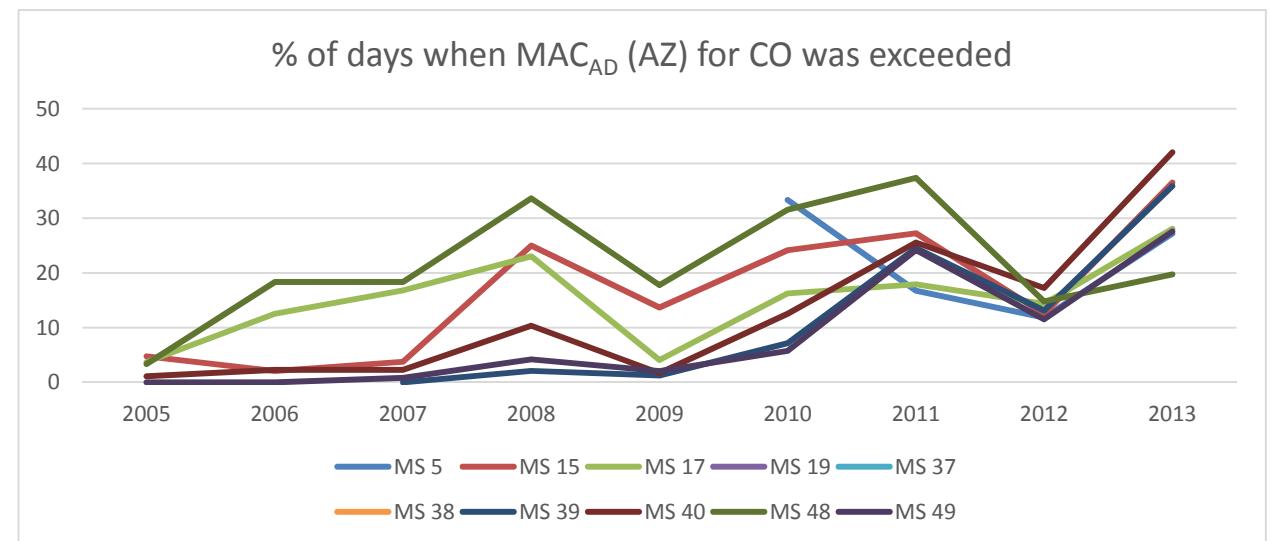
Data on ambient concentrations of dust in Baku and in entire Azerbaijan appear to contain systematic errors, thus have to be considered with utmost caution (Figures 9 and 10, Annex 5). It is obvious, that results from nine monitoring stations in Baku from 2006-2012 significantly differ from the measurements at the same stations in 2005 and 2013 and, moreover, from measurements at 16 stations in six other cities.

Figure 9. Annual mean dust concentrations in Baku, µg/m3
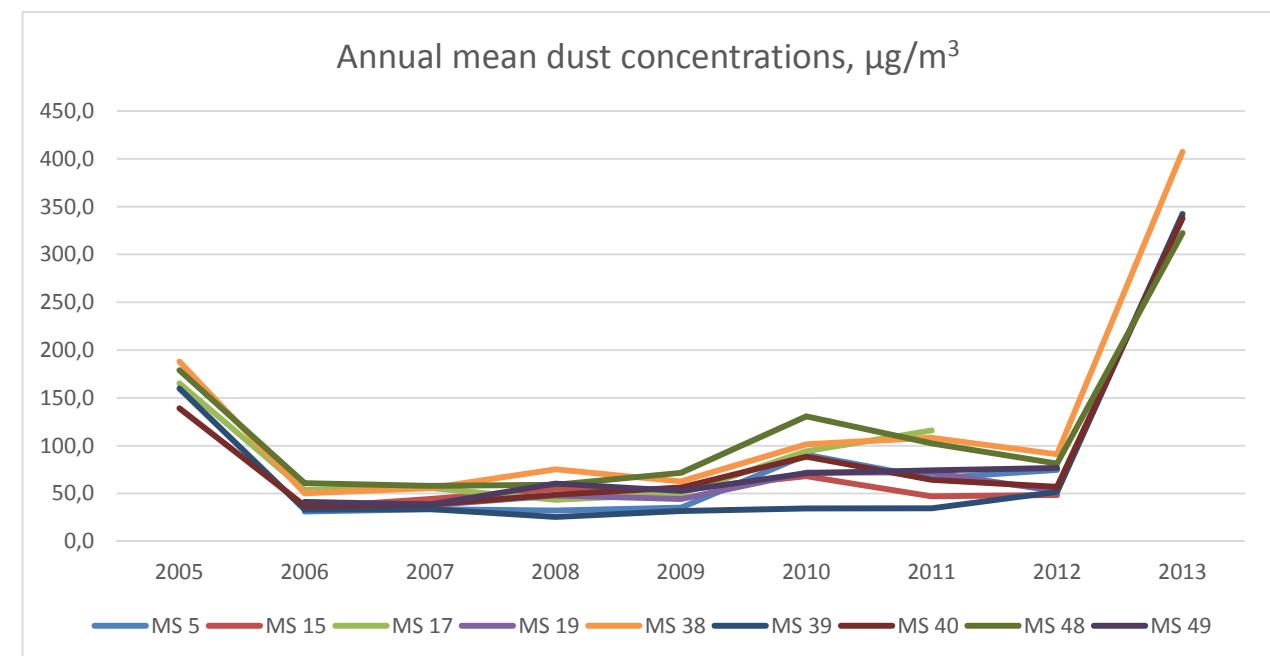
Figure 10. Annual mean dust concentrations in 6 major cities, µg/m3
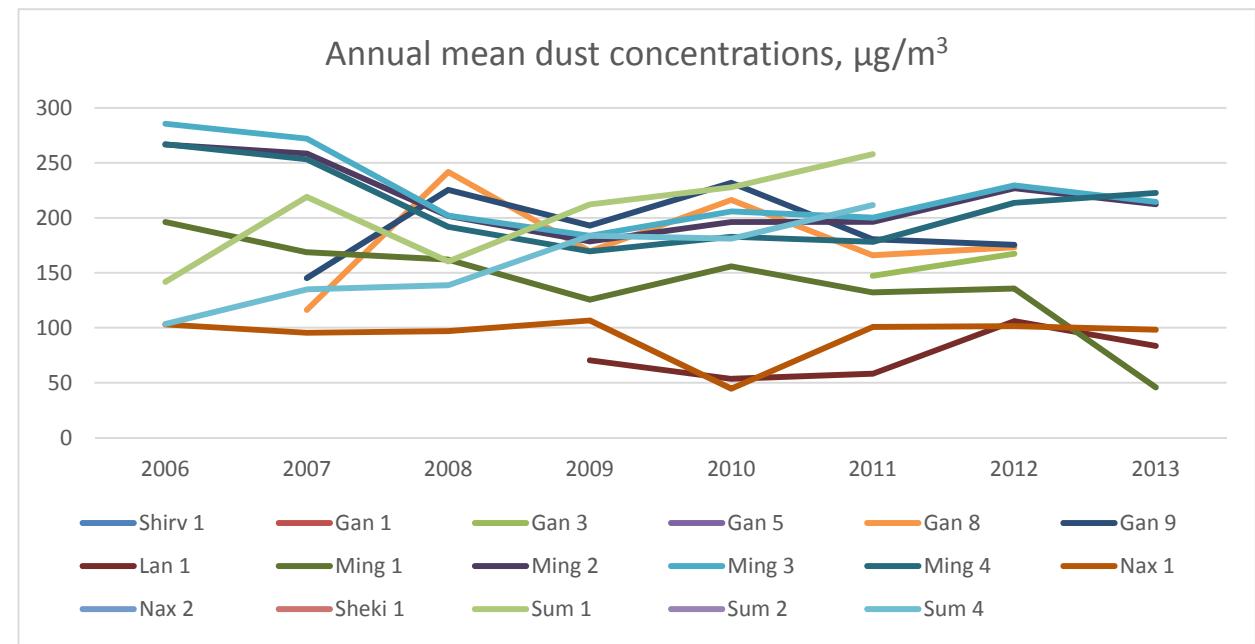
Even considering only the set of data from Baku in 2006-2012, concentrations of dust in ambient air are rather high, though exceedances of MAC_{AD} level (24-hour average concentration of 150 µg/m^3) are not very frequent, in the range of 5 to 15% of all days with observations. However, it should be stressed, that concentrations of small dust particles – PM_{10} and $PM_{2.5}$, which are considered to be priority pollutants in the EU, are directly correlating with the concentration of total dust. If applying a TSP/PM_{10} ratio 1.35 (A report on Guidance to Member States on PM_{10} monitoring and intercomparisons with the reference method. EC working group on particulate matter, 2002), observed dust concentrations would mean, that both PM_{10} annual limit value (40 µg/m^3)and daily limit value (50 µg/m^3, not to be exceeded more than 35 times a calendar year), could be exceeded in most stations for most years (Figures 11and 12).

Figure 11. Calculated annual mean PM_{10} concentrations, µg/m^3 in Baku on the basis of dust measurements (data for 2005 and 2013 are excluded)
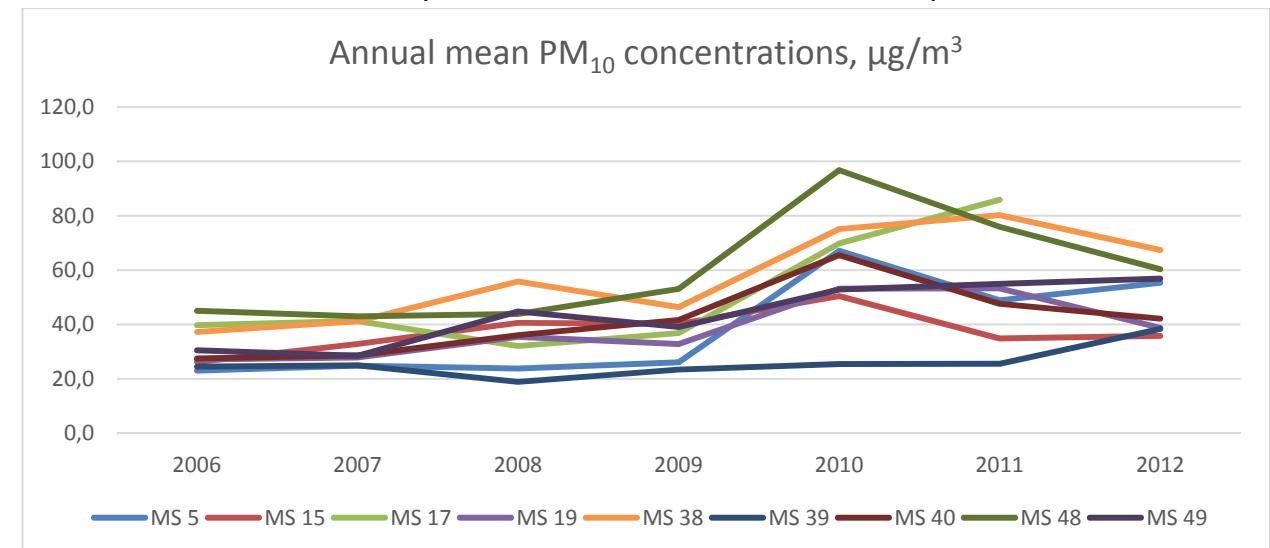
Figure 12.Number of days when EU limit value for PM$_{10}$ was likely to be exceeded in Baku (data for 2005 and 2013 are excluded)
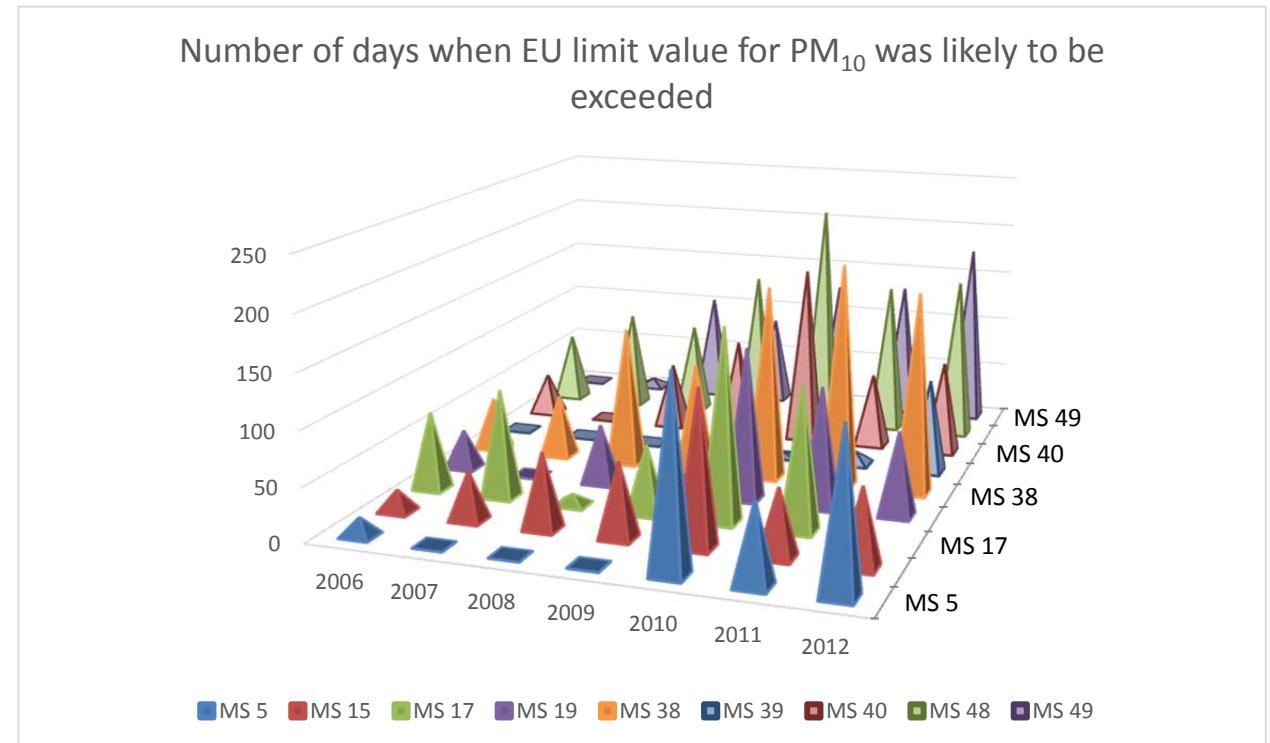
HF concentrations in Baku are being measured only at one monitoring station – number 19. It appears, that MAC$_{AD}$ (5 µg/m^3) has been exceeded in more than 50% of days, when measurements were taken, during the last five years (Figure 13, Annex 6).

Figure 13.% of days when MAC$_{AD}$ (AZ) for HF was exceeded
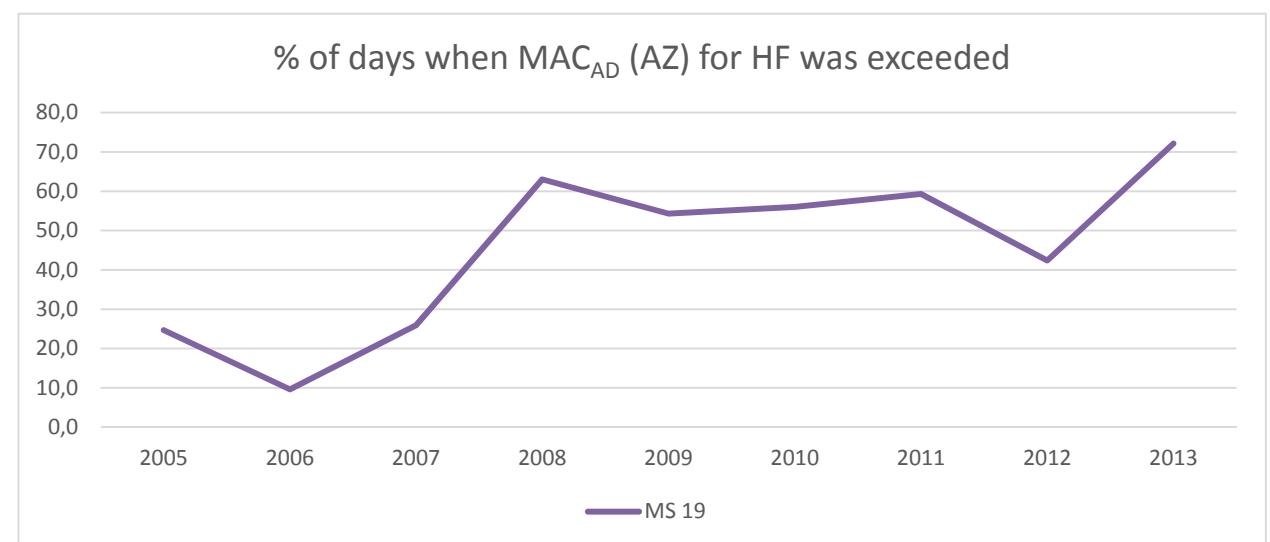
Finally, the last air pollutant of concern is formaldehyde, which constantly shows high concentrations throughout air quality monitoring network in Baku. MAC$_{AD}$ (3 µg/m^3) has been exceeded regularly during whole observation period at all monitoring stations, where it has been measured (Figure 14, Annex 7).

