FINNISH METEOROLOGICAL INSTITUTE

МИНИСТЕРСТВО ЗА ЖИВОТНА СРЕДИНА И ПРОСТОРНО ПЛАНИРАЊЕ

TWINNING INTERIM QUARTERLY REPORT number: 6

European Agency for Reconstruction

TWINNING PROJECT

INTERIM QUARTERLY REPORT

Project Title: Air Quality Improvement

Partners: The Finnish Meteorological Institute and the Ministry of Environment and Physical Planning

Date: 17th April 2008

Agency Contract Number 05MAC01/13/102

Twinning Contract number: MK05/IB-EN-01

Section 1: Project data

Twinning Contract Number	MK05/IB-EN-01
Project Title:	Air Quality Improvement
Twinning Partners (MS and BC)	The Finnish Meteorological Institute and the Ministry of Environment and Physical Planning
Report Number:	6
Period covered by the report:	1.12.2007-16.4.2008
Duration of the project:	1.9.2006-31.5.2008
Rapporteur:	• Harri Pietarila, Member State Project Leader (MS PL) • Svetlana Gjorgjeva, Beneficiary Country Project Leader (BC PL) • Tiina Harju, Resident Twinning Advisor (RTA)

17.4.2008

Harri Pietarila, MS Project Leader Svetlana Gjorgjeva, BC Project Leader

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

List of Abbreviations and Acronyms

BC	Beneficiary Country
BTX analyser	An analyzer which measures benzene, toluene and xylene isomers in the air, also called BTEX analyser
CADASTRE	Cadastre of Air Polluters and Pollutants in the Republic of Macedonia, 2004 (also KATASTAR)
CARDS 2004 project	CARDS 2004 project “Environmental management strengthening”
CARDS 2005 project	CARDS 2005 project "Strengthening of Environmental management, former Yugoslav Republic of Macedonia"
CAR- FMI	Model for estimating the concentrations originating from traffic (FMI)
CCEA	Climate Change Enabling Activities Office
CLRTAP	Convention on Long-Range Transboundary Air Pollution
EAR	European Agency for Reconstruction
ECMWF	European Centre of Medium Range Weather Forecast
EEA	European Environment Agency
EMEP	European Monitoring and Evaluation Program (monitoring and evaluation of long range transmission of air pollution)
ETC-ACC	European Topic Centre – Air and Climate Change
EPER	European Polluting Emissions Register
EPRTR	European PRTR
FEA	Federal Environmental Agency (Umweltbundesamt)
FMI	Finnish Meteorological Institute
GC	Gas chromatograph or gas chromatography
HMA	Hydro-Meteorological Administration
ICEIM-MANU	Macedonian Academy of Sciences and Arts, Research Center for Energy, Informatics and Materials

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

IEC	The International Electrotechnical Commission
ISO	The International Organization for Standardization
KATASTAR	see CADASTRE
MEIC	Macedonian Environmental Information Centre
MEPP	Ministry of Environment and Physical Planning
MPP	Meteorological PreProcessor (FMI)
MS	Member State
NCCC	National Climate Change Committee
NEC	Net Emissions Ceiling (EU Directive)
NFR	Nomenclature for reporting (CLRTAP)
NPAA	National Programme for the Adoption of the Acquis (European Union)
PL	Project Leader
PM	Particulate Matter
PRTR	Pollutant Release and Transfer Register
QA/QC	Quality Assurance and Quality Control
RIHP	Republic Institute for Health Protection
RTA	Resident Twinning Advisor
SEA	Secretariat for European Affairs
SOP	Standard Operation Procedure
TOC	Table of Concordance
UBA	Umweltbundesamt, Austria
UDM-FMI	Urban Dispersion Modelling System for stationary sources (FMI)
UNFCCC	United Nations Framework Convention for Climate Change
UNECE	United Nations Economic Council for Europe
VTT	Technical Research Centre of Finland

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

Section 2 and 3: Content

This section describes the activities of the project. It is divided in five sections.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2A - BACKGROUND

Policy Developments

During the reporting period covered by the sixth quarterly report, the following activities have been carried out in the Ministry of Environment and Physical Planning:

The project Progress monitoring that is related to preparation of TOC and implementation tables for the directives (96/62/EC; 99/30/EC; 2002/3/EC; 2001/81/EC; 2000/69/EC; 2004/107/EC) is ongoing. Within phase 2, during the period covered with the report responsible personnel in MEIC reviewed and updated the existing TOC and implementation tables of mentioned air quality directives. Analysis of TOC and implementation tables in the first and second phase showed improvement of the transposition of air quality directives. Framework directive 96/62/EC is entirely transposed, and the other daughter directives will be entirely transposed in the National legislation till end of 2008.

Regarding the National indicators for air, the working group adopt the proposed list of indicators and update the current indicators with available 2006-2007 data.

Ministry of Environment and Physical Planning received project proposal from UN Economic Commission for Europe UNECE / CLRTAP, for ratification of the following protocols: Heavy Metals Protocol, the Persistent Organic Pollutants Protocol and the Gothenburg Protocol. Mrs Marijonka Vilarova was point out as contact person from the Ministry for this project. Also during this period activates were undertaken for translation of the other six protocols under the convention.

Sub legislation List on zones and agglomerations was given to the Secretariat for Law and is in legal procedure for adoption.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

Project Assumptions

It has been expressed in the article 2 of the working plan in the Twinning contract that the Twinning project Air Quality Improvements relates to article 103 of the SAA, which mentions that "the Parties shall develop and strengthen their cooperation in the vital task of combating environmental degradation, with the view to supporting environmental sustainability". It adds that "Cooperation should focus on several priorities", including "combating air pollution, environmental impact assessment and strategic environmental assessment, continuous approximation of laws and regulations to Community standards".

The assumptions given in the Twinning contract are shown in the following table.

Table 1. ASSUMPTIONS from the Twinning contract

Component Number	Assumptions	Status
I	Cooperation and outputs of CARDS 2004 and CARDS 2005 projects	Fulfilled
	Translation of legislation and documents	Fulfilled
	Co-operation with the relevant stakeholders functional	Fulfilled – after workshop 16. April 2008
II	Results from CARDS 2003 Regional available	Fulfilled
	Activity data is available and its quality meets the requirements	Partly fulfilled
		Partly fulfilled
	Software and hardware meets the requirement	Partly fulfilled
	Skilful personnel available and enough personnel resources	Partly fulfilled
	Stakeholders available and willing to cooperate	
III	Cooperation and outputs of CARDS 2004	Fulfilled – CARDS2004

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

		finished
	Emission data, other activity data and AQ measurement data available and its quality meets requirements	Fulfilled
	Dispersion model and GIS tools existing and meets requirements	Fulfilled
	Enough personnel resources available	Fulfilled – after workshop 16 April 2008
	Enough resources for producing and distributing promotion materials	
IV	Skilful personnel available	Partly fulfilled
	Hardware and Software requirements met	Partly fulfilled
	Enough resources for new spare parts and/or equipments	Not fulfilled, no new spare parts procured in year 2007 in the MEPP
	New detector and a sample injection system for GC procured in the Environmental Laboratory	Fulfilled, no need for a new detector, a new GC column arrived and taken in use
	New equipments and spare parts for mobile emission laboratory procured	Fulfilled, arrived to the Central Laboratory 29 January 2008
V	BC human resources and computer meets requirements	Fulfilled – two persons for training
	Resources for model procurement available	Fulfilled – two models of the FMI given free

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

	Co-operation with HMA	of charge Partly fulfilled – after negotiation between MEPP &HMA needed data available without extra cost but encoded form – MS Experts made a programme for decoding, one meteorologist from the HMA to validate meteorology data in the MEPP – not possible (see page 16).
	GIS, emission and meteorological data available	Fulfilled – meteorology data available for Skopje area, emission data for point sources, country specific traffic emission coefficients available, more detail data needed

Project assumptions and the status of their fulfilment coming from the missions taken place in the reporting period:

II COMPONENT – Emission Inventories

- Activity data is available and its quality meets the requirements
  - Partly fulfilled

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

CURRENT SITUATION
Statistical data for energy consumption, population and animal numbers are available and enable building up Tier 1 level inventories in the energy and agriculture. These statistics are in general available since at least 1991 without any gaps. However, more detailed and comprehensive data collection is needed to enable development of national methodologies in the above mentioned sectors, and to establish emission inventories in the remaining sectors, such as for instance product use, process industries, storages and the waste sector. In some cases, where data to be collected for national statistical purposes is not applicable for emission inventories, other methods such as surveys and inquiries as well as research can be used. (more details in MS expert Kristina Saarinen's mission report)

The CADASTRE maintained by the MEPP includes information of concentrations and fuel consumption based on inquiries from point sources. However, the plants do not report annually their emissions to the supervising authorities. Improvements here can be foreseen with the transposition of EU directives in national legislation and their implementation as emission reporting is the basic requirement under the IPPC directive and the PRTR regulation.

REMAINING ISSUES
The preparation of inventories, including collection of activity data should be organized on permanent resources. Until December 2007, the work was project based funded by international organizations or other countries.

- Software and hardware meets the requirements
  - Partly fulfilled

AVAILABLE DATASETS AND DATABASES:
- Greenhouse gas emission data for 1990-2005 is managed by CEIM-MANU (prepared by GEF funding)
- A read-only database for air pollutant emission data for 2004 only, prepared by a private national consultant by EU CARDS funding.
- A read-only point source database CADASTRE, prepared by a private national consultant by Swiss funding.

ACHIEVEMENTS IN THE CURRENT TWINNING PROJECT:
- A MS Access integrated point source emission inventory database was prepared. The database structure is ready, and some activity data has already been fed in for the energy and agriculture sectors.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

The database is capable of processing and managing inventory data for both greenhouse gases and air pollutants and using plant level (reported) data as input and output (thus enabling reporting also according to E-PRTR and EU directives).

REMAINING ISSUES:
- o Input of activity data and technological data, adjusting default emission factors according to national circumstances
- o Inclusion of geographical data into the database to enable reporting of gridded data
- o Further developing the national inventory database prepared during the current Twinning project.
- o There is need for a permanent expert to organize activity data collection to make the database operational, and for further development of national methodologies.

- Skilful personnel available and enough personnel resources
  - ➢ Partly fulfilled

CURRENT SITUATION
There are skilful national experts trained in the international projects to prepare greenhouse gas and air pollutant inventories. Out of these only the MEPP experts participated in the training provided in the current Twinning project. However, based on their earlier experience with inventories, they are very capable to further developing the inventories of the BC without any external training in international development projects.
The training included introduction (with examples) of the following topics:
- o Requirements and practices in arranging national inventory system
- o Resource needs
- o Database structures
- o Means to collect activity data and make extrapolations to substitute missing data
- o Information sources for emission estimation methods and carrying out calculations
- o Estimation of emissions with examples
- o Data analysis (trends, key sources, uncertainties), QA/QC and documentation

REMAINING ISSUES
The GEF/UNIDO funded project ends in April 2008 and the current EU Twinning project Air Quality Improvement in May 2008. It is urgent that the BC arranges permanent full time resources to the emission

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

inventory work.

- Stakeholders available and willing to cooperate
  - Partly fulfilled.

  Responsibilities in the inventory work have not yet been discussed between the possible stakeholders. The BC experts involved in preparation of inventories have worked thus far in projects funded by international organizations (GEF and EU CARDS) or other countries (e.g. Switzerland).
  It is recommended that the MEPP experts organize a meeting with relevant stakeholders to discuss permanent organization of the inventory work. To ensure good cooperation it is necessary to establish a permanent forum, e.g. an inventory working group, for which this meeting could be a start.

III COMPONENT – Preliminary Air Quality Assessment

- Cooperation and outputs of CARDS 2004
  - Fulfilled. Cooperation has been established with CARDS 2004 project and the results, data and reports of the project have been delivered to the Twinning project.
- Emission data, other activity data and AQ measurement data available and its quality meets requirements
  - Fulfilled. AQ measurement data for years 2005−2007 were available and included to the preliminary assessment report. Nevertheless Preliminary assessment should be based on 5 years data. Also additional short time measurement campaigns are recommended in different kind of emission surroundings and in different part of the country to have more comprehensive picture of air quality. Preliminary assessment should be revised after five years data is available. Point source emission data available for year 2004 and total emissions for several years. More recent data from point sources would be desirable to include in the report. Traffic emission data was available only for Skopje area and total amount for the whole BC. The data sets mostly fulfil the requirements of the preliminary assessment.
- Dispersion model and GIS tools existing and meets requirements
  - Fulfilled. GIS tool MapInfo, which meets the requirements, is in use at the MEIC department and the BC personnel can independently work with the software. Dispersion model for stationary sources (UDM-FMI) is in active use. The model for mobile sources (CAR-FMI) is taken into active use during the last mission in the component 5 (March 2008). First dispersion modelling results produced with UDM-FMI are available for preliminary assessment.
- Enough personnel resources available

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- Fulfilled. Persons working in the component 3 are Leader of the component Marijonka Vilarova, RTA Counterpart Aleksandra Nestorovoska Krsteska and BC Experts Aneta Stefanovska, Arminda Rushiti and Margareta Cvetkovska.

- Enough resources for producing and distributing promotion materials
  - Fulfilled. A draft brochure was prepared during the mission. Popular leaflet describing the most important pollutants and their health effects, concentration levels, emission sources and their contribution to air quality and the role and importance of air quality monitoring system. The final brochure was printed for the workshop arranged 16 April, 2008.

IV COMPONENT – Air Quality Measurements and Laboratory Work

- Skilful personnel available
  - Fulfilled. Along the progress of the project the knowledge and skills of BC Experts in writing the QA/QC Plan increased and draft QA/QC Plan was completed. Working out the draft QA/QC Plan and having trained on QA/QC procedures during the missions the BC Experts have acquired a rather good understanding of QA/QC methods and procedures as well as control and assessment methods of the quality management system.
  - To continue the development process for establishing the accredited calibration laboratory to act as the National Reference Laboratory for Air Quality the BC Experts will need further training and support in their work

<u>Calibration laboratory</u>

- Skilful personnel available
  - Fulfilled. The calibration methods of the laboratory are the static injection method, dynamic dilution method and gas phase titration method. The use of static injection method has not been intensive. The target level for repeatability is achievable by the TS, but needs still practice.
  - The use of BTX analyser, especially calibration of the instrument needs a lot of practice. The TS is very capable to achieve a good level of practice for operation of the method after working hard in the laboratory.
- Enough resources for new spare parts and/or equipments
  - Partly fulfilled. The new equipment to establish the traceability chain from the reference laboratory to the measurement station (e.g. field calibrator, ozone calibrator, devices to obtain span and zero checks at the stations in Skopje) was arrived in the laboratory. The number of the spare parts in the reference laboratory for the analyzers is

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

fairly good, but lack of the tubing and connectors are still considerable. The use of the new equipment needs still training.

- There is a lack of one or two BTEX reference standards of highest quality with low concentration needed for the check of calibrations performed with dynamic dilution method. To prevent pollution of the whole system the carrier gas (nitrogen, quality 5.0 or higher) is filtered with activated charcoal (two filters). The carrier gas filters and preconcentration Tenax GR-tube should be changed once a year, if the instrument is continuously running. So these spare parts should be near at hand when needed.

