STANDARD SUMMARY PROJECT FICHE

Project Number 2002/000.601.05.01

1. Basic Information

1.1	**CRIS-number:**	**2002/000.601.05.01**
1.2	**Title:**	Development and Implementation of Integrated Computerised Information System for Environmental Management. (ICISEM)
1.3	**Sector:**	Environment
1.4	**Location:**	Ministry of Environment, Lithuania

2. Objectives

2.1 Overall Objective:

The wider objective of this **2.975 MEUR** Phare project, of which **0.469 MEUR** is national co-financing, is to strengthen the institutional capacity of the Ministry of Environment of Lithuania to comply with the EU Acquis in the field of environmental information management and reporting.

2.2 Project Purpose:

The project will have the following purposes:

- To strengthen capacities of responsible authorities to comply with the requirements of the EU Council Directives and regulations:
  - on the Freedom of Access to Information on the Environment (90/313/EEC), on Standardising and Rationalising Reports;
  - on the Implementation of Certain Directives Relating to the Environment (91/692/EEC);
  - on the establishment of the European Environment Agency and the European Environment Information and Observation Network (1210/90 EEC).
- To increase the effectiveness of the Ministry of the Environment of Lithuania in achieving an optimum use of its resources (human, technical, information, and financial) by introducing an integrated environmental data management system.

2.3 Accession Partnership and NPAA priority

The proposed scope of the project activities fits with the environmental priorities agreed between Lithuania and the European Commission and set out in the Accession Partnership and National Programme for the Adoption of the Acquis (NPAA).

Development and implementation of the ICISEM will help Lithuania in solving problems identified in the Accession Partnership 2001:

- strengthening the administrative and monitoring capacity, both at central and local level;
- integrating environmental protection requirements into the definition and implementation of all other sectoral policies with a view to promoting sustainable development.

The National Programme for the adoption of the Acquis (NPAA) provides a number of institutional strengthening measures, preparation of various recommendations, guidance etc. for the implementation of legal acts, development of databases, training of governmental and non-governmental institutions (including enforcement structures and industry).

In the field of water, waste, nature protection, radiation safety sectors, the NPAA foresees the following measures:

- to prepare for the re-organising of data collecting and processing systems,
- to list, analyse and compare EU and Lithuanian requirements for the provision of information in the environmental sector.

3. Description

3.1 Background and justification

Integration of environmental information systems is the process for the effective management of information for all environmental sectors. Integration of environmental information system will allow the rational management of different sectors (environmental and non environmental) according to the principles of sustainable development.

Most information systems for the various environmental sectors were developed independently without taking the need for integration into account. Consequently, information systems (including environmental state registers, statistical data sets, monitoring data, statistical analysis and modelling systems of environmental quality, internet oriented information publishing systems) require re-design and integration, using modern information technologies and methodologies.

After the implementation of the project the ICISEM will:

- allow effective use of information in the environmental sector related decision making processes,
- ensure effective reporting procedures and the capacity to fulfil the EU reporting obligations,
- create conditions for the use of electronic tools providing comprehensive environmental information to the public, as well as ensuring the transparency of environmental management policy.

The development of ICISEM will *inter alia* create conditions for the implementation of these EU technical level legal requirements in the environmental sector:

- Council Directive 90/313/EEC of 7 June 1990 on the Freedom of Access to Information on the Environment;
- Council Directive 91/692/EEC of 23 December 1991 Standardising and Rationalising Reports on the Implementation of Certain Directives Relating to the Environment;
- Council Regulation (EEC) No 1210/90 of 7 May 1990 on the establishment of the European Environment Agency and the European Environment Information and Observation Network.

The development of ICISEM will also create conditions for meeting reporting obligations, which are described in 60 EU directives, 28 decisions and 44 international conventions.

The development of ICISEM will help Lithuania implement requirements of the Ärhus convention through the use of electronic tools. It is expected that the system will be developed referring to modern web technologies and according to recommendations of this convention. Web based information system through development of accessible on the Internet meta-database would create conditions for easy public access to information.

