# Standard Summary Project Fiche

## 1. Basic Information

**CRIS Number: 2004/016-925/03-01**

1.1 Title: Strengthening of Lithuanian institutional capacities in ambient air quality modelling and forecasting

1.2 Sector: Environment

1.3 Location: Lithuania

## 2. Objectives

2.1 Overall Objective:

The overall objective of this **0.827 MEUR** institutional strengthening and investment project, of which **0.062 MEUR** is provided from the national co-financing, is to support the implementation of the Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent Daughter Directives (1999/30/EC, 2000/69/EC, 2002/3/EC).

2.2 Project purpose:

To support air quality modelling process and to provide the meteorological input required by air pollution diffusion models of different spatial resolution.

2.3 Justification

Comprehensive Monitoring Report on Lithuania's preparations for membership of November 2003 states, that "In the air quality sector legislation is in place and in line with the *acquis*. Administrative capacities are in place and function adequately. Air quality plans and programmes have been developed, but the identification of zones and agglomerations where thresholds are exceeded needs to be re-evaluated by accession. Monitoring needs to be enhanced by accession".

The European Union's Progress Monitoring Report Year 6 – 2003 (Country Report Lithuania), (in section "Critical Review of Transposition and Implementation") summarised the status of transposition and implementation per environment sector, including analysis on progress made till 2003, as well as challenges ahead to ensure full implementation upon accession. It is here stated that Lithuania continues to make excellent progress in transposition of the air sector, with virtually all EC requirements likely to be fully transposed by the end of 2003. Finalization for implementation for all Directives in the air sector is planed by the end of 2004, apart from the Stage One VOCs Directive and the National Emission Ceilings Directive. Finalisation of the Ambient Air Quality Framework Directive and its Daughter Directives will include the drawing up of air quality improvement programmes, establishment of an inspection and enforcement system, and virtually full implementation of the Ozone in the Ambient Air Directive.

For the implementation of the Framework Directive on the ambient air quality assessment and management (96/62/EC) and subsequent Daughter Directives (1999/30/EC, 2000/69/EC, 2002/3/EC), the key tasks involved are:

- To establish ambient air quality monitoring programme that should include sampling and analytical methodologies;
- Where there are no representative measurements for all zones and agglomerations, to undertake a preliminary assessment of the air quality including modelling techniques to supplement monitoring.

## 3. Description

### 3.1 Background and justification:

In the sphere of ambient air quality monitoring, actual quantitative meteorological indicators are not reliable due to outdated observational equipment and primitive data transmission technologies. Seeking implementation of the Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent Daughter Directives (1999/30/EC, 2000/69/EC, 2002/3/EC) in the field of ambient air quality modelling and forecasting, it is necessary to obtain meteorological observational data on an hourly basis as well as upper-air sounding data and to apply uniform methods of processing meteorological information used in different models.

Harmonisation of the pre-processing of meteorological data for atmospheric dispersion models, in order to fulfil requirements for model use, is a very important issue of the European air quality management policy.

Creation of the ambient air quality monitoring, modelling and forecasting system requires reliable and continuous meteorological observations as well as operational transmission, processing and analysis of the observational data. Well-designed air quality monitoring network are crucial for efficient and cost effective assessment and management of the air quality.

The present meteorological network of Lithuania comprises 18 meteorological stations including 7 belonging to European RBSN (Regional Basic Synoptic Network). Actual observations include air temperature, wind parameters, air humidity values, atmospheric pressure, precipitation and their intensity, sunshine duration, meteorological parameters of the soil, etc. Following the World Meteorological Organizations (WMO) guidelines, the observations are carried out every 3 hours. Actually, the data are processed manually that precludes their effective use for the ambient air quality management, especially in cases of emergency exhaust of pollutants from potentially dangerous sites.

More frequent data acquisition and automated observations (and thus better data reliability) enable more detailed and reliable analysis, forecasting and management of the ambient air quality. As regards monitoring capacity in the air sector, the automated air quality data acquisition and processing system has been implemented already by April 2002. However, no projects in the field of meteorological observations directly related to the air pollution have been carried out in Lithuania.

The existing system of meteorological observations does not conform to modern requirements since both observations and analysis are performed using outdated equipment with data acquisition and storage being done manually due to the lack of precision measuring equipment, computers and software. Therefore, this project is dedicated to the meteorological observations capacity building by modernization of related equipment, instruments and observing stations. Since the air quality assessment includes multiple parameters, it is necessary to assess the atmospheric circulation processes, the course of meteorological elements and regularities of their change in real-time mode. The fundamental parameters that determine the structure of the atmospheric boundary layer are very complex and the difficulties of obtaining reliable values for application to dispersion models require investigating current methods and recommending them for estimating these parameters. Dispersion models require meteorological inputs which are not routinely measured at meteorological monitoring stations, therefore a pre-processing of routinely observed meteorological parameters is necessary before dispersion models can be run.

