1. Basic Information

1.1 CRIS Number: HR2006/018-113/5/5
1.2 Title: Establishment of Air Quality Monitoring and Management System
1.3 Sector: 43010
1.4 Location: Croatia
1.5 Duration: 36 months

2. Objectives

2.1 Overall Objective:
To develop Croatia’s capacity to implement the acquis relating to air quality and to support exchange of air quality data and to increase public awareness of air quality issues.

2.2 Project purpose:

2.3 Accession Partnership (AP) and NPAA priority
The project follows the priorities of the Accession Partnership 2005
Short-term priority:
– Continue to strengthen the capacity of national and regional inspection services and enable them to effectively enforce environmental legislation.
– Medium-Term Priorities: Continue work on the transposition of the EU acquis, with particular emphasis on waste management, water quality, air quality, nature protection and integrated pollution prevention and control. Increase investments in environmental infrastructure, with particular emphasis on waste water collection and treatment, drinking water supply and waste management.

EC Regular Report on Croatia (2005) states that Croatia will continue to develop a national network for monitoring air quality.

The new Act harmonizes the area of air protection with the acquis, encompassing 13 directives and other regulations which cover the following areas: assessment and management of ambient air quality, emission of pollutants in ambient air, emission from stationary sources, quality of products and monitoring. Public participation, the procedure for issuing permits and the exchange of information are ensured in line with horizontal legislation.

On the basis of this Act, the required implementing legislation will be adopted in the
course of 2005-2006, in which manner the process of harmonization of the Croatian air protection legislation with the acquis will be completed.

In addition to passing the implementing legislation of the Air Protection Act in the course of 2005, the following activities are planned:

- to draft the Air Quality Protection and Improvement Plan
- to proceed with the establishment of permanent air quality monitoring stations within the national network

In accordance with the National Environmental Protection Strategy and the National Environmental Protection Plan (Official Gazette, No. 46/02) and on the basis of the legislation scheduled for adoption, the implementing measure of development of a complete national network for permanent air quality monitoring will be carried out in the period 2005-2008.

2.4 Coherence with National Development Plan (and/or Structural Funds Development Plan)

Not applicable

2.5 Cross Border Impact

Not applicable

3. Description

3.1 Background and justification:

The project is initiated to build on existing air quality monitoring network and to support development of comprehensive air quality management system: data transmission and acquisition, data quality control, data evaluation, publication and dissemination. Project supports compliance of Croatia with the requirements set by Framework Council Directive 96/62/EC on Ambient Air Quality Assessment and Management and Daughter Directives 99/30/EC, 2000/69/EC, 2002/3/EC and 2004/107/EC and it is based on harmonized Croatian legislation in the air sector.

Additional directives relevant for the project are:

Council Decision 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States


The objectives and measures laid down in the chapter Air Quality Management (4.2.1.4) which is a part of the National Environmental Strategy and National Environmental Action Plan (2002) will be directly addressed by the project. These are:

- to revise and expand the emission and air quality monitoring system,
- to establish the information system on air quality monitoring as a part of the environmental information system,
to harmonize existing regulations with EU Directives, guidelines and international treaties.

The project objectives will fully compare with the ambient air approximation strategy and action plan which will be completed within January 2006 through CARDS 2002 Project. It will include institutional analysis and cost assessment. It will identify the follow-on activities needed to implement the approximation strategy.

The project will produce a nation-wide ambient air quality monitoring network that will ensure measurements and results required by Framework Council Directive 96/62/EC on Ambient Air Quality Assessment and Management and Daughter Directives 99/30/EC, 2000/69/EC, 2002/3/EC and 2004/107/EC:

- The ambient air pollutants set up by the Framework Directive 96/62/EC and covered in detail as to their levels by four Daughter Directives will be monitored; The limit values specified will be introduced and their excess reported;
- The requirements specifying the number of measuring stations, their types, and micro setting will be met;
- The methods for ambient air quality sampling and analytical methods required will be introduced;
- The requirements on information of public will be fulfilled; the reporting obligations to EC will be assured.

The Air Protection Act (Official Gazette No. 178/04) has determined measures and methods of arranging and implementing air quality protection and improvement. In accordance with the schedule given in the relevant by-law and the Programme, 22 stations shall be in place by the end of 2007. The National Air Quality Network shall consist of: 7 stations for background and regional air pollution, 5 stations in national parks, parks of nature, protected areas, vulnerable ecological systems and cultural and natural heritage and 10 stations in urban and industrial areas. At present, the air quality monitoring network at the state level consist of 8 urban monitoring stations that are already in place. Two existing stations already built in industrial areas will be incorporated in the state monitoring network by the end of 2006. The Government has provided financial means for the establishment of all 8 urban monitoring stations.

