Green Alternative's Policy Briefs are short analyses on some of the challenges to country's sustainable development. They are part of the broader Green Alternative's analytical works; some complement or summarize reports, while others combine analysis from the research with consultation around a pressing issue. The purpose is to convey urgent public policy problems and promote debate on courses of action to resolve them.

This policy brief is intended for public policy makers and practitioners; it will also be useful for those groups and individuals seeking to influence the policymaking processes.

This policy brief is also available in Georgian.

AMBIENT AIR QUALITY CHALLENGES IN GEORGIA AND EUROPEAN UNION

This policy brief reflects the key issues of the related to the ambient air quality protection in Georgia, national legislation compliance with EU legislation and existing challenges. As there is clear lack about the state of air quality in the European Union, as well as on the air pollution impact on human health and economy, the brief also tries to analyses the existing problems from a wider point of view.

Introduction

Although air pollution is rarely visible nowadays, Europe's air quality is still a huge problem. More than 95 per cent of the EU's urban citizens are exposed to harmful levels of $PM_{2.5}$ and ozone. Air pollution is the number one environmental cause of death in the EU, with over 400,000 premature deaths in 2010 – more than ten times the annual deaths from traffic accidents. For that same year, the external costs of health damage due to air pollution have been estimated to amount to €330–940 billion[1].

Sensitive and vulnerable groups such as pregnant women, children, the elderly and those already suffering from respiratory and other serious illnesses or from low income groups are particularly affected[2]. The health effects of air pollution are well documented: not only is poor air quality a risk factor for heart and respiratory diseases such as asthma and chronic bronchitis, but it is also increasingly linked with harm to children's nervous systems and brain development, and even with diabetes. The World Health Organization's Cancer Agency (IARC) also confirmed that outdoor air pollution can cause lung cancer. Clearly the quality of indoor and outdoor air plays a major role in many chronic diseases in Europe with high costs for the individuals affected, national health services and the economy at large[3].

The Activities Committed Under EU Georgia Association Agenda

EU Georgia Association Agenda (2014-2016) requires from the Georgian side " full implementation of Georgia's National Environment Action Plan for 2012-2016".

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[1] Equals EU GDP - 3–9%.

[2] EC staff working document, Executive Summary of Impact Assessment for Clean Air program http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013SC0532

[3] http://www.eeb.org/EEB/?LinkServID=29879BFF-5056-B741-DB9478B2BA605338

According to the Georgia's Second National Environment Action Program 2012 -2016 (NEAP), Based on available data, concentrations of the priority pollutants (SO2, NO2, CO and in Zestafoni -MnO2) exceed the allowable limits in all Georgia cities where monitoring occurs. The long-term goal with regards to air quality is to have clean air throughout Georgia that is safe both for human health and the environment.

Short-term (five-year) targets for achieving the long-term goal are:

- Improvement and step-by-step automation of the existing air quality monitoring network that will make it possible to assess the state of ambient air and factors affecting the air quality;
- Reduction of industrial emissions through the introduction of modern energy saving technologies and proper enforcement of the requirements of environmental impact permits;
- Gradual reduction of vehicle emissions through introduction of relevant instruments based on international experience and national specifics.

Therefore, the ministry of Environment and Natural Resources protection, as well as the Government of Georgia were supposed to implement activities defined above.

Reduction of Vehicle Emissions

In 2013 Georgian Government does not approve the State program for the ambient air quality improvement that was designed first of all to ensure gradual reduction of vehicle emission through activities as stimulation of renewal of transport park, improvement of fuel quality and development of the public transport. According to the commitments undertaken under the Association Agreement, the priority obligation in 2016 is to adopt national legislation and designate competent authorities, in line with the EU Directive on reduction of the sulphur content of certain liquid fuels. According to the roadmap developed by the Ministry, the priorities for 2015 in a field of air quality were defined in accordance with environmental urgencies, which, first of all, involved the issues included in the EU Directive on reduction of the sulphur content of certain liquid fuels. Therefore, according to Decree No 229 of the Government of Georgia dated May 27, 2015, amendments were made to Decree No 124 of the Government of Georgia dated December 31, 2004 on Motor Fuel Quality Standard.