Monitoring stations

- Skilful personnel available
  - Fulfilled. BC personnel available and working during the mission was skilful, they were dedicated to work and worked hard to achieve best possible results.
- Hardware and Software requirements met
  - Partly fulfilled. New field calibration equipments had been delivered and taken into use before mission. It was not possible for BC to get the needed new software for data management during the Twinning project. MS expert had provided some simple excel sheet and trained simple procedure for correction of data.
- Enough resources for new spare parts and/or equipments
  - Partly fulfilled. There is still lack of spare parts. Also some of the equipments in the monitoring sites were out of order, like zero air generators and NO-monitor in one station. No spare part has been procured during the Twinning project from the budget of the MEPP.
  - There is a lack of needed spare parts and consumables. A special tool “source box” (shield for radioactive source) is needed for servicing PM10. PM10 analyser has a radioactive source and this source has to move to “source box” during measuring cell maintenance. According EU directive 96/29/EURATOM BSS (optimisation radiation protection principles) service work has to be carried out by minimize a radiation. Therefore it’s forbidden open measuring chamber without moving source first to “source box”

Emission measurements

- Skillful personnel available
  - Partly fulfilled. In the Central Environmental laboratory of the MEPP there is a group which has worked for the emission measurements. However, there have been many changes in the organisation and therefore, many experts have been changed and there has not been possible to form a team working for this task.
- New equipment and spare parts for the mobile emission laboratory procured

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- Fulfilled. Laboratory had received at the end of January 2008 new emission measurement equipment for gaseous components and for particulates. Also spare parts (such as connectors, tubing etc) were delivered. However, there is still need for proper tools, such as work wrenches, ring spanners, adjustable wrenches, screw drivers, side cutters, flashlights, multimeter, pipe wrenches, safety gloves, safety helmets, respirators, personal gas alarm analysers etc.

V COMPONENT – Dispersion Modelling

- Co-operation with HMA
  - Partly fulfilled. The cooperation and data exchange between MEPP and HMA is still partly unsolved issue. → One meteorologist from the HMA has been once in the MEPP in the autumn to check the state of the meteorological data of the MEPP. After this visit no other action has taken placed on this issue. According to the nominated meteorologist this work is too complicated to do from another institute. The MEPP is going through a possibility to employ an own meteorologist.
  - MS experts prepared the second time modified automated send-script which decodes the meteorological SYNOP data format and sends the decoded data to specified user by email. This program will be used to decode the HMA's meteorological data to be sent to the MEPP. The BC experts of the MEPP are expected to assist in installing the data-send script in the HMA computer.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2B - ACHIEVEMENT OF MANDATORY RESULTS

According to the Twinning contract the project has been assisting in implementing the air quality framework directive, in preparing relevant secondary legislation and in upgrading skills required to operate a significantly developed automatic ambient air quality monitoring network with supporting laboratory services. The project has 5 components (guidelines and secondary laws, emission inventories, preliminary air quality assessment, air quality measurements and laboratory works, and dispersion modelling).

Further steps for the developments in legislation and developing automatic ambient air quality monitoring network with supporting laboratory services have been taken in the Twinning project. A proposal for the future National System for air emission inventories and an establishment of a central national database for air emission inventories to improve emission inventories have been done.

For ambient air quality assessment and management including air quality modelling the availability and quality of relevant meteorological data is very important. Recommendations concerning the importance of the modernization and automation of the observation network including the upper air soundings, data acquisition, easily accessible database system and the data quality control have been given to strengthen the capabilities of the HMA in the future.

The preliminary assessment report is almost finalised. A popular leaflet describing the most important pollutants and their health effects, concentration levels, emission sources and their contribution to air quality and the role and importance of air quality monitoring system is prepared.

Technical staff has been trained on calibrations, maintenance and repair of the analyzers in the calibration laboratory and monitoring stations, calculation of the results, implement and assist in the preparation of SOP for maintenance and calibration of monitors in the reference laboratory and on the monitoring station. Also technical staff's capability to understand electronics of analysers has improved. The QA/QC Plan is finalised.

The emission measurement course was given to the staff off MEPP, the Central Environmental Laboratory (belongs to the MEPP) and other institutes or companies involving on emission measurement field.

The training has been given on GC analysis for air samples (the GC was not in good condition, loosing time to prepare it).

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

The practical training on using dispersion modelling in air quality assessment in the use of updated versions of a dispersion model (UDM-FMI) and a traffic model (CAR-FMI) and practical and theoretical instructions have been given how to evaluate the model results against air quality measurements, thus improving the capabilities of the BC to environmental impact assessment and strategic environmental assessment. Also some true dispersion modelling results are available for the use of preliminary assessment.

Component 2
It is explored a current availability of national source data for use in air emission inventories and possibilities to develop regular data collection systems in the future, a current and future involvement of the national scientific community to the inventory work and possibilities to establish a permanent system for inventory work, build up procedures and practices to collect data and to develop national methods for estimation of emissions.

Component 3
BC Experts have learned to process the data from field calibrations, to make zero and calibration corrections for the AQ data and to process the air quality data by calculation of statistics. A brochure manuscript covering the air quality situation and air quality monitoring in the BC was produced.

Component 4

- The working out of the QA/QC Plan has familiarized the BC Experts with the requirements and procedures of the quality management system and with planning and documenting. The skills and knowledge learned through this work as well as the written material produced will be beneficial later in the preparation process for the accreditation when the Quality manual for the Calibration laboratory is established according to the requirements of the accreditation standard EN ISO/IEC 17025.
- The BC Experts and other MEIC personnel have been trained to understand the methods and importance of controlling documents and records.
- Training given on the principles and methods for carrying out internal quality audits.
- The draft of the quality manual for the reference laboratory was prepared. The content of the SOPs for different tasks for the reference laboratory was under preparation.
- The technical staff of the national reference laboratory has been trained for the use of the static injection system and the gas dilution method operated with the mass flow controllers. The good repeatability and accuracy with the method shall, however reached by intensive use of

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

the method.
- The topics of overall uncertainty and the formation of the uncertainty budget for the method was discussed.
- Calibrations of the analyzers and calculation of the results were trained to the TS
- Implement and assist in the preparation of SOP for maintenance and calibration of monitors were started

Developments in practical air quality monitoring work has been achieved:
- Improvement for correction and validation of measurement data
- First actual field calibrations and data correction based on calibration results
- Some monitoring instruments has been checked out, adjusted and calibrated during the mission

Technical staff's capability has been improved for maintenance and repair of monitoring instruments by repairing or checking NO-NO_2-NOx, O_3, PM_{10} and CO analysers.

The TS of the calibration laboratory have had only slight experience in the use of BTX analysers. During the study tour to Finland in August 2007 included training in the accredited calibration laboratory at the FMI. The BTX instrument is quite different analyser in operational principles as compared to the other gas analysers that the TS are used to operate. Therefore only slight progress was possible to acquire during 5 days mission.
The key developments in practical work with BTX analyser have been achieved in principles of the method, quality of sample tubing, carrier gas, diluent/zero gas and reference standard and calibration.

Three missions focusing on emission measurement training took place in four weeks. The missions had to be postponed during the Twinning project until the new equipment arrived through the tender procedure (opened by the EAR) at the end of January 2008. Therefore, it is not possible to evaluate the progress of TS within the field of expertise.

The first missions focusing on the PAH sample handling and analysis and on the implementation of the standard EN ISO/IEC 17025 in a testing laboratory took place in February 2008 after most important consumables (through the tender opened by the EAR) had arrived to the Central Laboratory of the MEPP. BC experts worked long days in order to get the instrument functioning properly and finally succeeded in that.

Component 5
Practical guidance of urban dispersion model has been given using real

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

emission and other data from major emissions sources in Skopje. The concentration data from the model has been processed and concentration maps for major sources produced and the results of dispersion modelling reported. Also training had given in processing the data for traffic emission model CAR-FMI, running the model and processing the output data. The reported results of dispersion modelling can be used in environmental impact assessment and strategic environmental assessment.

All the benchmarks which were achieved from the start of the project has been listed and indicated which of the mandatory results are completed or close to completion. Those which were achieved in the reporting period are written by italicization.

Mandatory Results

I COMPONENT – Guidelines and Secondary Legislation

1. The EU air quality legislation based on the already harmonized air quality directive further aligned
    - GAP analysis - completed
    - Table of Concordance - completed
2. A Draft sub legislations on Air Quality completed
    - Draft Sub legislation existing - completed
        - A Rulebook on Monitoring and Reporting approved by MEPP and drafted but not yet approved by the relevant ministries
        - Rulebook on Plans and Programmes approved by MEPP – drafted but not yet approved by the relevant ministries
        - The CARDS 2004 produced a first version of the Decision on Zones and Agglomerations, which has been further discussed, reviewed in the Twinning project.
3. *About 50 persons trained and training material and instructions manual prepared*
    - *About 25 pages manual –completed. Manual has divided to three parts. MS Experts have prepared together with BC experts three drafts: A Practical and Technical Guidance to Monitoring and Quality Assurance, Toolbook on Monitoring and Reporting, Guidelines for preparing Programmes and Action Plans. BC Experts have finalised the manuals.*
    - *Training for 50 people arranged –completed. The workshop 16 April, 2008.*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

II COMPONENT – Emission Inventories

1. *Institutional capacity and tools improved for maintaining emission data inventories and improved tools*
    - *Capacity of personnel and tools improved - completed in this project.*
        - *It is urgent that the BC allocates permanent resources to the work.*
        - *In the MEPP's work plan for 2008, review of the data in CADASTRE is scheduled to be carried out by the Division for CADASTRE and Modelling of Data, with funding available from the Compensation Fund from Switzerland. This involves resourcing of two new persons to work with the review on Cadastre.*
        - *EEA/ETC project "Participation of the West Balkan Countries in the work of the Community Agencies - EEA (2005-2006); Air emissions" will continue also 2007-2008. Within this project a Regional workshop to improve capacities related to inventory work is planned to be organized*
        - *Transposition and preparation of the E-PRTR Regulation is included in the year 2008 work plan of the MEPP.*
2. *Report on compliance with EU based national emission system and priority list for improvement*
    - *Priority list – completed in this project.*
        - *A draft priority list was prepared by the MS expert during the mission in January 2007. According to the BC experts the work has been continued.*
        - *According to the fact that the National system for air emission inventories is not yet established, nevertheless during June 2007 the law of air quality was amendment with the article which gives a base for establishment of this system. Allocation of responsibilities to the national authorities in the different areas of the inventory work has not been started. A scheme for rearranging the organization of the MEPP has been developed and new development is expected in the near future.*
3. *Improvement of National methodology for air emission inventories for the country*
    - *Improved methodology and inventories – completed in this project*
        - *According to the EU CARDS 2003 Regional, Component 2: Emission Inventories project on Establishment of a National Methodology for Emission Inventory, it was expected that*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- *The BC has not prepared any inventory to the CLRTAP or to the EU NEC after the EU CARDS 2004 Regional project ended, because no resources have been allocated for the work. Nevertheless, data in SNAP sectors 1, 2, 3 for 2005 and 2006 have been corrected and reported to the CLRTAP. With help in the current Twinning project the BC is able to make improvements to the 2004 inventory and report new emission data for some sectors for 2006 in 2008.*
- *The inventory to the UNFCCC has been reported in 2002 as a part of the National Communications prepared with funding received from the GEF/UN. The GHG inventory is updated to each National communication reported to the UNFCCC. The current GHG inventory covers the period 1990-2002, and will be available in its final form in mid 2008. The next inventory will be prepared as a part of the next National communication, once GEF funding becomes available.*

4. *Capacities improved and draft training materials prepared on emission inventories and reports – completed in this project.*
   - *In time, the draft material should evolve into a complete manual.*
   - *The BC has not appointed permanent sector experts to be trained. The persons currently working within the area of inventories at the MEPP cannot take any new tasks because they already are overloaded. During the missions, contents of the tasks required by the UNFCCC, CLRTAP and EU directives were explained to the BC experts so that the need for new resources can be estimated.*
   - *During the last mission the focus was on looking closer to the three major emission sources in the BC: agriculture, residential combustion and industry. The MS and BC experts worked with activity data and emission factors in these sectors for both in the inventory database structure and the methodologies. However, some source data remained to be discussed and finalized between the MEPP experts and the sectoral experts of the BC.*
5. *Support to EPER reporting (EPER is now superseded by E-PRTR, European Pollutant Release and Transfer Register)*
   - *EPER report – not fulfilled, completed in this project.*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- *The BC has not prepared an EPER or E-PRTR report because secondary legislation to support collection of data does not yet exist and the data collection procedures have not been developed. The last reporting round in the EU to the EPER was carried out in 2007 and the next time the MSs will report in 2009 to the European PRTR, which will replace the EPER.*
- *Ms. Ljupka D. Zajkov from the MEPP has been appointed to work with implementation of the European Union PRTR Regulation and with the related emission registers. Organization of data collection, responsibilities and stakeholders as well as structure of the database related to the E-PRTR was discussed between the BC and MS experts.*

III COMPONENT – Preliminary Air Quality Assessment

1. *Improvement of methodology for preliminary assessment*
   - *Improved preliminary air quality assessment –completed.*
     - *Maps of spatial distribution of concentrations and emissions have been produced and the emission data available was integrated within the preliminary assessment.*
2. *Revised agglomerations and non-agglomeration zones established with CARDS 2004 project*
   - *Zone and agglomeration definition ready – completed.*
     - *Proposal of CARDS 2004 project analysed and commented. Two options for a revised zoning has been proposed. The zonings consist of one agglomeration (Skopje) and 2−3 zones (3.2.1. MS Experts Birgitta Alaviippola and Harri Pietarila). A final decision on the zonings will be done by the BC experts.*
3. *A preliminary assessment of ambient air quality has been worked out and reported to the EEA*
   - *Preliminary air quality assessment reported - close to completion.*
     - *A draft version of the preliminary assessment report is prepared. The conclusions to the assessment and improvement of the report outlook will be the last tasks.*
4. *Awareness raised on the importance of the air quality monitoring system*
   - *Workshop – completed.*
     - *A draft brochure was prepared during the MS expert's mission. Popular leaflet describing the most important pollutants and their health effects, concentration levels, emission sources and their contribution to air quality and the role and importance of air*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

quality monitoring system is prepared and printed for the workshop.

