



UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

UN ECE Working Group on Environmental Monitoring

in cooperation with KAZHYDROMET



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**Framework recommendations on Air Emissions Inventory and
Atmospheric Air Pollution Monitoring and Modeling
for the countries of Eastern Europe, Caucasus and Central Asia – new
parties to the Convention on Long-range Transboundary Air Pollution¹**

**Almaty
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¹ This document was not officially edited

These recommendations were developed and based on the analysis of the situation in Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan and Republic of Moldova. The information on Kazakhstan is put in the main report (see Report on air emission inventory and atmospheric air pollution monitoring and modeling in Kazakhstan). Detailed recommendations for Kazakhstan are in the report too.

The objective of the Recommendations developed under the framework of the joint UN ECE and European Environment Agency (EEA) Project “Support of the UN ECE Working Group Activities on Environmental Monitoring” is to improve the system of atmospheric air monitoring and also to enhance data collection and reporting on emissions assumed by obligations of the countries of Eastern Europe, Caucasus and Central Asia (EECCA)², those recently signed the Convention on Long-Range Transboundary Air Pollution. The recommendations were discussed at the International Meeting, held during 8-10 October, 2003 in Almaty with participation of the EECCA experts and international experts, representatives of the concerned enterprises and organizations of Kazakhstan, as well as in the course of subsequent consultations and discussions.

1. Introduction

The EECCA countries that participate in the Project and have acceded to the Convention on Long-Range Transboundary Air Pollution cover the following:

Country	Armenia	Azerbaijan	Georgia	Kyrgyzstan	Republic of Moldova
Date of accession to the Convention	21 February 1997	3 July 2002	11 February 1999	25 May 2000	9 June 1995

These countries undertake certain actions to meet their obligations under the Convention.

Armenia annually provides data on its emissions of harmful substances into the atmospheric air.

Statistical reporting in Azerbaijan is being brought into compliance with the requirements of the Convention.

The first national report on air emissions within the period of 1990 - 2000 was prepared by the Kyrgyz Republic and it was sent to the Secretariat of the Convention and also some work is being done to create the database on air polluting emissions.

The Republic of Moldova has signed the Protocol on Heavy Metals (HM) and the Protocol on Persistent Organic Pollutants (POPs) on the 24-th of June, 1998 and ratified them on the 1st of October, 2002.

Armenia is considering the issue of accession to the Protocol on Long-term Financing of the Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and also to the Protocol on Heavy Metals and the Protocol on Persistent Organic Pollutants.

In Azerbaijan the Protocol on Heavy Metals and the Protocol on Persistent Organic Pollutants are being translated into the Azeri language so that the Parliament would

² Further in this document EECCA countries are those participated in the Project.

consider the issue of accession to them.

Georgia is considering the issue of accession to the Protocol on Long-term Financing of the Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and also to the Protocol on Persistent Organic Pollutants.

In Kyrgyz Republic work is being done towards accession to the Protocol on Long-term Financing of the Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP).

1. Emissions Inventory

1.1. Overview of the situation

Armenia

In Armenia inventory of harmful emissions is carried out on the basis of statistical reports on emission of harmful substances into the atmosphere by stationary sources submitted by enterprises to the Ministry of Nature Protection annually by February 25. Unfortunately the quality of the reports does not fully comply with the requirements of the Convention.

Armenia may provide annual data on emissions, enumerated in the “Draft Guidelines on Estimation and Provision of Emissions Data”, except for PM_{2.5}, PM₁₀, TSP and POPs.

Currently in Armenia there is a gap between capacities of state emissions inventory and EMEP international requirements, no methods for assessment of emissions of pollutants, which have not been metered earlier; problems are still experienced, related to incompleteness of information and insufficient inventory transparency.

In its work on national emissions inventory Armenia applies EMEP/CORINAIR Emissions Inventory Guidebook.

Azerbaijan

For carrying out inventory of air emissions Azerbaijan uses the system developed by the former Goscomhydromet of the USSR (Guidelines on atmospheric pollution, 1979).

Azerbaijan may provide UN ECE some data only beginning since 1999, 2000 and 2001.

Georgia

In Georgia classification of the types of stationary air polluting sources and their identification on the basis of the above classification are carried out in conformity with the classifier of the “Types of Stationary Atmospheric Air Polluting Sources” and in compliance with the methodological instructions on “Identification of the Types of Atmospheric Air Pollution Sources” approved by the Order of the Minister of Environmental Protection and Natural Resources of Georgia.

Georgia can provide annual estimated data only on emissions of SO₂, NO_x, NMVOC_s and CO.