Table 1. Amendments to Decree No 124 of the Government of Georgia dated December 31, 2004 on Motor Fuel Quality Standards

Parameter	Time period		
	1.01.2015-1.01.2016	**1.01-2016-1.01.2017**	**01.01.2017-**
Maximum lead content g/l	0.005	0.005	0.005
Maximum benzene content %	3	1	1
Aromatic hydrocarbon %	42	35	35
Sulphur mg/kg	50	50	10

The amendments were done in the Georgian Administrative Code that gives possibility to fine the operator that will import the fuel that does not apply to above mentioned standards. In addition, the production of non-standard fuel and its distribution will be fined. The control is done through the major state agencies

Environmental Inspectorate of Ministry of Environment and Nature Resources Protection, Ministry of Energy and Revenue Income Service of Ministry of Finance. It's planned that the Environmental Inspectorate will monitor the fuel operators without any timetable and notification. Since May 2016, the inspection has been done twice and samples have been taken on fuel stations and analyzed in State laboratory. According to the report, all samples taken are in compliance with legislation[4,5].

Other directions to reduce the emissions from the transport sector were not implemented by government, including the development of the public transport sector. Only, in September 2016, the Tbilisi municipality introduces the new buses run on GNG. In total, it's planned to bring up to 150 buses that would not be enough for the city. In addition, there is no common transport development plan that will ensure the planning of the public transport and flows.

NEAP does not envisage the restoration of the vehicle technical inspection that in accordance with EU Georgia Association Agreement should be in place by January 1st, 2018. The non-existence of technical inspection creates problems, both in terms of emissions, as well as in terms of safety.

It should be stressed, that according to the ministry of Internal Affairs, the amount of vehicles in Georgia is up to 1100 000, while the biggest part is produced before 2004. By the end of 2015 was published information, that the Ministry of Internal Affairs will submit the law that envisage the favorable regime for the 3-6 year old car import, while for cars up to 9 years the custom fee would increase. However, at the end the law submitted to the Parliament, decreased the costumes fee by 50% for the hybrid cars aged from 0 to 6 years.

Ambient Air Quality Monitoring in 2015-2016 – Existing Problems and Challenges

The National Environmental Agency is responsible for the assessment and monitoring of ambient air quality in 2015. It should be noted that monitoring of ambient air pollution is conducted in five cities: Tbilisi, Rustavi, Zestaponi, Kutaisi and Batumi. From that till August 2016, the only background air monitoring automatic station was located in Tbilisi. One automatic station is functioning in Abastumani[6]. The agency plans to install automatic stations in Kutaisi and Batumi. After that Georgia will have the network of automatic stations that will be in full compliance with EU directive EC 2008/50/EC[7].

In 2015-2016, the National Environmental Agency conducted indicative measurements to assess ambient air quality on three stages. Ambient air was measured in 58 points of nine Georgian cities, including in 26 points of Tbilisi[8]. Based on the indicative measurements the National Environmental Agency prepared two reports and the interactive map[9] [10] [11]. Based on the received information, the National Environmental Agency submitted two reports and a relevant interactive map of measurements. The map contains measurement points and air pollution

[4] http://commersant.ge/?m=5&news_ id=40048&cat_id=6

[5] It should be mentioned that itself report has not been published, and ministry made just statement regarding the issue

[6] In 2010 in Abastumani, with support of Norwegian government, was installed one air monitoring automated station to measure transboundary air pollution.

[7] Thus, from 2017 Tbilisi will have fully automated air quality monitoring network with the number of stations that is in line with EU standards (Directive 2008/50/EC).

[8] The indicate measuring was conducted in three 14 day series. The samples were sent in UK sertified laboratory.

[9] https://www.google.com/maps/d/viewer?mid=zFoqx_U3i7ZI.kq2RDzkYIY_Y

[10] http://nea.gov.ge/uploads/slides/565c3ff59033f.pdf

[11] http://nea.gov.ge/uploads/slides/5690e012716d8.pdf

index is indicated at each measurement point (figure and explanation), as well as concentration of pollution ingredients in mkg/m^3.

It should be stressed, that the ministry of environment and natural resources protection, based on the indicative measurements, defined pollution in a country as a medium, that according to the ministry is not alarming as corresponds the average air pollution in Central and Eastern European Countries[12].