- *A workshop is 16 April, 2008. Expenses of the workshop are paid by the MEPP.*

IV COMPONENT – Air Quality Measurements and Laboratory Work

1. *Operation of the calibration laboratory improved and the staff is trained*
   - *Operation of the laboratory improved – completed*
     - During one mission it is possible to learn only fundamentals, particularly when the BTX analyser is quite different in operational principles from the other gas analysers that TS are used to operate. Therefore only slight progress can be expected. The technical staff is, however, very capable to achieve a good level of practice for operation of the method after working hard.
2. *Capacity built for operation, maintenance, calibration and repairs of air quality monitoring stations and samplers*
   - *Capacity of people improved – completed.*
     - *Practical hands on training concentrated on the working practices on field (checking, adjustment and calibration of analysers and documentation of calibration work), in laboratory (traceability of field calibrator) and in data centre (checking the data, data validation and correction)*
     - *Capability of technical staff for maintenance and repair air quality monitors was improved by preparing and checking NO_x, O_3, PM_{10} and CO analysers.*
     - *Focused on the working practices including calibration fundamentals with the BTX analyser. Therefore, capability of TS for maintenance and repair of BTX analyser has not much improved.*
3. *A draft QA/QC plan has been worked out*
   - *A draft QA/QC plan – completed.*
     - *The QA/QC Plan is finalised.*
     - *The topics to be covered by the Standard Operation Procedure (SOP) for maintenance and calibration of monitors has been listed and discussed. The SOPs are used as rules to be followed in all the actions in the laboratory and in the field measurements according. The procedures for maintenance are already prepared by the German colleague, but the implementation has not been complete. Therefore more work has to be done on the understanding of the quality system and the importance to follow*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

the SOP. The preparation of the SOP has not been started yet and a list of the SOP needed at the laboratory and at the field stations. The written SOPs will be part of the QA/QC plan to the laboratory. At the end it is the TS at the reference laboratory who needs to think thoroughly all the actions that are necessary to fulfil the task of the laboratory.

4. *Plan for improvement and training for data management has been completed*
   - *Improvement plan –completed.*
     Improvement plan and specifications for new software finalized
     It was not possible to procure the new data management software during the Twinning project because of lacking finance thus training was given on basic principles of data management and data validation during study Tours and MS expert missions. Also data validation with simple method was trained.
     Simple excel solution for data validation was given by MS expert and introduction was given how to correct the data by this methodology.
   - *Staff trained - completed in this project. More practises on data management and data validation are needed. Also additional training is needed when the new software is procured.*
5. *Plan for improvement and training for GCs analysis for air samples has been completed*
   - *Improvement plan – completed*
   - *Staff trained – completed. The staff has been trained how to perform PAH analysis of filter samples using GC-MS equipment.*
6. *The operation of a Mobile Emission Laboratory is improved and the staff received proper training for emissions measurements*
   - *Operation improved – completed. The laboratory has received new emission measurement equipment as planned. Equipment arrived to the laboratory 29 January 2008. However, there is still need for some tools and zero probe etc (explained in the chapter Recommendations)*
   - *Staff trained – completed. The TS has received basic training for the emission measurements both in theory and also in practice. Naturally, since the new analysers had arrived just one week before first emission measurement missions, it will take time before the TS is fully aware of all the technical details of these analysers. This can be achieved only by performing several actual measurements. Therefore, though it was not originally planned, MS expert Johannes Roine also concentrated partly on hands on training during his mission in February 2008. However, there is still need of training!*
7. Specifications and priority list for mobile emission laboratory

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- Specifications and priority list – completed

V COMPONENT – Dispersion Modelling

1. *An air quality model has been supplied and implemented*
   - *Operational model for dispersion calculation procured and implemented at the MEIC - completed.*
     - *Two Air Quality models (UDM-FMI, CAR-FMI) have been installed. A new version of CAR-FMI model was installed and tested in MEIC. The updated model includes emission factors for the vehicles of the BC developed by MS Expert. The new CAR-FMI version was modified and sent by MS since it was noticed to have different way of defining the coordinate system of the BC.*
2. *Methods to provide meteorological and emission dataset for dispersion modelling has been established*
   - *Meteorological and emission dataset available* – completed
     - *After the last mission some questions remained of creating emission timeseries for point sources. Creating the emission timeseries was gone through using the simple excel template provided after the previous mission..*
     - *MS experts prepared a modified automated send-script which decodes the meteorological SYNOP data format and sends the decoded data to specified user by email. This program will be used to decode the HMA's meteorological data to be sent to the MEPP. MEPP is expected to assist in installing the data-send script in the HMA computer.*
3. *The staff is trained in use and validation of the model results*
   - *Staff trained – completed,*
     - *Using the UDM to calculate the SO_2 concentrations caused by the major energy production units in Skopje. Processing the modelled concentration data in Mapinfo.*
     - *The traffic data was processed from the streets around Centar measuring station to be used in the CAR-FMI model. The model was run and the output data was processed in Mapinfo.*
4. *Real case studies prepared*
   - *Real case studies – completed*
     - *Done for point source emissions and for traffic emissions.*
     - *Using the UDM to calculate the SO_2 and NO_2 concentrations caused by the major energy production units in Skopje. Processing the modelled concentration data in Mapinfo. The results as concentration maps are attached in MS expert Sari Lappi's mission report.*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- *The SO_2 concentrations (caused by all major SO_2 sources in Skopje) were calculated also to the point of the Karpos air quality measuring station. The modelled data was compared to the measured data. The difference between the data is significant and indicates that the emission data used in the model does not include all the sources of SO_2 (for example domestic sources and traffic). Emission data may also not be reliable or that there may problems in the measurements. One reason for differences is also that meteorological data used in the modelling is taken from measurements in Alexander the Great airport and thus does not represent the actual situation in Skopje (no data available in Skopje).*
- *The results of the traffic modelling are not definite since the traffic data used is not up-to-date, emission factors remain uncertain and background NO_2-concentration data required by the model is not from the measuring station of the BC.*

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2C. ACTIVITIES IN THE REPORTING PERIOD

A sixth steering committee meeting was held 19 December 2007 in the Ministry of Environment and Physical Planning. The following participants were involved in the steering committee meeting:

1. Gordana Kozuharova, Head of European Integration Department MEPP – chairman
2. Svetlana Gjorgjeva, BC PL, MEPP
3. Aleksandra N. Krsteska, RTA Counterpart and Leader of Component 3
4. Harri Pietarila, MS, PL, Finnish Meteorological Institute (FMI)
5. Tiina Harju, RTA, FMI
6. Ivan Borisavljevic, Programme Manger, EAR
7. Dimitar Malinovski, Task Manager, EAR
8. Liljana Todorova Talevska, Hydro-Meteorological Administration (HMA)
9. Teodora Andreeva, European Commission
10. Biljana Jadrovska, Secretariat for European Affairs (SEA)
11. Martina Toceva, RTA Assistant

Absent

12. Dejan Panovski, State Secretary, MEPP – chairman
13. Mihail Kocubovski, Republic Institute for Health Protection (RIHP)
14. Jane Sapardanovski, Ministry of Economy – absent (he has changed a job)
15. Mate Gjorgievski, Secretariat for European Affairs (SEA), is not anymore the member of the steering committee anymore

Activities during short-term experts' missions in the reporting period:

I COMPONENT – Guidelines and Secondary Legislation

MS expert Wolfgang Spangl from 14^{h} April to 16th April 2008, 3 days and
MS expert Lorenz Moosmann from 15th April to 16th April 2008, 2 days.

- 1.3.2. Capacity building of stakeholders to use Manual
  BC experts Svetlana Gjorgjeva, Marijonka Vilarova, Aleksandra Nestorovska Krsteska, Aneta Stefanovska were involved from the MEPP and RTA assistant Martina Toceva in the activity and the workshop

MS expert Wolfgang Spangl prepared and gave presentations for the Workshop organised 16 April 2008 on the Rulebook on Monitoring and Reporting and the Toolbook on Monitoring and Reporting.
MS expert Lorenz Moosmann prepared and gave presentations for the Workshop on the Rulebook on Plans and Programmes and the Toolbook on

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

Plans and Programmes.

BC experts have finalised the Rulebook on monitoring and reporting and the Toolbook on monitoring and reporting which cover:

- implementation of the monitoring and reporting system
- monitoring, including quality assurance
- data management, including data exchange between responsible institutions
- data validation
- national and international reporting

Also the Rulebook on Plans and Programmes and the Guidelines for Drafting Programmes and Action Plans to Support the Rulebook on Plans and Programmes have bee finalised.

MS expert Marina Froehlich (no mission) has finalised together with BC experts A Practical and Technical Guidance to Monitoring and Quality Assurance in a form of a manual.

All those documents are translated to Macedonian.

II COMPONENT – Emission Inventories

MS expert Santtu Mattila from 26th November to 30th November 2007 (reporting now, it was approved by the EAR and accepted in the last steering committee meeting).

- 2.3.3.Support to update the National Methodology for air emissions inventories for Macedonia with special attention on subjects that need improvements such as emission from farming, emissions from wood burning, emissions from road traffic, emissions from air traffic and railroad traffic, emissions from off-road machinery. 3 working days
- 2.5.1. Support to EPER reporting in general. EPER is now superseded by E-PRTR (European Pollutant Release and Transfer Register. 2 working days
  BC experts Igor Paunovski, Driton Idrizi, Marijonka Vilarova and Aleksandra N.Krsteska were involved from the MEPP in activities. The database was presented to BC expert Maja Gramatikova who could act as a deputy person for database maintenance.

The activities during this mission were as follows:

- Redesigning the database using the (point source) data from the previous database (auxiliary work)
- Designing the system for collecting the activity data for point sources and for area sources and using it for emission calculations

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- Getting ready for area source calculations by importing activity data on animal husbandry and using it as first example on area source calculation
- Redesigning the database for compiling all the calculated and directly entered emission data together with the activity data
- Making a first version of user interface using forms to enable the emission experts use the database without opening the tables or queries
- Writing a user manual
- Training users (other than IT experts to enter the data and do calculations)
- Making a simple tool for arranging the results in reporting template and to fill the blanks automatically with required codes for fields with no value

The main issue in the methodology side was to establish a system that would handle the activity data and emission calculations in a straight forward manner and the main issue on the E-PRTR side was to do work that would make the reporting work easier for the emission experts. The latter was done together with the experts.

Kristina Saarinen from 10th December to 14th December 2007

- 2.3.3 Support to update National Methodology for air emission inventories for the country with special attention to subjects that need improvements, 1 working day
  - Introduction of information sources for methodologies and proposal for emission factors in the agriculture, residential combustion and industry sectors.
- 2.4.1 Improve capacities to develop comprehensive training program on emission inventories and reports, 2 working days
  - Introduction of information sources for emission factors and methodologies
  - Ways to collect source data and to estimate missing data
  - Tools and data need for spatial emission inventory
  - Introduction to key source analysis, uncertainty analysis and QA/QC issues
- 2.5.1 Support EPER reporting in general, 2 working days (the European PRTR has replaced the EPER)
  Working with Ljupka D. Zajkov from the MEPP to explain reporting requirements and obligations for operators, organising PRTR work at the administration, data collection, as well as establishment of emission registers and linking them with emission inventories.
  BC experts Marijonka Vilarova and Aleksandra N.Krsteska from the

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

MEPP were involved in the activities.

A lot of meetings took place during the mission. One of them was at the MEPP POPs Office with experts Emilija Cupeva-Nedelkova and Suzana Andonova working on the Stockholm Protocol project funded by GEF.

It was discussed that the EEA is considering a starting of a project on inventories with the West Balkan countries.

III COMPONENT - Preliminary Air Quality Assessment

MS expert Birgitta Alaviippola from 21th January to 25th January 2008

- 3.3.1 Reporting and visualization of the assessment results, 5 working days
  Aleksandra Nestorovska Krsteska, Aneta Stefanovska, Marijonka Vilarova, Ljupco Grozdanovski and Igor Atanasov from the MEPP were involved in the activity.

The main two tasks of this mission were to improve the preliminary assessment report and to practise processing of field calibration data and the correction of AQ data with MS Excel according to the calibrations.

Following activities were carried out during the mission:

- After BC Experts have extended zero-span times at Tetovo station (both zero and span check times are 27 min) now the determination of real zero level is possible and the drift of zero level or span can be continuously monitored.
- MS Expert visited in the afternoon. During the MS expert visited the Karpos station to see MS Expert Kaj Lindgren and BC Experts Ljupco Grozdanovski and Igor Atanasov checking calibrations, adjusted the devices and performed multipoint calibrations for SO_2 and CO.
- Calculation of the 8 hour statistics for different components.
- Processing of the field calibration data and the correction of the zero level for real AQ data was trained
- Calculation of the calibration coefficient and the zero level and span corrections for AQ data were trained. Different types of calibrations (check and multipoint calibrations) were reviewed. BC Experts learned to perform the calibration calculations and to correct the data independently.

MS expert Pia Anttila from 10th March to 14th March 2008

- 3.4.2 Preparation of a brochure covering the air quality situation in the BC, (most important pollutants and their health effects, concentration levels and most important emission sources and their contribution to air

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

quality) and the role and importance of air quality monitoring system, 5 working days.
BC experts Marijonka Vilarova, Aneta Stefanovska and Aleksandra Nestorovska Krsteska from the MEPP were involved in the activity. BC expert Dusco Janjic carried out the print design of the brochure.

A draft brochure of the air quality and monitoring in the BC was prepared during the mission. After the mission the brochure has been finalised in a co-operation between the BC and MS experts.

MS expert presented to BC expert Stefanovska the Finnish Air Quality Portal.

MS expert Harri Pietarila from 15th April to 17th April 2008

- 3.4.1 Perform campaign to promote results for public, 3 working days.
  BC experts Svetlana Gjorgjeva, Marijonka Vilarova, Aleksandra Nestorovska Krsteska and Aneta Stefanovska from the MEPP were involved in the activity and in the workshop.

MS Expert Harri Pietarila prepared and gave a presentation on Preliminary Air Quality Assessment for the Workshop organised 16 April 2008 and will participate in the final Steering Committee meeting 17 April, 2008.

IV COMPONENT – Air Quality Measurements and Laboratory Work

MS Expert Veijo Pohjola from 17th December to 21th December 2008

- Activity 4.3.2 Training on QA/QC, 5 working days
  BC experts Aleksandra Nestorovska-Krsteska, Marijonka Vilarova, Margareta Cvetkovska, Arminda Rushiti, Ljupco Grozdanovski and Igor Atanasov from the MEPP were involved in the activity.

During the mission the draft QA/QC Plan was almost completed. After the mission it was finalised in a co-operation between BC and MS experts. Two presentations concerning the training on QA/QC were held by MS Expert: “Control of documents and records” and “Internal quality audits”. Some practical training on internal audit was also given.

The QA/QC Plan, given presentations and discussion raced during the presentations are presented in the mission report.

Several examples of audit check lists were presented. Examples of forms were presented that can be used for reporting the summary of an audit, the nonconformities found in audit and the auditor’s recommendations for improvement. An application form for Accreditation was also presented to the BC Experts.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

MS Expert Jari Walden from 14th January to 18th January 2008

- Activity No. 4.3.2. Training on QA/QC 5 working days
  BC experts Ljupco Grozdanovski and Igor Atanasov from the MEPP were involved in the activity.

The draft of the quality manual was revised (see in appendix 1.1) and the content for the SOP for the reference laboratory was discussed. The structure for organizing the SOPs was made for the reference laboratory. Three drafts SOP for calibration and for calculation of the calibration results were prepared The topics of overall uncertainty and the formation of the uncertainty budget for the method were discussed. Individual components associated with the static injection system, gas dynamic dilution system and the performance characteristics of the analyzer.
Training of the transfer of traceability from the reference laboratory to the transfer standard was conducted for oxides of nitrogen (NOx = NO + NO2), carbon monoxide and sulphur dioxide. In addition the gas phase titration was conducted in order to define the converter efficiency of the NO_2 at the field station.