Figure 14. % of days when MAC$_{AD}$ (AZ) for formaldehyde was exceeded in Baku
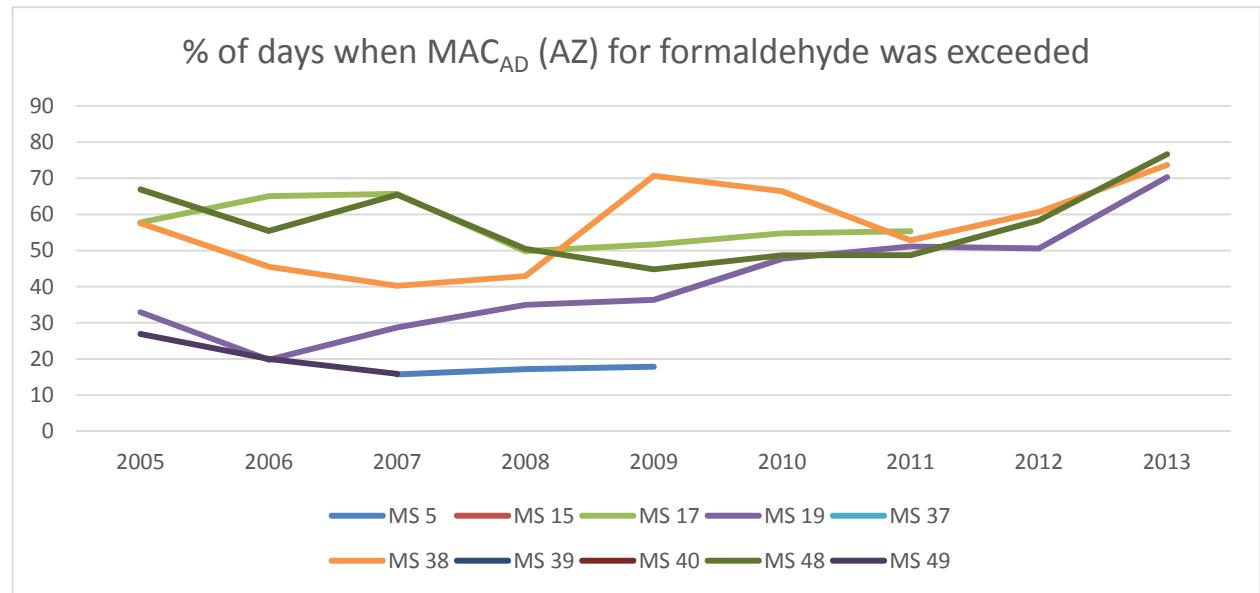
A couple of overall conclusions can be made from the above analysis:

⇒ monitoring results show surprisingly high concentrations of all pollutants in 2005, so reliability of measurement data for this year will have to be verified;

⇒ dust monitoring results demonstrate unusual trendswhich, most probably, indicate systematic measurement errors, so have to be considered with utmost caution;

⇒ NO$_2$ and CO pollution levels show a tendency to grow in the period 2008-2011, while some downward trend can be seen at some monitoring stations in 2012-2013.

2.3.2. Source apportionment

An attempt to carry out a basic source apportionment is included in this report as a new chapter –2.5. –as it is based not only on the analysis of the monitoring data, but also emission data.

2.4. EMISSION DATA FOR BAKU

2.4.1. Pollution permits

According to the Law on the protection of ambient air of Azerbaijan Republic, emission of harmful substances to ambient air is permitted only by "Special Permission" issued by Ministry MENR. "Special Permission" is the document providing permission toall private entrepreneurs and legal persons (enterprises) for emission of harmful substances and physical pressure to ambient air. "Special Permission" is provided for 3 years period. If divide enterprises by type of activities and sectors, the following enterprises must obtain special permission:

Enterprises of I danger category: big enterprises of oil-gas extraction, production of construction materials, metallurgy, ore extraction, energy production, petrochemical industry;

Enterprises of II danger category: some enterprises of oil-gas extraction, production of construction materials, metallurgy, ore extraction, energy production, petrochemical industry,

enterprises of big engineering, automobile production, ship production, ship repair, cotton cleaning and transportation;

Enterprises of III danger category: some enterprises of engineering, automobile production, ship production, ship repair, transportation, as well entities of light industry and food industry;

Enterprises of IV danger category: some enterprises of light industry, food industry and transportation, as well entities of service sector.

Special permission document is not related to preparation of statistical report, negotiating report with relevant authorities and its submission. Enterprises dealing with **production activities** that do not need special permission (entities without regular and stationary emission sources) are providing registration of emission and submit statistical reports to relevant authorities.

Regards the enterprises that do not need special permission (enterprises without regular and stationary emission sources) and entities that deal with **service activities**, those enterprises donot provide registration of emission. Emission from such enterprises is not reflected in the summary report on emission. It should be mentioned that GHG emissions from commercial and residential sector are calculated using IPCC methodology under National Communications to UNFCCC. This emission calculation method could be used for assessment and emission inventory system from commercial (service) and residential sector.

If the enterprise emits harmful substances to ambient air not from stationary source, but from mobile sources according to production or service profile, it does not have to have "Special Permission". These include emission from automobiles, welding aggregates and from other mobile devices. If there is no "Special Permission", emission of harmful substances to ambient air is calculated based on the methodology on calculation of used materials (such as welding rods, paints) or used fuel (diesel, benzene, natural gases, black oil etc.).

2.4.2. Emission data collection and storage

There is emission data availablefor separate enterprises, for different production sectors and for different cities of the country. It is also provided information of sources of pollution at the reports prepared by the enterprises. But, at present time, there is no geospatial metadata.

Information on emission sources of each enterprise are described in followingdocuments:

- Ecological passport of the enterprise (for the enterprises dealing with production activities and having pollution sources)is prepared for each enterprise once per 3 years;

- Emission limit values are calculated for those enterprises by Ecological Scientific & Technological Information and Methodology Center (Ecocenter) within MENRonce every 5 years.

All this information is stored at the entities in hard copy, as well at the relevant departments of the MENR.

In Azerbaijan, State Statistical Committee is responsible for collecting and handling data on air emission. Statistical information is collecting corresponding to the Law of the Republic of Azerbaijan "On official statistics". The law determines for the country main principles of collecting, storing, analysis, summarizing, spreading and publishing of the information about situation in economic, demography and ecological spheres and its implementation is necessary

for all governmental bodies, institutions, establishments, organizations, and also individuals regardless the type of ownership, conformation, location.

The information on emitted into atmosphere harmful substances is collected by the State Statistical Committee on the base of two official statistical report forms: these are #2-TG (air) "On protection of ambient air" and #2-TG (air-transport) "On emission of harmful substances into atmosphere from automobile transport" annual official statistical reports.All enterprises that hold a special permission and enterprises that do not require such permission, but are dealing with production activities, provide information on emissions on annual base submitting report on emissions to Statistical Committee after approval by local units of MENR.

Besides this, in the report it is collected information on emitted into atmosphere from stationary sources GHG – carbon dioxide (CO_2), nitric oxide (I) (N_2O), methane (CH_4), hydrofluorocarbons (HFC), sulphur hexafluoride (SF_6), perfluorinatedcarbons (PFC).

All enterprisesthat require special permission or not requiring such permission, but dealing with production activities provide registration of emission on annual base and submit report on emission to Statistical Committee after negotiating with local units of MENR. As a result, comprehensive information of atmospheric pollution are gathered and summarized by Statistical Committee. Generalized information on ambient air (report) is prepared by the Statistical Committee and placed in official web page –www.stat.gov.az/source/environment.

Climate Change and Ozone Center under MENR uses information from this report form inventory of GHG provide analysis and develop reports.

It should be mentioned that reporting mechanism described above is related to relatively big enterprises dealing with production activities. Small-size enterprises dealing with service activities are not covered under those reports. Currently, work in order to improve reporting system that will coversuch enterprisesis carried out as well.

2.4.3. Emission data validation and verification

Emission factors:

At present, inventory of emissions from stationary sources in Azerbaijan carried out by method of the "Rules of the inventory of hazardous air emissions and sources that have a physical effect," that was approved by the decision number 63 of Cabinet of Ministers of Azerbaijan Republic on April 15, 2002.

During the calculation of emission it can be used instrumental, instrumental-computational and computational methods. Methodological guidelines used for the calculation of emissions from stationary sources are developedduring former Soviet times. Therefore, for the calculation of emissions from stationary sources it is used different methodological guidelines.For instance, for calculations of emission from oil processing sector РД-17-86 methodology is used and for calculation of emission from boilers and thermal power stations methodology РД-34.02.305-90is used.

In the former Soviet period, emission inventory was properly organized. It was provided regular inventory at enterprises, taxi parks, "boiler points" (kotelni) and other places using special devices. But, at present, there is gap in emission inventory system. Obsolete methodologies, poor capacity of enterprises for emission calculation, weak coordination of emission reporting by relevant bodies of MENR are major shortcomings. There is a need of establishing emission inventory system based on modern EU experience.

Legislation has not specified exact list of methodologies to be applied for emission calculation. For instance, the Law on Thermal Power stations, article 10 states that all thermal power stations should identify guidelines for emission calculation and development of limit values. But, the Law does not indicate how should it be approached and which type of methodology to use. There is need for development of up-to-date methodologies and improvement of system itself in order to secure validation of submitted emission data.

Current national legislation of Azerbaijan on air quality is not adapted to the requirements of EU Directives: there is no list of major industrial plants and their evaluation by industry in accordance with the application of the Directive 2010/75/EU on industrial pollution and the EMEP / EEA Inventory - Emissions 2009. Applied methodologies and emission factors for calculation of emission are not adapted to the EU standards and it is not provided any significant analysis on advantages of different methods for emission calculation from stationary or mobile sources.

Instrumental measurementresults arenot used for calculation of emissions. Emissions are calculated on amount of used fuel and other materials based on mentioned methodologies.

Data verification and storage

Inventory of emission sources are provided by the enterprises and according to the result of a draft inventory Emission Limit Values developed, statistical reportsprepared and submitted to Statistical Committee.

Official statistical report form filled out by the enterprises, is verified by local units of the Ministry of Ecology and Natural Resources and after obtaining required consent (signature) is submitted to statistical bodies at district (city) level, where the enterprises are located, and then to higher body.

Information on air emission is collected on the base of two official statistical report forms: these are #2-TG (air) "On protection of ambient air" and #2-TG (air-transport) "On emission of harmful substances into atmosphere from automobile transport" annual official statistical reports. Annual official statistical report form #2-TG (air - transport) "On emitted into ambient air harmful substances from mobile sources" is developed and presented to the State Statistical Committee by the Ecological Scientific & Technological Information and Methodology Center (Ecocenter) within MENR.

The report reflects the data on emitted into atmosphere harmful substances from mobile sources by country, and separately by Baku, Shirvan, Ganja, Mingachevir and Sumgayit cities.

The data on emitted into ambient air harmful substances is reflected in website of the State Statistical Committee (www.stat.gov.az) and in published materials. All information is stored at State Statistical Committee and relevant units of MENR. Information on air quality and emissions is also placed at the official web page of MENR(www.eco.gov.az).

Monitoring results and prognosis for pollution concentration are included in information bulletins, placed at the official web page of MENR(www.eco.gov.az) and as well delivered to relevant state organizations and to mass media. The daily bulletin on daily concentration of ambient air and natural radiation condition is delivered to respective official persons and organizations dealing with environmental issues.

All information is accessible for units dealing with air quality assessment and management. Generalized data on air quality assessment is accessible for public through internet portals and annual publications.

The daily bulletin on daily concentration of ambient air and natural radiation condition is delivered to the following official persons and organizations according to the order No253 of MENR dated 28.11.2012:

- The President of Azerbaijan Republic;
- Prime Minister;
- State Councillors;
- First deputy Prime Minister;
- Senior State Security Service of Azerbaijan Republic;
- MENR (Minister, Deputy Minister, Division of Ecology and Natural Protection, Division of Ecological Propaganda, Division of Production Policy, Department of Environmental Protection, Department of National Hydrometeorology, State Archive Fond on Environment and Natural Resources, Center on Emergency Action)
- Ministry of Emergency Cases
- Ministry of Health

All information is accessible for units dealing with air quality assessment and management. Generalized data on air quality assessment is accessible for public through internet portals and annual publications.

2.4.4. Fugitive sources

Fugitive sources

At present, data from fugitive sources like households, quarries and landfills are not collected. The contribution of natural emission sources is not calculated. Fugitive emissions emitted to atmosphere are generated from the energy sector, natural gas production, storage, transportation, and burnings and from other sources. GHGs such as CO_2, CH_4, N_2O, hydrocarbons, are included in fugitive emissions. Basically fugitive emissions are mostly generated at coal, oil and gas industry.

In Azerbaijan, fugitive emissions are mainly generated from various activities of oil and gas industry. Mainly CH_4 and other hydrocarbons form the potential fugitive emissions. Fugitive emissions from oil fields constitute primarily methane gas (CH_4). Those gases are emitted to the atmosphere as associated gas. Besides, they are emitted to the atmosphere during processing of oil and gas and from storage reservoirs.

According to the IPCC's inventory methodology uncertainty of methane gas emissions reaches 100%. The most uncertainty is observed in the Energy sector. In energy sector the most uncertainty is in oil& gas production sector. In oil industry methane gas is formed during oil extraction and storage process. Exact amount of methane emitted from these sources cannot be precisely calculated.In most cases there are no measurement devices present, asproducer companies do not see installing such devices as economically viable. Methane gas formed during oil extraction from the oil wells is burned at the pipes without any calculation. Along with this, methane gas is formed during oil processing and storage at the oil reservoirs. Those methane emissions are not measured, as well. All these cases lead to uncertainty. Therefore additional investigations for the reduction of such uncertainty have to be carried out.

There is some uncertainty in methane emissions in residential sector, as well. But, during last years it has been established a lot of smart-type measurement devices in residential sector leading to reduction of leaks. Subsequently, it resulted in reduction of uncertainty in methane emission in residential sector.

Emission factors in fuel consumption

At present, the State Statistical Committee defines emissions from motor vehicles in general form based on the annual fuel consumption. Data on emission from fuel consumption is prepared by Ecological Center within the Ministry of Ecology and Natural Resources. It is old approach inherited from Soviet times which does not allow providing proper calculations.The following emission factors are used to calculate emission from the fuel consumption:

Table 5: Coefficients for emission calculation from fuel consumption

#	Name, t/t	Gazoline	Diesel
1	Carbon oxide (CO)	0.27	0.036
2	Hydrocarbons (CmHn), t/ton	0.034	0.011
3	Nitrogen oxides (Nox)	0.028	0.051
4	Sulphur dioxide (SO_2)	0.002	0.02
4	Soot	0.0008	0.005

For inventory of emissions from mobile sources it is used methodology of former Soviet times of inventory of emissions from mobile sources in big cities. As for other cases, such choice is not regulated by any legal act and only based on choice of local experts. Coefficients on calculation of emission from gasoline, diesel, liquefied petroleum gas and compressed gas are provided in below tables:

Table 6: Emissions from combustion of 1 kg gasoline

Type of vehicle	Ecological type	Emission, g/kg				
		CO	VOC	NO_x	SO_2	CO_2
Automobiles	0 (Euro 0)	250.0	31.0	30.0	0.54	2670
	1 (Euro 1) and higher	21.5	2.4	5.8	0.54	3120
Trucks and buses with total weight till 3500 kg	0 (Euro 0)	250.0	31.0	30.0	0.54	2670
	1 (Euro 1) and higher	21.5	2.4	5.8	0.54	3120
Trucks and buses with total weight over 3500 kg	0 (Euro 0)	360.0	39.0	30.0	0.54	2500

Table 7: Emissions from combustion of 1 kg diesel

Type of vehicle	Ecological type	Emission, g/kg					
		CO	VOC	NO_x	PM	SO_2	CO_2
Automobiles	0 (Euro 0)	13.6	3.0	40.0	4.0	1.6	3070
	1 (Euro 1) and higher	7.5	1.4	30.0	1.1	1.6	3100
Trucks and buses with total weight till 3500 kg	0 (Euro 0)	30.0	10.0	50.0	4.0	1.6	3020
	1 (Euro 1) and higher	8.6	4.3	25.0	1.1	1.6	3090
Trucks and buses over 3500 kg	0 (Euro 0)	30.0	10.0	50.0	4.0	1.6	3020
	1 (Euro 1) and higher	8.6	4.3	25.0	1.4	1.6	3090

Table 8: Emissions from combustion of 1 kg liquefied petroleum gas

Type of vehicle	Ecological type	Emission, g/kg				
		CO	VOC	NO_x	SO_2	CO_2
Automobiles	0 (Euro 0)	250.0	31.0	30.0	0.12	2520
	1 (Euro 1) and higher	21.5	2.4	5.8	0.12	2970
Trucks and buses with total weight till 3500 kg	0 (Euro 0)	250.0	31.0	30.0	0.12	2520
	1 (Euro 1) and higher	21.5	2.4	5.8	0.12	2970
Trucks and buses with total weight over 3500 kg	0 (Euro 0)	360.0	39.0	30.0	0.12	2350

Table 9: Emissions from combustion of 1 kg compressed gas

Type of vehicle	Ecological type	Emission, g/kg				
		CO	VOC	NO_x	SO_2	CO_2
	1 (Euro 1) and higher	21.5	2.4	5.8	0.12	2970
Trucks and buses with total weight over 3500 kg	0 (Euro 0)	140.0	14.0	20.0	0.08	2500

According to this outdated approach is not possible to calculate/model transport pollution in the city. In EU and in Russian Federation "COPERT 4" software is used for calculations of emissions from motor vehicles, and then the program UPRZA Ecolog is used for calculation of one-time maximum concentrations.