### 3.2 Linked activities:

A number of projects related to the air quality management and legislation were carried out in Lithuania, but no one of them was directly related to the ambient air quality modelling and forecasting. As regards the air sector management, the deliverables and experience of the following set of projects have been used:

- Strengthening of Environmental Monitoring Capacities (1999, Phare, L199/IB/EN-01);
- Long Term Assistance on Information and Reporting. Information Management Programme (2002, Danish Environmental Protection Agency);
- Environmental Policy Development and Regulatory Capacity Building Programme in Air Sector (1999, The World Bank).

But this project is complementary for the PHARE 2003.004-341.04.02 project “Preparation of national emission reduction and ambient air quality assessment programmes”, which shall support Lithuania to use systematic air quality assessment and quality modelling tools and enable more efficient air quality management. The necessary measures for atmospheric modelling are included in the mentioned PHARE project to be implemented by the Environment Protection Agency (EPA) of the Ministry of Environment (MoE) that provides for strengthening of administrative capacities of the EPA. Therefore, development of the automatic meteorological observing network and obtaining of hourly surface weather data, will strongly contribute in achievement of expected air quality assessment and quality modelling results.

### 3.3 Results:

The following results will be achieved under the activities of this project:

1. The requirements of relevant EU Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent daughter directives (1999/30/EC, 2000/69/EC, 2002/3/EC) for the qualitative air pollution modelling and management implemented.
2. Sophisticated assessment of the area affected by the ambient air pollution and its forecast provided.
3. Part of meteorological observation network to collect real-time meteorological data implemented and automated .
4. Meteorological data processing and management system designed for use with particular dispersion models developed.
5. Gained new knowledge and experience to process, analyse, forecast and provide models users with appropriate meteorological information.
6. Effective emergency management in cases of emergency release of pollutants to the atmosphere and from potentially dangerous sites.
7. Equipment required for the modernization of meteorological stations, meteorological data collection and transmission, and strengthening of administrative capacities purchased and operational.

### 3.4 Activities:

The implementation of the project activities will consist of two parts:

- Technical assistance;
- Supply.

*Technical assistance*

It is proposed to implement project activities as an integral part of necessary measures for atmospheric modelling to be implemented by the EPA. Therefore, the implementation of the project tasks requires specific professional expertise and a substantial number of local experts, which would to effectively achieve all its expected outputs.

The following activities are foreseen for technical assistance component:

1. Review and update, in accordance with air quality modelling requirements, the existing meteorological data observation, collection and analysis; a cost / benefit assessment of upgrading old meteorological network.
2. Processing of routinely observed meteorological variables, estimation of unmeasured meteorological parameters and the climatological processing of data necessary for dispersion models to be run.
3. Investigation of current methods for application of meteorological information to dispersion model.
4. Preparation of training programme for observing and technical/supporting staff to operate upgraded facilities and to provide meteorological input for the ambient air quality modelling and forecasting.
5. Training of relevant staff (at least 25 persons), to operate with new equipment and maintain the modernized systems and better provide meteorological information for all economical sectors and general public.

6. Assistance in reviewing, updating and finalisation of specifications and tender documentation for special hardware and software, measurement instruments, meteorological stations maintenance.
7. Assistance in organizing of the tender for purchase of equipment and evaluation of tender bids.
8. Purchase and installation of equipment.

The Technical Assistance project will be carried out with the help of one long - term expert (LTE) over a period of approximately 10 months together with short - term experts (STE) for approximately 6 man/months of EU experts and approximately 12 man/months of local experts.

**Profile of LTE.** The EU LTE should provide overall management of the project and strategic institutional support across the ambient air quality and meteorological sector. She/he will be requested to be aware of EU AQ Directives, WMO requirements and mechanisms, have knowledge and experience of the EU approximation process as well as to be familiar with relevant international developments related to the project activities.

The LTE shall have University degree (degree in meteorology or related sciences will be acknowledged as advantage) and at least 5 years of adequate experience in the field related to ambient air quality and meteorology including managerial experience. The LTE will work in close co-operation with the management and staff of the Lithuanian Hydrometeorological Service and the Environmental Protection Agency under the Ministry of Environment of the Republic of Lithuania.