Due to absence of methodologies no inventories are completed in Georgia on POPs, heavy metals, VOC are not deciphered. Georgia lacks professionals on sites and experiences a problem of big difference of emission factors between CORINAIR system and CIS system.

Georgia partly applies EMEP/CORINAIR Air Emissions Inventory Guidebook. Currently its latest version is not being studied with the purpose of its introduction for practical application in required calculations. In Georgia there is no scientific base to verify EMEP/CORINAR emission factors, and currently used technology of various origin is not adequate in relation to technologies referred to by CORINAIR. Consequently, it is necessary to additionally work out emission factors in relation to existing technologies. At present Georgia lacks required funds to conduct research works in this area.

Kyrgyzstan

The National emissions inventory system is built on “top-down” principle: enterprises report according to the form 2TP-air to the National Statistics Committee of Kyrgyz Republic.

Kyrgyzstan can provide annual data on emissions of the following pollutants: SO₂, NO_x, CO, suspended substances and hydrocarbons (VOC).

Republic of Moldova

Republic of Moldova uses both the “top-down” and “bottom-up” procedures as well as the EMEP/CORINAIR Inventory Guidebook, IPCC and UNEP Chemicals guidelines and also some methodological principles developed by the Scientific and Research Institute “Atmosphere” of Russia. The Draft Guidelines for Estimating and Reporting Emissions Data designed by the EMEP Task Force on Emission Inventories and Projections in coordination with the UN ECE Secretariat are available as of today in Moldova. However, there are several difficult issues like, for instance, calculating emissions of PM 2.5; PM10 and others.

On 11 major emissions categories, included into EMEP/CORINAIR Emissions Inventory Guidebook, Republic of Moldova can make calculations on all pollutants emissions, except for PM 2.5 and PM 10.

In Moldova there are problems with completeness and authenticity of information on raw material flows with breakdown by SNAP categories as well as with incompliance of statistical reporting forms with draft guidelines. Moldova needs methodology guidebook in connection with frequent change of requirements and pollutants composition, as well as training seminars for established group of experts.

EMEP/CORINAIR Emissions Inventory Guidebook for national emissions inventory is applied in Moldova since 1999.

1.2. Recommendations on Improvement of Air Emissions Inventory System

For the EECCA countries – new parties to the Convention:

I. Organization of Activities on the Convention

- (a) For preparing national inventories and national data on emissions it is advisable to establish special groups in the countries, dealing with these issues on the basis of state institutions:

- It is necessary to range the tasks on inventory improvement by degree of their importance and solution, as well to develop their solution plan for the nearest years;
 - To prepare and submit to UN ECE on annual basis national emissions data;
 - To introduce to annual emissions reports criteria, characterizing information quality, extent of its completeness;
- (b) Carrying out training specialists for improving emissions accounting;
- (c) Establishment of permanent contacts of the national emissions groups with similar groups of other countries, participation in seminars, training courses and experience exchange would be useful;
- (d) Reporting on emissions of enterprises shall be open;
- (e) To make measurements data on pollutants concentrations in enterprises' emissions accessible, which will help to accumulate information for development of emission factors;
- (f) To consider possibility of accession to the Convention Protocols.

II. Methodological Basis for Improvements in Emission Accounting

- (a) EMEP/CORINAIR Inventory Guidebook needs to be studied to use it as a uniform methodology for estimating emissions and developing procedures for calculating emissions of pollutants previously not covered in the reports produced by enterprises;
- (b) Wider use of methodological and scientific achievements in the field of emissions research, international experience. It has been summarized in such editions, as EMEP Guidebook, IPCC Work Book, AP-42 and other editions;
- (c) Active participation of national experts in the work of Task Force on Emissions Inventory and Projections (TFEIP) and EMEP management body is necessary.

III. Methodology and Research Related Activities:

- (a) As one of the top priority tasks it is essential to review the situation concerning inventory of emissions in the EECCA countries by breaking them down into the categories of pollutants with the objective of assessing completeness of the available and received information. It is expedient, therefore, to have emissions of key pollutants assessed by experts so as to compare the results against the available data;
- (b) It is necessary to compare national data against specific emission indicators or emission factors recommended by the EMEP/CORINAIR Inventory Guidebook;
- (c) In some cases emission factors recommended by the Guidebook should be adapted to the local conditions of the EECCA countries; national experts in cooperation with EMEP centers should make assessments of emissions of HM and POPs within the framework of individual international projects;
- (d) Develop research of emission processes and sources.