Activity 4.7.1. Preparation a draft specification and priority list of instrument

A tender “Supply for Equipment and Consumables for the MEPP” (Lot 1 and Lot 2) was announced in the local newspaper 23/24 August 2007 and on the official EAR website.
Equipment for mobile emission laboratory (Lot 2) arrived 29 January 2008 to the Central Environmental laboratory and Consumables for Central Environmental Laboratory are still arriving.

MS Expert Kaj Lindgren from 21th January to 25th January 2008

- 4.5.2. Training on calibration of the analysers on the monitoring stations, 5 working days
  BC Experts Igor Atanasov and Ljupco Grozdanovski from the MEPP were involved in the activity.

It was noted that in no additional stations zero and span times were changed after the last mission of MS expert. It was agreed that all of the stations shall be changed as follows: zero time 27 min, span time 27 min (these times are the maximum times software allows to use).

It was decided to make SO_2, CO and NO field calibrations and only check zero levels of O_3-analysers in measuring sites during the mission because properly made ozone calibrations in calibration laboratory took several days.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

Field calibration equipments were installed in the monitoring station Karpos. Zero and span checking times of CO monitor were changed into 27 min as agreed. Changes for other monitors could not be made because there are no span gas bottles in the station. Because zero-span calibration system in the station was out of order, field calibration system was installed to be used also for zero-span check.

All of the procedures carried out during operations and calibrations were carefully documented (important!). In the morning data from previous day calibrations were checked at the MEPP.

MS expert Birgitta Alaviippola whose mission on the week gave training on data correction based on the calibration result from previous days field calibration (calculation of correction factors, data correction procedure). The importance to use sufficient settling times in calibration were practically shown and discussed based on the experience gained from the practical work during the week. All of the calibrations carried out during the week were found to be successfully so that the calibration data could be used for correction of measurement data.

MS Expert Harri Granath from 4th February to 8th February 2008

- 4.2.4. Training on maintenance of electronic compounds of the analysers in the monitoring stations, 5 working days
  BC Experts Ljupco Grozdanovski and Igor Atanasov from the MEPP were involved in the activity.

Technical staff was trained to maintain and repair air quality monitors. A special focus was in trouble shooting by measuring test pins with oscilloscope and multimeter.

The following analysers were repaired or only checked if not out of order:
4 x NO_x, 1 x O_3 and 1 x PM_{10} analysers were repaired
1 x O_3 and 1 x CO analysers' function were checked
PM10 monitor was repaired by using MS expert's own "source box". This source box was brought by MS expert because BC experts do not have own "source box". Without the "source box" PM10 analysers could not have been prepared during the mission.

MS Expert Tuula Pellikka and Harri Puustinen from 4th February to 8th February 2008

- 4.6.3. Training course (Part 1) on emission measurements (basic principles) was given by MS expert Harri Puustinen, 5 working days
- 4.6.4 Training course (Part 2) on emission measurements (advanced emission measurement techniques and emission measurement audit

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

on a selected industrial source) was given by MS expert Tuula Pellikka, 5 day
BC Experts Katica Vasileva, Dragan Bucev, Branko Jakimovski, Tomo Grujovski, Voislav Cvetkovski, Pavle Malkov, Aleksandra Nestorovska Krsteska and Marijonka Vilarova from the MEPP were involved in the activities. Some of them only in emission measurement course, some of them only in field measurement and some of them in both of them. RTA Tiina Harju and RTA assistant Martina Toceva were involved in the course of emission measurement.

In addition to them also industrial enterprises were involved in the course. They explained in few words about their emission measurement activities:

- OKTA (oil refinery): continuous emission measurement equipment (SO2, NOx, CO, CO2, O2, dust, flow) since November 2007.
- OHIS (chemical plant): emissions measured by central laboratory of MEPP
- OSLOMEJ (power plant): emissions measured by TEHNOLAB, they used to have their own analysers but at this moment these are out of order
- ALKALOID (chemical plant): emissions are measured by central laboratory of MEPP
- TOPLIFIKACIJA (heating plant): emissions measured by their daughter company
- TITAN (cement plant): Sick-continuous analysers (SO2, NOx,O2, water content, dust, flow). Maintenance and calibrations on regular basis by Sick.

Typically the emissions are reported by the industrial enterprises on a monthly basis to the MEPP.

Presentations including also instruction to calculate emission measurement results given in the emission course are in the appendices of the mission report. Also field measurement was done in the Toplifikacija (heating plant).

BC expert wanted the Finnish emission measurement handbook to be translated into Macedonian language. Unfortunately it was not possible due to the high price of the translation cost (main text without appendices and figure texts EUR 3000).

MS Expert Pirjo Kuronen 18th February to 22nd February 2008

- 4.2.3: Training technical staff on repair and maintenance for BTX analysers, 5 working days
  BC Experts Ljupco Grozdanovski, Igor Atanasov and partly Aleksandra Nestorovska Krsteska from the MEPP were involved in the activity.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

This training concentrated predominantly on the use of BTX analyser, calibration and other related things. A detailed description on the mission is in the mission report.

MS Expert Hannele Hakola and Vuokko Karlsson from 25th February to 29th February 2008

- 4.5.3. Arrange and perform training courses for staff concerning standard operation procedures of target compounds for GC analysis for air samples (Include staff from HMA and RIHP Institute of Chemistry from the university and other stakeholders in training courses), 5 working days
  BC Experts Suat Ibishi, Afrim Latifi, Aleksandra Nestorovska Krsteska and Margareta Cvetkovska from the MEPP, Vesna Kostic and Margarita Timofejeva from the RIHP, Mirko Cvetkovski from the HMA and prof. Zoran Zdravkovski from the St. Cyril and Methodius University, at the Central Environmental Laboratory.

Two main topics during the mission were training on the sample handling of the PAH samples and gas-chromatographic analysis and training on the laboratory quality assurance procedures. A lot of documents and prepared guides were delivered to the participants (as appendices of the mission report)

The standard operation procedure for PAH analysis was carried out in detail. The implementation of the standard EN ISO/IEC 17025 in the laboratory was very comprehensive and records and standard operating procedures for the essential parts of the quality management system were already prepared.

MS Expert Johannes Roine from 26th February to 29th February 2008

- 4.6.2 Check the results of improvements (emission measurements), 4 working days
  BC Experts Dragan Buchev, Tomo Grujoski and Branko Jakimovski from the Central Laboratory of the MEPP were involved in the activity.

Some private emission measurement consultants and the inspectors Slavco Ristov and Violeta Panzova from the MEPP participated in the measurements done in the oil refinery OKTA.

The modified probe (zero probe) was built in the private company according to the instructions given by the MS expert. It was a purpose to test it in the brick factory. However, due to difficulties in the process, the personnel of the plant asked the team to hurry with the measurements because they were forced to turn the blower off in order to prevent the break down of it. Due to it there was only 15 minutes available for this test. Therefore the new equipment was

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

tested later in the laboratory conditions.

V COMPONENT – Dispersion modelling

MS expert Sari Lappi from 10th March to 14th March 2008

- Activity 5.2.2 Preparation of emission and other input data for dispersion modelling, 2 working days
- Activity 5.4.1 Use of dispersion modelling for air quality in a couple of real cases, 3 working days

BC expert Driton Idrizi and BC expert Igor Paunovski from the MEPP were involved in the activities.

Training was given for using the UDM-FMI, especially with processing the emission data. The UDM-FMI was used to create a sulphur dioxide concentration timeseries for the point where Karpos air quality measurement station is situated. The results of the modelling were compared with the measured data. The CAR-FMI was further tested with the traffic data from Centar area.

The MS experts' mission reports are in appendices of this report.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2D. TIMING AND DELAYS

Adherence to time schedule

During the reporting period 17 missions took place. In addition to these 17 missions one mission reported in this quarterly report took already place in November 2007. Three of the missions took place in the middle of April 2008. Those three mission reports will be sent later to the steering committee for approval. Mission dates are agreed by both MS and BC experts.

The time schedule for the activities taken from the working plan is shown in a following table. All the activities which have planned and taken place from the start of the reporting period until the end of the reporting period are marked with a cross and pink colour in the relevant box. The activities which have started earlier and now continued are marked with a circle and blue colour in the relevant box. In general the crosses show the time of the MS Expert's missions. Actually the activities have been done also before and after the missions in the BC.

The input of the RTA and RTA assistant was extended by 2.5 months untill 15 May 2008 by the addendum number 1 (approved by the EAR 28.2.2008).

There is no delayed more than three months.

There is no mission left in the project after 17 April 2008. The final meeting will be organised 13-14 May 2008. MS Project leader, representative of the Junior MS partner, component leaders, RTA and one MS expert from component 4 (a lot of different activities in the component 4) will participate in the final meeting from the side of the MS.

The expenses of the project from 1 April 2008 until the end of the project will be reported in the final report. All expenses of the MS expert Johannes Roine's mission (26-29 February 2008) will be also reported in the final report.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

Table 2. A time schedule in the reporting period.

CARDS Twinning Project Air Quality Improvement

Reporting

Reports — YEAR 2007

	December			January			February			March			April		
	XVI			XVII			XVIII			XIX			XX		
I COMPONENT - GUIDELINES AND SECONDARY LEGISLATION															
1.1.1 Review current secondary legislation, and preparation of Table of concordance for…															
1.1.2. Analysis of the needed sub legislation for further implementation of first, second and fourth…															
1.2.1. Drafting the sub legislation of monitoring and reporting for ambient air quality under the FWD…															
1.2.2. Drafting of sub legislation - 2004/224/EC and 96/62/EC…															
1.2.3. Drafted Guidelines on establishing agglomeration and non-agglomeration zones															
1.2.4. Amendments of the CAFE directive on air quality law															
1.3.1. Draft instructors to assist the application of secondary legislation - …															
1.3.2. Capacity building of stakeholders to use Manual													x	x	x
II COMPONENT - EMISSION INVENTORIES															
2.1.1 Identify and appoint stakeholders															
2.1.2. Support to construct the database and its content for prepartion of the reports…															
2.2.1. Identify data gaps for compliance with EU-based national air emission system…															
2.2.2. Preparing a Draft list of priorities for recommended improvements															
2.3.1. Support to develop a National Emission Factors and inventory methods															
2.3.2. Support to develop collection of activity data															
2.3.3. Support to update the National Methodology for air emissions inventories…	○	○	○												
2.4.1. Improve capacities to Develop comprehensive training program…	○	○	○												
2.5.1. Support to EPER reporting in general	○	○	○												
III COMPONENT - PRELIMINARY ENVIRONMENTAL ASSESSMENT															
3.1.1. Analyses and review the outcome of CARDS 2004 projects															
3.1.2. Improvement of methodology for preliminary assessment taking accoount…															
3.1.3. Integrate emission inventory data and dispersion modelling…															
3.2.1. Revision of agglomeration and non agglomeration zones															
3.3.1 Reporting and visualization of the assessment results				x	x	x									
3.4.1 Perform campaign to promote results for public													x	x	x
3.4.2 Preparation of a brochure covering the air quality situation in the BC										x	x	x			
IV COMPONENT - AIR QUALITY MEASUREMENTS AND LABORATORY WORK															
4.1.1. Review of the present situation at the calibration laboratory															
4.1.2 Preparing a Plan for improvement of calibration laboratory															
4.1.3. Sharing EU MS country's experience and training on air quality monitoring															
4.1.4 Training technical staff on calibration of instruments															
4.1.5. Calibrate and check instruments in cooperation with technical staff															
4.2.1. Training technical staff on repair maintenance															
4.2.2. Implement and assist in the preparation of SOP for maintenance and…															
4.2.3. Training technical staff on repair and maintenance for BTX analysers							x	x	x						
4.2.4. Training on maintenance of eletronic compounds of the analysers in the monitoring stations							x	x	x						
4.3.1. Developing draft QA/QC plan															
4.3.2. Training on QA/QC plan	x	x	x	x	x	x									
4.4.1. Review of present situation for data management system															
4.4.2. Identified needs for furthered development of the software															
4.4.3 Plan and specification for procurement of new data management software															
4.4.4. Training on validation, management, analysis and introducing methods for presentation…															
4.5.1. Review of present situation in Central Environmental Laboratory on GCs analysis…															
4.5.2. Preparing a plan for improvement of chemical laboratory…															
4.5.3. Arrange and perform training courses for staff concerning standard operation procedures…							x	x	x	planned 11/2007					
4.6.1. Check instruments of mobile emission laboratory and prepare plan for improvement…															
4.6.2. Check the results of improvements							x	x	x	changed by side letter 9*					
4.6.3. Training course (part 1) on emission measurements; basic principles										changed by side letter 9*					
4.6.4. Training course (part 2) on emission measurements; advanced emission…										changed by side letter 9*					
4.7.1. Preparation a draft specification and priority list of investments…															
V COMPONENT - DISPERSION MODELLING															
5.1.1. Specification and procurement of an appropriate system for AQ modelling…															
5.2.1. Investigate available meteorological data from HMA and Skopje airport and…															
5.2.2. Preparation of emission and other input data for dispersion modelling				added by side letter						x	x	x			
5.3.1. Training course on dispersion modelling and demonstrate methods for ….															
5.3.2. Develop training course materials															
5.4.1. Use of dispersion modelling for air quality assessment in couple of real cases				added by side letter						x	x	x			

Activities planned
x Activities planned and done
x Activities done
○ Activities started in time and now continued
* Equipment&consumables late (tender)

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2E. ASSESSMENT

Overall Assessment of progress

Overall the progress achieved during the project and missions has been really good.

The extended contracts of seven BC experts, being well trained and experienced during this Twinning project, expired in February 2008. They still continue working in the MEPP. There is no information available regarding the new contracts.

Announcements of two posts (for CADASTRE) for the MEIC were opened by the Ministry of Environment and Physical Planning in October 2007. Two selected persons started to work in the MEIC in March 2008 concentrating on Cadastre issues. Last autumn also a job announcement for a responsible person for emission measurements was published but it was withdrawn later.

There is a need for additional measurements (in the MEPP's budget for year 2008) for the preliminary assessment to have better picture on the air quality in different parts of the country. All of the needed data can not be anymore provided during the Twinning project because the advisable minimum measurement time is one year and the project ends in May 2008.

Capacity of technical personnel has improved for operation, maintenance, calibration and repairing of instruments in the monitoring station and calibration instruments in the calibration laboratory.
However more work shall be made at the station in the future with the field calibrator and working gas standards. Continuous practise and working will be needed by the BC staff to reach and keep the required level of calibration operation and operation of instruments.

Component 1.Guidelines and Secondary Legislation

All sub legislations planned in the contract and even extra tasks have been carried out in the project.

Component 2. Emission Inventories

Using the new data set from previous Cards 2004 project was an improvement as well as the new form based user interface.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

National System for inventories

1. An article for establishment of the national system for emission inventories has been put into the Law on Ambient Air Quality. After the project is finished a proposal on the practical arrangement of the national system will be made according to the recommendations prepared in the Twinning Project.
2. Since the last MS expert mission two experts have been appointed to work with implementation of the EU PRTR Regulation and with the related emission registers.
3. The BC experts at the MEPP are familiar with the requirements set in the UNECE CLRTAP and EU Directives' reporting requirements.
4. Correction of emission data in the BC's NFR Tables for 2004 on the EIONET CDR website will be done by the BC experts

Component 3. Preliminary Air Quality Assessment

The work has been mostly successful. The preliminary assessment report is almost finalized. The AQ data from years 2004−2007 has been processed and analysed and 2005-2007 were included in the assessment.