Meantime, the Georgian legislation does not define the norms and limits for the number of the pollutants, including PM2.5 and PM10. According to the Law of Georgia on Environmental Protection, the environmental quality norms, including air quality norms or maximum permissible concentrations for each hazardous substance is determined every five years by the Ministry of Labor, Health and Social Affairs under bylaw "On approval of the norms of qualitative state of the environment". This document is based on the sanitary-hygienic norms acting during the Soviet period – Hygienic Norms, HN 2.1.6.1983-05 "Maximum Permissible Concentrations (MPC) of Harmful Substances in Ambient Air of Populated Areas." Thus, the ambient air quality norms acting in Georgia today are actually identical to those acting in the Soviet Union in the eighties and don't comply with EU and WHO recommendations. Therefore, the existing norms of qualitative state of the environment should be renewed in accordance with WHO standards.

Table 2. Maximum Permissible Concentrations (MPC) of Harmful Substances in Ambient Air[13]

mane of substance	National Legislation	World Health organization	European Union	Average concentration over a specified time period
PARTICULATE MATTER < 2.5 micrometers		- 0,01	0,025	Calendar year
		0,25		One day (24 hour)
PARTICULATE MATTER < 10 micrometers		0,02	0,04	Calendar year
		0,05	0,05	One day (24 hour)
PARTICULATE MATTER (dust)	0,5			30 minutes
	0,15	0,12		
Nitrogen dioxide		0,2	0,2	1 hour
		0,04	0,04	Calendar year
	0,04			One day (24 hour)
	0,2			30 minutes
Sculpture dioxide		0,5		10 minutes
			0,35	1 hour
		0,5		Calendar year
	0,05	0,02	0,125	One day (24 hour)
	0,5			30 minutes

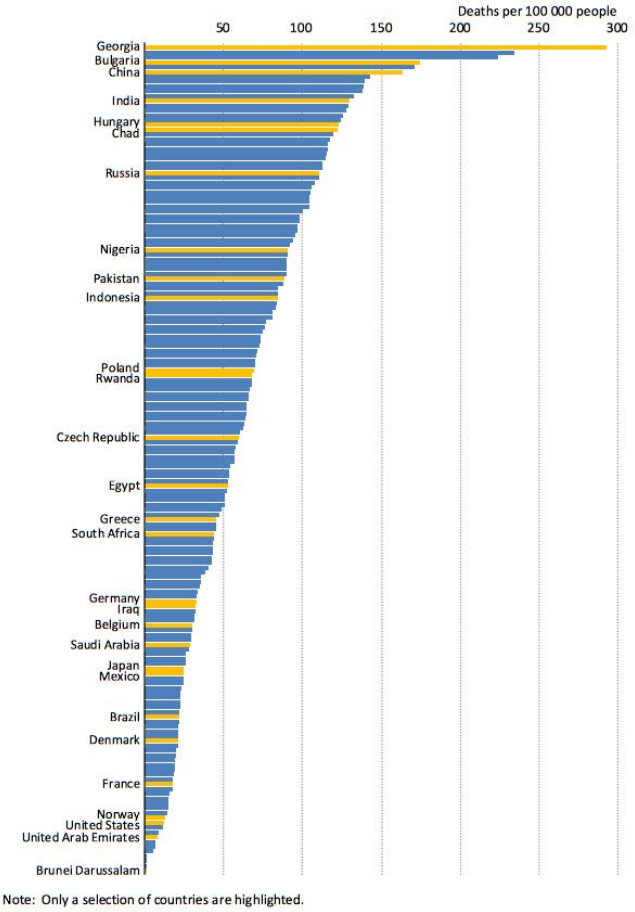
[12] Gigla Agulashvili: Tbilisi ambient air quality according to the eurostandards is medium 3.12. 2015, http://www.ipress.ge/new/18831-gigla-agulashvili-tbilisshi-haeris-khariskhi-evrostandartis-shesabamisad-sashualo-donisaa

[13] State of the Environment Report for Georgia 2007-2009.

Carbon monoxide		100		10 minutes
		10	10	8 hour
		30		1 hour
	5	60		30 minutes
	3			One day (24 hour)
Lead		0,0005	0,0005	Calendar year
	0,0003			One day (24 hour)
	0,001			30 minutes
ozone		0,12	0,12	8 hour
	0,03			One day (24 hour)
	0,16			30 minutes

According to the information of World Health organization May 2016, Georgia defined as number one in the world, due to the mortality rate attributed to the air pollution (indoor and outdoor) and it is 292 person per 100 000. The research was strongly challenged and hotly discussed by the Georgian Government.