The new air quality measurement network and management system will create a structure consisting of monitoring, database and data publication components. The system will be designed to enable access to relevant data and information to all involved authorities, stakeholders and public sector: Ministry of Environmental Protection, Physical Planning and Construction, environmental inspection of MEPPPC, Croatian Environment Agency, health and nature protection authorities, other governmental bodies and institutions, local and regional authorities, research and related institutes, NGOs and general public.

The system will be used as a tool for enforcement, meeting national and international reporting and air quality requirements, shaping policies, making decisions as well as taking appropriate actions, both at the national as well as local and municipal levels, to keep ambient air quality under control so that good air quality is ensured to everyone.

Project builds on existing infrastructure and institutional framework. Organizational setup at Meteorological and Hydrological Service enables establishment and further development of air quality monitoring units. There is:

- Monitoring operations unit: for both, meteorological and air quality field measurements,
- **Installation, services and maintenance unit** that operates within 24-hr notice,
- **Instrument calibration unit**: currently for meteorological instruments/sensors and tropospheric ozone measurements,
- **Chemical laboratory** currently equipped to analyse precipitation and air quality samples, needs upgrade,
- **IT and data management unit** that covers data acquisition, transmission and management and
- **Air quality research unit** that covers all activities related to data checking, analysis, reporting, research, international cooperation, projects and agreements.

Main beneficiary of the project is the Ministry of Environmental Protection, Physical Planning and Construction. Implementing agency for the all monitoring operations is Meteorological and Hydrological Service. Croatian Environment Protection Agency is an independent public institution established by a decision of the government of the Republic of Croatia to collect, integrate, and process environmental data. These three institutions will manage the implementation of the project by setting up Project Steering Committee and Project Implementation Unit. Technical Assistance will be used in addition to support and assist PIU.

Project management structure and responsibilities are outlined in the diagram:

![Project Management Diagram]

Responsible institutions shall formalise protocols and routes of institutional cooperation, division of tasks, duties and responsibilities. There is a need to establish permanent Steering Committee and Implementation unit for day to day management.

Authority responsible for the whole system is Ministry of Environmental Protection, Physical Planning and Construction.

Authority responsible for information/data reporting and policy relevant reporting is Croatian Environment Agency (CEA).

Authority responsible for air quality monitoring operation, maintenance, data management, dissemination, QA/QC and data validation, and research and monitoring development is Meteorological and Hydrological Service (MHS).
3.2 Sectoral rationale:  
Not applicable.

3.3 Results  
The project results are:  
1. Establishment and equipment of 12 monitoring stations;  
2. Chemical laboratory upgrading and equipment;  
3. Development and implementation of measurement protocols, transmission, acquisition, quality assurance and quality control systems for air quality data;  
4. Development and implementation of a system for collection, transmission and data acquisition, development of database and tools;  
5. Improved quality and density of information on the air quality.

3.4 Activities (including Means)  
Steps to be taken during the course of project implementation include:  
1. Formalising of institutional cooperation, tasks, duties and responsibilities. Establishment of Permanent Steering Committee and Implementation Unit.  
2. Undertaking organizational and personnel matters: make necessary organizational and personnel adjustments to ensure realisation of project and operation of network.  
3. Take on the process of accreditation for MHS Laboratories and work including education and training.  
4. Taking over the existing automatic monitoring stations in urban and industrial areas within the state air quality monitoring network (MHS) and upgrade and develop the system of data control, management, dissemination and publishing.  
5. Preparation of project documentation for monitoring sites (R1).  
6. Monitoring sites preparation and building (R1).  
7. Instrument, hardware and software purchase (for measurements and laboratories) (R2, R3).  
8. Data management and utility software development (R4).  
9. Development of software solutions for specific monitoring activities and tasks (R4).(see under 6.4.)  
10. Installation of instruments, hardware and software (R2, R3, R4).  
11. Education and training of personnel (R5)  
12. Examination and scrutiny procedure development for the system functioning (R2, R3, R4, R5). (see under 6.4)

Items 1-4 will be resolved in a preparation phase of the project (first half of 2006).

**Result 1: Preparation of project documentation for locations of measurement stations;**
For each monitoring station project documentation should include: description of a site, geographical position, detailed map of the site and surrounding area, designation and assignment of micro location by local authorities, agreement on the long-term use of micro location for monitoring purposes, technical project documentation, permits required by national construction condition regulations, electricity and telephone line infrastructure user agreements.

**Responsibility: Ministry of Environment, Physical Planning and Construction**

**Preparation and execution of works related to a site construction:** Preparation of a tender and a contract for construction works at all sites.

**Responsibility: Ministry of Environmental Protection, Physical Planning and Construction**

**Preparation of technical documentation, procurement and installation of technical equipment at measurement sites:** Conduction of training program for operators and technical staff at MHS.