Other skills – fluent in English, good general computer knowledge, familiar with specific meteorological applications (preferably in field of ambient air pollution meteorology).

LTE should pay attention to ensure the active participation of local professional skills where available, and a suitable mix of international and local staff in the project team.

**Profile of STEs.** The STEs should have appropriate experience in the different areas relevant to automated meteorological equipment, meteorological data collection, transmission, processing, air pollution meteorology and be able to cover all the activities foreseen under this component.

The STEs will provide assistance in:

- reviewing and updating the existing meteorological observation network and data collection, processing and analysis system and final cost/benefit assessment of upgrading old meteorological network;
- application softwares for meteorological data, transferring, processing;
- pre-processing meteorological input data for the ambient air quality modelling and forecasting;
- preparation of training programme;
- training of relevant staff to operate and maintain the modernized systems and better provide meteorological information for all users and general public;
- reviewing, updating and finalisation of specifications and tender documentation for special hardware and software, measurement instruments, meteorological stations maintenance;
- purchase and installation of project hardware and software equipment.

**Key expert 1 - Meteorologist**

*Qualifications and skills*

- University degree, preferably in meteorology or related natural sciences
- fluent in English

*General professional experience*

- minimum 5 years professional experience in the field of meteorology and forecasting

*Specific professional experience*

- knowledge in field of meteorological applications and modeling (preferably in air pollution meteorology and data processing)
- good knowledge and relevant expertise of work with national/international meteorological and environmental organizations

**Key expert 2 - Measurement systems expert**

*Qualifications and skills*

- University degree, preferably in automation engineering or related applied sciences
- fluent in English

*General professional experience*

- minimum 5 years of professional experience in the field of meteorological observation systems

*Specific professional experience*

- minimum 5 years work experience in the field of meteorological observations
- good knowledge and relevant expertise of work with national/international observation networks

**Key expert 3 - Computer Engineer**

*Qualifications and skills*

- university degree, preferably in information technologies (IT) or related applied sciences
- fluent in English.

*General professional experience*

- minimum 4 years professional experience

*Specific professional experience*

- has good knowledge in the field of meteorological or environmental data processing, data transferring networks

*Supply*

Equipment required for the modernisation of meteorological stations, meteorological data collection and transmission, and strengthening of administrative capacities, will be purchased under supply component. Hardware and software for development of the meteorological data processing and transmission programmes will also be supplied and installed with the assistance of the short-term experts.
(Indicative list of the equipment is presented in the Annex 4).

3.5 Lessons learned:

The conclusions and recommendations from the previous (see 3.2 Linked Activities) projects reports concerning the need for activities, which are foreseen to be implemented under this project, have been considered.

Strengthening of the capacities in the air sector was achieved with EC Phare 1999 project “Strengthening of the Monitoring Capacities in Lithuania”. One of outputs related to this project concerning survey and development of air data management in Lithuania will be fully taken into account implementing this project.

The output concerning developing of existing national data collecting system from the project “Long Term Assistance on Information and Reporting. Information Management programme” related to this project will be taken into account.

## 4. Institutional Framework

Lithuanian Hydrometeorological Service (LHMS) under the Ministry of Environment is the final beneficiary and together with the Environmental Protection Agency (EPA) of the Ministry of Environment as indirect beneficiary will be responsible for co-ordination of the project implementation.

Project implementation will involve day-to-day contacts with relevant divisions of the above institutions: with LHMS’s Meteorological Division consisting of 6 employees and EPA’s Air Quality Management Department. Currently, 3 employees in the EPA are responsible for the issues concerning air quality assessment and management.

The implementation of this project will be supervised by a Steering Committee appointed by the Ministry of Environment (MoE) and consisting of representatives of the stakeholder departments of the MoE. A representative of the EC Delegation and National Aid Co-ordinator (NAC) will be invited to participate as observers. Steering Committee will hold its meetings in order to follow-up and monitor project implementation.

LHMS capacities to observe and forecast meteorological parameters will be strengthened through the modernisation and automation a part of its observing station network, data transmission and processing systems. Also, the very important output will be the necessary training of relevant staff, which should be able to operate and maintain the modernized systems and better provide meteorological information for all economical sectors and general public. Therefore, the EPA of MoE will be the second beneficiary of this project through access to the necessary meteorological information for the ambient air quality monitoring process modelling, forecasting and management.