In some cases, emissions from mobile sources are also calculated using some coefficients of РД-17-86 methodology: Guidelines for the calculation of total emissions of harmful substances into the atmosphere for oil refining.This methodology is only used by enterprises having sufficient number of vehicles (for instance, taxi garages, transportation companies) for more exact calculation of emission using age coefficient of vehicles. Apparently, this methodlogy is outdated and modern methodologies applied in EU should be developed and applied for emission calculation from mobile sources.

Registration of auto mobiles is provided by the State Road Police Office under the Ministry of Internal Affairs.Due to last statistical data, the total number of vehicles has increased by 158% in 2012 (1,135,936 registered cars) in compare with 2000. 702,484 of those cars are registered in Baku city*(soure: State Statistical Committee)*. Notwithstanding the increasing number of new vehicles, the age structure of the vehicle fleet is not satisfactory and many obsolete highly polluting cars and lorries are still in operation. In 2012, approximately 65% of emissionsfrom mobile sources were registered in Baku city.

Table 10: Number of vehicles by type

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Lorries	80,918	90,852	97,395	110,391	113,088	117,378	118,460	122,182	130,019
Busses	20,991	26,735	27,474	28,092	29,340	29,985	29,569	29,189	29,647
Cars	423,696	458,840	525,348	589,298	668,587	725,843	779,658	832,599	916,431
Motorcycles	4,993	3,562	3,408	2,778	2,330	1,969	1,643	1,647	2,067
Others	5197	5,545	5,897	6,524	6,090	7,527	7,126	4,653	5,740

Unfortunately, there is no systematic information on amount of cars by date of production. The Ministry of Internal Affairs has data on age of all registered cars, but this information is not in systematic way. During assessment process, it was officially applied to the Ministry for provision of such information, but such information has not been provided at the time of writing.

State Committee on Standardization, Metrology and Patent of the Republic of Azerbaijan has endorsed AZS 636-2012 standard (Standards on mobile vehicles: ecological classification) and implementation was launched from 01 August 2012. It should be mentioned decision of Cabinet of Ministers 06 March 2010 endorsing application of Euro-2 standards for vehicles and action plan for implementation of necessary measures. It was also planned application of Euro-3 standards in 2013, but there is a delay in the process. Guidelines for application of Euro-3

standards has been developed by the Committee on Standardization, Metrology and Patents and submitted to the Cabinet of Ministers for final approval.Here it should be mentioned that, The President of Azerbaijan Republic, in his last speech at the annual meeting of the Cabinet of Ministers devoted to the results of socio-economic results of year 2013, stressed the air pollution problem and importance of improvement of air quality management and entrusted the cabinet of Ministers to develop a certain measures in order to address the problem. In this regards, the Cabinet of Ministers has followed the issue negotiating it with different Ministeries and in January 2013 issued a new decision on Euro standards for vechiles. According to recent decision of the Cabinet of Ministers, it is planned to switch to Euro-4 standard for produced and imported vechilessince April of 2014 and application of Euro-4 standards for fuel is going to be launched in coming years.

Table 11: Compliance with ecological classification of harmful substances according to origin country of production and production year

Country of production	Year of production			
	Meeting technical requirements according to ecological classification			
	Euro 2	Euro 3	Euro 4	Euro 5
EU countries, **gasoline**	1997 – 2000	2001 – 2004	from 2005	from 01.10.2009
EU countries, **diesel**	1997 – 2001	2002 – 2004	from 2005	from 01.10.2009
USA	1996 – 2000	2001 – 2003	from 2004	—
Japan	1998 – 2004	2005 – 2010	from 2011	—
Canada	2001 – 2003	from 2004	—	—
India	2005 – 2009	from 2010	—	—
Malaysia	from 2003	—	—	—
China	2004 – 2007	from 2008	from 2011	—
Korea	2001 – 2002	2003 – 2005	from 2006	—
Ukraine, M category	from 2006	2010	—	—
Ukraine, N category	from 2007	from 2010	—	—
Belorussia	2006 – 2007	from 2008	—	—
Uzbekistan	2007 – 2009	from 2010	—	—
Kazakhistan	2006 – 2011	from 2012	—	—
Russia	2006 – 2007	from 2008	—	—
Turkey	—	—	from 2009	—
Iran	from 2009	—	—	—

Source: Decision 45, dated 06 March 2010, of Cabinet of Ministers of Azerbaijan Republic

In the case of emissions from mobile sources, major measures were prepared and are being implemented, especially as regards improvement of transport infrastructure, management of transport in the Baku City or more efficient vehicle inspection measures.

Another important measure related to reduction of emissions from mobile sources represent the major issue is the implementation of the "The Intelligent Transport System for Bakucity"launched by the Ministry of Transport in 2011 with the support of Korean companies which was introduced recently and is to be fully operational in 2015. The system regulates car fleet in the city from the operational center and using big monitors placed in different places of the city. Drivers are informed on traffic conditions of roads using such monitors and information provided by radio. The system also provides automatic regulation of traffic lights during rush hours.

Regular information on conditions on the main and central roads is placed at the official web site – www.niim.az. The system also allows counting the number of cars and average speed on a monthly base. For instance, during March 20131.021.739 cars at the H.AliyevAvenue (main

avenue connecting city center with main highway to airport) were counted and average speed of cars was 69 km/hour. It is possible to obtain such data and use for AQ planning.

This scheme is expected to reduce transport-related emissions significantly by improving the flow of traffic and reducing traffic jams. In addition, other steps are being implemented in Baku such as extension of metro lines, extension of parking sites, and non-licensing of vehicles that failed to comply with at least the Euro-2 standards.

2.5. SOURCE APPORTIONMENT

The following section is an attempt to identify major sources of and contributors to air pollution, using, when possible, available emission data, air quality monitoring data, limited knowledge about meteorological conditions, and indicative air pollution dispersion modelling.It also presents an effort to assessshare of non-urban pollution influencing Baku areaby looking at monitoring data from various monitoring stations and long term climate characteristics.

2.5.1. Top point source emissions

For the purpose of this study, information on total annual emissions for the last few years from ca. 50 most polluting enterprises in Greater Baku area was collected. From this list, 22 enterprises were selected for further analysis, as they had been emitting at least one of the following pollutants – NO_2, CO, dust, or SO_2, and could be located on the map (eight of them had geographic coordinates, the others were visually identified of the aerial photograph) (see details in the Annex 8, and the location of these enterprises at Figure 15, also at https://mapsengine.google.com/map/edit?mid=zEueWpTTY60k.kqOoievyrSiQ). Ten of these enterprises emitted 9 or more tons of NO_2in 2012, so can be considered major polluters in the area.

Figure 15: Map of main enterprises in Baku city
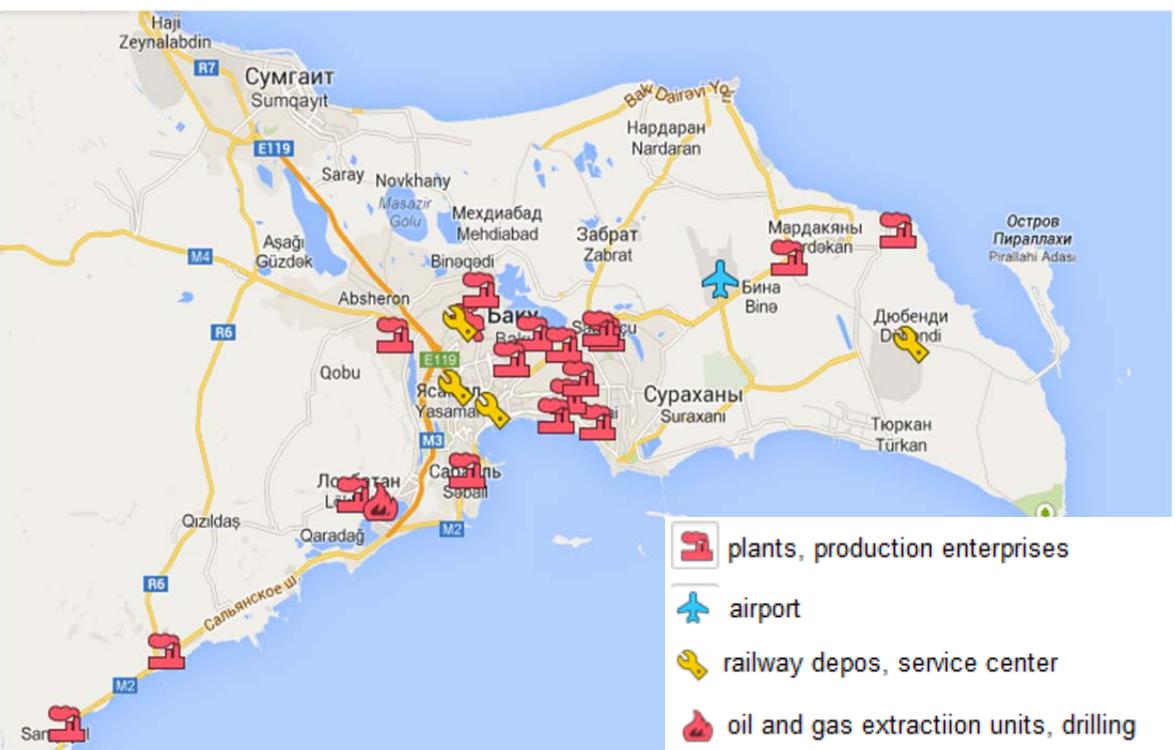
2.5.2. Indicative air pollution dispersion modelling

In order to get a rough understanding of the quality and suitability of available data, the project team has carried out a pilot modelling study. Given the origin, nature, and quality of emission and meteorology data and a number of assumptions, which were used to substitute missing data sets, the results of the study can be viewed as a very general indication, but still provide an overallimpressionof the magnitude of air pollution problem in greater Baku.

Air pollution dispersion model was prepared using ADMS Urban modelling software and EMIT 3.2 emission inventory software (both developed by CERC – Cambridge Environmental Research Consultants, UK).

Emissions of the main pollutants (NO_2, NO_x, CO, PM_{10}, $PM_{2.5}$, benzene) were calculated from 3 major groups of emission sources: major roads, minor roads, and major point sources with available emission data. Information on individual emission sources was aggregated using EMIT 3.2 software facilitating data entry into the ADMS Urban model.

Major roads were defined as roads with 2 or more lanes in each direction based on the information on road type available from the Greater Baku Master Plan project report(Figure 16)and publically available Open Street Map (http://www.openstreetmap.org). The intensity of road traffic was assumed to be 1900 cars per hour per lane expressed as number of cars per year. Minor roads were defined as all roads with 1 lane as identified by the previously mentioned information sources. In order to significantly decrease the time necessary for calculation of emissions from the minor roads, these emission sources were simplified and presented as grid source with grid cell equal to 1x1 km. The grid cell represents the sum of length of all minor roads falling within the specific cell. The road traffic intensity for minor roads was assumed to be 1900 cars per hour per lane expressed as total sum of km driven by cars within the specific cell in one year. The maximum value allowed by the EMIT 3.2 is 10 million km per year. When defining road fleet composition in was assumed that 90% of vehicles using major roads are light duty vehicles and 10% heavy duty vehicles; 100% of vehicles using minor roads were assumed to be light duty. The exhaust emissions from each vehicle were calculated by EMIT 3.2 software based on the assumption regarding vehicle fleet composition. In the context of this model EURO 2009 Urban dataset from year 2006 was assumed as the current vehicle fleet composition.

Figure 16: Map of the main roads in Greater Baku
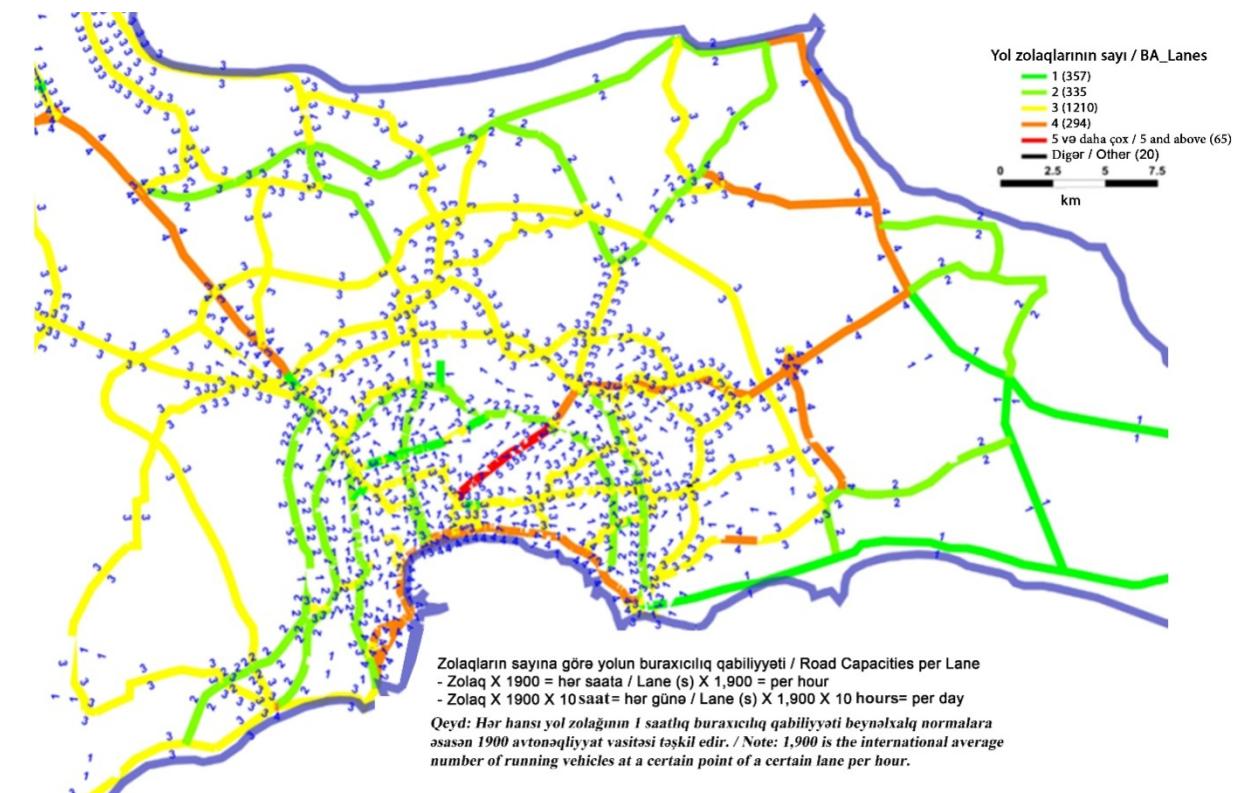
Source: "Greater Baku regional Development Plan" (GBrDP) project, presentation

Nine major point sources were included in the model. These were the enterprises,for which both emission and location data were available to the project team, and which have reported their annual NO_2 emissions in 2012 above 9 t. All the emissions reported by the operators were included in the model calculation. It has to be mentioned here, that these sources represent just a tiny fraction of point sources in Greater Baku, where an overall number of operators exceeds one thousand.

As no meteorological data set was available to the project team, for the modelling purposes it used a combination of incomplete real-time wind speed, wind direction, and air temperature data with generic precipitation, cloud cover, and boundary level height values. Real-time data set was coming from Baku environmental monitoring observations in 2012.

Four sample maps below (Figures 17-20) briefly present the results of this pilot exercise.