The Ministry of Environment of Lithuania lacks experience and resources to undertake the necessary information system development and implementation. This project will provide expertise in information system analysis and development as well as the investment resources to develop a system for the integrated management of environmental information.

By the end of 2003 transposition of legislation will be completed and requirements of relevant Directives to provide required information to EU will be fulfilled. However, this project is very important as it will help to improve the quality of the reports to the EU and information will be more effectively used in the decision making process. Activities planned to be fulfilled for development and implementation of ICISEM by 1st of January 2004 are provided in Annex 8.

In the scope of Information management programme, prepared by the Danish Environmental Protection Agency (DEPA) financed project "Long Term Assistance on Information and Reporting", legal and other measures (including commitments to responsible institutions), which would create preconditions for effective implementation of Information system are foreseen. According to the Action plan of Information management programme necessary legal acts regulating information management procedures (including reporting to EC) should be prepared by 2004.

One of the major institutional capacity development activities foreseen in PHARE 1998 project "Strengthening of institutional capacities in the Ministry of Environment in EU integration process" (LI9805.01.01) was the establishment of a Lithuania Environmental Protection Agency (LEPA). The Agency statute and other supporting documentation were developed during implementation of this project.

It is planned that all institutional reforms regarding establishment of LEPA should be finished by the end of 2002. During this process the administrative structures will be revised and improved also in respect of optimisation of Information management.

Information management department under LEPA is planed to be established, the main duty of which will be the coordination of development and management of environmental information systems. The department will be responsible for further development and administration of Integrated Environmental Information System.

It is expected that more detailed optimisation of Information management including administrative, organisational and procedural simplification, should be carried out under this project during IS specification and IS general design phases.

The project's purpose and activities have been discussed with the Lithuanian Office of Regional Environmental Center (REC), Nature Protection Society and Lithuania Green Movement.

3.2 Linked activities

The National Approximation Strategy was adopted by the Order of Environmental Minister No.199 on October 12, 1998. The Strategy defines transposition priorities in each environmental sector, points out the main implementation methods and measures. The Ministry of Environment prepared the strategy with the assistance from experts working under the 1995 PHARE project "Long term planning and institutional support to the Ministry of Environmental protection".

As it was mentioned above, with the assistance of the PHARE 1998 project "Strengthening of institutional capacities in the Ministry of Environment in EU integration process" (LI9805.01.01) support for the establishment of LEPA was a very important issue concerning institutional capacity development. The project was completed in October 2001.

The proposed project will ensure sustainability and further development of two Phare projects: LI9805.01 "Strengthening of institutional capacities in the Ministry of Environment in EU integration process" and LI9912.01 Strengthening Environmental Monitoring Capacities.

Though the activities of these two projects were oriented towards strengthening institutions and information systems within specific components or elements of environmental management system, recommendations, results and outputs of these projects will be fully taken into account when implementing this project and integrating all environmental information systems and databases (see Annex 5 and Annex 7).

An Information Management Programme for 8 Environmental sectors (except waste management) was developed with bilateral assistance from Denmark (through the Danish Environmental Protection Agency), under the project "Long term assistance on information and reporting. Information Management programme". In this Programme actions were foreseen for the transposition of Council Directive 91/692/EEC and other EU legal acts defining reporting

obligations, institutional strengthening and implementation of requirements for reporting obligations in 8 sectors. In the scope of the Information Management Programme, the guidelines for the extension and integration of information management systems were presented.

