

AIR QUALITY ASSURANCE – STRATEGIC ASPECT

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ABSTRACT. – **Air quality assurance – strategic aspect.** The air quality in RM cities is unsatisfactory and need urgent improvement measures of its quality. The necessity of elaboration of new active Strategy of air quality protection axed on the principles of durable development is an obligation of RM assumed within the environment international Conventions. The environment policy proposed in the Strategy foresees the ecologization of social and economical processes through the optimization of ecological management and real implementation of durable development principles in economical activity. The implementation of strategic objectives is accomplished according to the Action Plan of atmospheric air quality protection, which is periodically concretized through actualizations of air quality evolution scenario modeled in time.

Keywords: strategy, finance, objective, principles, obligation, performances.

1. INTRODUCTION

In air basin of RM over 130 polluting substances are emitted, but the higher influence upon the air quality have the powders, nitrogen oxides, sulfur oxides, carbon oxides, persistent organic pollutants, heavy metals. Taking into account that the air basin has a low pollution potential of the atmosphere, which constitute 2.8-2.9, the self-purification capacity of the atmosphere is low. The air quality in 2005 in the cities of RM, expressed by the complex index of atmosphere pollution (I_n), was the following: in Chișinău $I_7 = 4,77$; Bălți $I_5 = 6,74$; Tiraspol $I_6 = 5,17$; Râbnîța $I_4 = 1,86$; Tighina $I_5 = 4,21$. According to pollution level of the atmosphere the cities of the republic are placed in increasing order: Rezina, Chișinău, Tighina, Râbnîța, Tiraspol, Bălți. The mean annual concentrations expressed in maximum admissible concentrations for Chișinău and Bălți cities (accordingly) are: solid suspensions – 0,5 and 2,0; SO_2 – 0,2 and 0,6; CO – 0,7 and 0,4; NO_2 – 0,1 and 0,8; phenol – 0,7; formaldehyde – 1,3 and 2,3; SO_4^{-2} – 0,2. The data analysis from the last 5 years show a tendency toward reduction of the pollution level in Chișinău, Bălți, Tiraspol cities and a tendency toward increasing in Tighina and Râbnîța cities. The accomplished measurements reveal that the air quality in cities is critically affected. According to fond concentrations the air quality correspond to the sanitary normative, but in some periods the real concentrations in the atmosphere overpass many times the maximum admissible concentrations [1,3-5].

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The emissions from polluting sources of RM decreased continually due to the economical crisis from 1044,7 kt in 1990 to 137 kt in 2001, a slow increasing up to 265 kt in 2005 and a decreasing to 178 kt in 2008 was observed (fig.1). The comparative analysis of the contribution to atmosphere pollution of fixed and mobile sources in the period 1990-2008 shows that in 1990 the total weight of the polluting substances emitted by fixed sources (without Transnistria) constituted about 38% from total emissions, which gradually decrease to 7,6% in 2005 and continue with a slight increase to 10,7% in 2008. On the basis of presented data, we established that the mobile sources have a decisive contribution in local air pollution. The emissions from fixed sources occur at high altitude and are moved but the air streams at great distances from the source and before reach the soil it is strongly diluted, emissions from the mobile sources occur at about 0,5 m from the soil surface and affect directly and immediately the air quality in the terrestrial level of the troposphere. The background pollution is conditioned by the transboundary transfer of pollutant substances [1, 3-5].