Figure 17: Modelled annual average concentrations (µg/m^3) of NO$_2$ in Greater Baku
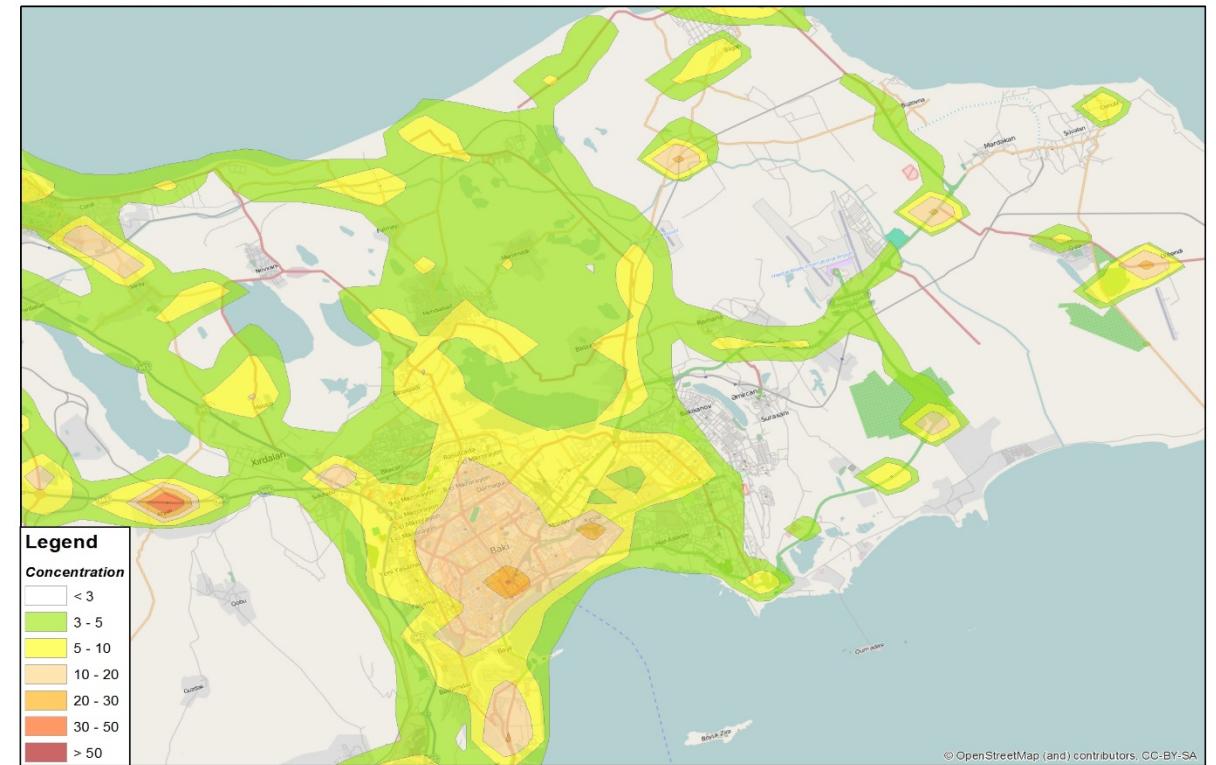
**Figure 18: Modelled annual average concentrations (µg/m^3) of NO$_x$ in Greater Baku**
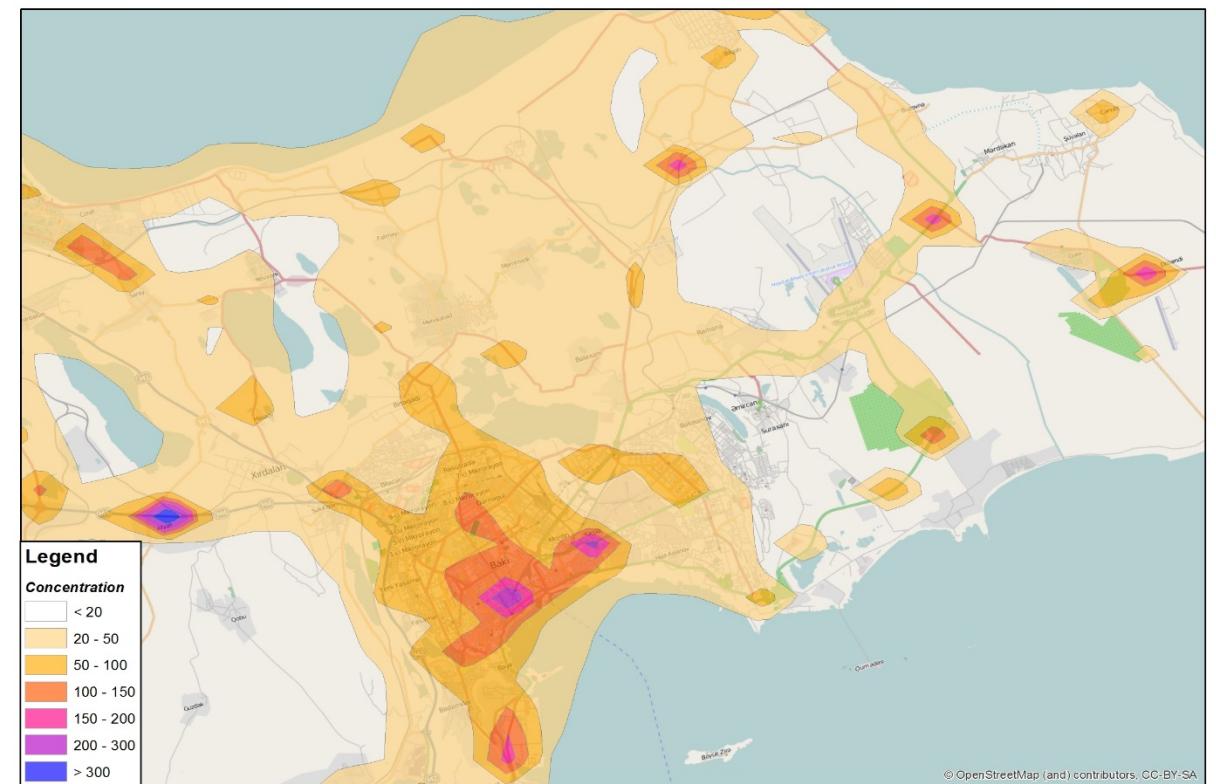
**Figure 19: Modelled annual average concentrations (µg/m^3) of PM$_{10}$ in Greater Baku**
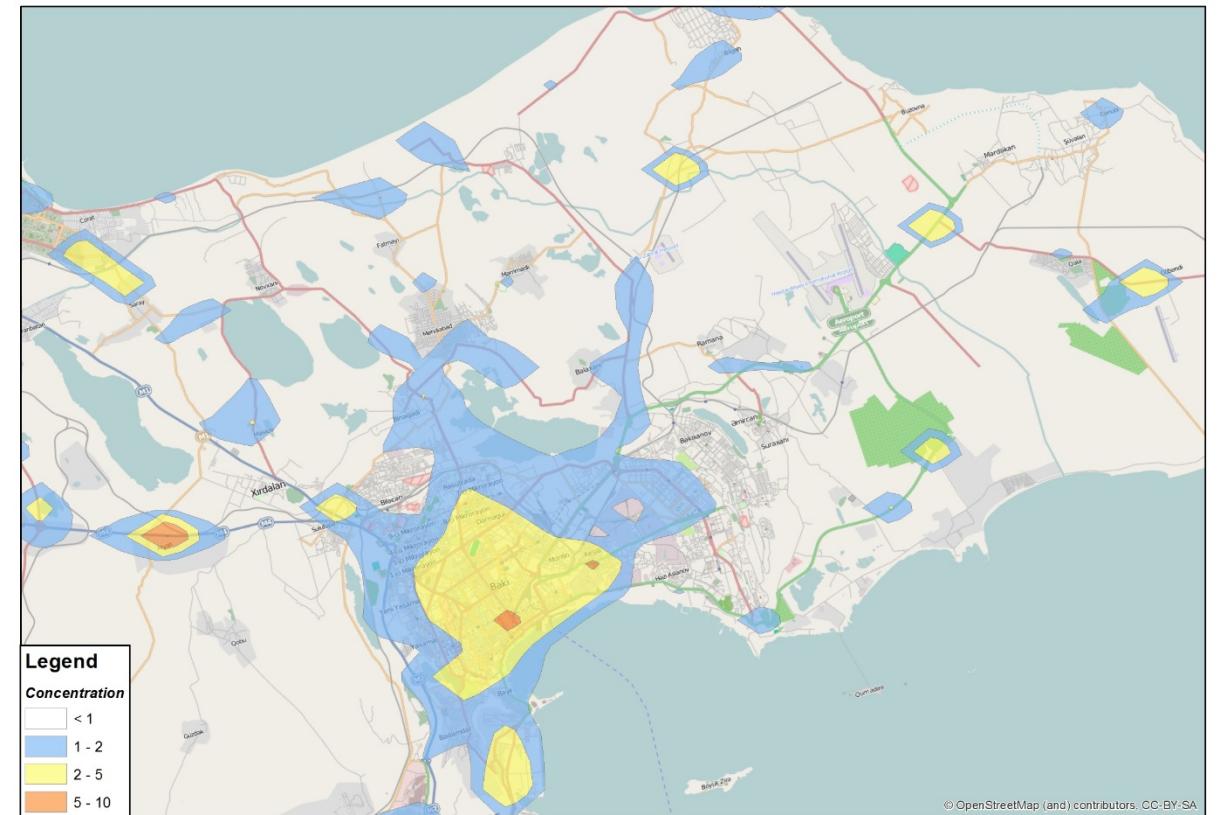
Figure 20: Modelled annual average concentrations (µg/m^3) of benzene in Greater Baku
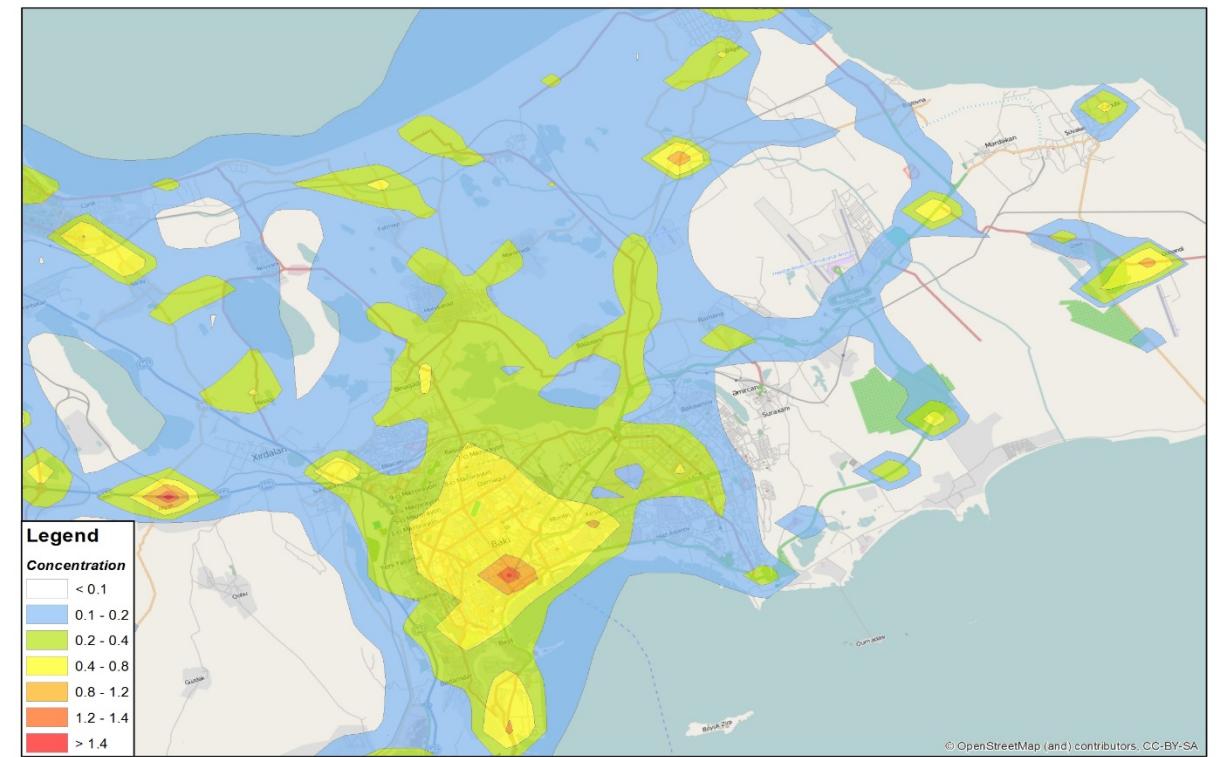
From the above maps (Figures 17-18) it can be seen, that road sources in combination with only a tiny fraction of point sources and no accounting for fugitive sources can create a noticeable air pollution problem. Annual average concentrations of NO_2 are comparable with the air quality monitoring results, but as the model also calculates total concentrations of nitrogen oxides (NOx) – there is clearly a reason for concern.

An estimate of PM_{10} pollution (Figure 19) accounts only for PM_{10}, emitted by car engines. Consequently, it can be seen that traffic flows alone would not create noticeable pollution levels with PM_{10}, however, it has to be repeatedly noted, that the model does not account for fugitive sources and point sources – which, as a rule, in a similar situation would produce the most noticeable share of particles. Also monitoring data of total dust concentrations, though unreliable as they are, suggest potential problems also with fine particle pollution in Baku.

Finally, a calculation of annual average benzene concentrations suggest, that also for benzene road sources alone will not constitute the main problem (Figure 20). Once again, main emission sources would be oil and gas extraction installations and oil refineries, which were not taken into account in the modelling exercise due to the absenceofdetailed benzene emission data.

2.5.3. Conclusions

Based on the results of the assessments above – analysis of air quality monitoring data, pilot modelling exercise, and expert judgement of available industrial emission data, and taking into account all data gaps and uncertainties, main sources of air pollution in Baku city might be listed as follows:

- oil and gas extraction installations and oil refineries;
- transportation sector and private automobiles;
- electric and heating energy production entities;
- chemical and petrochemical entities;
- entities of production of construction materials;
- gases burned out at torches of terminals and plants;
- fugitiveemissions from commercial and residential sector.

Regarding the external factors affecting air pollution in Baku city, it has to be noted, that large number of industrial enterprises is located also outside Baku city – throughout Greater Baku and Absheron peninsula (Figure 21). It can be seen from the map, that pollution from emission sources located in Sumgayit city (neighbouring city – still a part of Greater Baku area), might provide a greater share. The impact of such emission sources was significant especially during former Soviet times, but at present there are fewer industrial entities functioning in Sumgayit city. Still, frequent Northern winds might contribute to noticeable transport of air pollution from Sumgayit to the central areas of Baku.

As Baku city is situated in the region with flat and semi-desert relief, it also creates suitable conditions for external pollution of the city, mainly from natural dust pollution. If take into account the fact that Baku is the windy city (270-290 windy days annually in average), the problem shows its significance. All these statements are based on visual observation and experts judgements. Unfortunately, detailed monitoring analysis of external and internal dust pollution factors is not available at the time of writing.

Though most part of the external pollution of Baku city appears to originate from Sumgayit city and other industrial sources nearby, there might be cases (meteorological events) when pollution originates from neighbour countries such as Iran. Current monitoring stations #19 and #39 provide information on external pollution, but, at present, any analysis for identification of

the portion of external pollution of Baku city is not available due to incomplete data sets an uneven data quality.

Figure 21: Density of enterprises in Baku city
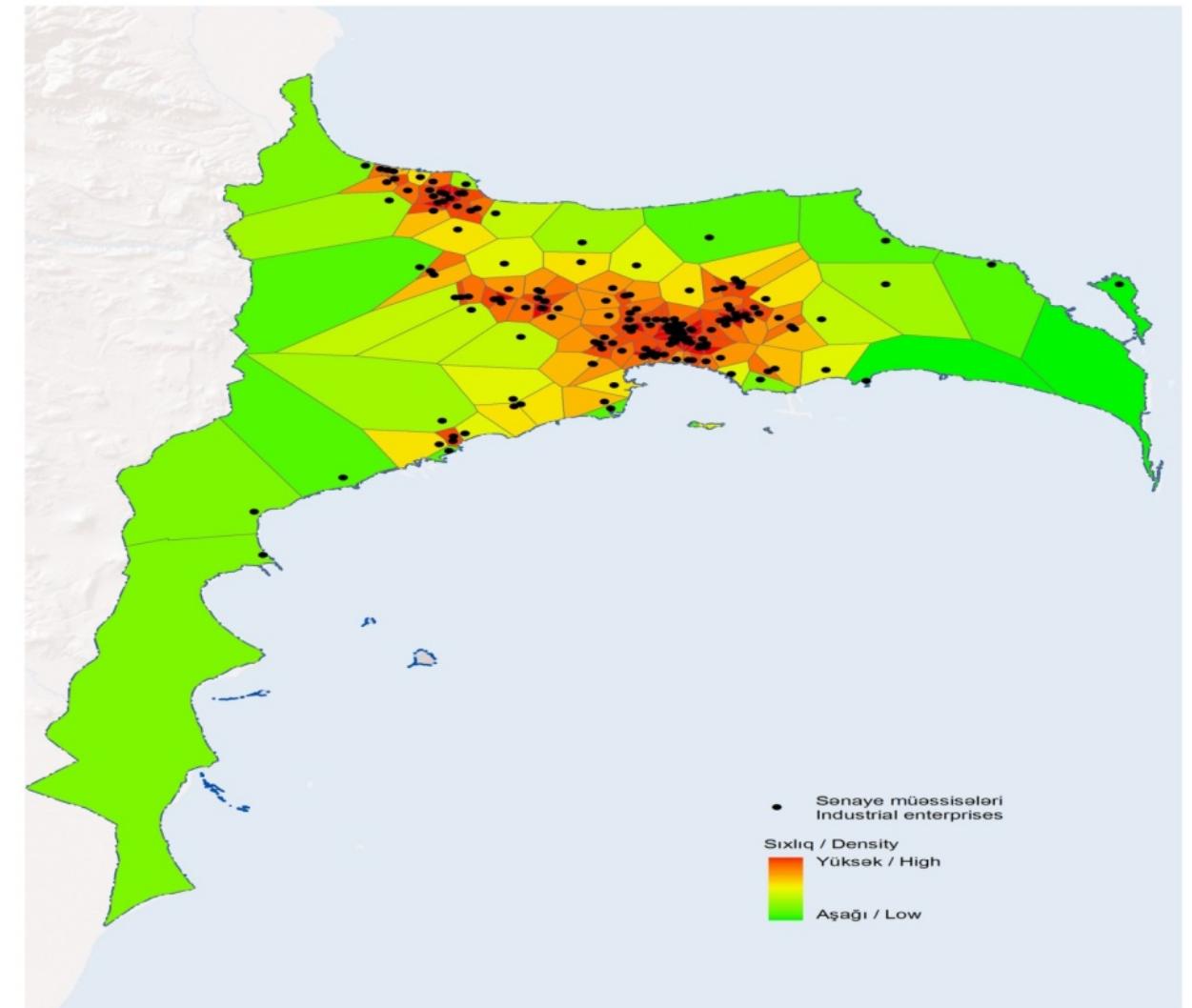
Source: "Greater Baku regional Development Plan" (GBrDP) project, presentation

3. AIR QUALITY STANDARDS AND OBJECTIVES

3.1. MAIN CONTRIBUTORS TO AIR POLLUTION

Being thec apital city, Baku is the most populated with high population density and industrialized region of the country. Active industrial enterprises (mainly in oil & gas sector), high traffic intensity, increasing number of commercial enterprises and population growth are playing main role in pollution of air in the city. Main sources of emission for Baku city could be listed as following:

- oil and gas extraction installations and oil refineries;
- transportation sector and private automobiles;
- electric and heating energy production entities;
- chemical and petrochemical entities;
- entities of production of construction materials;
- gases burned out at torches of terminals and plants;
- fugitive emissions from commercial and residential sector.