3.3 Results

- Effective communication of environmental data and information to other services and agencies established.
- Effective use of information for decision-making processes in environmental sector created.
- Administrative and IT capacities at the Ministry of the Environment to manage the environmental information under the EU obligations in environmental sector strengthened. This result will be achieved through the training programs and materials foreseen in the project activities (administrative capacities will be strengthened indirectly through the implementation of the information system, which will enable the Ministry to make more reasonable decisions implementing policies of sustainable development).
- Reporting obligations under the EU directives on the technical level fulfilled.
- Conditions for proper management of integrated information systems ensured.
- Human resources trained to manage the information requirements for environment sector decision-making processes available.
- Electronic tools providing comprehensive environmental information for public developed.

3.4 Activities

The project will cover all activities ranging from the IS specification to the implementation of a fully functioning computerised information system, including support to upgrade administrative capacity.

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

- A Technical Assistance component will concentrate on information system development and implementation;
- A Supply component will provide for the upgrade of existing information systems and for the purchase of new equipment.

It is not proposed to implement activities as a twinning project due to the predominantly technical content of the project. The implementation of project tasks requires specific professional expertise and a substantial number of local IT experts, which would be difficult to achieve through a twinning arrangement.

Scope of TA

A team of international and local experts will implement the following:

- Development of technical specification of ICISEM:
  - Detailed analysis of existing information systems (identification of information flows, information management processes, internal and external links between computerised objects);
  - Identification of the main problems and main aims of IS;
  - Description of desired conditions of the integrated information system (identification of activities and information flows between them that should be improved according to the main aims of IS);
  - Preparation of action plan for information system development.

- General design of ICISEM:
  - Concretisation of IS technical specification (description of foreseen database structure, information and work flows, as well as information processing activities; specification of IS requirements for all IS components on technical level);
  - Preparation of a conceptual model of the information system (detailed description of all IS components and the processes affecting these components, preparing information and work flow diagrams and process maps using computerised IS designing tools);
  - Preparation of comprehensive project document for detailed design and implementation of the ICISEM.
- Detailed design of ICISEM:
  - Design and programming of necessary IS components (databases, applications and etc.), needed to implement the system as well as preparation of required documentation (source codes of programmed and components, instructions of installation and use and etc.);
  - Preparation of the list and price indications of software/hardware as well as specifications and other required documentation for the procurement of the equipment (IT equipment, software, data transferring facilities and etc.), which is needed for ICISEM implementation.
- Implementation of Information system:
  - Installation of IS and connection of all IS components;
  - Testing of IS and its components according to the requirements that were specified in technical IS specification;
  - Performance of IS trial exploitation and elimination of noticed defects (bugs).
- Administrative and procedural arrangements for the system management:
  - Carrying out training needs analysis;
  - Development and delivery of extensive training programs and other materials on using and managing IS.

Technical Assistance

A long-term EU expert (LTE) for 18 man months providing general management and institutional support in the area of information system analysis, development and management, training, as well as responsibility for the overall management of the project. A series of short-term expert (STE) inputs will carry out the above-mentioned activities.

Profile of LTE

The LTE (18 man months) should have appropriate experience in the field of information management, developing and implementing of information systems. She/he will be requested to deliver a significant input of training and capacity building activities, particularly with regard to planning and implementing the guidelines and procedures for preparation of management plans, including use of management information system, monitoring, analysis and reporting. The LTE will work in close co-operation with the management and staff of the Ministry of Environment of the Republic of Lithuania.

Profile of STEs

Approximately 50 man months of combined EU and local STE input is foreseen. The STE's should have appropriate experience at a middle management level in the field in the areas relevant to the project information system. STEs responsible for information system development should have good programming skills and be able to use information system development and design tools. All

the STEs should be capable of providing training and advice covering workshops, classroom training, on-the-job training as well as advice at a high level in the institutions involved.

Supply

Supply will cover IT equipment and software (Servers, PC workstations, WAN (Wireless Area Network) and LAN (Local Area Network) equipment and data transferring facilities, DBMS (Data Base Management System) software, IS applications, statistical analysis and modelling software, all relevant software licences and etc.) for ICISEM users and administrators. New equipment and software must be compatible with previously financed projects.