- (e) It is essential to review the available methods for calculating emissions and measuring concentration of pollutants in emissions so as to check on their compliance with the up-to-date knowledge and to create a schedule for their reconsidering;
- (f) Classification of economic subjects (sectors) needs to be improved and in parallel with the existing codes the coding system proposed under the IPCC and SNAP should be introduced;
- (g) It is expedient to develop the system of inventory on the basis of the internationally recognized approach (like “top-down”) and namely based upon the EMEP methodology in parallel with the improvement of the state inventory (using the “bottom-up” approach).

For Working Bodies of the Convention and UNECE Secretariat:

- (a) To support new parties to the Convention in their move toward improvement of emissions inventory systems taking into account specific needs of these countries, related to their technological capacities, financial and economic difficulties;
- (b) Coordinating centers (MSC-W, MSC-E, CCC, CIAM) and EMEP experts should give methodological and technical support in organization and implementation of activities on emissions inventory, internship and training of specialists of the EECCA countries;
- (c) To support projects and seminars for the EECCA countries similar to those realized by UN ECE Working Group on Environmental Monitoring;
- (d) To assist new parties to the Convention on making new experts’ emissions assessments, especially on POPs and HMs;
- (e) To consider possibility of arrangement of workshops on annual basis for training and sharing experience in applying the EMEP/CORINAIR Inventory Guidebook in the EECCA countries, particularly:
 - It is important to translate into Russian the latest version of the EMEP Inventory Guidebook and also to adapt the software on reporting to the Russian language.
 - To conduct the first training workshop on applying the EMEP/CORINAIR Air Emissions Guidebook on “Mobile Air Emissions Sources”. Take into account readiness of Kazhydromet to host this seminar in Almaty.
 - To hold a consultation working meeting on preparation of documents and agenda for the first training workshop (Moscow, 2004).

2. Atmospheric Air Pollution Monitoring and Modeling in the EECCA Countries – new parties to the Convention

2.1. Overview of the situation

Practically in all of the EECCA countries participating in the Project environmental pollution monitoring is carried out by specialized monitoring centers.

In **Armenia** monitoring over atmospheric air pollution is carried out in 6 cities on a daily basis (including in two cities they measure dust, sulphur dioxide, carbon monoxide, nitrogen oxides while in four other cities - dust).

Azerbaijan uses instrumental sampling and processes samples in stationary laboratories. Azerbaijan checks on the state of 14 components (including dust, carbon, phenol, benz(a)pyrene, furfurool, CO, NO, NO₂, Cl, H₂S, SO₂, HCl, H₂SO₄, SO₄). The samples are taken three times a day (including at 7 a.m., 1p.m. and 6 p.m.). Such parameters as temperature, air moisture and pressure, wind speed and direction are checked.

In seven cities of **Georgia** samples are taken three times a day. In Tbilisi and in two more cities there is monitoring only of CO and dust. In addition to the above there is monitoring of N₂O, MnO₂, phenols, etc. in the remaining five cities.

Kyrgyzstan monitors the concentration of suspended particles, nitrogen oxides, sulphur dioxide, and carbon monoxide.

In the **Republic of Moldova** regular observations for air pollution are carried out by State Service “Hydrometeo” in cities of Kishinev (6 pollution observation posts), Tiraspol (3 posts), Beltsy (2 posts), Rybnysa (2 posts) and Bendery (4 posts) on short program (3-time 20 minutes sampling a day). The main components at each pollution observation post are: dust, carbon monoxide, nitrogen and sulphur oxides; in addition to them in the cities of Kishinev and Tiraspol: formaldehyde and phenol; in the city of Beltsy: formaldehyde (3-time 20 minutes sampling a day). Also, monitoring network provides for controlling such parameters as atmosphere pressure, wind speed and temperature in °C.

In fact, as it was pointed out that in all the countries involved in the Project observation networks designed for atmospheric air monitoring are poorly equipped from the technical view point, as for equipment and analytical facilities in their laboratories they are all in unsatisfactory condition.

The currently available system of monitoring in the EECCA countries does not comply with the requirements of the EMEP measurement program and for bringing it into compliance it is necessary to get information and methodological support from the EMEP centers and experts.

Modeling focused work on assessment of pollutants diffusion in the atmosphere is not carried out and, therefore, right now for the EECCA countries it would be a timely and useful thing to consult with the EMEP centers on development and use of modeling-oriented approaches for assessing transportation of pollutants in the atmosphere.