Accordingto statistical data of 2012 (*source: State Statistical Committee)* total emissions to ambient air from stationary sources in Baku city were 156.7 thousand tons, which is 69.2% of total emissions from stationary sources in Azerbaijan. Main pollutants forming the stationary sources of Baku city are divided to solid substances, gas and fluid substances, including sulphuric dioxide, carbon oxide and nitrogen oxide.

Unfortunately, statistics of emission from stationary sources by source by sector is not provided. In figure 22, it is provided information on emission by sources of Baku city prepared on the basis of expert judgements.

Figure 22: Main emission sources in Baku city

Emission from all sources, th.tons (2012)

Mobile sources — 63,92%
Water supply, waste water treatment and waste removal — 18,03%
Heavy industry, including oil& gas sector — 6,92%
3,45%
0,05%
2,93%
0,52%
0,09%
3,97%
0,12%

Legend:
- Mobile sources
- Heavy industry, including oil& gas sector
- Processing industry
- Water supply, waste water treatment and waste removal
- Electricity, water and gas production and distribution
- Construction
- Wholesale, retail, repair of vehicles
- Transport (not mobile sources, storehouse and communication

According to statistical data of 2012, total emissions from mobile sources in Baku city was 555.4 thousand tons, which is 65.3% from total emission from mobile sources in Azerbaijan (*source: State Statistical Committee*).

Figure 23: Total emission in Baku city by years, 2000-2012
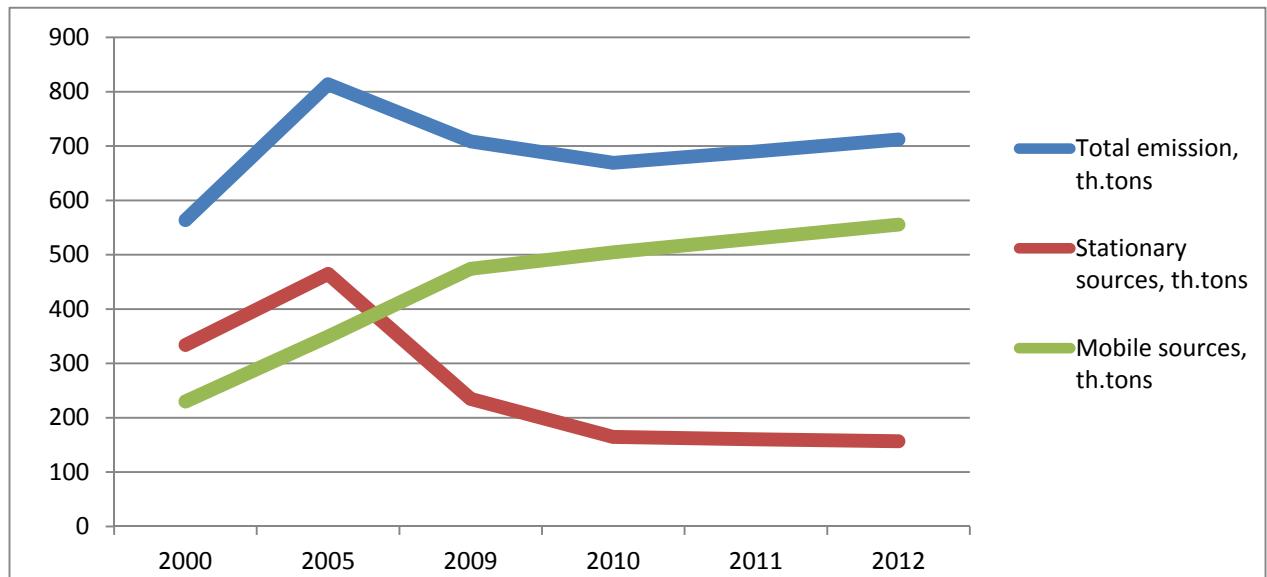
As it is seen from Figure 23, during 2000-2012 it is observed slight increase in total emissions. But, sharp increase observed in emissions from mobile sources. On the contrary, emissions from stationary sources have decreased in this period.

Based on available data for the whole country and expert judgements, it is concluded that main emission source for Baku city is mobile sources. It is followed by heavy industry (including oil& gas sector) and processing industry.

Currently, the biggest ambient air polluter in Baku city is transport sector. Vehicles have a strong impact on the atmospheric pollution. In recent years, intensive construction, rehabilitation and reconstruction works, and growing number of vehicles lead to the constant air pollution during the traffic jams in the streets which has become a serious problem.This information is based on analysis provided during preparation of the Second National Communication to UNFCCC, as well on experts' judgement and opinion according to latest trends on statistical data related to socio-economic and demographic indicators.

According to statistical data of 2012, total amount of emission of mobile sources in Baku city is approximately 7 times more in compare with total emission from mobile soures of other regions of the country*(source:State Statistical Committee).* The air quality limit values are exceeded for several pollutants and levels are overall relatively high, which has negative impact on human health. Along with this, the total number of vehicles is increasing year-by-year and almost 70% of registered vehicles (from total number of 1,135.936) are present in Baku city(*source: State Statistical Committee).*

The field observations conducted by Azerbaijan Branch office of REC Caucasus in November month (13-14 November) indicated that there is a number of cars entering Baku city from the surrounding settlements. Observations were conducted during working day of the week and from 9 am to 6 pm. The visual observations results demonstrated the entrance of roughly 52.500 and 53.000 vehicles from the northern and western entrance respectively. Furthermore,

more than 54.600 vehicles enter from the direction of Koroglu metro (Mardakan, Buzovna, Shuvalan, Zabrat, Bina, Gala and etc, settlements).

In the recent years, rapid increase in number of vehicles in Baku city raised the emission of harmful gases released into the atmosphere by mobile sources. In 2012, harmful substances emitted into the atmosphere from motor vehicles held 78% of total emissions *(source: State Statistical Committee).*

Most part of the external pollution of Baku city is created from Sumgayit city, but there were cases (meteorological events) when pollution originated from neighbour countries such as Iran. At present, any analysis for identification of the portion of external pollutionis not available.

3.2. TARGET VALUES AND OBJECTIVES TO BE REACHED

Overview of the standards used in Baku city to regulate air quality

During former Soviet times, Standards of USSR (Sanitary norms - CH245-71) for maximum allowed concentration values were used. According to Constitution Act on State Independency, adopted on 18 October 1991, "Soviet Laws keep their juridical power until adoption of appropriate national Laws…".

Currently, air quality norms of Soviet times are applied. Regards number of regulated substances, Soviet norms are applied for those substances, which are specific for the region, area or enterprise.

Table 12: Limit values applied

Substance	Averaging period	MACon$\mu g/m^3$	MAC$_{ad}\mu g/m^3$
SO$_2$	20-30 min	500	
	24 hours		50
NO$_2$	20-30 min	85	
	24 hours		40
CO	20-30 min	5 mg/m^3	
	24 hours		3 mg/m^3
O$_3$	20-30 min	160	
	24 hours		30
C$_6$H$_6$	20-30 min	1500	
	24 hours		100
Pb	20-30 min	1	
	24 hours		0.3
As	24 hours		2
Cd	24 hours		0.3
Ni	24 hours		1
HF	24 hours		5
Formaldehyde	24 hours		3

Proposed air quality objectives

It should be mentioned that, main document showing policy intention on the reduction of air pollutants is the concept of "Azerbaijan 2020: look for the future" approved on December 29, 2012 by the President of Azerbaijan Republic. In the concept it is stated that: "…*National standards will be prepared and applied in line with European standards adopted on poisonous substances released into the atmosphere. During the period covered by the concept, it is planned to bring the amount of energy used for the production of one unit of GDP and the amount of carbon dioxide in line with the appropriate indicator of member countries of the Organization for Economic Cooperation and Development, and this is important in terms of implementing the development goals of the millennium*".

According to other former and up-coming environmental policy documents, such as former *Action Plan on approximation of legislative basis of Azerbaijan to EU directives (2010-2012)* and up-coming *"Action Plan on improvement of ecological situation and efficient use of natural resources in Azerbaijan Republic (2014-2020)*" (this Action Plan is currenly under preparation and discussion process within different state bodies), Azerbaijan plans to replace Soviet/Russian air quality standards with the system, adopted in the European Union. European air quality management system is based on air quality objectives, which include limit values, target values, alert thresholds, information thresholds or long term objectives for all regulated pollutants.

Such transition will not be easy, as it would require not only changes in normative acts, but also upgrade of the air quality monitoring system, introduction of appropriate air quality modelling tools, and capacity building for all actors, which are involved in air quality management – environmental officials, operators, and consultants. Still, this is a necessity, determined both by the political will and Azerbaijan's rapid economic development.

Transition to the EU air quality management system will take time and will have to be gradual. Consequently, short term and long term air quality objectives, proposed in the Draft Air Quality plan for Baku city, are not only based on the estimations, how present pollution levels can be reduced with proportionate measures, but are also reflecting this transition.

Sections 2.2 and 2.3 of this report present available information of air quality in Baku along with its recent trends. The following table summarises situation with pollutants of concern (pollutants, for which limit values or target values are set by the EU and/or pollutants, for which monitoring results demonstrate exceedances of the current national limit values) for the last five years (2008-2012) along with relevant limit values, adopted in Azerbaijan and EU. Red colour indicates exceedances of the national and/or EU limit values, while orange colour marks potential problems – exceedances of estimated concentrations and lack of monitoring measurements of key pollutants.

Table 13: Air quality issues in Baku – summary for 2008-2012

Substance	Averaging period	Exceedances of MAC_{ad}	Exceedances of EU limit or target value	Notes
SO_2	One hour	-	-	not measured
	24 hours	negligible	no	
NO_2	One hour	-	-	not measured
	24 hours	regular	-	
	Calendar year	-	regular	
CO	maximum daily eight hour mean	-	-	not measured
	24 hours	medium	-	
O_3	maximum daily eight hour mean	-	-	not measured
	24 hours	-	-	not measured
Dust	24 hours	regular	-	measurement data are not reliable
	Calendar year	-	-	
PM_{10}	24 hours	-	estimated as highly likely	not measured
	Calendar year	-	estimated as highly likely	not measured
$PM_{2.5}$	Calendar year	-	-	not measured
C_6H_6	24 hours	-	-	not measured
	Calendar year	-	-	not measured
Pb	24 hours	-	-	not measured
	Calendar year	-	-	not measured
HF	24 hours	regular	-	
Formaldehyde	24 hours	regular	-	

Two important conclusions can be made on the basis of the above table:

- observed concentrations of NO_2, dust, HF, and formaldehyde are exceeding national and, in case of NO_2, also EU limit values. Moreover, also estimated concentrations of PM_{10}, calculated on the basis of conservatively chosen correction factors, appear to exceed corresponding EU limit values significantly;
- a significant number of substances, which are regulated by the EU – PM_{10}, $PM_{2.5}$, benzene, lead, ozone, As, Cd, Ni – are not measured by any of the monitoring stations in Baku city.

It is clear, that all the above problems have solid historical reasons and cannot be solved overnight. Meeting all European air quality limit values and target values for all priority pollutants requires significant and systematic investments into public infrastructure and abatement of industrial pollution, accompanied by modernisation of air quality management system on a national scale. This is taken into account, when suggesting short term (2-5 years) and long-term (10-15 years) air quality objectives for Baku city.

Short term objectives

Basing on the previous analysis, the following short term air quality objectives for Baku city can be formulated:

1) Recently observed trend of increasing NO_2 concentrations has to be reverted within the next fiour years (by 31 December 2018) to make sure, that observed NO_2 levels do not exceed levels, measured in 2011, at all monitoring sites in Baku;

2) Observed hourly average NO_2 concentrations at all monitoring sites in Baku should not exceed EU limit value (200 µg/m^3 not more than 18 times per calendar year) by 31 December 2020;

3) Observed daily average SO_2 concentrations at all monitoring sites in Baku should be kept well under the national and EU limit values.

4) Observed daily average dust (total suspended particles, or TSP) concentrations at all monitoring sites in Baku should not exceed national limit value (150 µg/m^3) by 31 December 2018.

5) Observed daily average CO concentrations at all monitoring sites in Baku should not exceed national limit values by 31 December 2020.

6) Observed daily average HF and formaldehyde concentrations at all monitoring sites in Baku should not exceed national limit values by 31 December 2017.

7) Information about concentration levels of EU priority pollutants – PM_{10}, $PM_{2.5}$, and benzene – should be collected and assessed by 31 December 2017.

Long term objectives

Taking into account Azerbaijan's political will to adopt EU environmental acquis, the long term air quality objective for Baku can be formulated as follows:

EU air quality limit values and target values, as stipulated by the Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, should be fully met in the entire territory of Baku city by 31 December 2030.

3.3. OVERVIEW OF LEGISLATION USED IN CASE OF EXCEEDANCES OF LIMIT VALUES

Legislative framework to address exceedances of air quality limit values

There is no particular legislative framework addressing exceedances of air quality limit values in Baku city. According to guideline of Environmental Monitoring Department approved by the order #273 of MENR dated 16 April 2003, in case of observations of exceedances of air quality limit values, a number of observations in particular area is increased and relevant information passed to respective organizations. Regards the same guideline, in case of exceedanses of air quality limit values by 1-10 times, it is provided information to the Environmental Protection Department of MENR. If exceedances are between 10-20 times, all enterprises in the area are notified and warned, and in case of exceedanses of air quality limit values by more than 20 times, local executive authorities are notified and warned.

In case of exceedances of air quality limit values by enterprises, the followingactions are regulated by decision of Cabinet of Ministers, number 122 dated 03 March 1992. In such cases Department of Expertise of the MENR provides investigation in the entity in order to identify the sources of high level pollution. As a result, written notification is provided to the entity in order to solve the problem in given period. Basically, enterprises agree their reports with local environmental units before submitting statistical report "On protection of ambient air". During with procedure, if local environmental units identify some miscalculations or high exceedances, it is organized additional field investigation in order to identify and prove such case.

Following actions

There are no any planned actions to be followed in case of exceedances of air quality limits values in Baku city.

Recommendations on improvement of the corresponding legislation

Correspondent legislative basis should be developed taking into account relevant EU directives.

4. EMISSION REDUCTION MEASURES

The reduction of air pollution has always been one of the priority issues of the Government. Inspite of the fact that there is no single action plan on the abatement of air pollution for Baku city yet, plans and programmes adopted, and measures taken on various areas (transportation, industry, urban planning and etc.) caused a relative decrease of the level of air pollution. However, the number of population growing both over the country and Baku city accompanied by the increasing requirements demand a comprehensive approach to this field.

It should be noted that, several actions on the reduction of air pollutants were purported in the concept of "Azerbaijan 2020: look for the future" considered the main development concept of Azerbaijan approved on December 29, 2012. In the concept it is stated that: "…*road-protecting green areas will be created to protect roadside areas and the atmosphere and to reduce traffic noises. National standards will be prepared and applied in line with European standards adopted on poisonous substances released into the atmosphere. During the period covered by the concept, it is planned to bring the amount of energy used for the production of one unit of GDP and the amount of carbon dioxide in line with the appropriate indicator of member countries of the Organization for Economic Cooperation and Development, and this is important in terms of implementing the development goals of the millennium*".