Figure 1.8 ▷ **Mortality rate attributed to air pollution (household and outdoor) by country, 2012**



Note: Only a selection of countries are highlighted.
Sources: WHO (2016b) and IEA analysis.

On the Facebook page of the Ministry of Environment and Natural Resources Protection was published the statement, that reads Information about Georgia provided by WHO in "World's Health Statistic 2016", that

itself established on data from 2012. According to the WHO report on Urban Ambient Air pollution 2016 (that is established on 2014 data -j.mp/ whooutdoor) air pollution in Tbilisi corresponds the median rate of Eastern Europe's medium and low middle income countries, that does not give the foundation for the conclusions provided by the EIA report. It should be mentioned, that there are no methodologies in the international practices that would unequivocally will connect atmospheric air pollution with death alone from other factors (indoor air pollution, amount of smokers[14]; While in Georgia's Health System despite the number of the reforms the unite information database, that would ensure management of data related to Environmental Health and provide this type of conclusions does not exist. In addition, the National Environmental Agency with periodically carries indicative measurements to establish the composition of Nitrogen and Sulfur dioxides, Ozone and Benzol. The results comparison with EU norms does not give any picture of high deviation.[15]

The Ministry of Health, Labor and Social Protection urgently invites the WHO mission in Georgia. After exchange of information, it appears that WHO study contains some inaccuracy, "particularly, from three components for one the data from 2003-2005 was used. That means that in case of ambient air pollution Georgia is not in first place in the world. The new data will be available soon[16]". However, mission expresses its concerns related to outdoor air pollution and the Georgia's stand with cardiovascular diseases. It stressed that Georgia's air pollution[17] corresponds the medium air pollution of the Eastern Europe that does not create the optimistic ground.

Therefore, in new report Georgia would not be the number one in the world regarding the mortality rate attributed to air pollution. This based on the fact, that in 2012-2016 in comparison with 2003-2005 the solid fuel utilization for cooking and heating was decreased, that is the major source for indoor pollution.

In parallel, in September 2016 WHO publishes the report "Ambient Air pollution: a global assessment of exposure and burden of diseases"[18]. In accordance, with the report, the average pollution by PM2.5 in cities is 23 μg/m3 and on whole country 19 μg/m3, that twice higher than WHO recommendations. The same report models the death of 90 people per 100 000 due to the diseases caused by ambient air pollution.

The Dust, Air Pollution and Related Challenges

The dust represents one of the most dangerous pollutants based on its chemical composition. It composed from different particular matters of different size. PM is an air pollutant consisting of a mixture of solid and liquid particles suspended in the air. These particles differ in their physical properties (such as size), chemical composition, etc. The most important chemical constituents of PM are sulfate, nitrate, ammonium, other inorganic ions (such as Na+, K+, Ca2+, Mg2+ and Cal), organic and elemental carbon, crustal material, particle-bound water and heavy metals.

Short and long-term exposure to PM causes respiratory and cardiovascular disease, atherosclerosis (thickening of the arteries), adverse birth outcomes, impacts on children's development of the brain and nervous system, diabetes, and can result in death. PM is also linked to respiratory infections and

[14] With this statement the Ministry of Environment and Natural Resources protection don't takes any responsibility for indoor pollution.

[15] http://meteo.gov.ge/radiation_pdf/69.pdf

[16] http://jandacva.ge/jandacvis-msoflio-organizaciis-eqspertebi-saqartveloshi-imyofebian

[17] http://jandacva.ge/jandacvis-msoflio-organizaciis-eqspertebi-saqartveloshi-imyofebian/

[18] http://apps.who.int/iris/bitstream/10665/250141/1/9789241511353-eng.pdf?ua=1

asthma in young children. The smaller the particles, the greater the harm to human health. The PM<5 are among the most dangerous, as are small enough to pass from lungs to bloodstream and damage lung tissues, aggravate existing respiratory and cardiovascular disease, and can lead to cancer.

While in Georgia there is not ongoing permanent monitoring of PM fractions, according to the National Environmental Agency it monitors the PM fractions in Vashlijvari and Abastumani stations. The data provided is alarming both in case of PM2,5 as well as of PM 10.

Vashlijvari Station data 2015[19].