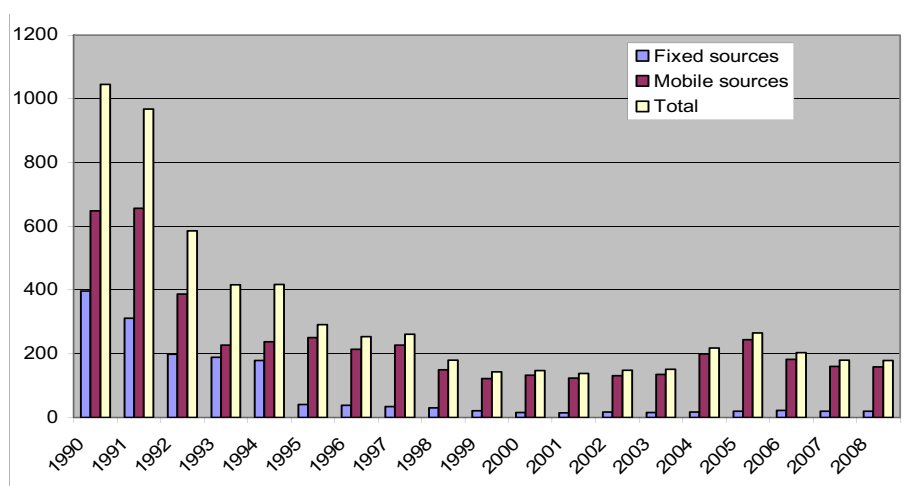


Fig. 1. Total emissions from polluting sources of Republic of Moldova in kt for the period 1990-2008

2. ARGUMENTS PRO ACTIVE STRATEGY

At present the legislative acts and the normative – methodical documents are acting elaborated on the basis of passive strategy of atmospheric air quality protection, that will not allow to preserve the air quality in the conditions of economical re-launching of RM. The strategy of economical development of RM foresee as main objective the creation of necessary conditions for a durable economical development with a mean growth rhythm of PIB between 5% and 8%. The unfavorable state of air quality need the elaboration of new strategy of atmospheric air quality protection in RM based on the principles of durable



development, which respond to the necessity of present days without compromise the capacity of next generations to satisfy its needs. The durable development asks for changes in the conception of thinking and action of the governments, as well as of all citizens. The life conditions in the RM cities need a substantial improvement. The damage caused to people health by the air pollution only by powders constitutes 17-30 million USA dollars.

Short time ago as pollutant were considered the harmful substances with direct effect upon the environment and human health. Today the spectrum of these substances is wider. Practically any substance emitted in the environment has an influence at certain concentration upon the ecologic balance of the terrestrial ecosystems. Even the natural substances necessary for vegetation development, such as carbon oxide (IV), which concentration slowly grows since the beginning of industrialization and at the beginning favored the vegetation development, nowadays is the trigger of greenhouse effect. The effect of freons, emitted by the industry of developed countries has affected in the first place the countries situated near the Poles, sulfur oxides emitted in central Europe lead to the forest damage and lake water acidulation in the countries form northern Europe. Thus, the atmosphere pollution from local phenomenon became a global one. The globalization of the phenomenon forced the signing of several international Conventions, such as:

- Vienna Convention regarding the protection of ozone stratum;
- Convention regarding impact evaluation upon the environment in transboundary context;
- Convention regarding transboundary effects of industrial accidents;
- Frame – Convention United Nations regarding climatic changes.

The necessity of elaboration of new atmospheric air quality protection strategy in the Republic of Moldova is also conditioned by the obligations taken within environment Conventions.

During the last decades the social-economical development was an extensive one, with irrational use of natural resources, poor investments in air protection, failure of ecological forecasts of the projects caused the critical ecological state of air quality in RM cities. While building new factories, the low capacity of self-purification of RM air basin wasn't taken into account.

The continuous degradation of air quality is favored by the following factors:

- legislative act and normative – methodical basis elaborated on the principle of waste collecting at the end of technologic chain;
- lack of efficient State policy in the field of atmospheric air protection;
- lack of state body responsible for atmospheric air quality management;
- non-allocation by the Government of the necessary financial resources;
- Lack of the mechanisms of economical stimulation and enforcement of existent legislative frame;
- inefficiency of state bodies responsible for environment protection;
- aging of control, production and protection equipment;
- low technologic discipline of economical agents;
- economical crisis.



3. STRATEGY STRUCTURE

The main compartments of the Strategy are: Aims; Environment policy; Main principles; Criteria of objective priority; Strategic directions; Accomplishment modalities; Economical stimulation methods; Objectives; Main actions; Priority tasks on short, medium and long term; Executants; Financial sources; Accomplishment terms; Scenario of air quality evolution depending on applied measures; Implementation ways of the Strategy (fig. 2).