As mentioned in the previous sections of the present report, the main areas of air pollutants in Baku city can be lined up as follows:

1) Traffic pollutants emitted to the atmosphere;

2) Heavy and light industry pollutants emitted to the atmosphere;

3) Residential and commercial pollutants emitted to the atmosphere;

4) Electricity production and heating systems

It should be noted that, year-by-year growth of the traffic pollutants emitted from the transport sector is observed in Baku. According to the official statistics (*www.stat.gov.az*), more than 100,000 new cars are imported into the country each year, andapproximately 80% of these cars are used in Baku city. In this regard, official statistics says (*www.stat.gov.az*), the number of vehicles rose from 612.069 to 1,135.936, i.e. 85,5% during the years of 2005-2012. If take into account that, the number of vehicles increases by 10% each year, and if the growth rate continues in this way, the number of automobiles over the country will reach 3.000.000 after 10 years.

Several actions on the development of transport system are carried out by the Government in Azerbaijan. In this regard, 'State Program on the development of transport system in the Republic of Azerbaijan (2006–2015)', and 'State Program on the innovation and development of highway network of the Azerbaijan Republic (2006-2015)' was prepared by the Ministry of Transport of the Republic of Azerbaijan, and the actions intended within the programs have started to be implemented. The main objective of the State Program on the development of transport system in the Republic of Azerbaijan is the achievement of high socio-economic development in the country by insurance of the growing requirement of the population and economy towards the transportation services, establishment of sustainable transport system, provision of the needs of transport and defence of the state, increase of transit potential of the

country, improvement of the quality of transportation services, and reduction of the passenger and freight transportation costs. Though these actions are not directly involved in the reduction of pollutants, they indirectly trigger the abatement of traffic pollutants emitted to the atmosphere. A number of roads were made, existing roads were expanded, overhead pedestrian crossings, and new parkings were built in Baku city within the Program leading to decrease in traffic jams and increase of traffic speed, which caused the reduction of pollutants emitted from the transportation sector to the atmosphere to some extent.

Taking into account current tendency of increase in number of population of Baki city, as well as increase in number of vechiles, actions related to development of transport network should regularly be under consideration. In this regard, it should be also mentioned that, the Ministry of Transport of Azerbaijan has prepared Development Scheme of Transport Network (Infrastructure) of Baku city till 2030. Along with this, "Conceptual Development Scheme of Baku Metro Lines", and "State Program for Development of Baku Metro by 2011-2015" was approved by the Order of the President of the Republic of Azerbaijan dated 18 March, 2011. Under this plan, it is planned to expand the network of subway lines, and increase the number of metro stations from 23 to 70.

Figure 24: Conceptual Development Scheme of Baku Metro Network

Source: www.metro.gov.az

It is worth mentioning the application of Euro-2 standard as a significant action for decrease of pollutants emitted from the transportation sector to the atmosphere. According to recent decision of the Cabinet of Ministers, it is planned to switch to Euro-4 standard since April of 2014, according to which the import of automobiles that donot meetthis standard will not be allowed.The regulation is related to all categories of vehicles including passenger cars, buses and commercial vehicles.

The Government also takes several important actions on the reduction of pollutants emitted from heavy and light industry to the atmosphere. It is planned to move the industrial enterprises located in the center of the city to the suburbs along with the Sea Port to Alat settlement within

the Regional Development Plan of Baku city prepared by the State Committee for Architecture and Urban Planning, and reflecting the development plan of the city by 2030. The project of 'White City' is a part of this plan, and works in this direction have already been started. According to the Plan, transfer of the heavy industrial enterprises from the area known as a 'Black City' has been commenced.

It should be noted that, increase in the number of enterprises and labor force in Baku city is inevitable under the current state of economic development. New enterprises are established to meet the growing needs, and it naturally leads to the reduction of pollutants. But it is also important to note that, majority of the big enterprises in Baku city, especially, oil and gas enterprises have begun to apply modern low-waste technologies which prevent the growth of air pollutants.

The issue of management of the emission from the residential and commercial sector to the atmosphere is of great importance. Heating is provided by gas and electric energy both in houses and commercial facilities. It should be noted that, replacement of gas meters with smart meters has significantly improved efficient use of gas by users, there is need for additional educational activities, especially in terms of the use of low-emission technologies.

9 central heating systems named "kotelni" (boiler) existed for the supply of apartments and public buildings in Baku city with heating during the period of former Soviet Union. At present, some of them donot work. Nonetheless, autonomous central heating system is installed in the new buildings, it is not public. Therefore, it would be more purposeful to apply a single regulation for the heating system in the new buildings.

In general, the actions intended for the improvement of the management of air quality in Baku city were grouped as follows: technical, institutional and administrative, legislative, awareness raising, as well as improvement of urban planning. The action plan which includes all actions was separately prepared as a table, and added to the report.

4.1. TECHNICAL MEASURES

One of the most essential technical actions is the expansion of monitoring network for more effective monitoring of the level of atmospheric pollution, and renewal, modernisation of equipment. Of course, these measures will not reduce emissions or improve air quality in Baku city, but such measures are necessary in order to improve monitoring system to obtain relevant information to ensure effective planning. For this, the following actions are needed to be carried out:

⇒ Replacement of all monitoring stations located in Baku city with modern automated stations, and ensuremeasurements of pollutants regulated by the European directives at new stations;

⇒ Revisionof location scheme of the monitoring stations in Baku City with the current and future development, and optimization of the number of stations in accordance with the future development of the city;

The technical actions intended for the reduction of air pollutants in Baku city can be listed as follows:

Technical measures on the industry sector:

⇒ Relocatetheenterprisesfromthe city center or close to city center, including oil and gas refinery enterprises, to the suburbs.

It should be noted that, works in this direction are underway. For example, it is planned to move the enterprises located in the part of the city called "Black City", as well as 2 oil and gas refinery plants fromBaku city to the outskirts by the year of 2020.

⇒ Application of the latest, low-emission technologies in the enterprises located in Baku city

In most cases enterprises are reluctant to finance new technologies, but by applying low-emission and energy efficient technologies in the enterprises it is possible to reduce costs of energy used for per unit of production.

⇒ Promotion of the use of alternative energy in the energy supply of the enterprises in Baku city as much as possible

Private sector in most cases does not apply alternative energy sources in energy supply. It is mostly related to lack of awareness on environmental and economic advantages of the alternative energy sources. A wide range of awareness raising activities such as dissemination of information materials, on-site trainings, awareness workshops, and so on, should be organised.

Technical measures on the transportation sector:

⇒ Expansion of metro transport network in Baku city

It should be noted that, certain works in this field are being done in the country. In this regard, "Conceptual Development Scheme of Baku Metro Lines", and "State Program for Development of Baku Metro by 2011-2015" was approved by the Order of the President of the Republic of Azerbaijan dated 18 March, 2011. Under this plan, it is planned to expand the network of subway lines, and increase the number of metro stations from 23 to 70.

⇒ Establishment of large parking areas near metro stations in the city entries

As it was indicated in previous chapters, most cars are entering the city from surrounding settlements resulting intraffic jams in central parts of the city. By construction of large parking areas near metro stations in the suburbs of Baku city (for instance, near Koroglu metro station or 20 Janvar metro station) opportunity totheresidents living in surrounding settlements and working in city centerwill be created providing possibility to park their cars and use *metro for travelling to city center. Parking fee in these parking areas should be set relatively low in order to stimulate individual vehicle users to use parking areas.*

$\Rightarrow$ Improvement of road infrastructure, and construction of new road junctions, underground or above ground pedestrian crossings and car parkings for the elimination of traffic jams in Baku city;

On average, 2.7% carbon oxide arises when a vehicle is operating in a normal mode with a standard fuel. It reaches 3.9% when speed is dropping down, and 6.9% in low speed mode. As carbon oxide, as well as other exhaust gases isheavier than air, it isconcentratedin1 m layer above the ground. That is why, increased traffic speed by preventing traffic jams, results in reducedamount of noxious substances emitted to the atmosphere.

$\Rightarrow$ Arrangement of bike paths in the newly built road junctions and at existing roads, mainly in city center (where possible);

Bike paths have not been considered in road system of the city. Reconsrtuction of roads by making bike paths at existing roads needs huge investment. But, it should be analysed the opportunites of arrangement of bike paths at existing roads, mainly in city centers. Along with this, it is expedient to arrange bike paths in new road networks.

$\Rightarrow$ Set up public bicycle rental system, mainly in city center;

This measure could be applied after constructionof bike paths. By this measure special bicycles will be offered at highly frequented locations to registered users against a fee and can be returned at dedicated stations. Application of the measure is highly related to cultural aspects, as most of population are reluctant to use bicycles as transportation mean. By provision of awareness raising activities, especially among younggeneration, use of bicycles could be promoted.

$\Rightarrow$ Development of intelligent transport management network regulating traffic in all the main roads of the city;

"The Intelligent Transport System for Baku city" was launched by the Ministry of Transport in 2011 with the support of Korean companies and will be fully operational in 2015. The system covers only main roads in city center. Its network should be expanded covering most roads and avenues in city center, as well as the main roads and streets outside the city center.
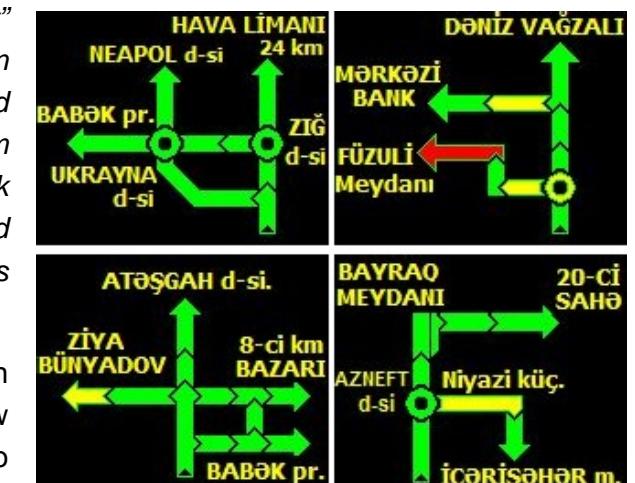
$\Rightarrow$ Regularly assess urban transportation demand and based on emerged new needs arrange necessary public funds to achieve sustainable urban transportation

⇒ Bus route optimisation

Bus route optimisation is an on-going exercise enhancing bus operation efficiency while meeting passenger demand, reducing traffic congestion and roadside emissions. As a result of changes in passenger demand and development of new transport infrastructure in recent years, at present fewof the franchised bus routes may substantially overlap or they are not operating effectively. Ministry of Transport regularly implements measures for route improvement. Such measures should be continued following futuredevelopments of the city.

⇒ Arrange separate bus lanes
⇒ Arrange necessary infrastructure and stimulate use of hybrid and battery electric cars

This measure could be applied in long term perspective as it needs wide range of infrastructural investments, as well awareness raising activities. Along with this, specific tax and custom privileges should be applied in order to stimulate individuals to use hybrid or batterey electric cars.

⇒ Improve quality of fuel used in transport, and produced in the country in compliance with the European standards.

For this purpose, technical capabilities of the plants producing gasoline should be improved, and content of sulphur in fuel should be reduced.

Technical measures on the residential and commercial sector:

⇒ Supply of all public buildings (schools, kindergardens, universities, ministries,etc.) located in Baku city with central heating system.
⇒ Arrange, where possible, applicationof alternative energy for all public buildings (schools, kindergardens, universities, ministries,etc.)

4.2. INSTITUTIONAL AND ADMINISTRATIVE MEASURES

Apart from the technical actions, institutional and administrative actions should also be implemented for the better management of ambient air inBaku city.

Institutional actions will be carried out in the form of structural changes and increase of human resources in the organizations dealing with the management of air quality. Administrative actions may be conducted in the form of any action, rule, requirement or fine that would reduce the level of air pollution.

4.2.1. Institutional measures

The following institutional measures are proposed:

⇒ Restructuring relevant unit within the Ministry of Ecology and Natural Resources (MENR) responsible for dispersion modelling and improve capacity of its staff;

⇒ Establishment of certain body under MENR, supply of it with necessary equipment and staff for the purpose of inventory of emissions from all enterprises located in the country in accordance with the present-day international practice

4.2.2. Administrative measures

Administrative measures in the industry sector:

⇒ Promotion of the use of low-emission technologies in the enterprises operating in Baku city.

It should be mentioned that, it could be either in the form of tax incentives or customs previliges in import/export operations.

⇒ Improvement of the access to low-interest loans targetingpromotion of low-emission technologies in the enterprises functioning in Baku city

The Government could regulate it through the National Fund for Entrepreneurship Support. For instance, it is possible to support loan application of the enterprises offering low-waste technologies.

⇒ Increase of payments and fines for emission discharged into the atmosphere from enterprises

Administrative measures in the transport sector:

⇒ Restriction of traffic access to the main central streets of Baku city and determination of low-emission areas in the city;

The current situation of Baku city is so that expansion of main roads in the city center and construction of new road junctions require a great deal of time and investment. Here, traffic management should be improved, and access to the city center should be limited at certain

hours of the day. It could be done by applying paid permits. At the same time, restrictions can be imposed on the rotational entrance of single and double plate cars to the areas with most traffic flow pursuant to the days of the week.There is a practice of low-emission areas applied currently applied in in the area called Icherisheher (Old City). It is available to apply this practice to other areas of the city as well.

⇒ Measures for the removal of expired old cars (raising taxes for the exploitation of old cars, purchase of old cars from the people on a centralized basis, and enabling the sale of low-waste cars under reasonable conditions and etc.) from the exploitation;

⇒ Introduction of tax and customs priviliges to low-emission, small-engine cars with low fuel consumption;

⇒ Increase of the rates of tax and customs to higher emission large-engine cars with more fuel consumption;

⇒ Increase of fines for improper parking of cars because of traffic jams, and carrying out regular awareness raising events in this sphere;

⇒ Congestion charging

By this measure fees will be applied to vehicle users based on actual usage of the road space in specific areas, mainly in city center. Variations regarding vehicle types and time of the day/week can be applied within this measure.

⇒ Compliance of fuel production with Euro-3 and Euro-4 standards;

⇒ Promote company bus services

At present, some big companies apply this system by picking up and returning their employees along certain established routes according to working hour. It reduces need for individual transportation, as well increases punctuality of workers. This practice should be replicated by other enterprises, as well by universities and schools. For this it could be organized a wide range of awareness raising activities such as dissemination of information materials, on-site trainings, awareness workshops and so on.

⇒ Expanding walking facilities;

Such facilities could be done in central places of the city. By this measures it will be arranged sufficient infrastructure to connect people from their place of residence to basic facilities like shops, social infrastructure, places of work etc.

⇒ Integrated fare and ticketing

By this measure different public transport entities will use one ticketing system to allow end-to-end connections with one fare and consequently increase user comfort. Ministry of Transport is going to launch such system from 2014. This should be enhanced and applied to all public transport means (bus, metro).

$\Rightarrow$ To carry out the action of "Clean Air Month" jointly conducted by the MENR and Ministry of Internal Affairs at least twice a year.

Within this action MENR and Ministry of Internal Affairs conducts control of engines of vehicles in the city during particular period. Identified cars with high emission are fined. At present, it is organized only once in a year. More control may increase awareness of drivers to pay more attention to emission issues and not use cars with unfit engines.

Administrative measures on the residential and commercial sector:

$\Rightarrow$ Application of the rule of issuance of construction permits to the new residential, administrative and private buildings in which parking areas and underground car park system, as well as central heating system in the construction scheme does not exist or compulsary inclusion of surface and underground parking lots, as well as central heating system in the construction scheme;

$\Rightarrow$ Application of tax and customs priviliges to the low-emission equipment for the stimulation of the use of more effective heating devices by the people and commercial sector;

$\Rightarrow$ Application of tax and customs priviliges to stimulate application of alternative energy in the new buildings.

4.3. LEGISLATIVE MEASURES

Oveview of current situation

Analysis on legal framework related to air quality management shows that there is no specific strategy on air quality management related to how ambient air pollution should be decreased and prevented in Azerbaijan. Legal framework in the sphere of ambient air quality management is only partially developed. Some issues of ambient air quality management, including such priority issues, as air pollution from motor vehicles, remain unregulated.

It should be mentioned that, The Law of the Republic of Azerbaijan on Ambient Air Protection, which was adopted in 2001, was an attempt to harmonize the Azerbaijan legislation in the sphere of air quality management with that of the European Union. Actually, still there are gaps in the legal framework related to ambient air protection in Azerbaijan.

Existing legal provisions do not create a sufficient basis for permit issuing, especially the absence of technology-based emission limit values, but also the lack of guidance on BATs. The EIA's role in the permit issuing process is not fully defined and depends on decisions by the competent authority.

Presently used air quality standards are based on the modification of the former Soviet system (maximum allowable concentrations – MACs). Standards for PM_{10} or $PM_{2.5}$ are not in place. Maximum allowable emissions (also called emission limit values – ELVs), in fact emission ceilings at the level of particular installations expressed in mass units per unit of time, are only calculated on an ad hoc basis from MACs, using a simple dispersion model. Technology-based emission limit values or generally binding quantified requirements to reduce emissions are not applied.

