

PART III. NATIONAL REPORTING GUIDELINES FOR CSD 14/15 THEMATIC AREAS

A. ATMOSPHERE / AIR POLLUTION

Government focal point(s):
Responding Ministry/office(s):

Decision – Making: strategies, policies, programmes and plans, legislation, policy instruments and the regulatory framework; involvement of Major Groups

1. (4.V) (Assessing ambient air quality and the levels of air pollution)

All possible pollutants have not yet been identified in the Republic of Macedonia. Due to this fact, series of activities have been carried out, including the preparation of the Cadastre of Air Polluters and Pollutants by individual environmental areas, including the Cadastre of air polluters and pollutants in Skopje and in the Republic of Macedonia as a whole. For the purpose of the Cadastre elaboration, data is collected from business entities and the following pollutants are measured: sulphur dioxide, nitrogen oxides, carbon monoxide, dust, quantity of exhaust gas-flow from outlets into the air, and heavy metals, where possible.

In order to achieve compatibility and comparativeness of the data on the quantities of emissions of the aforementioned polluting substances, a single methodology for stock taking is needed. The methodology is derived from the CORINAIR program.

From the data measured by the Laboratory of the Ministry of Environment and Physical Planning, data received from certain larger companies that monitor air emissions and pollution themselves, as well as data from the Statistical Year Book, with the application of the CORINAIR (Core Inventory for Air Pollution) methodology and the SNAP (Selected Nomenclature for Air Pollution) nomenclature, 220 polluters in the Republic of Macedonia have been compiled and categorized.

The compilation according to the SNAP was completed upon recommendation and with the assistance of experts from the European Topic Centre for Air and Climate Change (ETC/ACC) of the European Environmental Agency (EEA). In this process, the measurements and assessments presented in the Guidelines of the CORINAIR have been used. The compilation has not covered all 11 sectors proposed under the SNAP, due to the lack of data. Thus, 220 polluters have been designated up to sector 7.

Introduction of unique methodology of air pollution inventory on national level is of high importance with regard to individual pollutants, recommended under the CORINAIR (Core Inventory for Air Pollution). The Republic of Macedonia has ratified the Convention on Long-range Transboundary Air

Pollution and the EMEP Protocol (European Monitoring of Environment Programme) (Official Gazette of SFRY No. 11/86). The methodology will provide the data of the Republic of Macedonia to be compatible to and comparable with the relevant EU data.

Introduction of unique methodology of air pollution inventory (CORINAIR) and distribution of quantities of pollutants according to all 11 sectors in line with the SNAP, at the national level is planned for 2005 and 2006, through the CARDS Regional Programme and the European Environmental Agency (EEA).

The table below shows the quantities of polluting substances according to sectors on national level.

Quantity of air pollutant emissions according to 2003 data, in tonnes/year					
	Sector	SO₂	NO_x	CO	Dust
Sector 1	Combustion and power transformation in electricity generation plants	91,883.5	13,446.7	1,642	3,064.4
Sector 2	Non-industrial combustion facilities	6,298	1,130	1,846	326
Sector 3	Combustion in production industry	5,400	1,510	1,942	1,830
Sector 4	Production processes	30,880	6,221	5,267	24,312
Sector 6	Use of solvents and other products	3,980	1,420	16,594	145
Sector 7,8	Transport	514	11,384	49,305	67
Overall		138,974.5	35,045.7	76,596	26,744.4
Source: Ministry of Environment and Physical Planning					

Each year, the above data/quantities are corrected in the table and the EMEP's questionnaire is filled in. In this way The Republic of Macedonia participates in the spatial distribution with regard the emissions of those pollutants on which data is available, and on the basis of this the EMEP Protocol incorporates the data into its spatial network of pollution distribution into 50 x 50 km² grids at European level. After the completion of the Cadastre and Inventory of air polluters in accordance with CORINAIR, Macedonia will be able to collect data on the quantities and type of air pollution. At the same time, potential polluters will be identified at the national level. The Cadastre of air polluters in the Republic of Macedonia will be used as a basis for developing plans, programmes and measures for reducing pollution.

The Cadastre will be prepared according to the following schedule:

- The Cadastre of air polluters for the city of Skopje was completed in December 2004.
- The Cadastre of air polluters for the Republic of Macedonia will be completed by the end of 2005.
- The introduction of the unique methodology of pollution inventory in accordance with the CORINAIR and SNAP is envisaged to take place in 2005 and 2006.

2. (3V 5V) Control of air pollution, for stationary, mobile, area and other pollution sources

- **Analysis of costs and benefits**
- **Institutional changes made**

There are three networks for monitoring of ambient air quality in the Republic of Macedonia: a) the network of the National Public Health Institute (NPHI) and its regional branches located in major cities in the country; b) the network of the Hydro Meteorological Directorate (HDM); and c) the network of the Ministry of Environment and Physical Planning (MEPP). All three networks operate on the basis of separate programmes under the annual work programme of each of the above mentioned institutions.

The Law on Ambient Air Quality (Official Gazette of the Republic of Macedonia No. 67/04) provides a basis for the establishment and operation of a national network for monitoring the ambient air quality, (it is still not decided whether the three existing network will be integrated), as well as local networks for monitoring the ambient air quality in to be established in certain units of local self-government units (ULS), if there is a need for additional or specific ambient air quality monitoring on local level.

The Law on Ambient Air Quality stipulates the adoption of annual programme for ambient air quality monitoring concerning the operation of the national ambient air quality-monitoring network.

In the framework of PHARE SOP 99 Programme, the Environmental Monitoring Strategy was developed, including monitoring of air. This Strategy contains guidelines on the activities that should be undertaken initially, and based on these activities plans are to be made for improvement of the monitoring of air quality, as well as for the establishment of air quality zones and agglomerations.

Each of the existing monitoring networks performs measurements of concentration of polluting substances in different places in the country.

At present, there is no integrated programme for reduction of emissions of polluting substances into the atmosphere in the Republic of Macedonia.

Article 23 of the Law on Ambient Air Quality (Official Gazette of the Republic of Macedonia No 67/04) defines the obligation for the adoption of the National Plan for Ambient Air Protection and Programme for ambient air pollution reduction and quality improvement.

According to the Law, the National Plan for Ambient Air Protection should provide, inter alia, the following:

- Maintenance of the ambient air quality in the zones where air quality limit values are not exceeded;
- Improvement of the ambient air quality in the zones where air quality limit values are exceeded;
- Undertaking of measures for reduction of the emissions from certain stationary sources of pollution;
- Adoption of necessary measures for minimizing and completely eliminating the negative effects on the ambient air quality.

The Plan is to be adopted by the Government of the Republic of Macedonia on a proposal by the Ministry of Environment and Physical Planning (MEPP), for a period of eight years. For the purpose of implementation of the Plan, the Government of the Republic of Macedonia, on a proposal by the MEPP, adopts an annual programme of measures for the purpose of achievement of the Plan goals, accompanied with financial plan for implementation of the programme. The MEPP is the authority within the public administration responsible for the implementation of the Plan on which it reports to the Government every two years. The Law also stipulates an obligation for the adoption of programmes for reduction of the pollution and ambient air quality improvement on the territory of the units of local self-government, in the zones and agglomerations where one or more pollutants are found to be above the air quality limit values, plus margin of tolerance, or such values are between the air quality limit values and the air quality limit values, plus margin of tolerance.

According to the Law, the Plan and the programmes should be adopted within six years after the Law enters into force.

3. (5F) (Plans to deal with severe air pollution incidents)

The control of industrial risks and accidents is regulated by the Draft Law on Environment, the Chapter on Prevention and Control of Disasters Involving Hazardous Substances, in which the EU Directive 96/82/EC – SEVESO II has been transposed. In this Chapter, the Draft Law on Environment defines the activities conducted in the production, transport and storage systems for which the operators are required to undertake all precautions necessary to prevent disasters and severe incidents, and to control their effects on the environment and health of the people, as well as their obligation to inform the Ministry of Environment and Physical Planning (MEPP). By means of the adoption of the relevant by-laws, the Law provides the basis for the MEPP to limit the presence of hazardous substances used in the above mentioned activities, as prescribed with Directive 96/82/EC.