2.2. Recommendations on Atmospheric Air Pollution Monitoring and Modeling in the EECCA Countries – new parties to the Convention

The Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) is the main instrument for international cooperation in the area of monitoring and modeling atmospheric phenomena. In accordance with the purposes and objectives of the Cooperative Program for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) it is recommended:

For EECCA countries – new parties to the Convention:

1. The opportunity of accession to the Protocols to the Convention should be considered.

2. To use a comprehensive approach based on joint use of data obtained as a result of monitoring and modeling that would allow to optimize the number of monitoring stations located on the territory of the countries, verify modeling data, evaluate contribution of transboundary pollution and also to estimate long-term trends.
3. To study existing EMEP Manuals on carrying out measurements in the system of air pollution monitoring.
4. To get familiarized with the available models, participate in test trials.
5. To develop a plan of activities aimed at arranging and carrying out the EMEP monitoring program for each country that would cover the following items:
 - optimization of the observation network for environmental monitoring through identifying posts for monitoring the elements suggested under the EMEP monitoring program;
 - technical upgrading and modernization by means of using modern equipment in monitoring posts and also in chemical and analytical service facilities;
 - equipping the central and network services with modern communication means (like modems, computers, software, copying and multiplying office equipment) and facilities for automated processing of the data obtained as a result of monitoring related studies;
6. In the process of working on the elements assumed under the EMEP monitoring program it is essential to fully use the support provided by the EMEP international centers in the following areas:
 - in methodical and methodological coverage of work on the elements under the program of air pollution monitoring;
 - in training specialists of the EECCA countries by means of involving them into international training, courses, training workshops and also in international programs and projects of the EMEP centers;
 - in developing national models of pollutants transportation;
 - in selecting monitoring stations for verifying model estimates.

For Working Bodies of the Convention and UNECE Secretariat:

1. To support new Parties to the Convention in their move towards improvement of the environment pollution monitoring systems and modeling development taking into account the specific needs of the EECCA countries (technological capacities, financial problems, transition period etc.)
2. To support organization of the projects, similar to the one, completed in Kazakhstan as well as conducting workshops with participation of the EECCA countries to exchange experience in the field of air pollution monitoring and modeling and for implementation of these recommendations.
3. To provide training to specialists from the EECCA countries on the EMEP Program including through training in international training courses and workshops.

4. To support development of a program for preparing and carrying out the EMEP system of monitoring (mid-term) in every country that would include facilitation of a monitoring network, approval and coordination of monitoring and measurement programs, procedures of chemical analysis, recommendations on instruments and equipment, analysis and processing of monitoring and measurement data, exchange of information.

3. Additional Recommendations

Analysis of the situation on emissions inventory as well as of the state of air pollution monitoring and modeling in some EECCA countries has made it possible to develop additional recommendations, which are as follows:

1. The EECCA countries – new parties to the Convention need to coordinate in the most efficient way their national efforts on combating air pollution. In this respect, nature protection bodies, health bodies and research institutes are recommended to closely cooperate with the purpose to efficiently use resources and avoid undesirable duplication.
2. The EECCA countries - new parties to the Convention are recommended to start making their voluntary contribution to the European reporting under auspices of the European Union.
3. In interaction with Task Force on Emissions Inventory and Projections (TFEIP) and Task Force on Monitoring and Modeling (TFMM) the EECCA countries - new parties to the Convention are recommended to apply Environment Information and Observation Network (EIONET), coordinated by the European Environment Agency. As a rule TFEIP meetings are held jointly with EIONET, and TFMM meetings are also held in close cooperation with EIONET. Information on this net can be found at the following Internet addresses:

<http://www.nilu.no/projects/ccc/tfmm/oslo/index.html> and

http://air-climate.eionet.eu.int/docs/meetings/031106_8th_EIONET_AQ_WS/meetings031106.html

4. The EECCA countries - new parties to the Convention are recommended to coordinate activities within the framework of different international ecological Conventions, in particular Stockholm Convention on Persistent Organic Pollutants (POPs), United Nations Framework Convention on Climate Change.
5. It is necessary to apply to the EMEP Bureau (Geneva, March 2004) with the request to provide assistance to the EECCA countries - new parties to the Convention, in the development of monitoring, modeling and emissions inventory through Task Force on Measurements and Modeling and Task Force on Emissions Inventory and Projections.
6. To propose to the delegation of Kazakhstan to inform the Executive Body of the Convention (Geneva, December 2003) on the results of the International Meeting and intention of the Republic of Uzbekistan and Republic of Tajikistan to be accessed to the Convention; intention of Armenia, Georgia, Kyrgyz Republic, and Republic of Azerbaijan to be accessed to EMEP Protocol on Long-term financing and other Protocols to the Convention.