**Responsibility: Meteorological and Hydrological Service.**

**Result 2:** Installation of laboratory instruments/analyzers at MHS Chemical laboratory

Assessment of equipment needed for laboratory work and conduction of training program for laboratory staff.

**Responsibility: Meteorological and Hydrological Service, technical assistance**

**Result 3:** Installation of calibration units/instruments at MHS Calibration laboratory

Assessment of equipment needed for laboratory work and conduction of training program for laboratory staff.

**Responsibility: Meteorological and Hydrological Service, technical assistance**

**Result 4:** Preparation of technical documentation, procurement, development and installation of data acquisition system (hardware and software), with associated training

Assessment of needs for installation and technical assistance, development and programming work, conduction of trainings along with associated manuals.

**Responsibility: Meteorological and Hydrological Service, technical assistance**

**Result 5:** Training and workshops for air quality monitoring data/information users

providing technical assistance in support of institutional strengthening and public awareness.

**Responsibility: Meteorological and Hydrological Service**

**3.5 Linked Activities:**

Technical and financial support for the harmonization of legislation, the drafting of the Air Quality Protection and Improvement Plan and the establishment of a part of the national network will be provided through the CARDS programme. Financial support for the establishment of a part of the national network has also been requested under the 2005 PHARE programme.

1. **CARDS 2002 project "Strategy for EU Environmental Law Approximation", Croatia** commenced on 14 June 2004 and is to be completed in June 2006. The
overall objective of this project is to support the Croatian Government's objective of EU accession, by providing a basis for approximation of Croatian environmental legislation with the EU environmental *acquis*. The main output of the project will be the National Environmental Approximation Strategy (NEAS) focusing on the sectors under the responsibility of MEPPPC i.e.: waste management, air quality, industrial pollution control and risk management. In this respect, sectoral approximation strategies with detailed implementation plans will be developed for the three sectors.

2. **CARDS 2002 project** Capacity Building for Croatian Environment Agency

3.6 Lessons learned:

No previous experiences and lessons can be associated with this program. More general but important lesson from previous experiences relates to facilitating of the inter-institutional cooperation. Cooperation has to be well defined and streamlined which will be done through the Project Steering Committee.

4. **Institutional Framework**

**Ministry of Environmental Protection, Physical Planning and Construction** (MEPPPC) has the overall responsibility for environmental protection in Croatia. This includes drafting of legislation, license permitting, EIA and inspections. For the air quality sector it specifically responsible to:

- determine and affect measures in the area of protection and improvement of air quality so as to avoid, prevent or reduce harmful effects on human health, quality of life and the environment as a whole,
- preserve the air quality if the air is clean or negligibly polluted and improve it in instances where it is polluted,
- prevent and reduce pollution which depletes the ozone layer and induces climate change,
- establish, maintain and advance the overall system of managing air quality on the territory of the State,
- assess and procure relevant data on air quality on the basis of standardized methods and criteria and ensure public access thereof,
- carry out obligations assumed under international treaties and agreements to which the State is a party and participate in international cooperation in the area of protection and improvement of air quality,
- coordinate all activities related to state air quality monitoring network, and cooperate with other state bodies and institutes and expert institutions involved in air quality monitoring activities, health and nature protection, monitoring of meteorological conditions and local and regional authorities (see under 12.)

**Meteorological and Hydrological Service of Croatia** (MHS) is governmental institution established by the Government as the central state institution for the fields of meteorology, hydrology, climatology, and air quality providing expert services for state administration bodies and public, as described in the Law on MHS services in Croatia (Official Gazette No. 14, 1978). In general, among others, MHS is responsible for:

- monitoring of meteorological, hydrological and bio-meteorological parameters and
phenomena; special measurements of radiation, atmospheric electricity, radioactivity, air and precipitation pollution as well as fresh water and sea pollution, upper air soundings; maintenance, calibration and development of monitoring systems and instruments (in accreditation process);

- data management, archiving and dissemination of data, products and information; analysis and forecast of atmospheric conditions and phenomena; climate change and related phenomena; transport and deposition of air pollutants; severe weather forecasts and emergency response activities;

- analysis, research and development of meteorological products and services for the public, governmental bodies and specific users;

- national and international exchange of data and information;

- international cooperation in the field of meteorology, hydrology and air pollution

Meteorological and Hydrological Service of Croatia is involved in air quality and climate related activities under the responsibility of MEPPPC where its expertise is needed. MHS is responsible for international work, cooperation and implementation of CLRTAP EMEP programme in Croatia, for work and activities under the Framework Convention on Climate Change, and Vienna Convention on the protection of the ozone layer. MHS provides an expert and technical support to MEPPPC in the assessment of air quality over the territory of Croatia, in preparation of legal acts and ordinances and other related issues. MHS activities are financed by the state budget. The project will be implemented by the employees of MHS

The Croatian Environment Agency (CEA) is an independent public institution established by a decision of the government of the Republic of Croatia to collect, integrate, and process environmental data. In regard to Air sector the Croatian Environment Agency (CEA) collects data on air emissions and uses them for setting up of a central Environmental Information System (EIS) for the Republic of Croatia. The collected and processed data are used by the Agency to prepare reports and guidelines for the air quality and environmental protection strategy and in fulfilling the Croatian international commitments regarding the air and environment. The CEA, working with the National Reference Centres, determines and accepts new technologies in order to create an integrated operating system, the environmental data standards, methodologies, and data quality (QA/QC) system.