Protection and rescue in the Republic of Macedonia are generally regulated by the Law on Protection and Rescue (Official Gazette of the Republic of Macedonia No. 36/04, 49/04), which defines protection and rescue as a unified system of detection and prevention of disasters and elimination of their consequences. The activities that the competent authorities of the Republic of Macedonia may undertake in case of industrial risks and incidents may be classified in three groups of activities:

- a) Preventive measures
- b) Control activities
- c) Activities during and after the disaster.

Preventive measures include the activities undertaken in the process of planning for protection against industrial risks and accidents, i.e. for protection and rescue. According to the Draft Law on Environment, the operators are obliged to prepare and submit a report for the MEPP on the systems involving

hazardous substances three months ahead of their establishment and before the new systems are put into operation. On the other hand, with regard to the existing installations, these reports should be submitted no later than a year after the Draft Law becomes effective, including the reports on substantial changes in installations. Operators are required to prepare reports on the safety measures, providing evidence for the MEPP that all necessary measures and activities for disaster prevention and safety system operation have been undertaken. The report should be made available to the public and it should be periodically analysed and updated, at least every five years. As for the existing installations, safety measures should be prepared within two years after the entry into force of the Draft Law becomes. The Draft Law on Environment also takes into account the cumulative effect. By means of the information presented by the operators the MEPP determines which systems are liable to disasters, or in which systems the consequences of a possible disaster can become more serious due to their unfavourable location and their proximity to each other, or due to the amount of hazardous substances found therein. In such cases, the MEPP is obliged to facilitate the exchange of information so as to enable the operators of these systems to take into account the nature and the possible extent of the overall danger from a disaster in the measures and activities for disaster prevention, the safety management systems, and the internal emergency plans.

The operator has an obligation to prepare an Internal Emergency Plan that will incorporate all measures to be taken on the system itself in case of a disaster and to deliver it to the local self-government units (LSGU). The MEPP prescribes the contents of the said internal plans.

On the basis of the information from internal plan, the competent authority of LSGU prepares External Emergency Plan. The operators and the local self-government units are obliged to make the plans available to the public.

Preventive measures against industrial accidents and risks are also highlighted in article 13.1 of the Application for Integrated Environmental Permit, or Permit of Compliance with Operational Plans, which requires a description of the "Risk Prevention and Control System." Further on, according to article 14.1.2 the "Measures for eliminating potential risks to environment pollution and human health caused by an installation after it has stopped operating are needed if such risks do exist."

The Application form has been designed by the MEPP and has been submitted for discussion to all relevant entities. Measures envisaged in safety plans must be taken into account in the process of spatial and urban plans development.

The Draft Law also considers the problem of long-range transboundary pollution in case of disasters with regard to the systems located in the territory of the Republic of Macedonia in the vicinity of international borders. In that case the plans referring to those systems should be presented to the concerned states.

4. (Programmes designed to reduce indoor air pollution)

Indoor pollution in households is not monitored. In 1999 the National Institute for Health Protection has carried out a study in Bitola, the second largest

town in the Republic of Macedonia, on 352 children (aged - 9-10 years) divided in two groups and in separated areas, according to previous data for air pollution. Data on respiratory (allergic and non-allergic) diseases; data on the social and economic factors, passive smoking, cooking, etc., were collected using questionnaires. 135 children from both groups were chosen randomly for Spirometry. In this Case-Control Study the relation between prevalence of bronchitis and runny/stuffed nose with analysed risk factors was examined. Statistically significant differences ($p < 0.05$) were discovered between cases of bronchitis and air pollution; association ($p < 0.05$) between bronchitis cases and runny/stuffed nose with cooking by gas and woods, and also association between Spirometry FEV₁ Parameter between the two groups.

The use of asbestos is no longer allowed, but it is still present in buildings that have been neither cleaned up nor demolished. Any problems of exposure to asbestos are considered to be of an occupational nature. Substantial health risks come from asbestos when the crushed asbestos crystals are aerosolised and inhaled. It is important what the size and structure of the crystal is because it determines how far down the lungs the crystals can get, before getting stuck there and causing symptoms. Since the airways in the lungs get smaller as you get deeper into the lungs, smaller crystals will go farther. Also, if the structure of the crystal is very sharp, it will be better able to penetrate the tissues and get stuck there.

Smoking prevalence was assessed in a survey among 1,203 medical doctors (i.e. about 25 per cent of the total number) in 1999. The survey estimated that approximately 36% of the population over 15 years of age smoke regularly, with a higher prevalence among males (40 per cent) than females (32 per cent).

The Law on Smoking (1994, and with the Amendments in 2005) prohibits advertising of tobacco products on TV, radio and in the newspapers. It also prohibits the sale of tobacco products to persons under 16 years of age. Smoking is officially banned in all public and working facilities. Smoking is still allowed in bars and restaurants. Responsibility for enforcing the Law lies with the inspection services of the Ministry of Health Care and Ministry of Labour and Social Policy. Although the Law stipulates penalties for offenders, in practice, these are not enforced, and the Law is flouted. The Ministry of Health Care is taking steps to implement the WHO program "Tobacco-Free Europe", and is preparing a national action plan for smoking control in the country. The possibility of developing a new law to bring the norms closer to those in the EU and to enforce smoking bans more vigorously is under consideration.

Also, in 2005 the Ministry of Health Care will start with the preparation of the National Environmental and Health Action Plan for children, and the topic of indoor pollution will be included.

5. (Policy measures taken to improve the quality of fuels)

(1325 - Which are the mechanisms for monitoring the quality of petrol, diesel oil, gas and firewood?)

The Law on Standardisation (Official Gazette of the Republic of Macedonia No. 54/02), Article 9, stipulates that, for the purpose of developing

regulations to regulate technical requirements for products in order to ensure the safety of property and the protection of human life and health, and the environment and nature, the Institute for Standardisation prepares, adopts and publishes the relevant standards, on a request by the Government of the Republic of Macedonia.

The quality of liquid fuels is regulated with the national standards for liquid fuels:

MKS B.H. 2.220, motor fuels,
MKS B.H. 2.210, unleaded motor fuels,
MKS B.H. 2.410, fuel for diesel engines,
MKS B.H. 2.331, fuel for jet engines, type 1 (GM-1), and
MKS B.H. 2.430, heating oils.

The entry into force and mandatory application of the above standards are regulated by the Rulebook on the Quality of Liquid Fuels (Official Gazette of the Republic of Macedonia No. 72/03, 85/03 and 23/04), adopted by the Minister of Economy on the basis of Article 4 of the Law on Prescribing Technical Requirements for Products and Conformity Assessment (Official Gazette of the Republic of Macedonia No. 55/02).

The said Rulebook prescribes the quality of liquid fuels through the definition of the lowest/highest permissible quantity of sulphur, lead, olephines, aromates, benzenes, oxygen, oxygenates, etc., and the lowest/highest permissible value of other characteristics (parameters) of liquid fuels quality.

Other characteristics are: number of octanes, distillation, steam tension, viscosity, number of cetanes, and density at 15°C, filterability, water etc.

The sampling for liquid fuels quality testing and the methods for the determination of limit values are implemented in accordance with the abovementioned standards.

In addition to the mentioned methods, the methods complying with the applicable international standards, such as the ?S??, ISO, ?N and others, may be used.

Each delivery of liquid fuel intended for trade on domestic market should be accompanied by appropriate documentation and Certificate of quality compliance (Form JF-1) issued to the supplier by the producer, deliverer or accredited independent laboratory. With the certificate of quality compliance of liquid fuel, the deliverer guarantees that the liquid fuel complies with the limit values stipulated by the Rulebook.

At the request of the State Market Inspectorate, in case of doubt, an authorised independent laboratory, at the expense of the liquid fuel supplier, inspects the quality of the liquid fuel.