At present, there is no any mandatory legislation base on types, averaging periods, calculations intervals and other specifications of the dispersion modelling software, as well.

Recommendations

The following recommendations could be listed in order to improve legislative basis on air quality management:

$\Rightarrow$ Elaboration of relevant amendments to The Law on Ambient Air Protection (#109-IQ, 27.03.2001) in compliance to EU directives:
It is necessary to making amendments to this Law in accordance with harmonization of ambient air quality norms with EU Air Quality Standards; making amendments on development of the principles of air quality monitoring system, improvement of monitoring network by setting up automated network of monitoring stations, covering all EU priority air pollutants.

$\Rightarrow$ Elaboration of legislative normativebase for new adopted air quality standards in line with EU directives:

Updating of existing normative acts and elaboration of the new normative acts on air quality standardscorresponding with EU Air Quality Standards (Harmonising with Directive 2008/50/EC on ambient air quality and cleaner air for Europe ; The fourth

Daughter Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air; Decision 97/101/EC on the exchange of information and data from networks and stations measuring ambient air quality within Member States);

⇒ Elaboration of legal normative base for dispersion modeling, in compliance with EU legislation

Harmonising with the Directive2008/50/EC on ambient air quality and cleaner air for Europe

⇒ Updating of existing legal acts and preparation of the new normative acts on emissions from stationary sources

Elaboration of legislation defining emission norms for separate enterprises based on their peculiarity and used technologies, harmonising with Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (Directive 2010/75/EU)

⇒ Elaboration of new normative acts on emissions from mobile sources

Harmozing with Directive 2008/50/EC on ambient air quality and cleaner air for Europe; Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007; Commission Regulation (EC) No 692/2008 of 18 July 2008

4.4. AWARENESS RAISING MEASURES

It is also extremely important to carry out a wide range of awareness raising actions, and increase the access to the information on air quality alongside the technical, institutional, administrative and legislative actions for the purpose of improvement of management of ambient air. In this regard, it is expedient to consider the following actions within the action plan on the management of ambient air quality inBaku city:

⇒ Promotion of more use of public transport (bus, metro) among the population, and implementation of widespread awareness raising actions on this

Such actions can be carried out by means of various information booklets, social media, web portals, radio and television broadcasts, TV shows, and commercials.

Messages on the reduction of air pollutionas result of less use of cars, and positive effects of it on publichealthshouldbe delivered in the information given to the population. In particular, awareness raising actions should be carried out among the employeesof governmental and private enterprises and they should be encouraged to use public transport rather than private cars to work. Certainly, the quality of public transport should be improved in parallel with these educational activities.

⇒ Promote car sharing

Such actions can be carried out by means of various information booklets, social media, web portals, radio and television broadcasts, TV shows etc.

⇒ Driving training

By this measure, drivers will be trained in fuel-efficient driving techniques and gain awareness of environmental issues. Such training will be integrated in standard driving school lessons.

⇒ Posting of real-timedata on the state of ambient air in the city on monitors in different parts of Baku city

Such monitors enable to encourage the use of low-emission equipment at homes and work places, as well as less use of motor transport by people by posting operative data obtained from automated stations on the air quality in Baku city.

⇒ Implementation of a wide range of awareness raising actions on the benefits of the use of alternative energy sources and low-emission technologies for both population and enterprises

Such actions can be carried out by means of various information booklets, social media, web portals, radio and television broadcasts, TV shows, etc. In addition, a variety of educational actions should be conducted at secondary schools and universities, and issues on the protection of air quality should be included in curricula of secondary schools and universities.

4.5. IMPROVED CITY PLANNING

At present, the last planning system set up during the Soviet period is still in force, because a new master plan of Baku is not ready yet. A special task force has been established under the State Committee for Architecture and Urban Planning for the purpose of the preparation of Regional Development Plan of Baku, and the plan has already been prepared, and submitted to the Cabinet of Ministers. Apart from the capital Baku, it is planned to establish additional "city centers", move the production plants located in the city center to the suburbs, and arrange green areas. Besides, Regional Development Plan of Baku city considers the measures such as resettlement of Sea Port to Elet settlement, resettlement of oil terminals to Sangachal settlement, deconstruction of non-functioning industrial units situated in "Black City" and construction of new "Baku White city" comprising 221 ha, construction of metro line to airport which will lead to significant reduction of emissions leading to improvementof air quality.

The following actions should be taken into account in the urban planning for more effective management of pollution discharged into the atmosphere in Baku city:

- ⇒ Use dispersion modelling in the urban planning, map of pollution sources of ambient air of Baku city should be developed, and considered during an urban planning;
- ⇒ Mainstreaming of safe and uninterrupted movement during the construction and urban planning works;

Most countries of the world have such a practice: if it is not possible to establish a road infrastructure to meet the transportation needs of any designed facility (residential building, business center, factory, school, and etc.), or construction of that facility will disorder the safe and continous traffic overloading the existing road infrastrusture, construction of such a facility will in no way be allowed;

- ⇒ Tightening of the rules for the prevention of dust emissions emitted to the atmosphere at maximum level during the new construction works in the city;
- ⇒ Expansion of green areas and parks;
- ⇒ Prohibition of the construction of buildings lacking surface and underground parking lots;
- ⇒ Consideration of the enlargement of streets, re-designing junctions, optimising traffic lights during the urban planning to increase traffic speed

Action Plan

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
Technical meashures						
1	Relocate the enterprises in the city center or close to city center, including oil and gas refinery enterprises to the suburbs	reduced number of pollution sources inBaku city	formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO	high	MoEI, BCEC, SOCAR, MoE	2015-2030
2	Application of the latest, low-emission technologies in the enterprises located in Baku city	reduced air pollution from enterprises	formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO	high	MoEI, MoE, SOCAR, MENR	2015-2030
3	Encouraging the use of alternative energy in the energy supply of the enterprises in Baku city as much as possible	reduced air pollution from enterprises	NO_2, $PM_{2.5}$, CO, SO_2	medium	MOEI, MoE, SOCAR, MENR, SAARES	2015-2030
4	Expansion of metro transport network in Baku city	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	medium	BMO, BCEC, MoEI	2014-2030
5	Establishment of large parking areas near metro stationsin the suburbs of Baku city from the main directions entering the city	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	medium	MoEI, MoT, BCEC	2015-2030
6	Improvement of road infrastructure, and construction of new road junctions, underground pedestrian crossings and car parkings for the elimination of traffic jams	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, benzene	low	MoEI, MoT, BCEC	2015-2030

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
7	Arrangement of bike paths in the newly built road junctions and at existing roads, mainly in city center (where possible)	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoEI, MoT, BCEC	2015-2030
8	Application of public bicycle rental system, mainly in city center	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoEI, MoT, BCEC	2015-2030
9	Introduction of intelligent transport management network regulating traffic in all the main roads of the city	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoT	2015-2020
10	Regularly assess urban transportation demand and arrange funds based on emerged new needs to achieve sustainable urban transportation	sustainable urban transportation leading to reduced air pollution from transportsector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	medium	MoEI, MoT, BCEC	2015-2020
11	Bus route optimisation	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoT	2015-2020
12	Separate bus lanes	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoEI, MoT, BCEC	2015-2020
13	Arrange necessary infrastructure and stimulate use of hybrid and battery electric cars	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoEI, MoT, CC, MT, BCEC	2015-2030
14	Insurance of the compliance of fuel used in the transport, and produced in the country with the European standards (Euro 4, Euro 5)	reduced pollution from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoEI, SCSP, SOCAR	2015-2030

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
15	Supply of all public buildings (schools, kindergardens, universities, ministries and etc.) located in Baku city with central heating system	reduced pollution from residental sector	NO_2, $PM_{2.5}$, CO, SO_2	low	MoEI, all related ministries	2015-2030
16	Arrange, where possible, applicationof alternative energy sources inall public buildings (schools, universities, ministries, etc.)	reduced pollution from residental sector	NO_2, $PM_{2.5}$, CO, SO_2	low	MoEI, MoE, SOCAR, MENR, SAARES	2015-2030
	Institutional and administrative measures					
1	Restructuring relevant unit within the Ministry of Ecology and Natural Resources (MENR) responsible for dispersion modelling and capacity building for its staff	improved air quality modelling system	N/A	N/A	MENR	2015-2020
2	Establishment of certain body under MENR, supply of it with necessary equipment and staff for the purpose of inventory of emission in accordance with the best international practice	imporved works related to emission database	N/A	N/A	MENR	2015-2020
3	Promotion of the use of low-emission technologies in the enterprises operating in Baku city	reduced air pollution from enterprises	formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO	medium	MoEI, MoT, CC, SOCAR	2015-2020
4	Improvement of the access to low-interest loans in view of the promotion of the use of low-emission technologies in the enterprises functioning in Baku city	improved access of enterprises to apply low-emission technologies	formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO	medium	MoEI, NFSE	2015-2020
5	Increase of payments and toughening of fines for emission discharged from enterprises into the atmosphere	reduced air pollution from enterprises	formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO	medium	MENR, CM	2015-2020

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
6	Measures for the removal of expired old cars (raising taxes for the exploitation of old cars, purchase of old cars from the people on a centralized basis, and the sale of low-emission cars etc.) from the exploitation	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	low	MoEI, MoTr, MoIA, CC	2015-2030
7	Introduction of tax and customs priviliges to low-emission, small-engine cars with low fuel consumption	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoEI, MoTr, CC, MoIA, NP	2015-2020
8	Increase of the rates of tax and customs to higher emission, large-engine cars with more fuel consumption	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoEI, MoT, CC, MoIA, NP	2015-2020
9	Increase of fines for improper parking of cars because of traffic jams, and carrying out regular awareness raising events in this sphere	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoEI, MoT, CC, MoIA, NP, NGOs	2015-2020
10	Restriction of traffic access to the main central streets of Baku city	reduced emission from transport sector in central parts of the city	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	high	MoIA, BCEC	2015-2020
11	Promote company bus services	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoT, MENR, MoEI, NGOs	2015-2020
12	Congestion charging	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	medium	MoT, MoEI, BCEC	2015-2030

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
13	Determination of low-emission areas in Baku city, and restriction of traffic in those areas	reduced emission from transport sector in central parts of the city	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	high	MoIA, BCEC	2015-2020
14	Expanding walking facilities	reduced emission from transport sector in central parts of the city	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	BCEC	2015-2020
15	Integrated fares and ticketing	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoT	2015-2020
16	To carry out the action of "Clean Air Month" jointly conducted by the MENR and Ministry of Internal Affairs at least twice a year	increased capacity on use of cars with low-emission	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MENR, MoIA	2015-2020
17	Application of the rule of issuance of construction permits to the new residential, administrative and private buildings in which parking areas and underground car park system, as well as central heating system in the construction scheme does not exist or compulsary inclusion of surface and underground parking lots, as well as central heating system in the construction schemes	reduced emission from transport and residential sectors	NO_2, $PM_{2.5}$, CO, SO_2	low	MoEC, BCEC	2015-2030
18	Application of tax and customs priviliges to the low-emission equipment for the stimulation of the use of more effective heating devices	improved access to low-emission technologies	NO_2, $PM_{2.5}$, CO, SO_2	medium	MoEI, MoT, CC	2015-2020

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
19	Application of tax and customs priviliges to stimulate application of alternative energy in the new buildings	reduced emission from residental sector	NO_2, $PM_{2.5}$, CO, SO_2	medium	MoEC, MoEI, BCEC, SAARES	2015-2030
	Legislative measures					
1	Elaboration of relevant amendments to The Law on Ambient Air Protection in compliance to EU directives	improved legislation basis for air quality managament	N/A	N/A	MENR, CM, NP	2015-2020
2	Elaboration of legislative normative base for new adopted air quality standards in line with EU directives	improved legislation basis for air quality managament	N/A	N/A	MENR, CM, NP	2015-2020
3	Elaboration of legal normative base for dispersion modeling, in compliance with EU legislation.	improved legislation basis for air quality managament	N/A	N/A	MENR, CM, NP	2015-2020
4	Updating of existing legal acts and preparation of the new normative acts on emissions from stationary sources	improved legislation basis for air quality managament	N/A	N/A	MENR, CM, NP	2015-2020
5	Elaboration of new normative acts on emissions from mobile sources	improved legislation basis for air quality management	N/A	N/A	MENR, CM, NP, MoTr	2015-2020

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
Awareness raising measures and data sharing						
1	Promotion of more use of public transport (bus, metro) among the population, and implementation of widespread awareness raising actions on this	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MENR, MoTr, BCEC, NGOs	2015-2030
2	Promote car sharing	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, dust, PM_{10}, benzene	low	MoT, MENR, NGOs	2015-2020
3	Driving training	increased awareness of drivers to use cars with less emission	NO_2, $PM_{2.5}$, CO, benzene	low	MoT, MoIA, MoE	2015-2020
4	Posting of operative data on the state of ambient air in the city on monitors in different parts of Baku city	improved data sharing on air quality and air pollution	N/A	N/A	MENR, BCEC, MoTr	2015-2030
5	Implementation of a wide range of awareness raising actions on the benefits of the use of alternative energy sources and low-emission technologies for both population and enterprises	improved capacity on low-emission technologies and alternative energy sources	N/A	N/A	MENR, MoEd, NGOs	2015-2030
6	Dissemination of real time information on air pollution situation of the city	improved access to on air quality and air pollution	N/A	N/A	MENR	2015-2030

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
7	Improve public access to information on analytical reports based on analysis of air pollution situation	improved data sharing on air quality and air pollution	N/A	N/A	MENR	2015-2030
			Other measures			
1	Replacement of all monitoring stations located in Baku city with modern automated stations, and measurement of pollutants regulated by the European directives at new stations	obtained operative data on pollutants monitoring of pollutants in line with EU directives	N/A	N/A	MENR, SCSP, SN	2015-2020
2	Redevelopment of location scheme of the monitoring stations in Baku City with the current and future development, and optimization of the number of stations in accordance with the future development of the city	improved monitoring network	N/A	N/A	MENR, BCEC	2015-2020
3	Provision of dispersion modelling and development of pollution map of the city on the latest technological innovations and programs	identification of main pollution sources of Baku city	N/A	N/A	MENR	2015-2020
4	Application of dispersion modelling in the urban planning (a) and develop map of pollution sources of ambient air of Baku city (b)	developed map on polllution sources of Baku city	(a) formaldehyde, HF, SO_2, NO_2, benzene, dust, PM_{10}, $PM_{2.5}$, CO (b) N/A	(a) medium (b) N/A	MENR, BCEC	2015-2020

#	Measures	Expected outcomes	Targeted pollutant	Reduction potential	Responsible organizations	Time period
5	Mainstreaming of safe and uninterrupted movement during the construction and urban planning works	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	low	MoEI, BCEC	2015-2030
6	Consideration of the enlargement of streets for increase of traffic speed during the urban planning	reduced emission from transport sector	NO_2, $PM_{2.5}$, CO, benzene	low	MoEI, BCEC, MoTr	2015-2030
7	Tightening of the rules for the prevention of dust emissions emitted to the atmosphere at maximum level during the new construction works in the city	reduce dust emission	dust, PM_{10}	high	BCEC, MoEC, MENR	2015-2020
8	Expansion of green areas and parks	improve air quality of Baku city	dust	low	BCEC	2015-2020

5. DATA PUBLICATION

As it was described in previous chapters, in Azerbaijan, State Statistical Committee is responsible for collecting and handling data on air emission. Information of atmospheric pollution isgathered and summarized by the Statistical Committee and generalized information on ambient air (report) is prepared by the Statistical Committee and placed in official web page (www.stat.gov.az/source/environment).

At present, monitoring results and prognosis for pollution concentration are regularly published in information bulletins and placed at the official web page of MENR. At the same time, information on monitoring results is presented to the relevant state organizations and to mass media. All information is accessible for units dealing with air quality assessment and management. Generalized data on air quality assessment is accessible for public through internet portals and annual publications.

It should be mentioned that there are certain shortcomings in dissemination and publication of data related to air quality. First of all, data does not reflect real time information. On the other hand, information on analysis of air quality monitoring data isnot disseminated to public and mass media on regular basis.

The following measures arerecommened in order to improve quality of data publication:

⇒ Provide real time data on air quality information

It will be easy to provide real time data after installing automated monitoringstations in Baku city. Real time information from automated stations will be sentto monitoring center on certain times and it will be easy to disseminate such informaition.

⇒ Reguarly share report on analysis of air quality situation to public and mass media;

Such information could be placed at the official web site of the MENR, as well on other internet portals.

⇒ Organization of various capacity building activities (trainings, seminars, dissemination of information materials, radio-tv shows, etc), related to air pollution issues

6. OBJECTIVES OF THE ACTION PLAN

Overall objective of the Action Plan is improvement of air quality in Baku city. Action Plan provides detailed information on air quality standards and objectives, main contributors to air pollution, identifies target values and objectives to be reached, proposing realistic step by step objectives to be met by implementing specific measures. The measures are divided to technical, administrative and political, legislative measures as well measures related to improvement of city planning and increasing public awareness.