Supply will be based upon an analysis of present status of environmental information management systems, identified needs for information system development and strengthening of the institutions under the Ministry of Environment. Project contractor under the TA contract will carry out the analysis during the first phase of the project. Results of information system analyses will be incorporated in technical specification of ICISEM. An indicative list and price indication of equipment needed for fully functioning ICIEM implementation is provided as a starting point in Annex 4. The list should be reviewed and updated taking into account the results of the detailed analysis. Additional items may be identified and procured where a particular need exists. Supplier should provide a training program and warranty for equipment.

3.5 Lessons Learned

The conclusions and recommendations of the previous Evaluations and Reports (especially recommendations presented in the outputs of the project "Long term assistance on information and reporting. Information Management programme") have been considered and lessons learned (approximation of the EU legislative system, support the establishment of Environmental Protection Agency, ensure implementing structure, improvement of Information management programme etc.) have been incorporated into this project design.

4. Institutional Framework

The Project will be co-ordinated by the Ministry of Environment (MoE). The Ministry was created in 1998, merging the former Ministry of Environmental Protection, Ministry of Construction and Urban Development and Department of Forestry.

The Ministry consists of:

- Central office (6 departments: Environmental Quality Department, Environmental Strategy Department, Nature Protection Department, Department of Human Resources and Justice, Territorial Planning Department, Housing and Technical Regulation Department),
- 53 subordinated institutions (including Joint Research Centre, 8 Regional Departments, etc.),
- 182 staff in central office and its institutions have more then 10 thousand employees at all levels.

MoE functions include:

- Development of legislation in the environmental sector, including transposition of EU requirements,
- Policy planning and development of implementation programmes and institutional set-up,
- Environmental investment planning and management,
- Issuing of permits for nature resource use and emissions of pollutants,
- Environmental impact assessment,
- Inspection and enforcement of environmental requirements,

- Environmental monitoring.

The Project should cover all the departments, divisions and subordinate institutions of the Ministry of Environment, whose activities are related to environmental data collection, processing and dissemination of environmental information (see Annex 6).

Information management division of the Ministry of Environment will be responsible for co-ordination of the project implementation. Project implementation will involve day-to-day contacts with relevant divisions of the subordinated institutions. Representatives of these divisions will participate in the Steering Committee, established by the Ministry, which will have the overall responsibility for supervision of the Project implementation.

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e-mail: *a.gudaitis@aplinkuma.lt*;

5. Budget (MEUR)

Project Components	Investment Support	Institution Building	Total Phare (=I+IB)	National Cofinancing	IFI	TOTAL
Technical assistance		1.10	1.10			1.10
Supply	1.406		1.406	0.469		1.875
Total	**1.406**	**1.10**	**2.506**	**0.469**		**2.975**

The PHARE amount is binding as a maximum amount available for the project. The ratio between the PHARE and national amount is also binding and has to be applied to the final contract price. The national co-financing commitment is a tax-excluded net amount.

6. Implementation Arrangements

6.1 Implementing Agency

PAO:	Zilvinas Pajarskas, Director of the CFCU		
Address:	J. Tumo Vaizganto 8a/2	Telephone:	+ 370 2 22 66 21
	2600 Vilnius	Fax:	+ 370 2 22 53 35
	Lithuania	E-mail:	*Info@cfcu.lt*

6.2 Twinning

There is no Twinning component in the project.

6.3 Non-standard aspects

There are no non-standard aspects.

The Practical Guide for the Implementation of Phare, ISPA & SAPARD will strictly be followed.

6.4 Contracts

Two tenders will be launched:

1.Technical Assistance: 1.1 MEUR.

2. Supply: 1.875 MEUR, including 0.469 MEUR of national co-financing

7. Implementation Schedule

Component	Start of Tendering	Start of Project Activity	Project Completion
Technical assistance	2Q/02	4Q/02	2Q/04
Supply	1Q/03	3Q/03	1Q/04

8. Equal Opportunity

Equal opportunity principles and practices in ensuring equal gender participation in the project will be guaranteed.