The Draft Law on Environment, in Article 21, stipulates the prohibition of production, trade in and use of certain products, substances and the performance of certain activities and services in case there is evidence confirming that they present a danger for the environment and the health of the people, or if they do not comply with the applicable standards.

The Law on Ambient Air Quality (Official Gazette of the Republic of Macedonia No. 67/04) provides the legal basis for specifying limit values for the contents of harmful substances in fuels in order to avoid, prevent or reduce harmful effects on human health and the environment (Article 9). Limit values for the contents and types of harmful substances and other requirements for fuels quality are specified by the Ministry of Economy, in consent with the Ministry of Environment and Physical Planning (Article 14).

National standards for liquid fuels are partially harmonised with Directive 98/70/EC on the quality of petrol and diesel fuels, due to the differences in permissible contents of lead and benzene in both types of petrol, as well as in permissible contents of sulphur in diesel fuels.

There has been no national quality standard adopted for LPG as fuel for automobiles.

The National Oil and Lubricants Technical Committee of the Institute for Standardisation has initiated the procedure for the transposition of the standards EN 228: 2004 and EN 590: 2004. The transposition of the said standards, as well as the standard EN 589: 2004 for fuel for automobiles, is scheduled for 2005.

6. (7V) (Specific policy measures designed to reduce the level of lead in gasoline)

In 2003, in the framework of PHARE SOP 99, the “Master Plan for Leaded Petrol Phasing Out” was developed with the participation of all relevant stakeholders. This strategic document has been developed by taking into account the Directive 98/70/EC on the quality of petrol and diesel fuels, EU Decision 2000/159/EC, and Directive 96/62/EC on air quality.

The Master Plan includes the time frame for the phased elimination of lead from petrol. The first phase, which has been completed, included: the reduction of the contents of lead from 0.6 to 0.15 g Pb/l by 2004. The second phase – full elimination of the lead to 0.013 g Pb/l shall be completed by 2006.

There is no accredited laboratory in the Republic of Macedonia for fuels quality testing. A legal ground for laboratory accreditation has been established in the Law on Accreditation (“Official Gazette of RM” No. 54/02).

7. (Policies promoting cleaner transportation measures and technology)

According to the national legislation, motor vehicles of categories M, N, L and L are subject to compulsory homologation of vehicle type and individual vehicles prior to the import and first registration of motor vehicles. Specific regulations stipulating compulsory A-Testing of vehicles in terms of provisions related to catalytic converters include the:

- Order on Mandatory A-Testing (Homologation) of Vehicles with Minimum Four Wheels with regard to Noise (“Official Gazette of RM” No.16/97), and the
- Order on Mandatory A-Testing (Homologation) of Diesel Motor and Diesel Motor Driven Motor Vehicles with regard to Gaseous Pollutants (“Official Gazette of RM” No. 16/97).

Article 20 of the Draft Law on Environment, which has been fully harmonized with the relevant EU legislation, stipulates the prohibition of

production and import of transportation means that do not comply with the conditions specified for the emission of pollution and noise from mobile sources.

Furthermore, the Law on Transport and Traffic Safety (Official Gazette of the Republic of Macedonia No. 14/98) and the Law on Public Roads (Official Gazette of the Republic of Macedonia No. 26/96) address the emission control for vehicles at registration and technical services that is required once per year for all vehicles. Substantial improvement should be expected as soon as the Draft Law on Environment is adopted, since it includes provisions on EIA, SEA, access to information etc, which shall impact the transport sector as well. Spatial plans and urban development plans deal with urban sprawl problems in Macedonia. In 2004 the Parliament adopted the new National Spatial Plan that addresses environmental protection in a general manner, and for the transport sector it specifically highlights the need to monitor the transport of hazardous wastes and materials and to implement measures to reduce air emissions.

The Government strategy concerning railway transport is focused on completing the missing sections along the transport corridors, which unfortunately is on hold, due to funding difficulties. This strategy would enable shifting freight transportation from roads to rails, and particularly the combined transport of goods. This multi-modal way of transport of goods is in fact the best approach towards sustainable transport.

One of the means for promotion of cleaner transportation is organizing awareness raising campaigns that are regularly implemented by the Ministries as well as NGOs. For example, the Ministry of Environment and Physical Planning very often organizes and supports campaigns for increased use of public transportation and alternative means of transportation, such as bicycles).

However, taking into consideration the major priority of the Macedonian Government for accession into the European Union, and more implicitly to join the European common transport system, the country immediately needs an adequate policy on sustainable development of the transport sector.

8. (6V) (Emission limits on vehicular exhaust)

The Law on Ambient Air Quality (Official Gazette of the Republic of Macedonia No. 67/04) establishes the legal basis for the stipulation of emission limit values for exhaust gases from mobile sources (Articles 9 and 14). According to this Law, the technical inspection and registration of mobile sources of pollution includes compulsory regular control of the compliance of the emission levels from mobile sources of pollution with the specified emission limit values.

According to the Programme for Approximation of the National Legislation to the Legislation of the European Union and the European Partnership Action Plan, emission limit values for exhaust gases from mobile sources of pollution will be regulated by 2006, taking into account the relevant EU measures (31970L0220, 31997L0068, 31998L0070, 3199L012, 31999L0032, 32002D0159, 32002L0088).

The technical inspection and registration of mobile sources of pollution are carried out in accordance with the Law on Road Traffic Safety (Official Gazette of the Republic of Macedonia No. 14/98, 38/02, 38/04), and Rulebook on Technical

Inspection of Motor and Trailer Vehicles, Tractors and Agricultural Tractors (Official Gazette of the Republic of Macedonia No. 28/99). The Rulebook on Technical Inspection of Motor and Trailer Vehicles, Tractors and Agricultural Tractors (Article 43) stipulates the inspection of combustion gases outlet device at loaded motor, and the combustion gases emission is measured by a device for the measurement of volume percentage of carbon monoxide in exhaust gases of petrol driven vehicles and a device for opacity (degree of smoke) measurement of exhaust gases from diesel driven vehicles. Technical inspections of vehicles are conducted on a regular (once a year, and for vehicles older than 15 years, twice a year) and on an extraordinary basis for vehicles for which technical inspection is needed according to the written order by the authorised official.

9. (Role played by air pollution in urban planning, especially related to transportation)

The study on traffic that would facilitate the regulation and organization of the flow of traffic, with the aim of creating fast and efficient transport connections, while at the same time eliminating the pollution of the atmosphere in the urban areas from motor vehicles, is a part of all urban plans. The establishment of green barriers between the roads and the living areas is just one of the protection measures from exhaust gasses from the traffic.

Systemically, the reduction of pollution in the urban centres is also being solved by selecting an adequate transport model, such as underground, railway, trolley, organized bus service, or by establishing fast traffic lanes and elimination of transport from the hot spots.

The establishment of zones and the specification of the use of the land in the urban plans could contribute to drastic reduction of harmful effects of air pollution from traffic.

10. (Economic and market based incentives to meet national air quality goals)

VAT - Value Added Tax

Pursuant to the Law on Value Added Tax (VAT), (Official Gazette of the Republic of Macedonia No. 44/99, 59/99, 86/99, 11/00, 8/01, 31/01, 21/03, and 19/04), VAT rates are calculated using proportional tax rates on the tax base of taxable commodities and services turnover, based on the common tax rate of 18% which is applicable to all types of energy products.

Excise

Excise duties, as a special type of circulation tax, were introduced since January 1994 and were imposed onto turnover and import of: oil derivatives, processed tobacco products, alcoholic beverages, beer, coffee, passenger vehicles and luxury goods.

The taxpayers of excise duties on these products are their producers or importers.

Onto the tax bases of separate excise duty products defined in the Law on Excises Duties, rates are applied as determined by the Excise Tariff, which is an integral part of the Law.

Excise duty exemptions are anticipated in two segments, namely: the first concerns the excise duty exemptions on import, export, re-export and transit, and the second segment refers to the exemptions in domestic trade which are executed on a principle of recovery of paid excise duty.