The proper calibrations were performed and after it data could be corrected with the aid of calibration coefficients and knowledge from real zero level.

Component 4. Air Quality Measurements and Laboratory Work

The draft QA/QC Plan was nearly finalized during the mission (a mandatory result). MEIC personnel and calibration laboratory staff were trained on QA/QC by presentations on quality control of documents and records and internal auditing methods. In addition audit requirements and procedures were discussed and some practical training was carried out.

All of the planned activities in field calibrations were carried out and overall results fulfilled during the mission. BC expert worked hard during the mission and were devoted to their work. BC expert seemed to understand the importance and basic ideology of calibrations. BC experts have now basic knowledge and capability independently to get the traceability from calibration laboratory to field calibration and further on to carry out field calibrations. They have also basic knowledge to calculate the calibration coefficients and to make data correction according to the calibration results.

Special attention has been paid to electronics of analysers by repairing or checking the following monitoring instruments: four NO-NO2-NOx monitors repaired, one O3 monitor repaired and one checked, one PM 10 analyser repaired and one CO analyser checked.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

A lack of spare parts is a significant problem. In order to work according safety rules and regulations, a special tool “source box” was brought from Finland by MS expert. Without this tool PM10 analyser measuring chamber is not possible open and clean.

All of the planned tasks did not realize due to instrumental problems during the given training on the use of BTX analysers, but quite many practical experiments were performed and many problems were solved. Thus the significant progress of the TS was evident during this mission.

Though it was not planned within the project, MS experts supplied the Central Environmental laboratory (a part of MEPP) with some tools which are planned to be used in emission measurement activities. These tools were: work wrenches, ring spanners, adjustable wrenche, screw drivers, side cutter, flashlight, working gloves and tape.

At the time of these missions, there seemed to be emission measurement personnel at the laboratory of MEPP (engineer and several technicians). However, MS experts were told that there have been many changes in the personnel and this naturally effects on the development of emission measurement activities!
All three emission measurement missions took place in four weeks (missions needed to be delayed because equipment arrived late). Therefore, it is not possible to evaluate e.g how the things have been improved within the project.

RTA Tiina Harju had a possibility shortly to present to EU Commissioner for Enlargement Olli Rehn the running Twinning project Air Quality Improvement at the inauguration of the new premises of the European Union mission (7 March 2008).

Component 5. Dispersion Modelling

The modelling component has achieved all the pre-defined goals. Models are installed on the local servers – and local staff has been trained to use them. The last issue, practical model calculations with real data and the evaluation of the modelling results finalised in March 2008.

Cross cutting issues

At the moment there are twenty BC experts named into the Twinning project, fifteen of them from the MEPP, three of them from the HMA and two of them from the RIHP. Addition to these BC experts one other female BC experts from the MEPP was involved in the Twinning project at the beginning of the

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

project but at the moment she is on the maternity leave (since June 2007).

Table 3. Number of the BC experts involved in the Twinning project.

	MEPP	HMA	RIHP	**Total**
Women	7	1	1	**9**
Men	8	2	1	**11**
Total	**15**	**3**	**2**	**20**

A share of female and male BC experts is equal – both somewhere 50 %, slightly more male. Three of the BC experts are ethnic Albanians, from which one female and two males, and seventeen of them ethnic Macedonians, from which 8 females and 9 males. A share of the ethnic Albanians in the Twinning project is 15 %.

Most of the key persons in the Twinning project as BC PL, RTA counterpart, BC component leaders are female. Only one BC component leader is male and other four key persons are female, one BC PL, one RTA counterpart & BC component leader, two BC component leader from which one is BC component leader of two components.

Improving a basis of an air monitoring system and an operation of national ambient air monitoring network in the BC during the Twinning project will have a positive impact on the environment and human health as the data collected will enable the country to cure areas where pollution levels are unacceptably high. By implementation of a prepared national legislation in the Twinning project according to the EU directives the air quality of the country would be improved.

Issues

No problems with management or co-operation. The co-operation between MS and BC experts has been good.

There is still a need of human resources to fulfil all responsibilities on air quality field. More human resources would be needed especially for emission inventory (Component 2).

II COMPONENT – Emission Inventories

In the planning phase of the Twinning project the BC experts believed that

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

inventories could be carried out annually. However, as no resources have been allocated to the inventory work, it has not been possible to prepare annual inventories. Guidance was given to develop inventories in the three major emission sources for the BC: agriculture, residential combustion and industry.

III COMPONENT – Preliminary Air Quality Assessment

No problems but MEIC people can independently correct the data according to calibrations and from now on teach each other, if necessary.

IV COMPONENT – Air Quality Measurements and Laboratory Work

Some instrumental problems (e.g. zero air, use of gas dilution system with BTX analyser) and also problems relating to the working contracts of the BC experts.The temporary working contracts of the TS had expired or were just expiring. This fact gave rise to problems, because the TS had to leave the laboratory for several hours during the calibration day in order to take care of the continuation of their working contracts. The rundata.txt files of the BTX analyser is not possible to get of the analyser due to technical reasons.

There is no responsible person for emission measurements.

Recommendations

I COMPONENT – Guidelines and Secondary Legislation

The sustainability of the project should be ensured. For this it is a necessity to have key personnel employed on a permanent basis, so that not the experts, who have been well trained and obtained fruitful international experience, are either sacked or will strive to find other jobs.

It is extremely important to focus on implementation of the prepared sub legislations.

II COMPONENT – Emission Inventories

Further efforts should be made to tackle especially the traffic emissions, and other sources of particulate air pollution (including possibly PAH and HM), which seems to be the most severe air pollution problem in the BC. Some of these issues, like light-duty vehicles (passanger cars, vans), heavy-duty vehicle (buses, lorries) exhausts, require good cooperation with other ministries.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

First and foremost feature on the data system would be adding a feature for defining the locations of the emissions. After the BC experts' request BC expert gave advices to make a similar Access file for recording data concerning water pollutions.

It is recommended to store all the data received and imported to the system in the same place where the system file, manual and reporting templates are. Other calculations like calculating emission factors should not be included in the main system but done separately.

1. Establish legal framework, appoint responsible parties, ensure resources and develop a national system for inventories
To ensure resources for development of the national inventory system it is essential to establish the legal framework to support the tasks. Responsible stakeholders shall be appointed for each task with adequate resources. The governmental expert institutes could be made responsible for arranging emission inventory work in their field of expertise. Regular discussions (e.g. a permanent working group or other forum) need to be arranged between the different stakeholders and participation of the relevant experts needs to be made as a basic requirement.

A national system shall be organized to support reliable and timely working with inventories. In order to achieve the emission reductions in the future, NEC directive should be implemented.

2. Organize data collection
The earlier given recommendation is repeated: to start discussions with the State Statistical Office to improve and supplement the collection of statistical data collection to support preparation of emission inventories. Development of data collection will enable preparation of inventories at a more detailed level. In addition to statistical data, the following means for data collection can also be applied

- Industrial organizations often have good and detailed data
- Inquiries can be made to target groups such as operators of industrial facilities, farmers, solvent users
- Universities and research institutes
- Municipal authorities

III COMPONENT – Preliminary Air Quality Assessment

The reduced number of zones and agglomerations in the BC is strongly recommended, to reduce monitoring requirements and costs, and give more flexibility.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

In order to be able to do data validation it is necessary to get experience how the data should like in a normal situation in certain station → easier to observe incorrect values, to follow data from different types of stations. Experience from many years is needed.

Detail recommendations have been given in the mission report (MS expert Birgitta Alaviippola).

IV COMPONENT – Air Quality Measurements and Laboratory Work

For developing the calibration laboratory into an accredited calibration laboratory the following recommendations are given:
Organization and personnel

- The organization and personnel of the calibration laboratory should be defined. To act as an accredited laboratory the calibration laboratory should be a compact unit where the management hierarchy is clear and the responsibilities of laboratory personnel are defined. In the present organization of the MEPP calibrations and air quality data processing are made in two different divisions. It is recommended that organizational changes would be made to make possible to reach an accredited laboratory.
- The calibration laboratory, when accredited, should have a number of personnel large enough to be able to run the laboratory activities fulfilling the requirements of the laboratory's quality system and the accreditation standard (EN ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories). The minimum number of employees should be from 4 to 5 including the technical manager of the accredited laboratory. A smaller number is not possible because accreditation requires deputies for all key activities to prevent the activities from becoming vulnerable.
- A technical manager should be designated for the calibration laboratory. The person should have proper university education or corresponding qualifications or lower level education with long experience. He/she should have skills in instrumental measurements. He/she will be responsible for the technical operations of the accredited laboratory and for the required quality of laboratory operations.
- A member of the laboratory personnel should be appointed as quality manager (or quality officer) who, irrespective of other duties and responsibilities, will be responsible for the quality of operations and activities concerning the laboratory's quality management system. The quality manager shall have direct access to the highest level of management at which decisions are made on the laboratory's policy and resources.
- The responsibilities for the laboratory's personnel will be defined. For

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- Calibration laboratory must have sufficient resources to act as an accredited laboratory. For instance the availability of spare parts in time when needed must be guaranteed to prevent the breaks in activities. It is the responsibility of the laboratory management to guarantee this. This commitment is announced in the quality policy statement issued under the authority of the laboratory top management.
- The BC Experts involved in this twinning project have received very comprehensive and thorough training for one and a half years. They have achieved substantial skills and expertise which should be utilized in further development and maintenance of the calibration laboratory and air monitoring system. The development of the calibration laboratory into an accredited laboratory to act as the National Reference Laboratory for Air Quality will still be a demanding and time consuming task, so the trained personnel should be used. The trained BC Experts have proved to be capable of doing this work successfully and should continue this process. Further training should be given to them to increase their expertise in completing the work.

Documentation of accredited quality management system

- An accredited laboratory shall have a quality management system which follows the requirements of the accreditation standard EN ISO/IEC 17025. The laboratory's quality system is described in the Quality manual and in other documents supplementing it. Those ones whose job it is to write the quality manual shall be very familiar with the requirements presented in the accreditation standard. It is recommended to write the quality manual following the contents of the standard. In preparation of the Quality manual the written material of the QA/QC Plan can be used, when applicable.
- The SOPs (Standard Operating Procedures) concerning all the relevant activities of the calibration laboratory should be written.

Establishing calibration laboratory with accredited quality management system and getting prepared for applying for accreditation

- Because the accredited laboratory has to follow every single requirement written in the standard EN ISO/IEC 17025, laboratory personnel should read the standard carefully by paragraph to paragraph to check and find out whether the laboratory's quality management system fulfils every single requirement mentioned.
- When proceeding with the development of the laboratory's quality management system towards the accreditation process it is

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

recommended to check the laboratory's readiness for accreditation by answering the 44 questions concerning accreditation requirements presented in the Application form for accreditation (Appendix 2 "Initial description of the applicants competence", in the Application for accreditation) (See www.mikes.fi and there FINAS, How to apply for accreditation, Applications). At the stage when these questions can be answered YES the laboratory can consider applying for accreditation. If the answer is NO the laboratory has to develop and improve its procedures and activities further.

- The staff of the calibration laboratory (or the personnel/group involved with the air monitoring system) should hold regular "quality meetings" (e.g. once in two weeks) to plan and discuss the activities needed to reach the accreditation step by step and to follow and discuss the progress achieved. A short memo should be written about the progress and further plans. The memo will be delivered to the meeting participants and the management of the calibration laboratory.
- All the relevant European standards, i.e. CEN measurement standards for Reference methods and accreditation standard EN 17025, should be available and the laboratory personnel should have easy access to them. It is everybody's duty to train themselves by familiarising with these standards including the quality management system of the calibration laboratory.

Assessment of laboratory's activities, operations and quality system

- When the calibration laboratory's quality system is documented to the level needed by accreditation and its activities and processes are running properly, the assessment of the quality management system should be initiated by performing internal quality audits. The laboratory should not apply for accreditation before it has started to perform internal audits.
- The organizing of audits should be the responsibility of a Quality officer. The Quality officer should be also responsible for training the auditors to perform audits.

Key recommendations for field calibration are:

1. Enough time should be reserved to perform field calibrations at each station and monitor. Calibration should not be performed in hurry because enough settling time should be assured at each calibration point. Stabilizing times depend on for example used instruments and compounds to be calibrated.
2. Documentation of calibration procedure is extremely important. All of the tasks performed during calibration should be carefully documented. There is never too much documentation available.
3. Transportation of calibration equipments, especially transportation of gas bottles should be made carefully to avoid any damages.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

4. Automatic zero and span check times should be changed as agreed in every station, i.e. 27 min zero, 27 min span.
5. All of the broken instruments should be repaired in due time. For example zero air generators seem to be out of order almost in every station. Checking of zero level is extreme important for reliable measurements.
6. The automatic zero adjustment function of monitors at measurement stations should be disabled, at least until zero air is properly assured at station.
7. Field calibrations should be performed on regular bases at every monitoring site according to the measurement quality plan.
8. Continuous training on these issues is also strongly recommended.
9. Other recommendations given in last mission report are still valid.

As a recommendation a list of needed spare parts for NO_x, O_3, SO_2, CO and PM_{10} analysers found during the mission was given. A special tool "source box" PN 425451016 is needed to service PM10 analysers. It's against safety rules and regulations to work with radioactive source without using "source box". In addition to them also a detailed list for spare parts to be in stock from one to three years period in order to ensure analysers uninterrupted function was given (see more details in MS Expert Harri Granath's mission report).

Key recommendations for BTX analysers:

- The operations of the BTX instrument have to be learnt in depth reading manual and working with the instrument.
- Use of right materials for sampling tubings is important to get right measurements results (Teflon, FEP or stainless steel). Use always inert microfilter and in addition T-fitting in the sample line of the BTX analyser in order to ensure atmospheric pressure.
- Calibration is the most important part of the measurement procedure. Only correct calibration, which is time consuming process, ensures reliability of the data.
- Multipoint calibration of the BTX analyser should be performed using both the laboratory gas dilutor and field dilutor with high concentration BTEX gas from NPL. In that case the correction equation between these two dynamic dilutors is obtained which makes it possible to establish the traceability chain from the reference laboratory (calibration laboratory) to the measurement station. This BTX analyser should be located permanently in the calibration laboratory.
- Replacements of filters and scrubbers in the calibration laboratory should be strictly made according to schedule.
- The TS of the laboratory should have a room for their office tasks near the laboratory. Then they could efficiently utilize the waiting time when instruments are warming or stabilizing or being calibrated with time-

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

- The long-term working contracts for the TS are an absolute prerequisite for a successful work in the calibration laboratory. The laboratory needs trained and experienced personnel, and high practical experience will be acquired only by working hard.
- The only way to acquire exhaustive knowledge about the BTEX method is learning by doing.