The Project Steering Committee, consisting of representatives from all three institutions will ensure proper navigation of the project. The Project Implementation Unit will ensure day to day management and follow-up.

In view of the fact that MEPPPC is the beneficiary of the project, Ministry becomes an owner of the assets provided. After project completion MHS will serve as implementing and management agency for the assets of state monitoring network.

There are no institutional constraints with regard to the cooperation and implementation of environmental projects. The results of the project will not lead to the change in the institutional framework.

All activities related to establishment of state air quality monitoring network have been financing from state budget.
### 5. Detailed Budget

<table>
<thead>
<tr>
<th>Year 2006 - Investment support jointly co-funded</th>
<th>Phare/Pre-Accesion Instrument support</th>
<th>Co-financing</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National Public Funds</td>
<td>Other Sources</td>
<td>of Project</td>
</tr>
<tr>
<td>M€</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract 1: Supplies</td>
<td>1.687</td>
<td>0,563</td>
<td>0,563</td>
</tr>
<tr>
<td>Investment support – sub-total</td>
<td>1.687</td>
<td>0,563</td>
<td>0,563</td>
</tr>
<tr>
<td>% of total public funds</td>
<td>75 %</td>
<td>25 %</td>
<td></td>
</tr>
<tr>
<td>Year 2006 Institution Building support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract 2: Technical assistance (training, study visits)</td>
<td>0.700</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IB support</td>
<td>0.700</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total project 2006</td>
<td>2.387</td>
<td>0,563</td>
<td>0,563</td>
</tr>
</tbody>
</table>

1. All investment sub-projects supported by PHARE must receive co-financing from national public funds. Minimum requirement for co-financing from national public funds is 25% of the combined PHARE and national contributions to the overall investment support.

2. Many Institution building projects will also have a degree of co-financing – this should be quantified and included wherever possible.

3. Expenditure related to equipment (regulatory infrastructure or ESC-related) and to Technical Assistance supporting investment (e.g. pre feasibility study / supervision of works / technical specifications) should be considered as Investment support in the project fiche.

4. All co-financing must be provided on a joint basis. Parallel co-financing will, in a principle, not be accepted. Exceptions to this rule have to be agreed with the Commission in advance.

5. All co-financing should be clearly quantified, also the degree of certainty of such co-financing (i.e. for National Public Funds: is it already earmarked in local or national budget, for FIs Loans, private funds: are they already approved/ under appraisal, etc.).
6. Where parallel co financing is accepted and justified per exception to the normal rule it should be provided in monetary form. If this is not possible there should be clear criteria set out for the valuation of any non-monetary contributions (that should be quantified in the table).

7. If twinning is involved, clearly state the expected budget of the twinning covenant.

8. The financial engineering of the project should be closely monitored against actual delivery during implementation and against the objectives that were set in the project fiche so that corrective actions may be taken where required.

6. Implementation Arrangements

6.1 Implementing Agency

The Central Financing and Contracting Unit (CFCU) at the Ministry of Finance is responsible for the tendering, contracting and disbursement of all the project’s components in line with DIS principles and the PRAG.

Programme Authorizing Officer
Mrs. Vladimir Ivandić,
Assistant Minister Ministry of Finance
Katančićeva 5, 10000 Zagreb, Croatia

Senior Programme Officer
Josipa Blažević Perušić, State Secretary
Ministry of Environmental Protection, Physical Planning and Construction
Vinogradska 25, 10000 Zagreb, Croatia

Deputy Senior Programme Officer
Ms. Suzana Tarnik
Assistant Minister
Environmental Protection Directorate
Ministry of Environmental Protection, Physical Planning and Construction
Ul. Republike Austrije 14, 10000 Zagreb, Croatia

Contacts:
Jasenka Nećak, Head of Department for Atmosphere Protection
Ministry of Environmental Protection, Physical Planning and Construction
Ulica Republike Austrije 14, 10000 Zagreb, Croatia

Sonja Vidic, B. Sc. Phys.
Head, Air Quality Research Unit, Research and Development Division
Meteorological and Hydrological Service of Croatia
Gric 3, 10000 Zagreb, Croatia
Phone: +385 14565719
Fax: + 385 1 4565630
E-mail: vidic@cirus.dhz.hr
6.2 Twinning:
Not applicable

6.3 Non-standard aspects:
Not applicable

6.4 Contracts:

Expected number of contracts is two: one supply contract and one service contract.