The Law on Excise (Official Gazette of the Republic of Macedonia No. 32/01, 50/01, and 52/01, 45/02, 98/02 and 24/03) regulates the excise duties which are charged indirectly or directly for consumption on the territory of the Republic of Macedonia for: mineral oils, alcohol and alcoholic beverages and tobacco products. In terms of energy, important are the mineral oils (automotive fuel, diesel fuel, domestic heating oil - extra light and light special, jet fuel and aircraft petrol, engine petroleum, lighting petroleum, for airplanes and engines), which are processed pursuant to: subject of taxation, specific excise duty, proportional excise duty, mineral oils labelling, application of labelled mineral oils, excise duty exemption for mineral oils, special cases which are not considered as production of mineral oils, and excise duty storage of mineral oils.

The primary basis for preparation of the Law on Excises Duties was the systemic European Council Directive 92/12/EEC, as well as its associated structural directives, separately for each of the goods subject to taxation with excise duties.

The Law on Excises Duties presents an entirely new system in the functioning of an indirect tax, which is based on the following new concepts:

- Focusing the subject of taxation by using terms established exclusively for the purposes of this system;
- Liability to excise duty;
- Transportation of excise duty goods through the territory of the Republic of Macedonia;
- Origin of excise duty;
- Excise duty period; and
- Excise duty exemptions.

Specific excise for the different derivatives:		
Derivative	Legal excise (MKD/Kg)	Legal excise (MKD/l)
MB – 96	32.313	24.396
BMB – 90	28.731	21.692
BMB – 95	28.731	21.692
D (diesel)	14.344	12.121
EL (extra light)	3.711	
M – 1 fuel oil	0.100	
? – 2 fuel oil	0.100	

In determining the retail price of separate oil derivatives, and for the purpose of rounding off the prices, the specific excise duty of mineral oils may vary up to $\pm 3\%$.

Proportional Excise

Mineral oils are subject of taxation in the amount of 10%, and the excise duty base is the retail price minus the value added tax that does not include the excise. For imports, the tax base is the value of the commodity determined in accordance with the customs regulations, including the customs duty and the other taxes paid for imports.

CO₂ tax on energy

Article 31, paragraph 2 of the Law on Protection and Promotion of the Environment and the Nature (Official Gazette of the Republic of Macedonia No. 69/96, 41/2000, 13/2003) specifies that the assets for environment and nature protection and promotion, which are revenue to the Fund of Environment, are provided also from fees which are paid upon registration of motor vehicles and water vehicles, in the amount of 4% of the principle insurance, and for vehicles with catalytic exhaust gasses purification systems in the amount of 2% of the basic insurance. The assets of the Fund of Environment are used for a purpose of funding projects which are directly aimed towards protection of the environment. The Ministry of Environment and Physical Planning coordinates the realization of these projects.

The new Law on Environment specifies that "The polluter shall compensate the costs associated with the elimination of the danger of the environment pollution, bear the remedial costs and pay a fair compensation for the damage caused to the environment, as well as to restore the environment to as close to the condition before the damage as much as possible". The compensation for the pollution is specified as "the legal and natural persons, which according to the Registry of Polluters of different environment elements and the Registry of Toxic and Harmful Substances, have at their disposal sources of environment and nature pollution, provide assets aimed towards protection and promotion of the environment and the nature, according to the type and quantity of pollutants, in a form of compensation regulated by law".

The Law on Environment also provides the basis for determining future fiscal measures which will apply to energy products.

This Law is in compliance with the following Directives: 2003/4/EC on public access to environmental information; 85/337/EEC, 97/11/EC and 2003/35/EC on the assessment of the effects of certain public and private projects on the environment; 96/61/EC on integrated pollution prevention and control; 2001/42/EC assessment of the effects of certain plans and programmes on the environment; 96/82/EC the control of major-accident hazards, including harmful substances; 2003/35/EC providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice.

This Law will be adopted by the end of 2005.

At the same time, the Second National Environmental Action Plan, which will be adopted in the second half of 2005, shall deal with the economic instruments and shall provide recommendations on introduction of other fiscal measures in the Republic of Macedonia. The economic instruments will also be

subject to detailed analysis in the CARDS 2004 project for "Further strengthening of the environmental management".

The tax system of the Republic of Macedonia, concerning energy products, does not favour domestic energy sources.

The harmonization with the European Union tax regulations shall not influence the balance sheet of the Republic of Macedonia in the field of energy.

11. (9V) Nature and Impact of transboundary air pollution, including pollutants emitted within your country as well as those received from nearby countries)

Transboundary air pollution is monitored in one measuring point where, during last year, automatic instruments for measuring the concentration of sulphur dioxide, nitrogen oxides, ozone and 10 micrometers suspended particles were installed. The instruments are in experimental stage of operation. At the moment we are not in a position to provide the pollution tendency.

However, the Law on Ambient Air Quality has been fully harmonised with the requirements of the EU Directive 96/62/EC, as well as in the Convention on Long-Range Transboundary Air Pollution. Article 25, paragraph 1, of the Law stipulates the obligation for the development of the National Plan for Ambient Air Protection, providing, inter alia, the adoption of the necessary measures for minimization and full elimination of negative effects on the quality of ambient air in a transboundary context, as well as the fulfilment of the obligations undertaken through international agreements ratified by the Republic of Macedonia. Furthermore, according to Article 26, paragraph 6, the Law prescribes that, in case certain polluted zone and/or agglomeration covers territories of two or more countries, the Programmes for reduction of air pollution and improvement of the quality of ambient shall be developed in agreement with the involved countries. According to the Law, these Plans and Programmes shall be adopted within six years of the entry into force of the Law (Article 78).

In order to identify the level of pollution within the context covered by the Convention, the Law, in its Article 40, paragraph 1, stipulates the obligation for the measurements of transboundary transmission of air pollutants, as well as the measurements related to international obligations of the country. This Law in Article 43 assigns the Ministry of Environment and Physical Planning (MEPP) as an authority responsible for the monitoring and control of transboundary transmission of air pollutants. The MEPP is also responsible for the presentation of data on the ambient air quality and air emissions in the context of the implementation of the obligations deriving from ratified international environmental agreements (Article 44). The MEPP is also obliged to inform the public. According to Article 50 of the Law, the Ministry is responsible to prepare reports on the ambient air quality for the purpose of implementing the obligations under the Law, as well as reports in accordance with the obligations under the ratified international environmental agreements.

The available data is submitted on regular basis, once a year according to the requirement, to the EMEP and UNECE, as well as to the European Environmental Agency (EEA).

12. (9G) (Programmes designed to reduce ozone-depleting substances and promote alternatives under the Montreal Protocol)

The Republic of Macedonia has ratified the Vienna Convention on Ozone Layer Protection and the Montreal Protocol on Ozone Depleting Substances in 1994.

The first step undertaken on national level is the preparation of the National Program for Elimination of the ODSs (1996) and the creation of the Ozone Unit within the Ministry of Environment and Physical Planning.

The Programme is a strategic document with clearly defined guidelines for the reduction and final elimination of halogenated carbons. By preparing the Programme, the Government of the Republic of Macedonia demonstrated readiness its to deal with global issues, in particular for stratospheric ozone protection. The Programme describes the existing situation with the use, consumption, import and export of substances that deplete the ozone layer in the Republic of Macedonia, inclusive of the year 1996. Detailed evaluation of the national institutions that consume or emit ozone layer depleting substances was also made.

The Programme defines the priorities in the elimination of the ozone-layer depleting substances and the exact issues requiring urgent responses. The National Programme also establishes the institutional coordination framework. The Ministry of Environment and Physical Planning is the executive body that has the obligation to establish the National Ozone Layer Protection Office.

The activities of the Ozone Office are financed by the Multilateral Fund of the Montreal Protocol, and assisted by UNIDO, as an implementing agency.