It should be also mentioned that meeting modern European air quality limit values and target values for all priority pollutants requires significant and systematic investments into public infrastructure and abatement of industrial pollution, accompanied by modernization of air quality management system on a national scale. Besides, air quality legislation base also should be developed in line with EU directives following by introducing necessary institutional framework in order to achieve proposed targets.

In chapter 3 of the current Action Plan objectives of the plan were described, being divided into 2 parts: short-term objectives and long-term objectives.

6.1. NEAR FUTURE OBJECTIVES

Short-term objectives of the Action Plan could be summarized as below:

- Recently observed trend of increasing NO_2 concentrations has to be reverted within the next five years (by 31 December 2018) to make sure, that observed NO_2 levels do not exceed levels, measured in 2012, at all monitoring sites in Baku;

- Observed hourly average NO_2 concentrations at all monitoring sites in Baku should not exceed EU limit value (200 µg/m^3 not more than 18 times per calendar year) by 31 December 2020, expect days with extremal weather conditons;

- Observed daily average SO_2 concentrations at all monitoring sites in Baku should be kept well under the national and EU limit values;

- Observed daily average dust (total suspended particles, or TSP) concentrations at all monitoring sites in Baku should not exceed national limit value (150 µg/m^3) by 31 December 2018;

- Observed daily average CO concentrations at all monitoring sites in Baku should not exceed national limit values by 31 December 2020;

- Observed daily average HF and formaldehyde concentrations at all monitoring sites in Baku should not exceed national limit values by 31 December 2017;

- Information about concentration levels of EU priority pollutants – PM10, PM2.5, and benzene – should be collected and assessed by 31 December 2017.

Mentioned short term objectives can be achieved only in close cooperation with relevant stakeholders involved in air quality assessment and management in Azerbaijan – public authorities, industries, environmental professionals, and public. To facilitate this, all these stakeholders have been involved in the preparation of the report. It was done in different ways. Key role in stakeholder consultation process was done by the Project Steering Committee. At the initial phase of the project, Project Steering Committee was formed, consisting of the representatives

fromall relevant state and no-state stakeholders such as National Parliament, Ministry of Ecology and Natural Resources, Ministry of Transport, Ministry of Health, Ministry of Industry and Energy, State Statistical Committee, State Oil Company of Azerbaijan Republic, "Azerenergy", non-governmental organizations, as well as national focal points of relevant conventions. Regular Project Steering Committee meetings were organised, where draft reports have been delivered to members to get their comments and recommendations. Besides, regular consultations and negotiations have been carried out with relevant departments of different Ministries (National Environmental Monitoring Department within MENR, Intellectual Management Centerof Transport within Ministry of Transport, State Committee on Standards, Meterology and Patents,etc) in terms of obtaining necessary data or discussion of various project related issues.

Along with this, projects experts involved to the report development process were representing relevant institutions dealing with air quality issues, such as National Environmental Monitoring Department, State Inspection Service, previous Ecological Scientific & Technological Information and Methodology Center(due to recent changes, MENR is providing some restructure of this unit) within MENR, SOCAR etc.

Relevant stakeholders involved to air quality assessment and management issues have provided their significant inputs for development of the action plan. Final version of the document is going to be circulated among all stakeholders for final review and discussions will be held at a final workshop. Final revised version of the Air Quality Action Plan for Baku City will be submitted to the MENR for further consideration.Following this, MENR will submit Air Quality Action Plan for Baku City to the Cabinet of Ministers for further actions.

6.2. LONG TERM OBJECTIVES

Taking into account Azerbaijan's political will to adopt EU environmental acquis, the long term air quality objective of the Action Plan for Baku can be formulated as follows:

EU air quality limit values and target values, as stipulated by the Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, should be fully met in the entire territory of Baku city by 31 December 2030.

7. CONCLUSIONS

Comprehensive overview of available air quality data for Baku city, legislative framework, institutional structure, analysis of the existing air quality monitoring system and air quality standards, data reporting, emission data and main sources of pollution allows concluding that:

- Despite of non-existence of separate plan on air quality improvement of Baku city, several aspects of air quality issues have been reflected in "Azerbaijan 2020: look for the future" considered as the main development concept of Azerbaijan, and also several actions on air quality improvement are considered within "Greater Baku Regional Development Plan";

- Monitoring and observation of pollution of ambient air in Baku city is conducted only for the basic polluting ingredients and the number of stations is not compliant with criteria of arrangements of monitoring stations which based on number of population in the area;

- Mostly obsolete instrumentation is used at the observation points and there in no automated monitoring system;

- There is a lack of qualified staff and weak capacity of monitoring staff;

- Absence of hourly measurements at monitoring stations of CO, NO_2 and SO_2 does not allow comparing concentrations of these pollutants to the EU limit values;

- The air quality limit values are exceeded for several pollutants and the levels are overall relatively high, which has negative impact on human health;

- Observed concentrations of NO_2, dust, HF, and formaldehyde are exceeding national and, in case of NO_2, also EU limit values. Moreover, also estimated concentrations of PM_{10}, calculated on the basis of conservatively chosen correction factors, appear to exceed corresponding EU limit values significantly;

- A significant number of substances, which are regulated by the EU – PM_{10}, $PM_{2.5}$, benzene, lead, ozone, As, Cd, Ni – are not measured by any of the monitoring stations in Baku city;

- There is a need to improve public access to monitoring data through dissemination of real time information on air pollution situation, especially in Baku city and other big cities;

- Mobile sources are the main source of pollution that shows increasing tendency in recent years. Total amount of emission frommobile sources in Baku city is approximately 7 times more in compare with total emission from mobile sources of other regions of the country;

- Emission data are available for separate enterprises (in paper form only, and with no metadata included), for different production sectors and for different cities of the country, but not for small-scale enterprises and residential sector;

- Out-dated methodologies are used for emission calculation. Methodologies and emission factors applied for calculation of emission are not adapted to the EU standards. There is no analysis on advantages of different methods for emission calculation from stationary or mobile sources;

- Instrumental measurement devices are not used for calculation of emissions. Emissions are calculated based on amount of used fuel and other materials based on mentioned methodologies;

- Air pollution dispersion modeling is provided on case-to-case level only at enterprises level;

- Current national legislation of Azerbaijan on air quality is not adapted to the requirements of EU Directives.

8. RECOMMENDATIONS

Based on conclusion and findings recommended measures in order to improve air quality in Baku city and to achieve set objectives have been described in chapter 4 of the current report. Recommended measures have been divided into 5 groups: technical measures, administrative and institutional measures, legislative measures, measures related to awareness raising and improved city planning.

The following could be listed as main recommendations:

- It is essential to implement technical measures for development of monitoring system in Baku city,optimization of the number of stations in accordance with the future development of the city and ensure of measurement of pollutants regulated by the European directives at new stations;

- It is important to follow technical measures related to industrial sector, such as relocate the enterprises from the city center or close to city center, including oil and gas refinery enterprises, to the suburbs, application of the latest, low-emission technologies in the enterprises located in Baku city, promotion of the use of alternative energy in the energy supply of the enterprises in Baku city as much as possible;

- Considering the role of transport sector in city pollution, it is urgent to implement technical measures on transport sector, namely continue expansion of metro transport network in Baku city, establishment of large parking areas near metro stations in the city entries, improvement of road infrastructure, and construction of new road junctions, underground or above ground pedestrian crossings and car parking, arrangement of bike paths and set up public bicycle rental system, mainly in city centers, development of intelligent transport management network regulating traffic in all the main roads of the city, optimize bus route scheme, arrange separate bus lanes, arrange necessary infrastructure and stimulate use of hybrid and battery electric cars;

- Taking into account latest decision of Cabinet of Ministers on application of Euro 4 standards, it is important to work on improvement of quality of fuel used in transport, and produced in the country in compliance with the European standards;

- It is also important to provide measures in order to supply of all public buildings located in Baku city with central heating system and arrange, where possible, application of alternative energy sources;

- It is recommended to arrange institutional measures such as restructuring relevant unit within the MENR responsible for dispersion modeling and establishment of certain body under same Ministry, supply of it with necessary equipment and staff for the purpose of inventory of emissions from all enterprises located in the country in accordance with the modern international practice;

- It is also recommended to promote use of low-emission technologies in the enterprises operating in Baku city, improve access to low-interest loans targeting promotion of low-emission technologies in the enterprises functioning in Baku city and increase of payments and fines for emissions discharged into the atmosphere from enterprises;

- It is advisable to implement measures for the removal of expired old cars from the exploitation, introduction of tax and customs privileges to low-emission, small-engine cars with low fuel consumption, increase the rates of tax and customs to higher emission large-engine cars with more fuel consumption, increase of fines for improper parking of cars because of traffic jams, and carrying out regular awareness raising events in this sphere;

- It is also recommended to restrict traffic access to the main central streets of Baku city and determination of low-emission areas in the city, promote company bus services, expand walking facilities in central areas of the city, apply integrated fare and ticketing in public transportation;

- Administrative measures in residential and commercial sectorshould be considered, namely by restricting construction permits forthe new buildings without parking areas or underground car park system, as well as central heating system. It should be followed byapplication of tax and customs privileges to the low-emission equipment for the stimulation of the use of more effective heating devices and alternative energy sources by the publicand commercial sector;

- In parallel, it is recommended to implement legislative measures to improve air legislation in compliance to EU directives;

- It is also important to implement a number of awareness raising measures such as promotion of more use of public transport, promote car sharing, posting of real-timedata on the state of ambient air in the city, as well as implementation of a wide range of awareness raising actions on the benefits of the use of alternative energy sources and low-emission technologies;

- It is recommended to use dispersion modeling in the urban planning, develop the map of pollution sources of ambient air of Baku city and consider it during an urban planning, tighten of the rules for the prevention of dust emissions emitted to the atmosphere at maximum level during the new construction works in the city and continue activities related to expansion of green areas and parks in the city.

Next steps

It is obvious that preparation of the Draft Action Plan for Baku City for improvement of air quality assessment and management is only first step. Final revised version of the Action Plan will be submitted to the MENR for further consideration. Following this, MENR will submit Air Quality Action Plan for Baku City to the Cabinet of Ministers for further actions.

As other important next step, all relevant stakeholders involved to the stakeholder consultation process during preparation of the current Action Plan should consider proposed recommendations in their sectoral strategies and plans in order to achieve proposed short-term and long-term objectives.

ANNEXES

ANNEX 1: GOOGLE VIEW OF MONITORING STATIONS IN BAKU CITY
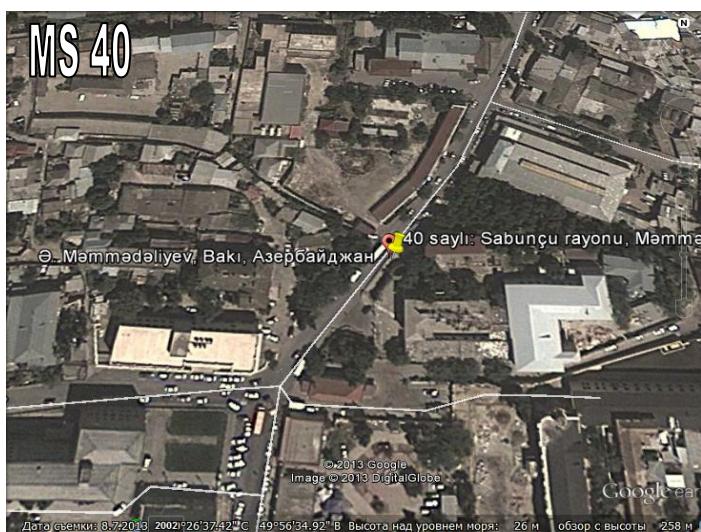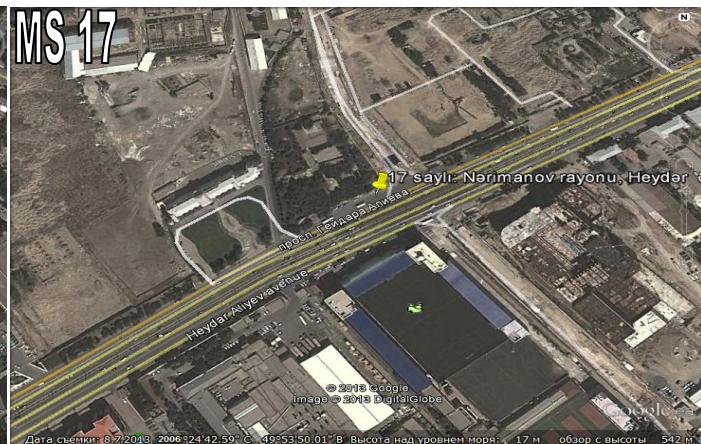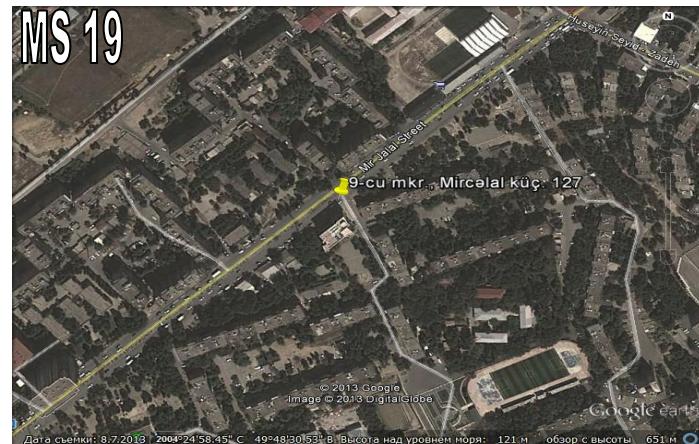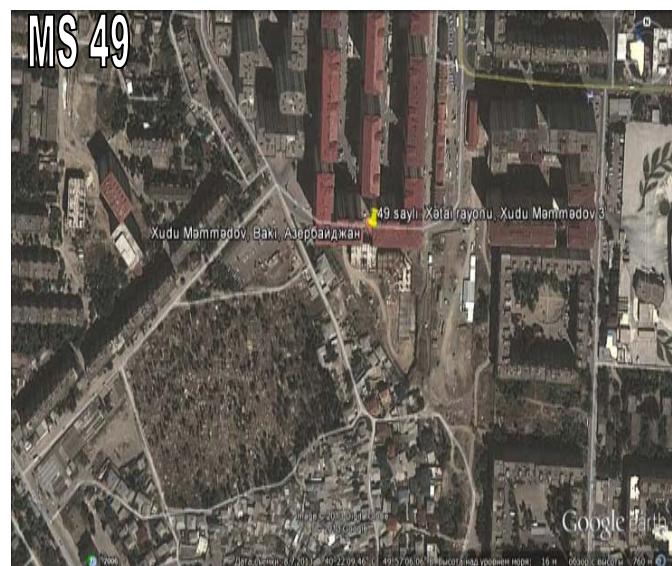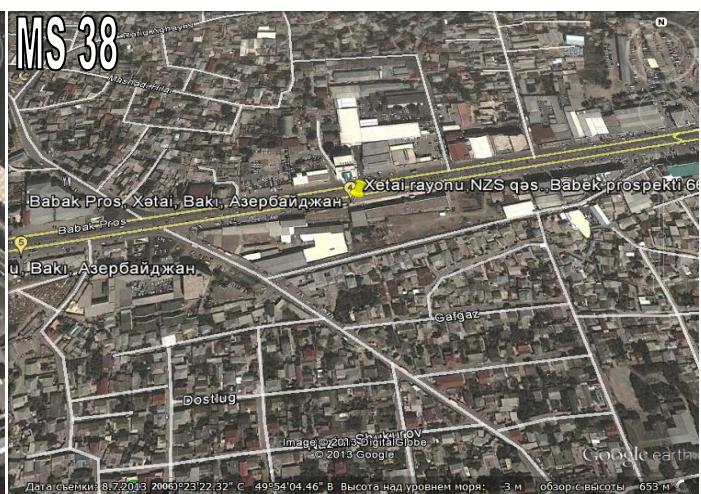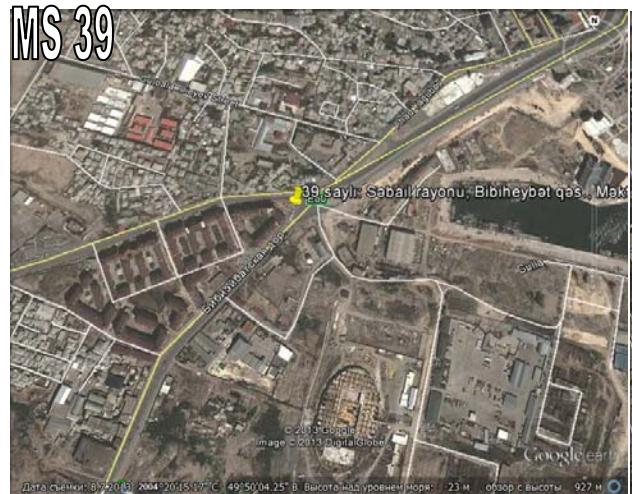
ANNEX 2-7: BASIC STATISTICS ON DATA CAPTURE, ANNUAL MEAN VALUES, EXCEEDANCES OF AZERBAIJANI AND EU LIMIT VALUES, AND GENERAL TRENDS FOR THE PERIOD 2005-2012