Mobile Emission Laboratory

1. It is recommended that an emission measurement team will be created at the Central Environmental laboratory which is a part of MEPP. In this team there must be a team leader on permanent base, who is in charge of the activities but also all the other personnel (technicians etc) in this team must be trained for emission measurements. Only then the quality of emission measurement activities can be guaranteed!
2. National comparison measurements for emission measurements should be organised in the BC in the near future.
3. Laptop should be procured for the control calculation of the measurements during the field measurement as well as for the calculation of emission measurement results.
4. New tools and other working accessories for emission measurement activities should be procured to the laboratory of MEPP. Tools are such as work wrenches, ring spanners, adjustable wrenches, screw drivers, side cutters, flashlights, multimeter, pipe wrenches. Other working accessories are safety gloves, safety helmets, respirators, personal gas alarm analysers etc.
5. A separate volumetric gas meter is needed for the calibration of gas mass flow meter in the particulate measuring control unit.
6. New particulate sampling probes (In-Stack-filtration and Out-Stack-filtration) are needed.
7. A new balance is needed for the determination of the water content of sampled gas.
8. It is advised that the laboratory of MEPP will actively look for the possibility of having accreditation according to EN 17025 procedures for their emission measurement activities in the future.
9. The following items should be procured: new zero probe as well as containers for filters to be used during transportation, new digital manometer (range 1 Pa- 5 kPa) and K-type temperature sensors
10. There should be proper guidance from the MEPP how to install proper measurement ports to the plants. Otherwise, the quality of emission measurements will be in questionable.
11. A study tour should be arranged to emission measurement team so that they would be able to follow the particulate measurement procedure

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

GC analysis
The highly motivated chemists working with GC analysis worked long days during the mission in order to get the instrument functioning properly and finally succeeded in that.

Analyzing PAH compounds in the air is a demanding task and within the current project the basic principals were supervised. However, more training should be provided for Suat Ibishi and Afrim Latifi especially in a practise of GC software, preferably by the manufacture of the instrument. Also the proper maintenance has to be provided for the GC-MS instrument in order to gain good quality data. The laboratory still needs to have standard reference materials for the quality control and rotary evaporator of the laboratory was broken and needs to be fixed or replaced with a new one.
The Quality Manual needs still to be finalized and taken into daily use.

V COMPONENT – Dispersion Modelling

Using good quality emission and other technical input data as well as representative meteorological input data is essential for achieving reliable results from the modelling. The most essential emission input data needed for the UDM-FMI is available and the BC experts are able to do the modelling in practice. This local scale air pollution dispersion model has been developed to be used for assessing the dispersion of atmospheric emissions from single or multiple point sources. In future efforts should be continued to ensure the emission data used in the models is reliable. The Cadastre database is a good foundation for getting data for UDM-FMI, but further work needs to be carried out to improve the quality of the data.

Further efforts should also put in the future to enlarge and modernize the meteorological measurement network in BC so that representative meteorological input data for dispersion modelling can be provided. For example at the moment there is no good quality and representative meteorological data available in the Skopje area. New automatic meteorological measurements and necessary data management system and close cooperation between MEPP and HMA are highly recommended.

Getting reliable data for CAR-FMI will be very challenging and is most likely to be achieved only in time after significant effort has been put into gathering updated traffic volume data and information of the emissions from the vehicles of the BC.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

The BC experts are able to work with both air quality models and after data used in the models has improved the modelling results can be used as a part of reliable environmental impact assessment.

Already started cooperation covering shared data between HMA and MEPP is crucial for dispersion modelling in the future.

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

3 – EXPENDITURES

Twinning Contract number: MK05/IB-EN-01 – 05MAC01/13/102 ***Makedonia - 2006***

Section 3: Expenditures 1st December 2007-31st March 2008

PROVIDE TOTAL FIGURES OF DISBURSEMENT IN THE REPORTING PERIOD FOR KEY GROUPS OF COSTS

Travels (15 Missions)

Expert fees	19 750,00 €	
Twinning Management costs	29 625,00 €	
Per diems	13 677,00 €	
Air tickets	6 354,71 €	
Taxi fares (22:00-7:00)	411,06 €	
Other costs		
Emission measurement course		
For interpreter 2 days	200,00 €	
7. Equipments	4 878,84 €	
		Actual travel and other costs 1st Sep 06- 31st March 08
Total	74 896,61 €	*364 194,88 €*

RTA remuneration and allowances

	Actual costs 1st Dec 07 – 31st March 08	Actual costs 1st Sep 06 – 31s March 08 The whole project	Original budget The whole project
Tiina Harju			
1. Salary+labour costs	24 482,72 €	113 606,08 €	106452,00+15273,13 € (Addendum 1)
Remaining budget			*8 119,05 €*
2. RTA Allowances	18 933,11 €	95 719,89 €	105 004,22 € (original budget+side letter 6+Addendum 1)
Remaining budget			9 284,33 €
4. RTA Assistant salary	1 818,19 €	8 795,54 €	9 681,90 € (Addendum 1)
Remaining budget			*886,36 €*
Total	45 234,02 €	218 121,51 €	236 411,25 €
Remaining budget			*18 289,74 €*

TOTAL COSTS / sixth quarter year period (travels and RTA costs) 120 130,63 €

TRAVELS: COSTS BY ACTIONS 1ST SEPT 2006 – 31ST MARCH 2008:

Amount paid in Euro	Original budget, the whole project or new budget (side letter)	Remain to the next periods or other actions
3. RTA training		
1 092,68 €	1 323,00 €	0 € (reallocated to 4.2.3.)

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

5. Project Preparation

13 741,56 €	16 668,00 €	0 € (reallocated to 4.2.3.)

Amount paid in Euro	**Original budget, the whole project or new budget (side letter)**	**Remain to the next periods or other actions**
Project co-ordination		
29 301,91 €	***52 127,13 €(side letter 11)***	***22 825,22 €***

6. Project Activities

1.1.1. Review current secondary legislation, and preparation of Table of concordance

5 919,65	6 620,00	0 € (reallocated to 4.2.3.)

1.1.2. Analysis of the needed sub legislation for further implementation of daughter directives

5 505,00	5 560,00	0 € (reallocated to 1.2.4.)

1.2.1. Drafting the sub legislation of monitoring and reporting for ambient air quality

21 274,18	21 274,18 (side letter 10)	0 €

1.2.2. Drafting of sub legislation

23 776,08	23 776,08 (side letter 4, 10)	0 €

1.2.3. Review of a rulebook for zones and agglomerations prepared by the CARDS 2004 project

2 915,60	2 915,60 (side letter 4, 10)	0 €

1.2.4. Amendments of the CAFÉ directive on the air quality law

3 703,00	3 703,00 (side letter 4, 10)	0 €

1.3.1. Draft Instructions to assist the application of secondary legislation-considering air quality

12 809,87	16 809,87 (side letter 4, Addendum 1)	4 000,00 €

2.1.1. Identify and appoint stakeholders

6 503,80	7 070,00	0 € (reallocated to 4.2.3.)

2.1.2. Support to construct the database and its content for preparation of the reports

8 779,05	8 779,05	0 € (addendum1)

2.2.1. Identify data gaps for compliance with EU-based national air emission system and reporting requirements

2 885,00	2 885,00	0 € (side letter 9)

2.2.2. Preparing a Draft a list of priorities for recommended improvements

2 578,44	2 578,4 (side letter 10)	0 €

2.3.1. Support to developing a National Emission Factors and inventory methods

4 836,30	4 836,30 (Addendum 1)	0 €

2.3.2. Support to develop collection of activity data

12 835,00	12 835,00 (side letter 7, 10)	0 €

2.3.3. Support to update the National Methodology for air emissions inventories for Macedonia

9 408,56	9 408,56 (Addendum 1)	0 €

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

2.4.1. Improve capacities to Develop comprehensive training program (supporting training materials)
3 117,00 | 3 117,00 side letter 10 | 0 €

2.5.1 Train staff to use atabase for producing EPER reports
3 656,00 | 3 656,00 side letter 7,10 | 0 €

3.1.1. Analyses and review of the outcomes of CARDS 2004 project
4 312,13 | 4 730,00 | 0 € (reallocated to 1.2.4.)

Amount paid in Euro	**Original budget, the whole project or new budget (side letter)**	**Remain to the next periods or other actions**

3.1.2. Improvement of the methodology for preliminary assessment
3 805,73 | 3 805,73 (Addendum 1) | 0 €

3.1.3. Integrate emission inventory data and dispersion modelling to the preliminary assessment
4 642,74 | 4 642,74 (Addendum 1) | 0 €

3.2.1. Revision of agglomeration and non-agglomeration zones
5 986,48 | 5 986,48 (Addendum 1) | 0 €

3.3.1. Reporting and visualization of the assessment results (Side letter 5, Addendum 1)
9 001,45 | **9 001,45** | **0 €**

3.4.2. Preparation of a brochure covering the air quality situation in the BC
4 733,22 | **4 770,00** | **36,78 €**

4.1.1. Review of the present situation at the calibration laboratory
2 009,90 | 2009,90 | 0 € (reallocated to 4.2.3.)

4.1.2. Preparing a Plan for Improvement of calibration laboratory
2 403,00 | 2 403,00 (Addendum 1) | 0 €

4.1.3. Sharing EU MS country's experience and training on air quality monitoring
21 284,40 | 21 284,40 (side letter 5, 9) | 0 €

4.1.4. Training technical staff on calibration of instruments
2 132,00 | 2 132,00 | 0 € (reallocated to 1.2.4.)

4.1.5. Calibrate and check instruments in cooperation with technical staff
2 376,00 | 2 376,00 | 0 € (reallocated to 1.2.4.)

4.2.1. Training technical staff on repair maintenance
4 389,63 | 4 389,63 | 0 € (reallocated to 1.2.4.)

4.2.2. Implement and assist in the preparation of SOP for maintenance and calibration of monitors
4 622,00 | 4 622,00 (Addendum 1) | 0 €

4.2.3. Training technical staff on maintanance and repairing of BTX-monitors
4 537,26 | **4 707,41 (side letter 3, 9)** | **170,15 €**

4.2.4. Training on maintenance of electronic compounds of the analysers in the monitoring stations
4 537,70 | **4 730,00 (side letter 8)** | **192,30 €**

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

4.2.5. Training on calibration of the analysers on the monitoring stations

4 490,26	**4 490,26 (side letter 9, Addendum 1)**	**0 €**

4.3.1. Developing draft QA/QC plan

8 867,82	8 867,82 (Addendum 1)	0 €

4.3.2. Training on QA/QC

8 959,64	**8 959,64 (Addendum 1)**	**0 €**

4.4.1. Review of present situation for data management system

2 019,18	2 294,00	0 € (reallocated to 1.2.4.)

4.4.2. Identified needs for furthered development of the software

1 602,00	1 602,00 (Addendum 1)	0 €

Amount paid in Euro	**Original budget, the whole project or new budget (side letter)**	**Remain to the next periods or other actions**

4.4.3. Plan and specification for procurement of new data management software

801,00	801,00 (Addendum 1)	0 €

4.5.1. Review of present situation in Central Environmental Laboratory on GCs analysis for air samples

1 977,07	1 977,07	0 € (reallocated to 1.2.4.)

4.5.2. Preparing a Plan for improvement of chemical laboratory

5 180,51	7 166,00	0 € (reallocated to 1.2.4.)

4.5.3. Training for GC analysis of air samples

18 714,97	**17 105 and 1 609,97 Contingencies**	**0 €** (contingencies left 1 856,98, side l. 11)

4.6.1. Check instruments and plan for improvement of mobile emission laboratory

3 560,98	3 560,98	0 € (reallocated to 1.2.4.)

4.6.3. Training course part 1 for emission measurements

5 863,37	**6 080,00**	**216,63 €**

4.6.4. Training course part 2 for emission measurements

5 864,85	**5 864,85**	**0 € (side letter 9, 11)**

4.7.1. Draft specification and priority list of investments

4 505,00	4 505,00 (Addendum 1)	0 €

5.1.1. Specification and procurement of an appropriate system for AQ modelling on local scale

4 364,94	4 364,94 (Addendum 1)	0 €

5.2.1. Investigate meteorological data and develop methods to provide it for dispersion modelling

4 454,77	4 454,77 (Addendum 1)	0 €

5.2.2. Preparation of emission and other input data for dispersion modeling

6 680,43	**7 024,00 (Addendum 1)**	**343,57 €**

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

5.3.1. Training course on dispersion modelling and methods for validation and for scenario making

4 387,29	4 387,29 (Addendum 1)	0 €

5.3.2. Develop training course materials

4 711,22	4 711,22 (Addendum 1)	0 €

5.4.1. Use of dispersion modeling for air quality assessment in couple of real cases

6 898,42	**7 166,00**	**267,58 €**

7. Equipment and supplies

4 878,80	**5 000,00**	**121,16 €**

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. Project Co.ord. (3 days)**	17/12/2007-20/12/2007									
	Mission of expert Harri Pietarila	17/12/2007-20/12/2007			**ARRIVAL 17th Dec 2007 14:35 in Skopje AND DEPARTURE 20th Dec 2007 15:20 from Skopje]**						
	Fees	17/12/2007-20/12/2007	70001	15.1.2007	**[3 X 250,00]**			750,00			
	Flat rate compensation	17/12/2007-20/12/2007	55078	27.3.2008	**1,5*750,00**			1 125,00			
	Per diem	17/12/2007-20/12/2007	29108	21.12.2007	**[3]** x 164,00			492,00			
	Helsinki - Skopje Air ticket	20.12.2007	68257	31.12.2007	**[2. CLASS]**			431,26			
	Local travel (Taxi) to location Helsinki Airport - home							23,15			
	Total							**2 821,41**			
xx	**Activity no. [2.3.3 (3 days+flights), 2.5.1. (2 day)**										
	Mission of expert **[Santtu Mattila]**	26/11/-30/11/2007			**ARRIVAL 25th Nov 14:00 in Skopje AND DEPARTURE 30th Nov 14:50 from Skopje]**						
	Fees	26/11/-30/11/2007	21630	31.12.2007	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	26/11/-30/11/2007	21630, FMI 55078	31.12.2007, 27.3.2008	**1,5*1250,00**			1 875,00			
	Per diem	26/11/-30/11/2007	21630	31.12.2007	**[5]** x 164,00			820,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	26/11/-30/11/2007	21630	31.12.2007	**[2. CLASS]**			340,26			
	Local travel (Taxi) to location Helsinki Airport - home		21630	31.12.2007	**Taxi 22:00-7:00**			31,48			
	Total							**4 316,74**			
xx	**Activity no. 2.3.3. 1 day+flights, 2.4.1. 2 days, 2.5.1. 2 days**										
	Mission of expert Kristina Saarinen	10/12/2007-14/12/2007			**ARRIVAL 9th Dec 2007 12:45 in Skopje AND DEPARTURE 14th Dec 2007 14:50 from Skopje]**						
	Fees	10/12/2007-14/12/2007	21650	31.12.2007	**[5 X 350,00]**			1 750,00			
	Flat rate compensation	10/12/2007-14/12/2007	21650, FMI 55078	31.12.2007, 27.3.2008	**1,5*1750**			2 625,00			
	Per diem	10/12/2007-14/12/2007	21650	31.12.2007	**[5]** x 164,00			820,00			
	Helsinki - Skopje Air ticket	10/12/2007-14/12/2007	21650	31.12.2007	**[2. CLASS]**			478,26			
	Local travel (Taxi) to location Helsinki Airport - home		21650	31.12.2007	**Taxi 22:00-7:00**			48,15			
	Total							**5 721,41**			