The Constitution of Lithuania, the Law on Equal Opportunity between Men and Women, and other legal acts explicitly forbid the discrimination on the basis of sex, nationality, and religion. A Controller on equal opportunities between men and women is appointed by the Seimas (the

Parliament).

The institution involved in the project execution will observe equal opportunity of men and women in its recruitment and human resources development. Vacancies are equally open to both genders. The beneficiary will also ensure equal access of men and women to the project activities and results.

Women and men will have equal access to participate in the project activities (Steering Committee, training, information, etc.) and will have equal access to the new IT&T tools.

9. Environment

The investment component of this project is related to Institutional Building activities.

10. Rates of return

The investment component of this project is related to Institutional Building activities.

11. Investment criteria

The investment component of this project is related to Institutional Building activities.

12 Conditionality and sequencing

1. The project is conditional upon co-financing being available.
2. Equipment and software will be compatible with, and based on, any previously financed monitoring systems.
3. Certain activities have to be completed prior to accession (see Annex 8).

ANNEXES TO PROJECT FICHE

1. **Logical framework matrix in standard format**
2. **Detailed implementation chart**
3. **Contracting and disbursement schedule**
4. **Reference to feasibility / pre-feasibility studies**
5. **List of outputs from the previous projects**
6. **Overview of organisations, which are involved in gathering environmental information to be used for the system**
7. **Review of existing main databases and principles of data management, guidelines for integrated information system development**
8. **Planned fulfillment of activities for development and implementation of ICISEM by 1st of January, 2004**

Annex 1

LOGFRAME PLANNING MATRIX FOR Project		Programme name and number	
Development and Implementation of Integrated Computerised Information System for Environmental Management (ICISEM)		Contracting period expires: 3Q/04	Disbursement period expires: 3Q/05
		Total budget: 2.975 MEUR	Phare budget : 2.506MEUR
Overall objective	**Objectively verifiable indicators**	**Sources of Verification**	
To strengthen the institutional capacity of the Ministry of Environment of Lithuania to comply with the EU acquis in the field of environmental information management and reporting.	• ICISEM is implemented to fulfil the obligations of EU requirements. • More reliable data provided. • More effective way of information provided • Information for the decision making process efficiently used	• Ministry of Environment • EC Delegation to Lithuania • Regular Progress reports	
Project purpose	**Objectively verifiable indicators**	**Sources of Verification**	**Assumptions**
• To strengthen capacities of responsible authorities to comply with the requirements of the EU Council Directives and regulations: - on the Freedom of Access to Information on the Environment (90/313/EEC), on Standardizing and Rationalizing Reports; - on the Implementation of Certain Directives Relating to the Environment (91/692/EEC); - on the establishment of the European Environment Agency and the European Environment Information and Observation Network (1210/90 EEC). • To increase the effectiveness of the Ministry of the Environment of Lithuania in achieving an optimum use of its resources (human, technical, information, and financial) by introducing an integrated environmental data management system.	• EU requirements are met as defined in Directives 90/313/ECC, 91/692/EEC and regulation EEC/1210/90 • Institutional set-up is strengthened, 50 people trained. • Information System installed and tested.	• Commission Regular Reports • Ministry of Environment • EC Delegation to Lithuania • Progress reports	• Resources are allocated from Lithuania budget • Other institutions concerned are willing to co-operate
Results	**Objectively verifiable indicators**	**Sources of Verification**	**Assumptions**
• Effective communication of environmental data and information to other services and agencies established. • Effective use of information for decision-making	• Administrative capacities of relevant institutions strengthened and 200 people trained. • Equipment is available, installed and	• Ministry of Environment • Steering Committee of the project • Final Report • Reports from other projects	• The Ministry of Environment staff is co-operating on the implementation of the project

processes in environmental sector created. • Administrative and IT capacities at the Ministry of the Environment to manage the environmental information under the EU obligations in environmental sector strengthened. • Reporting obligations under the EU directives on the technical level fulfilled. • Conditions for proper management of integrated information systems ensured. • Trained human resources to manage the information requirements for environment sector decision-making processes available. • Electronic tools providing comprehensive environmental information for public developed.	operational. • 20 relevant institutions involved in the integrated information system		• Steering Committee makes required decisions on time • All counterparts are co-operating and providing required information • Supply contracts are prepared in time
Activities	**Means**		**Assumptions**