The Office is responsible for the activities in the following fields:

- control and monitoring of import, export and consumption of ozone layer depleting substances;
- project preparation and provision of sufficient financial resources for the implementation of the
 - national activities concerning the protection of the ozone layer;
 - coordination of projects on substitution, reduction and elimination of ozone depleting substances;
 - Dissemination of reports on the progress of the programme activities to the bodies of the international organizations participating in the implementation of the Protocol;
 - Initiation of drafting of legislation with regard to the control, reduction and elimination of import, export and consumption of ozone layer depleting substances;
 - information of the relevant stakeholders and the public about the problem of ozone layer;
 - depletion and initiation of their involvement into the activities.

Many projects are already implemented in the Republic of Macedonia, almost in all areas where formerly ozone depleting substances found application:

1. **Phasing out of CFCs at the refrigerator plant of Frinko:** recommended by the Technical Options Committee of the Montreal Protocol, HFC-134a was used as a substitute for CFC-11/12. The main advantage of HFC-134a is its zero ozone depletion potential. The implementation of the project has been completed in November 1998.
2. **Phasing out of CFC-11 from flexible slabstock foam manufacturing at "Sileks":** liquid carbon dioxide, with zero ozone depletion potential and no global warming potential has been chosen as a substitution for CFC-11 in the manufacturing of the flexible slabstock foams. The project has been completed in December 1999.
3. **Phasing out of CFC-11 from rigid PU-sandwich panels manufacturing at "Sileks":** SILEKS from the town of Kratovo was the major consumer of ODSs in the Republic of Macedonia. About 64% of the total consumption in the country was in the foam production. The project for phasing-out of CFC-11 from manufacturing of rigid PU sandwich panels has been completed in April 1998.
4. **Refrigeration Management Plan:** the aim of the project RMP was to develop a comprehensive and detailed program for recovery and recycling of ozone depleting substances used for refrigeration equipment servicing in the country (training program on good practices in refrigeration maintenance for service technicians; training of customs officers; recovery and recycling of refrigerants) contributing to prevent unnecessary emission of the refrigerants into the atmosphere.
5. **Demonstration project on the alternatives to the use of methyl bromide in agriculture:** the objective of the project was to demonstrate the technical and economic feasibility of alternative methods to the use of methyl bromide for the production of tobacco transplants and vegetables.
6. **Phase-out of methyl bromide in tobacco seedling and horticulture production sector:** based on the results from the demonstration project, phase-out project is implemented in tobacco seedling and horticulture production. The selected alternatives are floating tray system for tobacco seedlings and biofumigation with solarization for the horticulture production.
7. **Halon Management Plan:** the Plan defines accelerated halon phase-out and elimination through most effective methods for its implementation.

With the successful realization of its projects, The Ministry of Environment and Physical Planning, with the assistance of the Ozone Layer Protection Office, has reduced more than 90 % of the consumption of ozone layer depleting substances in the Republic of Macedonia, thus fulfilling the Montreal Protocol requirements targeted for 2007.

ODSs*	ODP	ODP** tons/year								
		1995	1996	1997	1998	1999	2000	2001	2002	2003
CFC-11	1.000	464.80	420.00	418.00	7.00	8.80	7.12			
CFC-12	1.000	64.70	410..	69.10	70.84	183.07	39.60	39.58	34.07	44.53
CFC-13	0.800						0.02			
CFC-115	0.600					0.03	4.53	11.84	0.07	8.01

Halon 1211	3.000			1.19						
Halon 1301	10.000	3.00	3.00	3.24						
CCl4	1.100		4.00	0.02	0.09	0.05	0.04		0.01	
HCFC-22	0.055	28.00	42.00	33.20	22.71	19.56	89.71	188.34	69.34	108.38
HCFC-141b	0.110		1.00		20.96	0.96	0.47		0.96	
MeBr	0.700		20.00	20.00	21.50	45.40	38.95	33.20	8.87	
Total (MT tons)		560.50	531.00	544.85	143.10	257.87	180.44	272.96	113.32	16.092
Total (ODP Tons)		561.04	511.82	539.22	96.54	224.90	81.75	80.28	44.25	55.30

Source: MEPP- Ozone Layer Protection Office

*ODSs - Ozone depleting substances

**ODP tons - amounts of consumed substances that deplete the ozone layer (MT) multiplied by the value of the ozone depletion potential (ODP)

The Ozone Layer Protection Office also conducted activities aimed at public awareness raising, thus making the public and the directly involved groups aware of the ozone layer depletion problem. In compliance with the provisions of the Montreal Protocol on monitoring the import, export and consumption of substances that deplete the ozone layer, a system for continuous monitoring of the sale of these compounds has been set up, for the purpose of which specific software has been developed. In this way the obligations imposed by the Protocol have been fulfilled, the situation in the country is monitored, and the preparation of reports for the Multilateral Fund, the UNIDO, the Ozone layer Protection Secretariat at the UNEP and other international bodies is facilitated.

With regard to the control of cross-border distribution of ozone depleting substances classified in the Annexes to the Montreal Protocol, and to the equipment containing such substances, companies must obtain an import/export permits from the Ministry of Environment and Physical Planning.

The table below shows the ratified amendments to the Montreal Protocol.

Act	Adopted on	Ratified by the Republic of Macedonia	Official Gazette of the Republic of Macedonia
Vienna Convention	22 March 1985	Succession from SFRY	Official Gazette of SFRY No. 1/90
Montreal Protocol	16 September 1987	Succession from SFRY	Official Gazette of SFRY No. 16/90
London Amendment	27-29 June 1990	4 June 1998	Official Gazette of the Republic of Macedonia No. 25/98
Copenhagen Amendment	25 November 1992	4 June 1998	Official Gazette of the Republic of Macedonia No. 25/98
Montreal Amendment	15-17 September 1997	9 August 1999	Official Gazette of the Republic of Macedonia No. 51/99

Beijing Amendment	29.11-03.12.1999	23 January 2002	Official Gazette of the Republic of Macedonia No. 13/02
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Capacity-building, Information, Research and Development

- **Availability of data concerning:**
 - a) the impacts of air pollution on human health and ecosystems;**
 - b) the levels of pollution on different industries**

Generally, the road transport, power and heat production, the industry and the agriculture are the main economic sectors that cause emissions of air pollutants worldwide. Other sources of lesser significance are households (residential heating) and marine transport, that for some countries is not an issue at all. These emissions result in widespread exposure of the human population, as well as of the ecosystems and materials to adverse air quality. The emissions are dispersed into the air and chemical reactions occur after their release in the atmosphere.

The main air pollution issues of concern in Europe, in view of their impacts (EEA, 2002), are:

- Human health-related impacts due to exposure, in particular to ozone and particles, and to a lesser extent to NO₂, SO₂, CO, lead, benzene;
- Acidification and eutrophication of water, soils and ecosystems;
- Damage to vegetation and crops due to exposure to ground-level ozone;
- Damage to materials and cultural heritage due to the exposure to acidifying compounds and ozone.

The interconnection among the air emissions - the main driving forces causing the different impacts on the human population, ecosystems, materials and cultural heritage has been shown in Figure 1*.