	January	February	March	April	May	june	July	August	September	October	November	December
PM2,5	49,63	40,58	29,03	14,81	14,04	15,94	15,99	11,60	21,90	30,12	23,70	27,01
PM10	72,34	69, 84	53,92	31,30	34,29	43,90	38,04	32,46	52,90	52,32	45,68	43,21

Abastumani, PM10

	I quarter	II quarter	III quarter	IV quarter
2014	22,47	44,60	31,62	47,99
2015	_	24,04	38,51	38,62

According to the National Environmental Agency, the dust amount in the air often exceeds the norms for 2-3 times.It should be mentioned, that according to the different fractions of the dust, Georgia uses the EU norms, as Pm10 – 48 µg/ m3 annual mean, while Pm2.5 - 25 µg/m3 annual mean20, that is higher than the recommendations set by WHO standards[21].

Legislative Changes in 2015-2016

The work over the Georgian Law on Ambient Air Protection began in 2015. It should reflect all the measures defined by the EU-Georgia Association Agreement in the sphere of air quality protection. A legislative package includes amendments to the Law of Georgia on Ambient Air Protection was registered in the Parliament of Georgia on December 15, 2015. The issue is now undergoing the stage of committee hearings and will apparently be approved in the first quarter of 2016[22].

[19] Provided by National Environmental Agency on 03.08.2016;

[20] PARTICULATE MATTER (PM):. Depending on their size, PM is referred to as either PM10, which are coarser particles, or PM2.5, which are finer particles.

[21] WHO Recommendations:

$PM_{2.5}$	PM_{10}
10 µg/m^3 annual mean	20 µg/m^3 annual mean
25 µg/m^3 24-hour mean	50 µg/m^3 24-hour mean

[22] https://matsne.gov.ge/ka/document/view/3253825

The amendments provided in the draft law mostly aim at fulfilling the international commitments undertaken by Georgia in frames of the Montreal Protocol on Substances that Deplete the Ozone Layer and implementation of the requirements of the EU-Georgia Association Agreement. According to the draft law, one of the amendments concerns threshold limit values of concentration of harmful substances in the ambient air.

According to current legislation, environmental quality standards (involving air, water, soil quality standards) are defined once in 5 years by the regulations on environmental quality standards, which is developed and approved by the Ministry of Labor, Health and Social Affairs of Georgia through the agreement with the Ministry of Environment and Natural Resources Protection of Georgia. According to the draft law, threshold limit value of concentration of harmful substances in the ambient air is believed to be an ambient air quality standard and represents a component of environmental quality standards. It is approved by the Government of Georgia in a form of technical regulations – ambient air quality standard.

The same law determined the ambient air quality standards measurement based on EU legislation. The threshold limit values of concentration of harmful substances in ambient air are determined on the basis of Directive 2008/50/EC of the European Parliament and of the Council of May 21, 2008 on ambient air quality and cleaner air for Europe and Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. In 2014 the Government of Georgia approved a number of technical regulations, which were not reflected in the Law of Georgia on Ambient Air Protection. Respectively, the draft law is directed towards reflecting the developed technical regulations in the Law of Georgia on Ambient Air Protection.

The Ambient Air Quality Monitoring and Existing Challenges in European Union

Current EU air quality standards to limit harmful air pollution were agreed in the late 1990s. However, in many places in Europe, especially in cities, people are exposed to concentrations that are above the legal limits. These EU limit values are 'informed' by World Health Organization guidelines, but in some cases are much less stringent [11]. For example, allowing Member States to exceed the daily PM concentrations up to 35 times a year has no scientific basis at all. The WHO also recently announced that they will make their guidelines even stricter, following a comprehensive review of the scientific evidence. This assessment showed that serious health effects occur at levels lower than current guidelines and that the range of effects is broader than previously thought[23].

The European Union strategy of ambient air quality improvement envisaged following:

- Establishment of ambient air pollution standards (minimum and orientation);
- Regulation and control of ambient air pollution emissions from stationary and mobile sources;
- Improvement of fuel quality;
- Integration of Environmental requirements in transport and energy sectors;
- Awareness raising of Public and ensuring its participation in air pollution reduction activities.

According to the EC "Clean Air Programme for Europe", a strategy document for the meeting already existing targets by 2020 and setting new air quality objectives for the period up to 2030, it includes supporting measures to improve air quality in cities, support for research and innovation, and the promoting of international

[23] Air & Health, http://www.eeb.org/EEB/?LinkServID=29879BFF-5056-B741-DB9478B2BA605338

cooperation. The package also contains a main legislative proposal to revise the National Emission Ceilings (NEC) directive, setting new country-by-country emission reduction requirements and mechanism up to 2030 for six main air pollutants; the 2001 NEC directive covered four pollutants – SO_2, NOx, NMVOCs and NH_3– the new one is also extended to cover fine particulate matter ($PM_{2.5}$), with from 2020, and methane (CH_4) from 2030.