The supply contract 1 (Investment support) at 2,25 M€ is intended for the procurement of technical equipment at measurement sites, procurement of laboratory instruments/analyzers at MHS Chemical laboratory and of calibration units/instruments at MHS Calibration laboratory.

The service contract 2 (Institutional building) at 0.7 M€ is envisaged: for technical assistance for installation of laboratory instruments/analyzers at MHS Chemical laboratory, installation of calibration units/instruments at MHS Calibration laboratory, assessment of equipment needed for laboratory work and conduction of training program for laboratory staff, preparation of technical documentation, installation of data acquisition system (hardware and software), assessment of needs for installation and technical assistance, programming work, conduction of trainings.

Specifically, three major components of technical assistance contract are planned:

---

**Component 1 (0.25 M€):**
Technical assistance and training of personnel in developing and implementing monitoring activities:

a) installation and maintenance of monitoring equipments
b) QA/QC system (as a whole and separate parts: monitoring, calibration, data acquisition, data quality control)
c) Reference laboratory and technical work with instruments and
d) Data base management system

**Component 2 (0.20 M€):**
Technical assistance and training of personnel in developing and implementing chemical laboratory:

a) installation and maintenance of laboratory equipments
b) QA/QC system (as a whole and separate parts: calibration, data acquisition, data quality control)
c) Reference laboratory and technical work with instruments and
d) Data base management system

**Component 3 (0.25 M€):**
Technical assistance in developing appropriate software tools for the integration and harmonization of air quality data protocols, QA/QCs, data flow, upgrading and adjustment of existing data protocol systems for 10 operating automatic monitoring stations installed in urban areas until 2006 within state monitoring network.

7. Implementation Schedule
### Table: Tendering and Project Dates

<table>
<thead>
<tr>
<th>Equipment supply</th>
<th>Start of Tendering</th>
<th>Start of project activities</th>
<th>Project completion</th>
</tr>
</thead>
</table>

#### 7.1 Start of tendering/call for proposals
Expected start of tendering is October 2006

#### 7.2 Start of project activity
Expected date of commencement of contract is April 2007

#### 7.3 Project completion
Completion period expires: November 2008

#### 8. Equal Opportunity
Based on the fundamental principles of promoting equality and combating discrimination, participation in the project will be guaranteed on the basis of equal access regardless of sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation.

Specifically in relation to the issue of equality between men and women, Croatia's population (2001 census) constitutes 51.87% women and 48.13% men, with those in active employment (based on Labour Force Survey statistics, conducted in accordance with ILO methodology, for the second half of 2002) divided 45.31 % women and 54.69% men.

All contractors shall be requested to provide monitoring data recording the participation of men and women in terms of expert inputs (in days) and of trainees benefiting under the project (in days) as an integral component of all project progress reports.

Equal participation of man and woman during the implementation of the project will be assured.

#### 9. Environment
The project will not have any negative effects on the environment. The project will implement a part of the European environmental policy. For this project is not obligatory to perform environmental impact assessment.

#### 10. Rates of return:
*Not applicable*

#### 11. Investment criteria *(applicable to all investments)*
11.1 Catalytic effect
Due to the limited budget incomes and high state needs, state budget financing in the field of air quality in Croatia is limited on cca 3 mil. kn per year. In last 3 years Government has provided financial means for the establishment and 8 urban monitoring stations in place within the state air quality monitoring network. For completing of National Air Quality Network before 2007 (2010) and its implementation, additional ED financing is essential.

11.2 Co-financing
For needed 25% of the total eligible public expenditure national co-financing is ensured (M€, see 5. Detailed Budget).

11.3 Additionality
Not applicable

11.4 Project readiness and size
Not applicable

11.5 Sustainability
Not applicable

11.6 Compliance with state aids provisions
Not applicable

12. Conditionality and sequencing
Conditions that have to be fulfilled prior to the commencement of the project include

<table>
<thead>
<tr>
<th>Action to be taken</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working agreement between MHS and MEPPPC</td>
<td>MEPPPC and MHS</td>
<td>May 2006</td>
</tr>
<tr>
<td>Adjustment of organizational structure and personnel and personnel policy development</td>
<td>MEPPPC and MHS</td>
<td>September 2006</td>
</tr>
<tr>
<td>Final evaluation of locations for measurement stations</td>
<td>MEPPPC and MHS</td>
<td>March 2006</td>
</tr>
<tr>
<td>Final decision on air quality measurement programme for each station</td>
<td>MEPPPC</td>
<td>March 2006</td>
</tr>
<tr>
<td>Attainment of permits for the construction work at measurement sites</td>
<td>MEPPPC</td>
<td>July 2006</td>
</tr>
<tr>
<td>Protocol on data distribution to the Croatian</td>
<td>MEPPPC, MHS and CEA</td>
<td>December 2006</td>
</tr>
</tbody>
</table>
Most important milestones of the project:

– Timely completed construction works,
– Maintain the dynamic of timely contracting and purchase according to the timetable,
– Equipment installation completed by September of 2007, testing completed by March 2008,
– Training and education of all involved.
## ANNEX I

Logical framework in standard format

<table>
<thead>
<tr>
<th>LOGFRAME PLANNING MATRIX FOR Project</th>
<th>Programme name and number</th>
<th>Total budget</th>
<th>Phare budget: 2,387 M €</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of State Air Quality Monitoring and Management System</td>
<td>Contracting period expires: 31/11/2008</td>
<td>2,95 Phare budget</td>
<td>Execution of contracts period expires: 30/11/2009</td>
</tr>
</tbody>
</table>

### Overall objective

To develop air quality monitoring and management system in order to implement and execute environmental *acquis*, support exchange of information and increase public awareness

<table>
<thead>
<tr>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Compliance with the Acquis Coimmunautaire for the environmental sector</td>
<td>• Fulfilment of reporting requirements</td>
</tr>
<tr>
<td>• Access to data and related information</td>
<td></td>
</tr>
</tbody>
</table>

### Project purpose

To contribute to establishment of a national air quality monitoring and management system according to requirements of Framework Council Directive 96/62/EC on Ambient Air Quality Assessment and Management and Daughter Directives 99/30/EC, 2002/3/EC and 2004/107/EC.

<table>
<thead>
<tr>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Air quality measurement data</td>
<td>• Annual report on air quality for national monitoring network</td>
</tr>
<tr>
<td>• Access to data</td>
<td>• Fulfilment of reporting requirements</td>
</tr>
<tr>
<td>• Fulfilment of reporting requirements</td>
<td></td>
</tr>
</tbody>
</table>

### Assumptions

• Active involvement of all stakeholders
• Inter-service agreements between the MEPPC, CEA & MHS established

### Results

- Establishment and equipment of 12 monitoring stations;
- Chemical laboratory upgrading and equipment;
- Development and implementation of measurement protocols, transmission, acquisition, quality assurance and quality control systems for air quality data;
- Development and implementation of a system for collection,

<table>
<thead>
<tr>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number of stations, number of collected samples</td>
<td>• Daily, weekly and monthly sampling protocol</td>
</tr>
<tr>
<td>• Number of measurement parameters and indicators</td>
<td>• Data report on in situ measurement</td>
</tr>
<tr>
<td>• Number of laboratory</td>
<td>• Report on</td>
</tr>
</tbody>
</table>

### Assumptions

• Effective management of Air Pollution Monitoring Network in Croatia
• Active involvement of stakeholder
• Protocol on data distribution to the Croatian Environment Agency (CEA) agreed
transmission and data acquisition, development of data base and tools;  
- Improved quality and density of information on the air quality.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Means</th>
<th>Costs</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preparation of project documents for locations of measurement stations</td>
<td>1. Supply/Investment contract</td>
<td>Estimated costs:</td>
<td>Organization of work and management of project by MHS personnel, participation in thematic workshops and training programs, completion of accreditation procedures for conducting of monitoring and laboratory work</td>
</tr>
<tr>
<td>3. Preparation of technical documentation, procurement and installation of technical equipment at measurement stations</td>
<td></td>
<td>TA = 0,7 M€</td>
<td></td>
</tr>
<tr>
<td>4. Installation of laboratory instruments/analyzers at MHS Chemical laboratories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Installation of calibration units/instruments at MHS Calibration laboratories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Preparation of technical documentation, procurement and installation of data acquisition system (hardware and software)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Training and workshops for air quality monitoring data/information users</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preconditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Involvement of all stakeholders,</td>
</tr>
<tr>
<td>2. Working agreement with Meteorological and Hydrological Service (MHS)</td>
</tr>
<tr>
<td>3. Final evaluation of locations for measurement stations done by the Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC)</td>
</tr>
<tr>
<td>4. Attainment of permits for the construction work at measurement stations</td>
</tr>
<tr>
<td>5. Air quality measurement programme adopted by the Minister of Environmental Protection, Physical Planning and Construction</td>
</tr>
</tbody>
</table>
ANNEX II

C - Contract; I - implementation; T – tender

Annex 2: Indicative Implementation Chart by quarters

<table>
<thead>
<tr>
<th>Project Title: Air quality monitoring and management system</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>Contract 1 (Purchase)</td>
<td></td>
<td>T</td>
<td>T</td>
<td>C</td>
<td>I</td>
</tr>
<tr>
<td>Contract 2 (TA &amp; training)</td>
<td></td>
<td></td>
<td>T</td>
<td>T</td>
<td>C</td>
</tr>
</tbody>
</table>
## ANNEX III