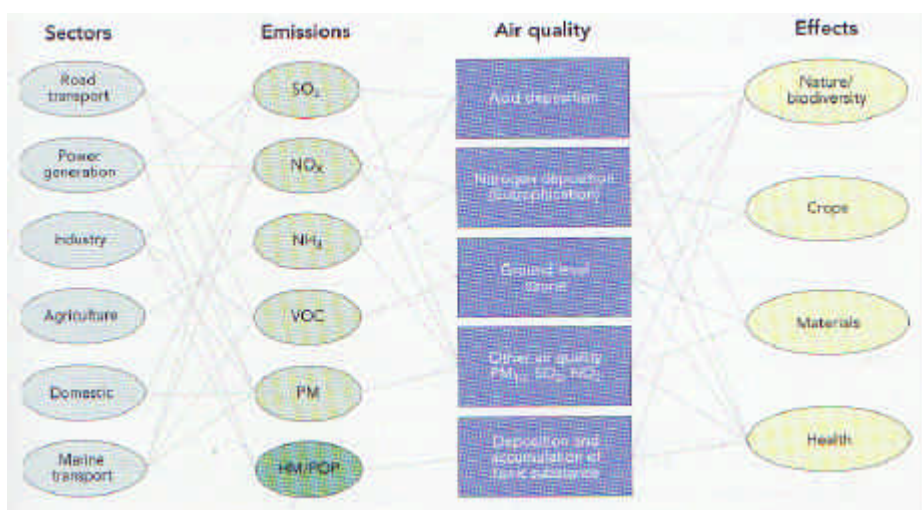


Figure 1: Schematic interconnection between different sectors and their emissions, air quality issues on local and regional scales and relevant impacts

* EEA, Air pollution in Europe 1990-2000, 2003

Taking into account that same pollutants are clearly contributing to different adverse environmental and health effects emphasizes the need for an integrated approach in addressing these concerns.

A) The impacts of air pollution on human health and ecosystems;

The air we breathe contains varying levels of pollutants derived from motor vehicles, industry, housing and commercial sources. They are mainly produced by the combustion of fossil fuels. Despite efforts to reduce pollution levels, they continue to pose risks to human health throughout the country. If policies can achieve reductions in human exposure, the potential health benefits may therefore be substantial. Those policies may operate through a range of mechanisms. A recent example reveals health benefits following legislation to limit the sulphur content of fuel oil. Epidemiological evidence shows that various health effects, including illness and death from respiratory and cardiovascular diseases, are causally associated with such air pollutants. There is thus a “chain of causality” that links our dependence on high-energy consumption and motorized transport with pollutant emissions, ambient air pollution concentrations and effects on health.

Problems due to air pollution affect approximately 60 per cent of the population, i.e. some 1,225,000, in particular those living in the cities of Skopje, Veles, Bitola and Tetovo. The health effects of particulate air pollution depend on particle size, composition and concentration, and can fluctuate with daily changes in PM₁₀ or PM_{2.5} levels. This is the particulate fraction of the greatest health concern, as it penetrates the respiratory system. Particulate matter may have acute health effects, such as increased mortality, increased hospital admissions because of the exacerbation of respiratory diseases, fluctuations in bronchodilator use, cough and peak flow reductions. There are also long-term effects on mortality and respiratory morbidity, but there are fewer studies on this. From a qualitative point of view, particulate matter pollution frequency levels reached in Skopje, Bitola, Veles and Stip are expected to be related to increased incidence of lower respiratory illness in children, of chronic obstructive pulmonary diseases, of asthma episodes, as well as increases in adult mortality. Lead is still present in fuels and in the air from the smelter operating in Veles. According to the World Health Organization (WHO), blood lead levels in children of 100 to 150 µg/l have been consistently reported as having a negative effect on measures of cognitive functioning, such as the psychometric intelligence quotient. The obtained results from the Veles Study have show slightly increased blood lead levels in randomly tested children (mean value 16.51 µg/dl), reflected correspondingly in the level of intelligence and graphomotor ability (randomly, n=31). In addition, the autonomous nervous system studied by peripheral biofeedback appeared to function normally, reacting adequately in stress situations. However, the EEG results have shown that only in two children the theta-beta ratio has normal values, while in others the obtained ratios correspond to increased attention deficit. Moreover, the two children from 31 with the highest theta-beta ratio showed pathological ADHD findings and also the highest blood lead levels (> 20 µg/dl). The suspected correlation between increased blood lead

levels due to industrial pollution and changes in EEG, toward increased attention deficit in tested children has been confirmed, implying the need for corresponding health care and environmental response measures. Compared to other applied psychometric instruments, neurofeedback appeared to be the most sensitive and discriminative modality.

Other sources of exposure to lead may include lead-ceramic pottery, lead-soldered cans and contaminated soil. Analyses of monthly morbidity reports produced by the Public Health Institutes show that both preschoolers (under 6 years of age) and schoolchildren (aged between 7 and 14 years) living in polluted cities, such as Skopje and Veles, have a higher (up to 2 – 3 times) level of morbidity from respiratory diseases (J00-J99) (excluding influenza and pneumonia (J10-J18) than children living in relatively less polluted villages. The difference is particularly high in winter, when heating and climatic factors (including temperature inversion) contribute to an increase in air pollutants (especially SO₂ and black smoke).

B) In the section for the air quality, emissions from stationary and mobile sources will be presented.

Main driving forces in air pollution

Air pollution as a major environmental issue was mentioned in the first National Environmental Action Plan (NEAP) adopted in 1996, and although a lot of measures have already been implemented it is still on the top of “hot” environmental issues in our country.

The main economic sectors and human activities causing air pollution in Macedonia can be grouped in two main groups according to the point of origin:

- Stationary sources of air pollution in general:
 - Energy sector;
 - Industry sector;
 - Public sector and commerce;
 - Agriculture and forestry;
 - Waste treatment and disposal.
- Mobile sources of air pollution:
 - Road transport and other mobile sources and machinery.

Emission data for elaborating the air emissions as the pressure to the environment in Macedonia are the official data collected, analysed and summarized by the Ministry of Environment and Physical Planning – The Macedonian Information Centre. According to their reports, the air emissions were analysed using the submitted data from polluters and institutions that perform the air emissions measurements, as well as using the data from the official Statistical Office for certain year.

It is important to mention that in this report only the values of air emissions for 2002 and 2003 will be discussed, due to their reliability for the main air pollutants – SO₂, NO_x, CO and dust, expressed in t/year. For the preparation of the specific inventories in accordance with the guidelines under the LRTAP and

UNFCCC international agreements, the results concerning air emissions have been presented using the SNAP 97 (Selected nomenclature for air pollution) methodology from the EEA Programme CORINAIR (The Core Inventory of Air Emissions in Europe) Inventory.

The data for anthropogenic emissions of SO₂, NO₂ and CO in 2002/2003 have been presented in Table 1*.

Table 1: Anthropogenic emissions (in thousands of tons)

Air pollutant	2002	2003
SO ₂	138	139
NO _x	32	35
CO	76	77
Dust	5	28

Emissions from mobile sources (transport and other mobile sources) are incomplete.

The Review of the air emissions in Macedonia per various sectors according the SNAP 97 methodology has been shown in the Table 2.

According the data from Table 2*, it is evident that the largest part – 66% of the total annual SO₂ air emissions comes from the sector 1 due to the combustion and transformation of energy including power stations, refinery, public electricity and district heating. The amount of SO₂ incomes from other sectors is also very high due to the usage of the heavy oil as a fuel for operation with high sulphur content of 2% according to the fuel standards.

Table 2: Total emissions of air pollutants (SO₂, NO₂, CO and dust) in Macedonia for 2002/2003

		2002				2003			
	SECTORS	SO₂ t/year	Nox t/year	CO t/year	Dust t/year	SO₂ t/year	NOx t/year	CO t/year	Dust t/y
Sector 1	Combustion in energy and transformation industries(stationary sources)	90275.5	12267	1642	2064.4	91883.5	13447	1642	2064.4
Sector 2	Non-industrial combustion plants (stationary sources)	6298	1130	1846	326	6298	1130	1846	326
Sector 3	Combustion in manufacturing industry (stationary sources)	5400	1510	1942	1830	5400	1510	1942	1830

* MEPP, Information Centre, State of air quality and air emissions Report for the Republic of Macedonia, 2003

* MEPP, Information Centre, State of air quality and air emissions Report for Republic of Macedonia, 2003

Sector 4	Production processes (stationary sources)	30660	4167	4730	1240	30880	6221	5267	24312
Sector 5	Solvent and other product use	3980	1420	16594	145	3980	1420	16594	145
Sector 6	Road transport and other mobile sources and machinery	514	11348	49305	67	514	11348	49305	67
TOTAL emissions		137128	31842	76059	5672.4	138956	35076	76596	28744

Major contributors to the total emissions of NO_x are energy production and mobile sources with 73% of the total annual NO_x emissions. The production processes are the main source for the dust, with 85% of the total annual dust emissions in 2003. The major source for CO emissions is the road traffic.