The package contains a proposal for a new directive to reduce pollution from medium-sized combustion plants (MCP), such as local heating plants for smaller districts and small industrial installations;) and a proposal to transpose into EU law the international emission reductions for 2020 that the EU has committed to under the 2012 Gothenburg Protocol of the Convention on Long-Range Trans boundary Air Pollution (LRTAP).

After 2 years of inter-institutional discussions, votes and negotiations, the EU came to a watered-down final text. Compared to the original draft from the European Commission, amended by the European Parliament, the Directive is now expected to save around 48,000 lives EU wide in 2030[24], compared to business as usual (provided it is fully implemented). The 52% cut in mortality by 2030 (compared to 2005 levels) was brought down to 49, 6% which means approximately 9,400 additional deaths compared to the Commission and Parliament proposals[25]. A series of so called 'flexibilities' were introduced, making it more difficult to enforce the new rules, so the overall ambition level is likely to be weaker in practice.

The conclusions and recommendations

The above mention makes clear the existing ambient air pollution in Georgia is alarming, while the legislation does not comply the EU legislation. During 2014-2016 the Georgian Government has been unable to implement the activities described under the Second NEAP to improve the ambient air quality. The majority of activities listed under the program still needs to be implemented. However, even the full implementation of given activities would not bring the touchable result without decreasing of average age of the vehicles, improvement of fuel quality, establishing the standards for emissions from vehicles and strict implementation of those standards in practice. All those measures are not listed under the NEAP.

The data provided by the National Environment Agency on ambient air quality are alarming. Comforting with the fact that in Georgia Ambient air pollution rate does not exceed the air pollution in the Easter European countries is not productive. In addition, there are a few details that differ Georgia from Eastern European countries, among them:

- Georgia does not carry extensive programs for improvement of ambient air quality, as it required by rather weak, but still active EC directive;
- Georgia has no developed heavy industry or manufacture as Bulgaria or Poland;
- In Georgia the major cause of ambient air pollution are vehicles[26];
- Georgia claims development of ecological agriculture and tourism is priorities.

[24] The proposed Clean Air Package by EC, claims to reduce 58 000 preleminary deaths and decrease of health care cost by EUR 40-140 billions.

[25] In comparison with 2005

[26] NEAP 2012-2016. Georgian Government decree 127, January 24, 2012.

The Government of Georgia should adequately acknowledge the risks and problems related to the ambient air quality and develop the state policy and program established on the recommendations of WHO. Therefore, improvement of the ambient air monitoring system and air quality improvement should defined as a priority, both in case of state budget planning, as well as when communicating with the donor community.

In addition, the following activities must be implemented:

- Strengthen technical capacity of the National Environmental Agency for ambient air quality monitoring, analysis and information disclosure;
- The information received as a result of ambient air quality monitoring in cities should be available on the web sites of the Ministry of Environment and Natural Resources Protection and/or National Environment agency in real-time;
- It is essential to strengthen the role and capacities of the Ministry of Environment Protection so that while issuing an environmental impact permit, the Ministry is able to define what particular technologies can be used by an entrepreneur to reduce ambient air pollution;
- To reduce air pollution from motor vehicles, it is expedient to change the structure of excise tax on import so that to encourage import of newer motor cars and more economic vehicles, in terms of fuel consumption. In parallel, it is necessary to define the norms of emissions from motor vehicles and to prohibit the import of such vehicles, which fail to meet these norms. At the same time, the practice of compulsory inspection of emissions from motor vehicles should be resumed. It is also important to define an institution, which will be responsible for controlling emissions from motor vehicles in the country;
- The Ministry of Environment and Natural Resources Protection together with the Ministry of Economy should ensure the elaboration of national public transport development policy;

The relevant local self-government bodies, in cooperation with the Ministry of Environment and Nature Resources Protection, should develop and implement ambient air protection plans in those settlements, where this problem is extremely pressing. Finally, the development and implementation of such plans should have a decisive importance for the improvement of air quality management throughout the country.

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