• Development of technical specification of ICISEM:
  • Detailed analysis of existing information systems (identification of information flows, information management processes, internal and external links between computerised objects);
  • Identification of the main problems and main aims of IS;
  • Description of desired condition of integrated information system (identification of activities and information flows between them that should be improved according main aims of IS);
  • Preparation of action plan of information system development.
• General design of ICISEM:
  • Concretisation of IS technical specification (description of foreseen database structure, information and work flows, as well as information processing activities; concretisation of IS requirements for all IS components on technical level);
  • Preparation of a conceptual model of information system (detailed description of all IS components and the processes affecting these components, preparing information and work flow diagrams and process maps using
	• A 18 months Long Term EU expert and STE's of EU) and local experts.
	• Documentation, equipment and other resources for IS establishment and management.
		• Project implementation team
		• Steering Committee
		• Project reports
		• The Ministry of Environment
		• EU Delegation
			• Qualified and capable company and pool of EU and local experts is selected to implement the project
			• Qualified local specialists are attracted
			• The Ministry is providing necessary support, including office space (if indicated in ToR)

computerised IS designing tools); • Preparation of comprehensive project document for detailed design and implementation of the ICISEM. • Detailed design of ICISEM: • Design and programming of necessary IS components (databases, applications and etc.), needed to implement the system as well as preparation of required documentation (source codes of programmed and components, instructions of installation and use and etc.) • Preparation of the list and price indications of software/hardware as well as specifications and other required documentation for the procurement of the equipment (IT equipment, software, data transferring facilities and etc.), which is needed for ICISEM implementation; • Implementation of Information system: • Installation of IS and connection of all IS components; • Testing of IS and its components according to the requirements that were specified in technical IS specification; • Performance of IS trial exploitation and elimination of noticed defects (bugs). • Administrative and procedural arrangements for the system management: • Carrying out training needs analysis; • Development and delivery of extensive training programs and other materials on using and managing IS.			
			Preconditions • Co-financing available

Annex 2

Detailed Implementation Chart for the Project

Year	2002												2003												2004											
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																																				
Procurement																																				

design
tendering
implementation

Annex 3

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

	2002			2003				2004			
	31/06	**30/09**	**31/12**	**31/03**	**30/06**	**30/09**	**31/12**	**31/03**	**30/06**	**30/09**	**31/12**
Contracting											
• Technical Assistance			1.1								
• Supply						1.406					
Total contracting (cumulative)			**1.1**			**2.506**					
Disbursement											
• Technical Assistance			0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.1	
• Supply						0.84	0.84	1.26	1.406	1.406	
Total disbursement (cumulative)			**0.33**	**0.44**	**0.55**	**1.5**	**1.61**	**2.14**	**2.396**	**2.506**	

Annex 4

Reference to feasibility /pre-feasibility studies

Indicative list of the equipment needs:

No	Equipment (hardware/software)	Indicative budget (Phare and National Cofinancing) (MEUR)
1.	Data transferring network (WAN, LAN) equipment and high speed Internet/Intranet connections.	0.200
2.	Computerised working places, needed for effective functioning of IS:	
2.1.	PC workstations	0.430
2.2.	Software (OS, office software, other)	0.200
3.	Servers (SQL servers, application servers) for central data base management system:	
3.1.	Hardware	0.500
3.2.	Software (DB application server, SQL server, enterprise edition)	0.300
4.	GIS services (ArcSDE, ArcIMS, ArcGIS workstations)	0.90
5.	Statistical analysis software and modelling equipment	0.155
	TOTAL	1.875

The list above has been prepared on the basis of "The Feasibility Study for Development and Implementation of Integrated Computerised Information System for Environmental Management". The document is at the moment being finalised by the project "Long term assistance on information and reporting. Information Management programme" financed by Danish EPA. The document planned to be finished in the 2nd quarter 2002.