- **Emissions from mobile sources** in the larger towns with a high population density (Skopje, Bitola, Tetovo, Kumanovo, etc.) are also a big pressure on the environment in the country. Air emissions from mobile sources have been directly related to the fuel quality and the number and age structure of the vehicle fleet. The total number of the vehicles in Macedonia in February 2003 was 444,278 (Table 1.4), which is 23% more than registered in 1995, when the number of registered vehicles was 327,000. Their average age is around 15.5 years, and around 51% of these vehicles were produced 20 or more years ago. The market share of vehicles running on petrol and diesel fuels has been shown in Table 3*:

Table 3: The market share of vehicles running on petrol and diesel fuels

Total number of registered vehicles in 2003 - 444,278	
	% of total registered vehicles
Vehicles running on petrol	82.42
Vehicles running on diesel	16.10
Vehicles running on mixture and LPG	1.48

The main emissions pollutants from mobile sources are: CO₂, CO, NO_x, SO₂, lead, oxygenates, benzene and polycyclic aromatic hydrocarbons (PAH).

The analysis during the preparation of the Master Plan for phasing out leaded petrol (2002-2003) shows that the total annual lead emissions in 2003, according the standards (0.6 g Pb/l), was 47 t Pb/year from the fuel consumption. The calculations per capita showed 23.5 g Pb/capita, which is a very high amount compared to other countries in the region. 34 countries out of the 45 European countries have already phased out leaded petrol (all Western European countries, some accession countries and NIS countries) and most of others will do that until 2005.

* MEPP, Master Plan for phasing - out leaded petrol, 2003

The new standards that enter into force on 13 January 2004 allow the selling of petrol with 75% less amount of lead, which means petrol with 0.15 g Pb/l. This will decrease the lead emissions in the air and together with the promotion of usage of unleaded petrol will be aimed at improvement of the situation with the environment.

Starting from 1.01.2004 there are three types of petrol on the market in Macedonia (two leaded types and one unleaded petrol), with a quality of liquid fuels according to the Macedonian standards on liquid fuels (**MKS B.H2.220 and MKS B.H2.210**).

The maximum content of lead in these types of petrol is given in Table 4*:

Table 4: Types of petrol and lead content according to the standards on fuel quality in force in Macedonia (2004)

Leaded petrol	Unleaded petrol
Premium MB-96 (RON 96) - < 0,15 g Pb/l	Unleaded Premium BMB-95 (RON 95)- < 0,013 g Pb/l
	Unleaded Regular BMB-90 (RON 90)- < 0.013 g Pb/l

At the same time with the enforcement of the new Macedonian standards, the sulphur content in diesel fuels (max. 0.2 %S m/m) and heavy oils (max. 2%S m/m for M -1 and 3 % S m/m in M-2) was also limited.

The emissions of sulphur and sulphur dioxide from mobile sources (according the annual consumption of all fuels in Macedonia) for the period 1998-2002 has been presented in Table 5*:

Table 5: Annual emissions of S (t/year) and SO₂ (t/year) from mobile sources (1998-2002)

YEAR	1998	1999	2000	2001	2002
Emissions of S (t/year) from mobile sources	9466	9111	10158	7212	9610
Emissions of SO ₂ (t/year) from mobile sources	18931	18222	20316	14423	19220

The testing of vehicles is performed according to the Book of Regulations for technical control of vehicles, tractors and agricultural tractors (Official Gazette of the Republic of Macedonia No. 28/99) by several authorized institutions. The vehicle testing system imposes periodical control of vehicles with the emphasis on the “road-worthiness” of the vehicles including: brake systems, steering and

* The Book of Regulation on fuel quality (Official Gazette of the Republic of Macedonia No. 72/2003)

* Mathematical calculations based on fuel quality standards and total consumption of fuels in Macedonia, Ministry of Economy, 2003

steering wheel, visibility, lamps, reflectors, electrical equipment, tires, axes, noise etc. The regular tests are conducted every year for all vehicles.

- **ODS Emissions**

The data on ODS consumption from 1995 to 2003 show the effect of the national action to eliminate the ODS, as shown in Table 6*.

Table 6: ODS (t/year) Consumption for 1995-2003

ODS	1995	1996	1997	1998	1999	2000	2001	2002	2003
CFC-11	464.80	420.00	418.41	7.00	8.80	7.12			
CFC-12	64.74	41.00	69.10	70.84	183.07	39.60	39.58	34.07	44.53
CFC-113						0.02			
CFC-114									
CFC-115					0.02	2.72	7.10	0.04	4.80
Halon-1211			3.87						
Halon 1301	30.00	30.00	32.40						
CFC-111					1.36				
CCl ₄		4.40	0.02	0.10	0.06	0.04		0.01	
HCFC-22	1.50	2.31	1.83	22.16	6.57	4.93	10.36	3.81	5.96
HCFC-141b		0.11		2.31	0.11	0.05		0.11	
MeBr		12.00	12.00	12.90	27.24	23.37	19.92	5.32	
TOTAL	561.04	509.82	537.63	115.31	227.23	77.85	76.96	43.36	55.29

- **Emissions from POPs**

As main POPs air emission pollutants mentioned in the inventory are: the PCDDs (polychlorinated dibenzo-p-dioxins) and PCDFs (polychlorinated dibenzofurans), referred together as “dioxins”. In the first phase of the inventory the dioxin-like PCB emissions are not included.

There are several main categories of emission sources of dioxins in Macedonia that are listed in Table 7*, that also contains the information on annual emissions release expressed in g TEQ/a (standard unit of measurement for dioxins is grams toxic equivalent).

Table 7: Summary - PCDD inventory by source category (2003)

Category	Source of dioxins emissions	Annual emissions [g TEQ/god]				
		AIR	WATER	SOIL	Products	Residue
1	Waste incineration	22,000	0.000	0.000	0.000	0.1
2	Ferrous and non-ferrous	4,660	0.000	0.000	0.000	5.6

* MEPP, POPs Project Implementation Unit, Draft Version of the Persistent Organic Pollutants National Implementation Plan, 2004

* MEPP, National Implementation Plan on reduction and elimination on Persistent Organic Pollutants, 2004

3	metal production					
	Power generation and heating	1,422	0.000	0.000	0.000	2.1
4	Production of mineral					
	products	0.886	0.000	0.000	0.000	0.8
5	Transport	0.284	0.000	0.000	0.000	0.0
6	Uncontrolled combustion					
	processes	133,560	0.000	0.000	0.000	0.0
7	Production of chemicals and					
	consumer goods	0.000	0.000	0.000	0.000	0.012
8	Miscellaneous	0.000	0.000	0.000	0.000	0.0
9	Waste disposal/ Landfill	3,141	0.000	0.000	0.000	0.0
1-9	Total	166.0	0.0	0.0	0.0	8.612

- **1.5 Emissions of GHG**

In the average total of 14,405 kt CO₂-eq. emissions in the period 1990-1998, the energy sector contributes with 70.04% of CO₂-eq. emissions, industrial processes with 7.08%, agriculture with 14.13%, land use change and forestry with 0.64%, and waste with 8.11%. The total CO₂ –equivalent emissions during the period 1990-1998 have been shown in Table 8*.

Table 8: Sectoral CO₂ –equivalent emissions (kt)

Sector	1990	1991	1992	1993	1994	1995	1996	1997	1998
Energy	10,596	9,932	9,382	9,925	9,802	10,086	9,921	10,451	11,204
Industrial processes	1,632	1,371	1,281	1,105	992	848	895	1,102	1,064
Agriculture	2,025	1,953	1,967	1,942	1,977	1,912	1,766	1,665	1,577
Land use and forestry	88	7	144	221	89	2	15	54	29
Waste	1,170	1,202	1,198	1,201	1,136	1,148	1,177	1,182	1,213
Total	15,512	14,466	13,973	14,394	13,995	13,995	13,775	14,454	15,086

The contribution of GHGs in the amount of CO₂ –equivalent emissions are: CH₄ with 25.34%, CO₂ with 64.23% and N₂O with 10.43%.