## 5. Detailed Budget (in MEUR)

| | **Transition Facility** | **Support** | | | | |
|---|---|---|---|---|---|---|
| | Investment Support | Institution Building | **Total TF(=I+IB)** | **National Co-financing** | **IFI*** | **TOTAL** |
| Technical assistance | | 0.58 | 0.58 | | | 0.58 |
| Supply | 0.185 | | 0.185 | 0.062 | | 0.247 |
| Total | **0.185** | **0.58** | **0.765** | **0.062** | | **0.827** |

## 6. Implementation Arrangements

6.1 Implementing Agency

PAO: Aloyzas Vitkauskas, Director of the CPMA

| | | | |
|---|---|---|---|
| Address: | J. Tumo Vaizganto 8a/2 | Telephone: | + 370 5 2514400 |
| | 2600 Vilnius | Fax: | + 370 5 2514401 |
| | Lithuania | E-mail: | Info@cfcu.lt |

The beneficiary institution is the Lithuanian Hydrometeorological Service under the Ministry of Environment and the following person is the responsible officer for the Project and the main contact point:

| | | | |
|---|---|---|---|
| | Vytautas Bernadisius | Telephone: | +370 5 2 75 12 83 |
| Address: | A. Jaksto 4/9 | Fax: | +370 5 2 75 03 09 |
| | 2600 Vilnius | E-mail: | vytautasb@meteo.lt |
| | Lithuania | | |

6.2 Twinning

There is no Twinning component in the project.

6.3 Non-standard aspects

There are no non-standard aspects to this project. The project will be implemented according to the EDIS procedures.

6.4 Contracts

1. Technical assistance tender: 0.58 MEUR
2. Supply tender: 0.246 MEUR, including 0.062 MEUR of national co-financing

## 7. Implementation Schedule

| Component | Start of Tendering | Start of Project Activity | Project Completion |
|---|---|---|---|
| Technical assistance | 3Q/04 | 1Q/05 | 4Q/05 |
| Supply | 1Q/05 | 3Q/05 | 4Q/05 |

## 8. Sustainability

In order to ensure sustainability of the present project regarding automation of meteorological observations, data pre-processing and transmission facilities, the Lithuanian Hydrometeorological Service under the Ministry of Environment (LHMS) has foreseen necessary strengthening/restructuring of its trained meteorological and technical/supporting staff. To this end, no additional human and financial resources will be required. Also, LHMS has provided in its budget estimates for necessary maintenance and updating of the supplied equipment.

## 9. Conditionality and sequencing

The project is conditional on co-financing being available for the supply component of the project.

## ANNEXES TO PROJECT FICHE

1. Logical framework matrix in standard format
2. Detailed implementation chart
3. Contracting and disbursement schedule by quarter for full duration of programme
4. Indicative list of the equipment needs to be financed under the Project

| **Annex 1**<br><br>**LOGFRAME PLANNING MATRIX FOR**<br>Project:<br><br>**Strengthening of Lithuanian institutional capacities in ambient air quality modelling and forecasting** | | Programme Name and number:<br>Transition Facility | |
|---|---|---|---|
| | | Contracting Period Expires:<br>3Q/2006 | Disbursement Period Expires:<br>3Q/2007 |
| | | Total Budget:<br>0.827 MEUR | Transition Facility Budget:<br>0.765 MEUR |
| **Overall Objective**<br><br>To support the implementation of the Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent Daughter Directives (1999/30/EC, 2000/69/EC, 2002/3/EC) | **Objectively Verifiable Indicators**<br><br>EU requirements for modelling techniques as defined in the Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent daughter directives (1999/30/EC, 2000/69/EC, 2002/3/EC) are met". | **Source of Verification**<br><br>Documents of the Ministry of Environment<br>Documentation of LHMS | |
| **Project Purpose**<br><br>To support air quality modelling process and to provide the meteorological input required by air pollution diffusion models of different spatial resolution | **Objectively Verifiable Indicators**<br><br>Meteorological data processing and management system for automated observing stations developed at least for 20 % of network<br><br>Reliability of meteorological forecasts increased to reach till 95% | **Source of Verification**<br><br>Documents of the Ministry of Environment<br><br>EC Delegation to Lithuania<br>Documentation of LHMS<br>Progress reports | **Assumptions**<br><br>Other MoE institutions concerned are willing to co-operate |