Aims	
Environment policy	
Main principles	Priority criteria of the objectives
Strategic directions	
Accomplishment modalities	Economical stimulation methods
Objectives	
Main actions	Priority short, medium and long term tasks
Executants	
Financial sources	Accomplishment terms
Evolution scenario of air quality in RM	
Strategy implementation	

Fig. 2. Bloc-scheme of Strategy of air quality protection in Republic of Moldova

The general purpose of the Strategy in the field of atmospheric air quality management is the preservation, rehabilitation and rational use of atmospheric resources with a view to assure the durable social-economic development of Republic of Moldova. The strategic long term aims in this domain are:

- complex evaluation of existing information regarding the quality and tendencies toward changing of atmospheric air quality in Republic of Moldova;
- promoting priority actions of preservation and protection of atmospheric air quality;
- awareness of the people to encourage their participation to the actions of preservation and durable use of atmospheric resources.

Environment policy. Affiliation of RM to environment international Conventions entail the ecologization of sector strategies of economic development of the republic. The fundamental support of economical and technological development strategies must be based on the principles of durable development. The over passing of economical crisis and ulterior re-launching of RM economy will need the development of economic objectives, which will inevitably lead to the increasing of emissions in the atmosphere. The background level of atmosphere



pollution in RM is conditioned by the transboundary pollution and within environment policy the regional polluting sources are also taken into account [1, 5].

The environment policy will include:

- short, medium and long term objectives;
- economical mechanisms for transition period;
- mechanisms of supervision, control and implementation of quality air protection programs;
- permanent control of dangerous pollution sources;
- expertise and prognosis of project ecological impact;
- elaboration of ecological normative;
- implementation of principle: the pollutant pay;
- slowly passing to market prices;
- elaboration of State support mechanisms of programs of minimalization of economic impact upon air quality and of more pure technology implementation.

The main directions of environment policy are:

- creation of new legal and institutional frame, corresponding to the market economy requests;
- integration of ecological strategies with the economical ones;
- optimization of ecologic management;
- assessment of priority ecological problems and focalization of financial resources in their solving.

The implementation actions of the environment policy in the field of protection and preservation of atmospheric air quality are efficient when have as support: the institutional frame (national and local level), appropriate legislative frame, human and financial resources, monitoring system of air quality:

- the legislative frame is constituted in generally from the main law regarding air quality protection, connected laws and locally from regulations and standards that assure the process of air quality protection;
- human and financial resources that assure through general programs of: research-development; financial and tax stimulants; communication and information; personnel professional formation, assistance for local and sector authorities of control, assurance of air quality, implementation of more pure technologies.
- monitoring assure the database, prognosis of air quality modification in time and space, arguments for decisions making, elaboration of air quality protection preventive measures and minimalization of ecologic impact.

The main elements of the new Strategy are:

- development of national action plan and realization of short, medium and long term objectives;
- making definitive the responsibilities;
- action coordination between ministries and at the ministry level;
- encouragement by the State of priority actions.



Rather slow transition to the real market economy, late privatization also entail the change of actual Strategy of air protection with a Strategy based on the following priorities:

- affixing of economical mechanisms in air quality management;
- efficiency, ecologization of production, implementation of ecological management in enterprises;
- adaptation of normative basis to new requests;
- elaboration of action plan in the field of atmospheric air protection.

These elements must be applied in common. Planning of the processes include important supplementary elements:

- action management;
- monitoring and evaluation of the accomplishments;
- reforming during time of tactics and objectives, as well as re-staging of targets.

Strategic principles as priorities at national level:

- caution, foreseen and prevention of pollution;
- control and diminishing of pollution;
- durable development;
- removal of causes, but not fighting against consequences;
- assurance of pure air;
- avoid pollutant movements from one space into another;
- preservation of health conditions of people;
- the pollutant pays;
- integration of air protection policy with the economical policy;
- optimum ratio benefice/cost;
- affiliation to the environment international Conventions.