Recognizing the opportunities for sustainable development of the country through implementation of the Clean Development Mechanism, the Republic of Macedonia has ratified the Kyoto Protocol in 18 November 2004, and now is in the process of establishing the Designated National Authority for the implementation of the Protocol.

14. Capacity to carry out air dispersion modelling

No available data.

15. (Programmes designed to increase citizens' awareness about the impacts of indoor air pollution)

No available data.

*UNDP Climate Change Office, Macedonia's First National Communication under the UNFCCC, 2003

16. Internet websites related specifically to the issues contained in these Atmosphere/Air Pollution Guidelines, providing homepage addresses (URL)

www.moepp.gov.mk
www.eea.eu.int

17. (R & D programmes in the areas of: atmospheric conditions; air quality management; air pollution control technology; clean fuels technology; environmental economics; environmental impact assessment; and remote sensing)

(FINANCING)

18. (Financing for related programmes from bilateral or multilateral sources)

Programmes financed in the previous period:

- By the Government of Japan: 4 automatic monitoring stations;
- With the PHARE 99 Programme: 7 monitoring stations and 4 high volume samplers for measuring suspended particles smaller than 10 micrometers;
- With the CARDS 2001 Programme: 4 monitoring stations and 6 low-volume samplers for measuring suspended particles smaller than 10 micrometers.

(Cooperation)

19. (9V) (Efforts to establish or participate in regional, multilateral or bilateral agreements to address transboundary air pollution concerns)

The Republic of Macedonia is actively participating in the international efforts aimed at solving the global environment pollution and degradation and has achieved significant progress in the international cooperation in the area of the environment, on bilateral, regional, European and global levels. In this context, the Republic of Macedonia is a signatory to a considerable number of multilateral environmental agreements, which are of great importance to the Republic of Macedonia in terms of its participation and influence in the Region and Europe in general.

Following is a list of ratified/signed agreements with regard to transboundary air pollution.

GENERAL

Ratified:

- **Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, February 1991)**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 44/99);
- **Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters**, the Convention

was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 40/99;

- **Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects**, the Protocol was ratified by means of the Law on Ratification of Final Document from the European Convention On the Energy Charter (Official Gazette of the Republic of Macedonia No. 16/98);

Signed:

- **Protocol on Strategic Environmental Assessment**, the Protocol was adopted based on the Espoo Convention. The Republic of Macedonia has signed it in May 2003, in Kiev, Ukraine, at the 5th Ministerial Conference “Environment for Europe”;
- **Protocol on Pollutant Release and Transfer Registers**, the Protocol was adopted based on the Aarhus Convention. The Republic of Macedonia has signed it in May 2003, in Kiev, Ukraine, at the 5th Ministerial Conference “Environment for Europe”;

ATMOSPHERE

Ratified:

- **Vienna Convention for the Protection of the Ozone Layer**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of SFRY No. 1/90). The Republic of Macedonia has accepted the Convention by means of succession on 10 March 1994;
- **Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, September 1987)**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of SFRY No. 16/90). The Republic of Macedonia has accepted the Convention by means of way of succession on 10 march 1994;
- **The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – London**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 25/98);
- **The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Copenhagen**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 25/98);
- **The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Montreal**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 51/99);
- **The Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer – Beijing**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 13/02);
- **United Nations Framework Convention on Climate Change**, the Convention was ratified by means of the Law on Ratification of this

Convention (Official Gazette of the Republic of Macedonia No. 61/97). It entered into force on 28 April 1998;

- **The Kyoto Protocol to the United Nations Framework Convention on Climate Change**, the Protocol was ratified by means of the Law on Ratification of this Convention (Official Gazette of the Republic of Macedonia No. 49/04);
- **The Convention on Long-Range Transboundary Air Pollution (Geneva, 1979)**, the Convention was ratified by means of the Law on Ratification of this Convention (Official Gazette of SFRY No. 11/86). The Republic of Macedonia has accepted the Convention by means of succession on 17 November 1991;
- **The Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Long-Term Financing of the Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMER)**, the Protocol was ratified by means of the Law on Ratification of this Convention (Official Gazette of SFRY No. 2/87), and The Republic of Macedonia has accepted the Convention by means of succession;
- **The Stockholm Convention on Persistent Organic Pollutants**, The Republic of Macedonia has signed the Convention in Stockholm, Sweden, on 22 May 2001. the Convention was ratified with the adoption of the Law on Ratification of this Convention (Official Gazette of SFRY No. 17/04)

Signed:

- **Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants (POPs)**, The Republic of Macedonia has acceded to this Protocol by means of statement, but has not yet ratified it (Aarhus, June 1988);
- **Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Heavy Metals (Geneva, 1979)**, The Republic of Macedonia has acceded to this Protocol by means of statement, but has not yet ratified it (Aarhus, June 1988).

CASE STUDY OF A SUCCESSFUL NATIONAL ATMOSPHERE/ AIR POLLUTION PROGRAMME/STRATEGY

1. The problem or issue addressed: **Protection of the ozone layer**
2. Name of the programme: **Refrigeration Management Plan**
3. Timeframe: **2 years** Year started: **2000**
4. Status: **Ongoing** **X** Completed in year **2002**
5. Main objectives:
 - **Training of the service technicians;**
 - **Training of customs officers and providing equipment for identification and control of ozone depleting substances on border check-points;**
 - **Establishment of refrigerant recycling centres and providing recovery equipment for the service workshops**
6. Lead institution: **Ministry of Environment and Physical Planning of the Republic of Macedonia / Ozone Unit**

7. Other implementation arrangements and stakeholders involved (public, private, NGOs, CBOs, international support, etc.):

The training of the service technicians was realized in close cooperation with the Faculty of Mechanical Engineering in Skopje and the Technical Faculty in Bitola. These institutions were provided with demonstration equipment for refrigerant recovery and recycling. 266 service technicians were trained on good practices in refrigeration. In cooperation with the Macedonian Customs Administration, 299 customs officers were trained in identification and control of the CFC-refrigerant. Thematic brochures were prepared and disseminated among service technicians and customs officers.

15. The results achieved (if possible, please address the social, economic and environmental impacts of the programme):

During the first stage of the project (training of the service technicians and customs officers), 266 service technicians were trained on good practices in refrigeration and 299 customs officers were trained on CFC identification and control. Also, the border check-points were provided with special equipment for CFC-identification (leak detectors). Three recycling centres (Skopje, Ohrid and Strumica) were fully equipped with facilities for refrigerant recovery and recycling. In the time period 2001-2002, the recycling centres reported a quantity of 2,839 kg recycled

CFC-refrigerants. At the end of 2003 this quantity was 2,466 kg. In 2004 the reported recycled quantity was 7,102 kg.

16. The relationship of the programme to internationally agreed goals and targets:

The Project "Refrigeration Management Plan" is one of the activities undertaken by the Macedonian Government towards elimination of the substances that deplete the ozone layer. After ratification of the Vienna Convention for Protection of the Ozone Layer and the Montreal Protocol on Substances That Deplete the Ozone Layer in 1994 and the establishment of the Ozone Unit under the Ministry of Environment and Physical Planning (1997), the Republic of Macedonia undertook actions towards elimination of the chemicals that deplete the ozone layer. According to the National Programme for Elimination of ODSs, specific projects in all area where ODSs found application (refrigerator production, rigid and flexible foam manufacturing, agriculture, fire protection, servicing of CFC containing equipment) are implemented. The national action on protection of the ozone layer resulted in elimination of the 90% of the ODS consumption. All the activities are funded by the Multilateral Fund of the Montreal Protocol and are realized by the Ministry of Environment and Physical Planning of the Republic of Macedonia and UNIDO, as an implementing agency.