### Annex 3 – Contracting and Disbursement Schedule (PHARE funding only)

#### Project Title:
- **Air quality monitoring and management system**

#### Cumulative contracting schedule by quarters in EUR (provisional)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VI I</td>
<td>II I</td>
<td>III I</td>
<td>IV I</td>
</tr>
<tr>
<td>Contract 1. (supply)</td>
<td>1.687</td>
<td>1.687</td>
<td>1.687</td>
<td>1.687</td>
</tr>
<tr>
<td>Contract 2. (technical assistance)</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>TOTAL (MEUR):</strong></td>
<td><strong>1.687</strong></td>
<td><strong>2.387</strong></td>
<td><strong>2.387</strong></td>
<td><strong>2.387</strong></td>
</tr>
</tbody>
</table>

#### Cumulative disbursement schedule by quarters in EUR (provisional)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VI I</td>
<td>II I</td>
<td>III I</td>
<td>IV I</td>
</tr>
<tr>
<td>Contract 1. (supply)</td>
<td>1.15</td>
<td>1.25</td>
<td>1.35</td>
<td>1.45</td>
</tr>
<tr>
<td>Contract 2. (technical assistance)</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>TOTAL (MEUR):</strong></td>
<td><strong>1.15</strong></td>
<td><strong>1.25</strong></td>
<td><strong>1.75</strong></td>
<td><strong>1.95</strong></td>
</tr>
</tbody>
</table>

**AMOUNTS IN MEUR**
ANNEX IV

For all projects: reference list of feasibility/pre-feasibility studies, in-depth ex ante evaluations or other forms of preparatory work. For all investment projects, the executive summaries of economic and financial appraisals, environmental impact assessments, etc, should be attached (compulsory).

Preparatory work and pre-feasibility study for this project has been conducted by Meteorological and Hydrological Service (as the implementation agency) in cooperation with the Ministry of Environmental Protection, Physical Planning and Construction on the basis of:

- Technical cooperation project supported by the Government of Japan, 2003 only: "Establishment of the National Network for Permanent Air Quality Monitoring in the Republic of Croatia".
- Activities conducted under the "Co-operative programme for monitoring and evaluation of the long range transmission of air pollutants in Europe" of LRTAP Convention, 1992-2006 (permanent activity).
- Activities conducted under the "Global Atmosphere Watch Programme" of World Meteorological Organization (permanent activity of MHS).

Activities under these programmes comprised:

- analysis and assessment of air pollution conditions based on precipitation quality, modelling and evaluation of transmission and deposition of atmospheric pollutants for Croatian territory,
- assessment of monitoring needs and costs,
- assessment of needs for laboratory equipment,
- regular participation in programmes' activities, meetings and workshops, training and education.

Evaluation of investment costs is given in the table, M€:

<table>
<thead>
<tr>
<th>Art.</th>
<th>Pes.</th>
<th>Description</th>
<th>Unit cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Sulphur dioxide analyser</td>
<td>0,010</td>
<td>0,010</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Nitrogen oxides analyser</td>
<td>0,010</td>
<td>0,010</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Carbon monooxide analyser</td>
<td>0,010</td>
<td>0,010</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>BTX analyzer</td>
<td>0,030</td>
<td>0,030</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Gas sampling system</td>
<td>0,001</td>
<td>0,001</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Calibration set</td>
<td>0,015</td>
<td>0,015</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Standard Container</td>
<td>0,009</td>
<td>0,100</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Ozone analyser</td>
<td>0,008</td>
<td>0,064</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Filter - 3 pack system with air intake, pump and gas meter</td>
<td>0,009</td>
<td>0,108</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>VOC, light hydrocarbons</td>
<td>0,015</td>
<td>0,060</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>Wet-only sampler</td>
<td>0,010</td>
<td>0,240</td>
</tr>
<tr>
<td>7</td>
<td>PM10 analyser - continuous measurement</td>
<td>0.016</td>
<td>0.112</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PM2,5 analyser - continuous measurement</td>
<td>0.016</td>
<td>0.112</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PM-10 High volume sampler</td>
<td>0.030</td>
<td>0.210</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PM-2.5 High volume sampler</td>
<td>0.016</td>
<td>0.112</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Combined speed-direction ultrasonic anemometer 2D</td>
<td>0.001</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Temperature and relative humidity sensor</td>
<td>0.001</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Solar radiation sensor (pyranometer)</td>
<td>0.002</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Atmospheric pressure sensor</td>
<td>0.001</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rain quantity sensor</td>
<td>0.001</td>
<td>0.009</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DAS - Data Acquisition System for station</td>
<td>0.006</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Network outputs - internet connection</td>
<td>0.010</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>CAS Software - Specialized software for workstation I server</td>
<td>0.130</td>
<td>0.130</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Communication - modem GPRS or modem ADSL with router and firewall for measuring station</td>
<td>0.000</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Ion Chromatograph (IC)</td>
<td>0.060</td>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Gas Chromatograph (GC-MS)</td>
<td>0.125</td>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Atomic Absorption Spectrophotometer with graphic furnace (AAS-GF)</td>
<td>0.060</td>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Inductively coupled plasma mass spectrometry (ICP-MS)</td>
<td>0.120</td>
<td>0.120</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Water cleaning system</td>
<td>0.150</td>
<td>0.150</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Cleaning system for canisters (VOG)</td>
<td>0.020</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Trainings for chemical equipment installation and maintenance</td>
<td>0.012</td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SO2 calibration mixture</td>
<td>0.001</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NO calibration mixture</td>
<td>0.002</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CO calibration mixture</td>
<td>0.001</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>BTX calibration mixture</td>
<td>0.001</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Secondary flow meters</td>
<td>0.008</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Sulphur dioxide analyser</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Nitrogen oxides analyser</td>
<td>0.012</td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Ozone analyser</td>
<td>0.010</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Carbon monoxide analyser</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>BTX analyser</td>
<td>0.030</td>
<td>0.030</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Calibration set for the laboratory</td>
<td>0.018</td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>UV Photometer for the laboratory</td>
<td>0.090</td>
<td>0.090</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dilution equipment for sulphur dioxide</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dilution equipment for nitrogen oxides</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dilution equipment for BTX</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dilution equipment for carbon monoxide</td>
<td>0.011</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Software for calibration lab</td>
<td>0.025</td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Trainings for Calibration Lab equipment</td>
<td>0.028</td>
<td>0.028</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>2.25</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL PHARE</strong></td>
<td></td>
<td><strong>1.687</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL STATE BUDGET</strong></td>
<td></td>
<td><strong>0.563</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANNEX V

Reference list of relevant laws and regulations (compulsory)

- Environmental Protection Act
  Published in «Narodne novine» (Official Gazette – hereinafter referred to as OG)
  No.82/94, 128/99.
- National Environmental Strategy (OG No. 46/02)
- National Environmental Action Plan (NEAP) (OG No. 46/02)
- Ordinance on Environmental Impact Assessment (OG No. 59/00, 136/04)
- Regulation on Environmental Information System (OG No.74/99, 79/99)
- Regulation on Conditions for Issuing Permits for Performing Professional Environmental Activities (OG No. 7/97)
- Regulation on Environmental Emission Inventory (OG No.36/96)
- Instructions on the Form, the Tenor and the Manner of Keeping Records of Inspections Performed by Environmental Inspectors (OG No. 79/95)
- List of Legal Persons with Granted Approval for Performing Professional Environmental Activities (OG No. 187/03)
- Regulation on the Establishment of the Environment Agency (OG No. 75/02)
- Access to Information Act, (OG 172/03)
- Act on Physical Planning (OG 30/94; 68/98; 35/99; 61/00; 32/02; 100/04)
- Ordinance on exceptions form Physical Planning Permits Issuing (OG 66/04; 138/04)
- Act on Construction (OG 175/03; 100/04)

AIR

- Air Protection Act (OG No. 48/95, 178/04), applied from 31st March 2005
- Regulation on Limit Values of Pollutant Emissions from Stationary Sources into the Air (OG No. 140/97, 105/02, 108/03, 100/04)
- Regulation on Sitting of National Network Stations for Continuous Air Quality Monitoring (OG No. 4/02)
- Programme on Air Quality Measurement in the National Air Quality Monitoring Network (OG No. 43/02)
- Regulation on Limit Values of Pollutants in Ambient Air (OG 133/05)
- Regulation on Alert Thresholds of Pollutants in Ambient Air (OG 133/05)
- Regulation on Ozone in Ambient Air (OG 133/05)
- Ordinance on Air Quality Monitoring, (OG 155/05)
- Ordinance on Emission Monitoring from Stationary Sources (OG 1/06)
- Regulation on Conditions for Issuing Permits for Performing Professional Environmental Activities (OG 07/97)
- Regulation on Quality Standards for Liquid Oil Fuels (OG No. 83/02, 100/04, 117/04, 159/04)
- Regulation on Quality Standards for biofuels (OG No. 141/05)
ANNEX VI

Reference list of relevant strategic plans and studies (may include institution sector strategies, development plans, business development plans, etc) (compulsory)

- National Environmental Strategy (OG No. 46/02)
- National Environmental Action Plan (NEAP) (OG No. 46/02)
- 2005 PRE-ACCESION ECONOMIC PROGRAMME FOR CROATIA