| Results | Objectively Verifiable Indicators | Source of Verification | Assumptions |
|---|---|---|---|
| 1. The requirements of relevant EU Framework Directive on ambient air quality assessment and management (96/62/EC) and subsequent daughter directives (1999/30/EC, 2000/69/EC, 2002/3/EC) for the qualitative air pollution modelling and management implemented.<br>2. Sophisticated assessment of the area affected by the ambient air pollution and its forecast provided.<br>3. Part of meteorological observation network to collect real-time meteorological data implemented and automated .<br>4. Meteorological data processing and management system designed for use with particular dispersion models developed.<br>5. Gained new knowledge and experience to process, analyse, forecast and provide models users with appropriate meteorological information.<br>6. Effective emergency management in cases of emergency release of pollutants to the atmosphere and from potentially dangerous sites.<br>7. Equipment required for the modernization of meteorological stations, meteorological data collection and transmission, and strengthening of administrative capacities purchased and operational. | 3 types models applied for air quality assessment and management in the entire zone and two agglomerations<br><br>At least 3 sets of meteorological data in standard formats that are used with particular dispersion models, meteorological data pre-processing programmes, computerized data base<br><br>Trained staff – 25 specialists<br><br>A number of meteorological stations modernized (at least 4 stations) | Ministry of Environment, EPA, LHMS<br>Steering Committee for the project<br><br>Project Reports<br>Local authorities (municipalities) | |

| Activities | Means | Assumptions |
| --- | --- | --- |
| 1. Review and update, in accordance with air quality modelling requirements, the existing meteorological data observation, collection and analysis; a cost / benefit assessment of upgrading old meteorological network.<br>2. Processing of routinely observed meteorological variables, estimation of unmeasured meteorological parameters and the climatological processing of data necessary for dispersion models to be run.<br>3. Investigation of current methods for application of meteorological information to dispersion model.<br>4. Preparation of training programme for observing and technical/supporting staff to operate upgraded facilities and to provide meteorological input for the ambient air quality modelling and forecasting.<br>5. Training of relevant staff (at least 25 persons), to operate with new equipment and maintain the modernized systems and better provide meteorological information for all economical sectors and general public.<br>6. Assistance in reviewing, updating and finalisation of specifications and tender documentation for special hardware and software, measurement instruments, meteorological stations maintenance.<br>7. Assistance in organizing of the tender for purchase of equipment and evaluation of tender bids.<br>8. Purchase and installation of equipment. | 1. Technical Assistance tender (EU LTE for 10 months and short term EU and local experts for approximately 18 months<br>: approximately 6 man/months of EU experts and approximately 12 man/months of local experts).<br>2. Supply tender. | Qualified and capable company with relevant experience, EU and local experts are selected to implement the project |
| | | **Preconditions**<br>Co-financing is available. |

**Annex 2**

## Detailed Implementation Chart for the Project

| Year | 2004 | | | | | | | | | | | | 2005 | | | | | | | | | | | | 2006 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Technical assistance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Supply | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

design

tendering

implementation

**Annex 3**

CUMULATIVE CONTRACTING AND DISBURSEMENT SCHEDULE (PHARE Contribution only, MEUR)

| | 2004 | | | | 2005 | | | | 2006 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 31/03 | 30/06 | 30/09 | 31/12 | 31/03 | 30/06 | 30/09 | 31/12 | 31/03 | 30/06 | 30/09 | 31/12 |
| *Contracting* | | | | | | | | | | | | |
| • Technical assistance | | | | | 0.58 | | | | | | | |
| • Supply | | | | | | | 0.185 | | | | | |
| Total contracting (cumulative) | | | | | **0.58** | | **0.185** | | | | | |
| *Disbursement* | | | | | | | | | | | | |
| • Technical assistance | | | | | 0.348 | 0.348 | 0.348 | 0.348 | 0.58 | | | |
| • Supply | | | | | | | 0.111 | 0.167 | 0.185 | | | |
| Total disbursement (cumulative) | | | | | **0.348** | **0.348** | **0.459** | **0.515** | **0.765** | | | |

**Annex 4**

Indicative list of the equipment needs to be financed under the Project

| No | Component | Indicative Phare Budget (MEUR) | Indicative national co-financing (MEUR) | Total budget (MEUR) |
|---|---|---|---|---|
| 1 | High speed meteorological data transferring network | 0.0117 | 0.0035 | 0.0152 |
| 2 | Hardware and software for meteorological data pre-processing at observing stations and transmission in accordance with WMO requirements to the meteorological data centre | 0.0057 | 0.0025 | 0.0082 |
| 3. | Automatic measurements equipment for meteorological stations | 0.0876 | 0.0295 | 0.118 |
| 4. | Hardware and software for data acquisition and processing to provide meteorological input for atmospheric dispersion modelling | 0.026 | 0.009 | 0.035 |
| 5. | Equipment necessary for maintenance, testing, validation of automated meteorological stations | 0,054 | 0,0166 | 0,0706 |
| | **Total** | **0.185** | **0.062** | **0.247** |