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 4.3.2. 5 days**										
	Mission of expert Veijo Pohjola	16/12/2007-21/12/2007			**ARRIVAL 16th Dec 2007 23:45 in Skopje AND DEPARTURE 21st Dec 2007 15:20 from Skopje]**						
	Fees	16/12/2007-21/12/2007	70001	15.1.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	16/12/2007-21/12/2007	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	16/12/2007-21/12/2007	29110	31.12.2007	**[5]** x 164,00			820,00			
	Helsinki - Skopje Air ticket	16/12/2007-21/12/2007	68257	31.12.2007	**[2. CLASS]**			478,26			
	Local travel (Taxi) to location Skopje Airport - Skopje		29110	31.12.2007	**Taxi 22:00-7:00**			11,42			
	Local travel (Taxi) to location Helsinki Airport - home		29110	31.12.2007	**Taxi 22:00-7:00**			37,22			
	Total							**4 471,90**			
xx	**Activity no. 4.3.2. 5 days**	14/1/2008-18/1/2008									
	Mission of expert Jari Walden	14/1/2008-18/1/2008			**ARRIVAL 13th Jan 2008 14:35 in Skopje AND DEPARTURE 18th Jan 2008 15:20 from Skopje]**						
	Fees	14/1/2008-18/1/2008	70003	15.2.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	14/1/2008-18/1/2008	55078	27.3.2008	**1,5*1250,00**			1 875,00			
	Per diem	14/1/2008-18/1/2008	29008, 68012	25.1.2008, 29.1.2008	**[5** x 195,00			975,00			
	Helsinki - Skopje Air ticket	14/1/2008-18/1/2008	68012	29.1.2008	**[2. CLASS]**			346,26			
	Local travel (Taxi) to location Helsinki Airport - home		68012	29.1.2008	**Taxi 22:00-7:00**			41,48			
	Total							**4 487,74**			
xx	**Activity no. 4.2.5. 5 days**										
	Mission of expert [Kaj Lindgren] 5 days	21/1/2008-25/1/2008			**ARRIVAL 20th Jan 2008 15:00 in Skopje AND DEPARTURE 25th Jan 2008 15:00 from Skopje]**						
	Fees	21/1/2008-25/1/2008	70003	15.2.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	21/1/2008-25/1/2008	55078	27.3.2008	**1,5*1250,00**			1 875,00			
	Per diem	21/1/2008-25/1/2008	29011	31.1.2008	**[5]** x 195			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	21/1/2008-25/1/2008	68019	4.2.2008	**[2. CLASS]**			390,26			
	Total							**4 490,26**			

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 3.3.1. 5 days**	21/1/2008-25/1/2008									
	Mission of expert Birgitta Alaviippola	21/1/2008-25/1/2008			**ARRIVAL 20th Jan 2008 14:00 in Skopje AND DEPARTURE 25th Jan 2008 15:20 from Skopje]**						
	Fees	21/1/2008-25/1/2008	70003	15.2.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	21/1/2008-25/1/2008	55078	27.3.2008	**1,5*1250,00**			1 875,00			
	Per diem	21/1/2008-25/1/2008	29010	31.1.2008	**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket	21/1/2008-25/1/2008	68019	4.2.2008	**[2. CLASS]**			390,26			
	Local travel (Taxi) to location Helsinki Airport - home		29010	31.1.2008	**Taxi 22:00-7:00**			33,33			
	Total							**4 523,59**			
xx	**Activity no. 4.2.4. 5 days**										
	Mission of expert [Harri Granath] 5 days	4/2/2008-8/2/2008			**ARRIVAL 3rd Feb 2008 12:10 in Skopje AND DEPARTURE 8th Feb 2008 17:05 from Skopje]**						
	Fees	4/2/2008-8/2/2008	70004	29.2.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	4/2/2008-8/2/2008	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	4/2/2008-8/2/2008	29013	18.2.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	4/2/2008-8/2/2008	68216	22.11.2007	**[2. CLASS]**			408,44			
	Local travel (Taxi) to location Helsinki Airport - home		29103	20.11.2007	**Taxi 22:00-7:00**			29,26			
xx	**Total**							**4 537,70**			
xx	**Activity no. 4.2.3. 5 days**										
	Mission of expert **[Kuronen Pirjo] 5 days**	17/2/2008-22/2/2008			**ARRIVAL 14th Feb 2008 14:35 in Skopje AND DEPARTURE 22nd Feb 2008 15:20 from Skopje]**						
	Fees	17/2/2008-22/2/2008	70005	29.2.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	17/2/2008-22/2/2008	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	17/2/2008-22/2/2008	29016	26.2.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	17/2/2008-22/2/2008	68056	6.3.2008	**[2. CLASS]**			437,26			
xx	**Total**							**4 537,26**			

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 4.6.3. 5 days**	4/2/2008-8/2/2008									
	Mission of expert Harri Puustinen	4/2/2008-8/2/2008			**ARRIVAL 3rd Feb 2008 12:10 in Skopje AND DEPARTURE 8th Feb 2008 17:05 from Skopje]**						
	Fees	4/2/2008-8/2/2008	70004	29.2.2008	**[5 X 350,00]**			1 750,00			
	Flat rate compensation	4/2/2008-8/2/2008	11640, 55078	19.3.2008, 27.3.2008	**1,5*1750,00**			2 625,00			
	Per diem	4/2/2008-8/2/2008	29015	18.2.2008	**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket	4/2/2008-8/2/2008	11640	19.3.2008	**[2. CLASS]**			382,44			
	Local travel (Taxi) to location Helsinki Airport - home		29015	18.2.2008	**Taxi 22:00-7:00**			30,93			
	Total							**5 763,37**			
xx	**Activity no. 4.6.4. 5 days**										
	Mission of expert **[Tuula Pellikka] 5 days**	4/2/2008-8/2/2008			**ARRIVAL 3rd Feb 2008 12:10 in Skopje AND DEPARTURE 8th Feb 2008 17:05 from Skopje]**						
	Fees	4/2/2008-8/2/2008	70004	29.2.2008	**[5 X 350,00]**			1 750,00			
	Flat rate compensation	4/2/2008-8/2/2008	11640, 55078	19.3.2008, 27.3.2008	**1,5*1750**			2 625,00			
	Per diem	4/2/2008-8/2/2008	29014	18.2.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	4/2/2008-8/2/2008	11640	19.3.2008	**[2. CLASS]**			382,44			
	Local travel (Taxi) to location Helsinki Airport - home		29014	18.2.2008	**Taxi 22:00-7:00**			32,41			
xx	**Total**							**5 764,85**			
xx	**Activity no. 4.5.3. 5 days**										
	Mission of expert **[Karlsson Vuokko] 5 days**	24/2/2008-29/2/2008			**ARRIVAL 24th Feb 2008 14:35 in Skopje AND DEPARTURE 29th Feb 2008 15:20 from Skopje]**						
	Fees	24/2/2008-29/2/2008	70005	14.3.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	24/2/2008-29/2/2008	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	24/2/2008-29/2/2008	29018	29.2.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	24/2/2008-29/2/2008	68056	6.3.2008	**[2. CLASS]**			390,26			
	Local travel (Taxi) to location Helsinki Airport - home		29018	29.2.2008	**Taxi 22:00-7:00**			33,15			
xx	**Total**							**4 523,41**			

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 4.5.3. 5 days**										
	Mission of expert **[Hakola Hannele] 5 days**	24/2/2008-29/2/2008			**ARRIVAL 24th Feb 2008 14:35 in Skopje AND DEPARTURE 29th Feb 2008 15:20 from Skopje]**						
	Fees	24/2/2008-29/2/2008	70005	14.3.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	24/2/2008-29/2/2008	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	24/2/2008-29/2/2008	29019	29.2.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	24/2/2008-29/2/2008	68056	6.3.2008	**[2. CLASS]**			390,26			
xx	**Total**							**4 490,26**			
xx	**Activity no. 5.2.2. 2 days, 5.4.1. 3 days**	10/3/2008-14/3/2008									
	Mission of expert Sari Lappi	10/3/2008-14/3/2008			**ARRIVAL 9th March 2008 23:45 in Skopje AND DEPARTURE 14th March 2008 17:05 from Skopje]**						
	Fees	10/3/2008-14/3/2008	70006	31.3.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	10/3/2008-14/3/2008	55078	27.3.2008	**1,5*1250,00**			1 875,00			
	Per diem	10/3/2008-14/3/2008	29020	18.3.2008	**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket	10/3/2008-14/3/2008	68065	17.3.2008	**[2. CLASS]**			503,35			
	Local travel (Taxi) to location Helsinki Airport - home		29020	18.3.2008	**Taxi 22:00-7:00**			31,3			
	Total							**4 634,65**			
xx	**Activity no. 3.4.2. 5 days**										
	Mission of expert **Pia Anttila] 5 days**	9/3/2008-14/3/2008			**ARRIVAL 9th March 2008 12:10 in Skopje AND DEPARTURE 14th March 2008 17:05 from Skopje]**						
	Fees	9/3/2008-14/3/2008	70006	31.3.2008	**[5 X 250,00]**			1 250,00			
	Flat rate compensation	9/3/2008-14/3/2008	55078	27.3.2008	**1,5*1250**			1 875,00			
	Per diem	9/3/2008-14/3/2008	29021	18.3.2008	**[5]** x 195,00			975,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**	9/3/2008-14/3/2008	68074	27.3.2008	**[2. CLASS]**			605,44			
	Local travel (Taxi) to location Helsinki Airport - home		29021	18.3.2008	**Taxi 22:00-7:00**			27,78			
xx	**Total**							**4 733,22**			

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Resident Twinning Adviser [Tiina Harju]**							4 months	(3 months)		
	Gross salary	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	70024, 70002, 70004, 70006	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	4 x **MONTHLY SALARY 3 677,56**			14 710,24	10 659,60		4050,64
	Non wage labour costs	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	70024, 70002, 70004, 70006	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	4 x 2096,69			8 386,76	6 077,40		2 309,36
	6%of sal+non wage	31.3.2008	55078	27.3.2008	3 x 346,43			1 385,72	1 005,00		380,72
	RTA 50 % allowances (RTA costs reports)				**(Monthly cost reports)**						
	Total							**24 482,72**	**17 742,00**		**6 740,72**
xx	**RTA Assistant Martina Toceva (acting on a freelance basis) salary costs**	2.1.2008, 1.2.2008, 5.3.2008, 31.3.2008	2.1.2008 29109, 1.2.2008 29012, 5.3.2008 29017, 27.3.2008 29022	31.12.2008, 31.1.2008, 29.2.2008, 27.3.2008	2.1.2008 454,55, 1.2.2008 477,27, 5.3.2008 431,82, 27.3. 454,55			1 818,19	1 500,00		500,00
	Total							**1 818,19**	**1 500,00**		**500,00**
xx	**Activity no. 4.6.3. 1 day, 4.6.4. 1 day]** Emission measurement course for Interpretator	29.2.2008	29017	29.2.2008	**Activity no. 4.6.3. 1 day 100 €, 4.6.4. 1 day 100 €]** Emission measurement course for Interpretator			**200,00**		**200,00**	
xx	**7. Equipment and supplies**	20.3.2008	21147,21420,21420, 55073	31.12.2007, 20.3.2008	**Procurements of equipments for the mobile emission laboratory**			**4 878,84**	**5 000,00**		

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget (left after previous periods)	Amount introduced by side letter /amendment	Amount charged to contingencies
xx	**Activity no. [Project co-ordination]**										
	Mission of expert **[Harri Pietarila 3 days]**	17/12/2007-20/12/2007									
	Fees				**[3 X 250,00]**			750,00			
	Flat rate compensation				**1,5*750,00**			1 125,00			
	Per diem				**[3]** x 164,00			492,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**				**[2. CLASS]**			431,26			
	Local travel to location				**Taxi**			23,15			
	Total							**2 821,41**	**27 901,50**		
xx	**Activity no. 2.3.3. Support to update the National Methodology for air emissions inventories for Macedonia**										
	Mission of expert Santtu Mattila 3 days + flights, Kristina Saarinen 1 day + flights	26/11/-30/11/2007, 10/12/2007-14/12/2007									
	Fees				**[3 x 250,00 + 1x350]**			1 100,00			
	Flat rate compensation				**1,5*1100,00**			1 650,00			
	Per diem				**[4]** x 164,00			656,00			
	Air ticket **[PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]**				**[2. CLASS]**			818,52			
	Local travel to location Home-Airport				**Taxi**			79,63		Side letter 9	
	Total							**4 304,15**		**4 304,15**	
xx	**Activity no. 2.4.1. Improve capacities to Develop comprehensive training program**										
	Mission of expert [Kristina Saarinen 2 days]	10/12/2007-14/12/2007									
	Fees				**[2 x 350]**			700,00			
	Flat rate compensation				**1,5*350**			1 050,00			
	Per diem				**[2]** x 164,00			328,00			
	Air ticket [PLACE OF DEPARTURE Helsinki -DESTINATION Skopje]				**[2. CLASS]**						
	Local travel to location									**Side letter 10**	
	Total							**2 078,00**		**2 078,00**	

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget (left after previous periods)	Amount introduced by side letter /amendment	Amount charged to contingencies
xx	**Activity no. 2.5.1. Train staff to use database for producing EPER reports(side letter)**										
	Mission of expert Santtu Mattila 2 days, Kristina Saarinen 2 days	26/11/-30/11/2007, 10/12/2007-14/12/2007									
	Fees				**[2 x 250,00+ 2 x 350,00]**			1 200,00			
	Flat rate compensation				**1,5*1 200,00**			1 800,00			
	Per diem				**[4]** x 164,00			656,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**						
	Local travel to location									**(side letter 7 and 10)**	
	Total							**3 656,00**		**3 656,00**	
xx	**Activity no. 3.3.1. Reporting and visualization of the assessment results**										
	Mission of expert Birgitta Alaviippola 5 days	21/1/2008-25/1/2008									
	Fees				**[5 x 250,00]**			1 250,00			
	Flat rate compensation				**1,5*1250,00**			1 875,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			390,26			
	Local travel Taxi Airport-home							33,33		(Side letter 5, Addendum 1)	
	Total							**4 523,59**		**4 523,59**	
xx	**Activity no. 3.4.2. Preparation of a brochure covering the air quality situation in the BC**										
	Mission of expert Pia Anttila 5 days	9/3/2008-14/3/2008									
	Fees				**[5 x 250,00]**			1 250,00			
	Flat rate compensation				**1,5*1250,00**			1 875,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			605,44			
	Local travel Taxi Airport-home							27,78		Side letter 10	
	Total							**4 733,22**		**4 770,00**	