Principles and criteria of the strategy constitute the main elements for fundamentation of National Action Plan in the field of air quality protection. The Strategy has a dynamic character. It will be permanently actualized, taking into account each passed stage, and must be actualized depending on new appeared elements, because the transition of the economy.

As scientific base for Strategy serve the law of matter conservation, of which come out that none impurity is lost on Terra, it can be found somewhere in terrestrial space.

The national marks of environment policy in RM are:

- the management of air quality must be subordinated to the interests of durable development of the country;
- stopping of actual economic decline;
- revitalization of scientific researches in the domain;
- environment policy must be compatible with economy development based on market principles; - air protection: common citizen obligation;
- framing in the environment policy of national peculiarity.

The economic situation, obsolete technologies and the mentality use to wait for indications from the authorities don't allow the quick and simultaneous



diminishing of atmosphere pollution level. Therefore, it is necessary a series of consecutive measures that can be assured materially and intellectually, applied first of all where considerable financial allocation aren't request and in critical zones, gradually passing to the projection of new enterprises with more pure technologies. Today, when many factories don't function anymore, it is more ecologically rentable to use the financial resources not for revival, but only for re-tech.

Priorities in air protection must show the importance and emergency of the ecological problems, such as:

- public health;
- productivity decreasing;
- lost of resources;
- biodiversity diminishing.

The priority problems in the field of atmosphere protection come out from the value of air pollution steam from the economical activities in:

- Transport (NO_x , CO_2 , CO, Pb, VOC);
- CTE (SO_2 , NO_x , CO_2 , powder, volatile ashes);
- Agriculture and natural processes (N_2O , CH_4);
- Industry (powders, CO_2 , VOC, heavy metals, freons).

The main ecological problems and their priorities:

- Diminishing of NO_x emissions;
- Diminishing of powder emissions;
- Diminishing of SO_2 emissions combined with powders;
- Diminishing of Pb concentration in air;
- Diminishing of energy, water, natural resources consumption;
- Development of industry of energy production from biomass [6,7,9].

Strategic directions for action in protecting the atmosphere in Moldova are:

- elaboration of action plan of Government and sectorial programs;
- classification technologies applied in Moldova by the degree of environmental impact;
- Develop list of prohibited technologies for implementation in Moldova and those recommended for implementation;
- Organization of national committees for each environmental convention signed by RM;
- Reviewing economic and social programs in the environmental aspect;
- technical retooling of the atmosphere monitoring stations;
- Develop and adopt normative documents harmonized methodological requirements of EU Directives in the field of air quality;
- funding scientific research and programs of personnel development;
- Improvement of economic mechanisms to stimulate the production of pure efficiency, energy saving;
- Integration Strategy for the protection of the atmosphere in the development strategies of economic sectors;
- public awareness of environmental hazard. The alternative approach to the principle issue of critical pressure, is the attitude toward the source of



pollution or the technology factor in the possible emission reduction technology, parallel use mitigation regulatory prohibitions and environmental tax.

The actual situation in the issue of natural resource use, management and control is ambiguous and requires a review cardinal. Merging functions for use and control are unacceptable for management of natural resources and environmental protection.

Legislative framework. To achieve strategic objectives in protecting the atmosphere must be changed within the existing environmental legislative requirements harmonized EU Directives and in line with international agreements.

Economic mechanisms of stimulation. Current legislation does not meet requirements because it is directed to maintain the level of production, showing the state interests, he is regarded as a polluter and the only object of amendment, watching that all environmental measures are intended to form a healthy environment for citizens.

Extensive development of industry and especially the agro-industrial complex in the past were essentially anti-ecological, even anti-economical and antihuman. The processes of economic, social and environmental conditions can only integrate sustainable development of society, and environmental policy is an integral and not separate from the reform of society, economic, social and political. Strategy can only be achieved if the economic success.