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget (left after previous periods)	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 4.2.3. Training technical staff on maintanance and repairing of BTX-monitors**										
	Mission of expert Pirjo Kuronen 5 days	17/2/2008-22/2/2008									
	Fees				**[5 x 250,00]**			1 250,00			
	Flat rate compensation				**1,5*1250,00**			1 875,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			437,26			
	Local travel Taxi Airport-home									Side letter 3, 9	
	Total							**4 537,26**		**4 707,41**	
xx	**Activity no. 4.2.4. Training on maintenance of electronic compounds of the analysers in the monitoring stations**										
	Mission of expert [Harri Granath]	4/2/2008-8/2/2008									
	Fees				**[5 x 250,00]**			1 250,00			
	Flat rate compensation				**1,5*1250,00**			1 875,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			408,44			
	Local travel Taxi Airport-home							29,26		Side letter 8	
	Total							**4 537,70**		**4 730,00**	
xx	**Activity no. 4.2.5. Training on calibration of the analysers on the monitoring stations**										
	Mission of expert Kaj Lingren]	21/1/2008-25/1/2008									
	Fees				**[5 x 250,00]**			1 250,00			
	Flat rate compensation				**1,5*1250,00**			1 875,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			390,26			
	Local travel Taxi Airport-home									Side letter 9, (Addendum 1)	
	Total							**4 490,26**		**4 490,26**	

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget (left after previous periods)	Amount introduced by side letter /amendment	Amount charged to contingenc ies
xx	**Activity no. 4.3.2. Training on QA/QC**										
	Mission of expert [Veijo Pohjola 5 days, Jari Walden 5 days]	16/12/2007-21/12/2007, 14/1/2008-18/1/2008									
	Fees				**[10 x 250,00]**			2 500,00			
	Flat rate compensation				**1,5*2500,00**			3 750,00			
	Per diem				**[5]** x 164,00 + 5 x 195			1 795,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			824,52			
	Local travel Taxi Airport-home							90,12		(Addendum 1)	
	Total							**8 959,64**		**8 959,64**	
xx	**Activity no. 4.5.3. Training for GC analysis of air samples**										
	Mission of expert [Vuokko Karlsson 5 days, Hannnele Hakola 5 days]	24/2/2008-29/2/2008									
	Fees				**[10 x 250,00]**			2 500,00			
	Flat rate compensation				**1,5*2500,00**			3 750,00			
	Per diem				**[10]** x 195,00			1 950,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			780,52			
	Local travel Taxi Airport-home							33,15			
	Total							**9 013,67**	**7 403,70**		**1609,97**
xx	**Activity no. 4.6.3. Training course (part 1) on emission measurements; basic principles**										
	Mission of expert [Harri Puustinen 5 days and course for interpreter 1 day]	4/2/2008-8/2/2008									
	Fees				**[5 x 350,00]**			1 750,00			
	Flat rate compensation				**1,5*1750,00**			2 625,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			382,44			
	Local travel Taxi Airport-home							30,93			
	Total							***5 763,37***			
xx	**Activity no. 4.6.3. 1 day course**] Emission measurement course for Interpreter	29.2.2008	29017	29.2.2008	**Activity no. 4.6.3. 1 day 100 €**, Emission measurement course for Interpreter			***100,00***		Side letter 9	
	Total							**5 863,37**		**6 080,00**	

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

ANNEX I : Expenditures (See excel file - Expenditure Report Template)
Twinning Contract number: MK05/IB-EN-01 - 05MAC01/13/102 Makedonia -2006 -
Section 3: Expenditures

Section No.	Name of services / goods purchased or direct costs	Date(s) of services	Invoice number	Date of invoice	Breakdown and clarification	Amount paid in local currency (if applicable)	INFO-EURO exchange rate	Amount paid in EUR	Amount foreseen in original budget (left after previous periods)	Amount introduced by side letter /amendment	Amount charged to contingencies
xx	**Activity no. 4.6.4.Training course on emission measurements 5 days**										
	Mission of expert [Tuula Pellikka 5 days]	4/2/2008-8/2/2008									
	Fees				**[5 x 350,00]**			1 750,00			
	Flat rate compensation				**1,5*1250,00**			2 625,00			
	Per diem				**[5]** x 195,00			975,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			382,44			
	Local travel Taxi Airport-home							32,41			
	Total							***5 764,85***			
xx	**Activity no. 4.6.4. 1 day course**] Emission measurement course for Interpreter	29.2.2008	29017	29.2.2008	**Activity no. 4.6.4. 1 day 100 €,** Emission measurement course for Interpreter			***100,00***		Side letter 9, 11	
	Total							**5 864,85**		**5 864,85**	
xx	**Activity no. 5.2.2.Preparation of emission and other input data for dispersion modelling**										
	Mission of expert [Sari Lappi 2 days]	10/3/2008-14/3/2008									
	Fees				**[2 x 250,00]**			500,00			
	Flat rate compensation				**1,5*500,00**			750,00			
	Per diem				**[2]** x 195,00			390,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**			503,35			
	Local travel Taxi Airport-home							31,3		Addendum 1	
	Total							**2 174,65**		**2 518,22**	
xx	**Activity no. 5.4.1. Use of dispersion modeling for air quality assessment in couple of real cases**										
	Mission of expert [Sari Lappi 3 days]	10/3/2008-14/3/2008									
	Fees				**[3 x 250,00]**			750,00			
	Flat rate compensation				**1,5*750,00**			1 125,00			
	Per diem				**[3]** x 195,00			585,00			
	Helsinki - Skopje Air ticket				**[2. CLASS]**						
	Local travel Taxi Airport-home									Side letter 4 and 9, Addendum 1	
	Total							**2 460,00**		**2 727,58**	
xx	**7. Equipment and supplies**	20.3.2008	21147,21420,55073	31.12.2007, 20.3.2008	**Procurements of equipments for the mobile emission laboratory**			**4 878,84**	**5 000,00**		
xx	**Resident Twinning Adviser [Tiina Harju]**							4 months	(3 months)		
	Gross salary	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	70024, 70002, 70004, 70006	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	4 x **MONTHLY SALARY 3 677,56**			14 710,24	10 659,60		4050,64
	Non wage labour costs	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	70024, 70002, 70004, 70006	31.12.2007, 31.1.2008 and 29.2.2008, 31.3.2008	4 x 2096,69			8 386,76	6 077,40		2 309,36
	6%of sal+non wage	31.3.2008	55078	27.3.2008	3 x 346,43			1 385,72	1 005,00		380,72
	RTA 50 % allowances (RTA costs reports)				**(Monthly cost reports)**						
	Total							**24 482,72**	**17 742,00**		**6 740,72**
xx	**RTA Assistant Martina Toceva (acting on a freelance basis) salary costs**	2.1.2008, 1.2.2008, 5.3.2008, 31.3.2008	2.1.2008 29109, 1.2.2008 29012, 5.3.2008 29017, 27.3.2008 29022	31.12.2008, 31.1.2008, 29.2.2008, 27.3.2008	2.1.2008 454,55, 1.2.2008 477,27, 5.3.2008 431,82, 27.3. 454,55			1 818,19	1 500,00		500,00
	Total							**1 818,19**	**1 500,00**		**500,00**

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

REPORT OF RTA COSTS IN DECEMBER 2007

TWINNING PROJECT
Project Title: Air Quality Improvement
Twinning Contract Number: MK05/IB-EN-01
Agency Contract Number: 05MAC01/13/102

Name of services / goods purchased or direct costs	Date(s) of services	Invoice No.	Date of invoice	Breakdown and clarification	Costs, €	Notes
Daily Allowances (50%)	from [date] to [date] 1.-31.12.2007	No. of MS administration document against which payment has been made to the RTA 29109	Date of this MS administration document 31.12.2007	[No of days] * 50% [per diem] 31 days* 93.5 €/day	2898.50	1. The applicable rates are fixed at the time of the signature of the Twinning Contract for its entire duration. They are not subject to revision during the lifetime of the project. 2. This is checked against the dates of travel to/from place of duty for the first and last quarter respectively
Monthly allowance for special economically priced return tickets	Period 1.-31.12.2007	Quotation No. 29109	Quotation date 31.12.2007	[Name of travel agency that has issued the quotation] [No. of months] * [flat rate as stated in the quotation] AREA, 1 month * 600 €	600.00	1. Only applicable, if no removal of personal belongings or any other costs related to accompanying family members are charged to the project. 2. Eligible from the second month of secondment
Taxi Flight 22:00-07:00	22.12.2007	29109	31.12.2007	Transfer from the airport, Helsinki- home, Espoo 45.20 € (incl. VAT)	45.20	Taxi Flight 22:00-07:00
Accommodation	from [date] to [date] 1.12.2007- 31.12.2007	No. of receipt FMI: 55493	Date of receipt FMI paid 13.12.2007	[Starting date of lease] [Name of landlord] (for first report only and after that if changed) [No. of months] * [monthly rent] 1.11.2006, Marija Boskovska, 1 month * 1 250,00 €/month	1 250,00	1. Full month's rent can be claimed even if some of the period is beyond the period reported in the Quarterly Report. 2. The first month for which rent is claimed must not overlap with the period claimed under "Allowances for first 30 days". In case of overlap the first rent is reduced accordingly
TOTAL					**4 793,70**	

REPORT OF RTA COSTS IN JANUARY 2008

TWINNING PROJECT
Project Title: Air Quality Improvement
Twinning Contract Number: MK05/IB-EN-01
Agency Contract Number: 05MAC01/13/102

Name of services / goods purchased or direct costs	Date(s) of services	Invoice No.	Date of invoice	Breakdown and clarification	Costs, €	Notes
Daily Allowances (50%)	from [date] to [date] 1.-31.1.2008	No. of MS administration document against which payment has been made to the RTA 29012	Date of this MS administration document 31.1.2008	[No of days] * 50% [per diem] 31 days* 93.5 €/day	2898.50	1. The applicable rates are fixed at the time of the signature of the Twinning Contract for its entire duration. They are not subject to revision during the lifetime of the project. 2. This is checked against the dates of travel to/from place of duty for the first and last quarter respectively
Monthly allowance for special economically priced return tickets	Period 1.-31.1.2008	Quotation No. 29012	Quotation date 31.1.2008	[Name of travel agency that has issued the quotation] [No. of months] * [flat rate as stated in the quotation] AREA, 1 month * 600 €	600.00	1. Only applicable, if no removal of personal belongings or any other costs related to accompanying family members are charged to the project. 2. Eligible from the second month of secondment
Accommodation	from [date] to [date] 1.1.2008- 31.1.2008	No. of receipt FMI: 55009	Date of receipt FMI paid 23.1.2008	[Starting date of lease] [Name of landlord] (for first report only and after that if changed) [No. of months] * [monthly rent] 1.11.2006, Marija Boskovska, 1 month * 1 250,00 €/month	1 250,00	1. Full month's rent can be claimed even if some of the period is beyond the period reported in the Quarterly Report. 2. The first month for which rent is claimed must not overlap with the period claimed under "Allowances for first 30 days". In case of overlap the first rent is reduced accordingly
Taxi Flight 22:00-07:00	14.1.2008	29012	31.1.2008	Transfer from the airport, Helsinki- home, Espoo 45.60 €	45.60	Taxi Flight 22:00-07:00
TOTAL					**4 794,10**	

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

REPORT OF RTA COSTS IN FEBRUARY 2008

TWINNING PROJECT
Project Title: Air Quality Improvement
Twinning Contract Number: MK05/IB-EN-01
Agency Contract Number: 05MAC01/13/102

Name of services / goods purchased or direct costs	Date(s) of services	Invoice No.	Date of invoice	Breakdown and clarification	Costs, €	Notes
Daily Allowances (50%)	from [date] to [date] 1.-29.2.2008	No. of MS administration document against which payment has been made to the RTA 29017	Date of this MS administration document 29.2.2008	[No of days] * 50% [per diem] 29 days* 93.5 €/day	2711.50	1. The applicable rates are fixed at the time of the signature of the Twinning Contract for its entire duration. They are not subject to revision during the lifetime of the project. 2. This is checked against the dates of travel to/from place of duty for the first and last quarter respectively
Monthly allowance for special economically priced return tickets	Period 1.-29.2.2008	Quotation No. 29017	Quotation date 29.2.2008	[Name of travel agency that has issued the quotation] [No. of months] * [flat rate as stated in the quotation] AREA, 1 month * 600 €	600.00	1. Only applicable, if no removal of personal belongings or any other costs related to accompanying family members are charged to the project. 2. Eligible from the second month of secondment
Accommodation	from [date] to [date] 1.2.2008- 29.2.2008	No. of receipt FMI: 55031	Date of receipt FMI paid 19.2.2008	[Starting date of lease] [Name of landlord] (for first report only and after that if changed) [No. of months] * [monthly rent] 1.11.2006, Marija Boskovska, 1 month * 1 250,00 €/month	1 250,00	1. Full month's rent can be claimed even if some of the period is beyond the period reported in the Quarterly Report. 2. The first month for which rent is claimed must not overlap with the period claimed under "Allowances for first 30 days". In case of overlap the first rent is reduced accordingly
Taxi Flight 22:00-07:00				Transfer from the airport, Skopje - home, Skopje	0.00	
TOTAL					**4 561,50**	

REPORT OF RTA COSTS IN MARCH 2008

TWINNING PROJECT
Project Title: Air Quality Improvement
Twinning Contract Number: MK05/IB-EN-01
Agency Contract Number: 05MAC01/13/102

Name of services / goods purchased or direct costs	Date(s) of services	Invoice No.	Date of invoice	Breakdown and clarification	Costs, €	Notes
Daily Allowances (50%)	from [date] to [date] 1.-31.3.2008	No. of MS administration document against which payment has been made to the RTA 29022	Date of this MS administration document 27.3.2008	[No of days] * 50% [per diem] 31 days* 93.5 €/day	2898.50	1. The applicable rates are fixed at the time of the signature of the Twinning Contract for its entire duration. They are not subject to revision during the lifetime of the project. 2. This is checked against the dates of travel to/from place of duty for the first and last quarter respectively
Monthly allowance for special economically priced return tickets	Period 1.-31.3.2008	Quotation No 29022.	Quotation date 27.3.2007	[Name of travel agency that has issued the quotation] [No. of months] * [flat rate as stated in the quotation] AREA, 1 month * 600 €	600.00	1. Only applicable, if no removal of personal belongings or any other costs related to accompanying family members are charged to the project. 2. Eligible from the second month of secondment
Taxi Flight 22:00-07:00	26.3.2008	29022	27.3.2008	Transfer from the airport, Helsinki- home, Espoo €	42,04	Taxi Flight 22:00-07:00
Accommodation	from [date] to [date] 1.3.2008- 31.3.2008	No. of receipt FMI: 55062	Date of receipt FMI paid 13.3.2008	[Starting date of lease] [Name of landlord] (for first report only and after that if changed) [No. of months] * [monthly rent] 1.11.2006, Marija Boskovska, 1 month * 1 250,00 €/month	1 250,00	1. Full month's rent can be claimed even if some of the period is beyond the period reported in the Quarterly Report. 2. The first month for which rent is claimed must not overlap with the period claimed under "Allowances for first 30 days". In case of overlap the first rent is reduced accordingly
TOTAL					**4 790,54**	

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk

APPENDICES

- **MS Experts' mission reports**

Finnish Meteorological Institute
P.O. Box 503, FI-00101 Helsinki
Tel. +358-9-19295432, Fax. +358-919294129
www.fmi.fi

Ministry of Environment and Physical Planning
Drezdenska 52, 1000 Skopje
Tel. +389 2 3066-930, Fax. +389 2 3066-931
www.moepp.gov.mk