The largest emission reduction opportunities are in sectors atmosphere communal, industry and they must be supported by the state by fostering:

- programs and energy saving information;
- scientific research to develop new technologies,
- the teacher training courses;
- projects for developing rules for the use of energy;
- through regulation, incentive structures and specific programs.

Changing attitudes towards beneficial economic environment should be achieved through economic methods to protect air, the action on the cost. The economic transition methods in managing air quality are priority. An incentive to minimize waste is increasing raw material prices, energy in the context of economic sanctions.

Main strategic objectives are:

- Reducing atmospheric pollution to protect health, preserve biodiversity and protect the atmosphere;
- Analysis of pollution sources and determine ways of minimizing emissions;
- Diversification of raw materials base and change energy consumption;
- Air Quality must be upgraded to sanitary requirements within established rules of international environmental Conventions.

Strategic objectives to be achieved by:

- Promoting environmental legislation; Implementation of measures to reduce pollution in particular through technical equipment to maintain



the retention of pollutants from factories in operation by upgrading their reengineering;

- implementation of pure technology at new plants currently under reconstruction;
- Replacement of substances harmful to health and environment;
- Develop mechanisms to protect ecological and economic air;
- Enhance the role of forests in air purification;
- tasks arising out of environmental conventions;
- Develop scientific research.

The strategic objectives are classified and temporary: the short, medium and long. Short-term objectives are those that can be made for 1-3 years, medium - 4-6 years, long a term of more than 7 years. The short and medium term objectives are assigned:

- Optimizing purification systems old factories;
- Speeding up the process for improving air quality;
- emissions limitation;
- Repair and restoration of partial restraint systems;
- Investment gain;
- institutional structuring.

Strategy objectives can be achieved if the government will speed up restructuring and reform by:

- making real economic reform, privatization;
- restructuring;
- economic policy reform;
- liquidation of subsidies for polluting technologies;
- opportunities to strengthen the state;
- develop internal mechanisms for financing the restructuring of the economic sector.

Measures to protect the atmosphere as important, is presented with two levels:

- National interests of the public nature and the environment;
- International obligations under international conventions; responsibilities to the community world and the planet.

Conservation programs and protection of ambient air quality and environmental policy will include:

- collecting information on air quality;
- ensuring compliance with environmental norms;
- dissemination of information about performance;
- methods of inspection and control;
- programs to reduce the releases in atmosphere;
- proposals for external funding;
- pilot demonstration.

Economic recovery in Moldova will require new quantities of energy, which will require expansion of energy production capacities, which in turn will generate a new wave of pollution and a large financial investment. Energy efficiency



measures can reduce the need for capital investments in new power generation capacity [6 - 9].

Recommended ways to reduce the emissions of pollutants are purer technology implementation, which provide for the elimination of pollutants in the technological process of fuel prior preparation by quality and content of modern technologies of fuel and a low temperature stage, using gas energy discharge [2, 6-9].

Declaration of environmental problems as priority is conditional on socio-economic damage caused by environmental pollution, which is valued at around 130-216 million dollars. Caused health damage from air pollution from dust is worth 17-30 million dollars, lead - 1,5-3 million U.S. dollars.

As indicators of overall efficiency and local strategic objectives to serve the fulfillment of obligations in international conventions RM deadlines that will have the result and decreasing levels of atmospheric pollution in cities of RM.

Funding projects to protect air quality requires the development of strategies for financing to be taken into account: recovery (repayment) of investment, risk, technical performance, using fluctuations, maintenance, price fluctuations, the risks of construction and warranty. To fund the protection of the atmosphere in developing countries required the development of national funds for special purposes. First funds require government subsidies [8].


Action Plan for achieving the goals of protection of ambient air quality to achieve the strategic goals through concrete activities. Determination of Performers, funding sources, distribution bonds, the delimitation of competence allows implementation of National Action Program and achievement of Strategy objectives in atmosphere air quality protection in Moldova.

4. CONCLUSION

The practical implementation of the Strategy to protect atmosphere air quality will allow the government to accomplish its constitutional obligations of providing the population with healthy living conditions.

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