Annex 5

List of outputs from the previous projects

No.	Project title and number	Project start/finish	Results related to this project
1.	Strengthening of Institutional Capacities of the Ministry of Environment in the EU Integration Process in Lithuania (Phare, LI9805.01)	2000 October/ 2001 October	• Updated projects database. • Support for the LEPA establishment.
2.	Strengthening of Environmental Monitoring Capacities (Phare, LI9912.01)	2001 March/ 2002 September	• Survey and development of air data management in Lithuania with special interest for the link to possibilities of data publication. • Draft guidelines for processing, storage and reporting of water quality data.
3.	Long Term Assistance on Information and Reporting. Information management programme (financed by DEPA)	2000 December/ 2002 April	• Identification of national legal, institutional and technical gaps according to the EU reporting obligations. Preparation of Information management programme and action plan according to identified gaps. • Proposition of Environmental Information system extension strategy.
4.	Pilot project: Technical assistance for MoE regional departments inspection and control development (124/025-0139, financed by DEPA)	1999 November / 2000 June	• Implementation of IT infrastructure of Vilnius, Kaunas and Panevezys regional environmental protection departments. Translation and adoption of GeoEnviron information system (Denmark) industrial pollution module for Lithuanian purposes. • Human resources IT training. • Evaluation of potential of IT solution according EU standards.

An overview of organisations, which are involved in gathering environmental information to be used for the system

Integrated information system for Environmental Management should cover activities of all institutions involved in collection, processing and publishing environmental information for the purposes mentioned in fiche.

One of the main procedures that should be covered by Information system is reporting and provision environmental information to EU and international institutions.

The primary institution responsible for reporting obligations within all the environmental sectors is the Ministry of Environment (MoE). The Ministry is responsible for management and provision of environmental policies, but is at present also carrying out technical tasks such as collection of information, processing of information, preparation of reports and submission of reports to national and international organizations, even if major reporting tasks are delegated to sub-ordinate institutions and organisations.

Data collection and providing of required information from sub-ordinate institutions and organisations will be ensured by the order of the Ministry of Environment.

Other Ministries also participate in the exchange of environmental data, information and reporting.

Ministry of Health, Public Health Centre is obliged to control compliance with Hygiene Norms for drinking water and air polluting chemicals in residential areas. Within the water sector the Centre carries out drinking water sampling and reporting and within the air sector the Centre is end-reporter to WHO on environmental health information.

Within the Chemicals and GMO sector *Ministry of Finance* provides data to MoE on imported and exported dangerous substances and their production to meet requirements of the Vienna Convention.

Ministry of Agriculture provides air sector data to MoE and JRC for reporting to Eurostat/OECD.

Ministry of Transport provides data, such as traffic counts, for the air sector to be reported to the Air Division in Ministry of Environment.

Ministry of Agriculture reports on water related issues concerning among others the Nitrates Directive.

However, the main ministerial institution is the *Lithuanian Ministry of Environment,* which is involved in reporting for all the environmental sectors.

According to Lithuanian law two departments and eight divisions (see table below) of the Ministry of Environment have tasks and obligations related to management of information (monitoring, processing, collecting or delivering of data, coordination, organisation, keeping registers, reporting, etc.).

Besides the departments and divisions of the MoE twenty-two other institutions are involved in environmental information related tasks and obligations within the environmental sector in Lithuania. Most of these institutions are subordinated to MoE.

In the matrix-table below the twenty-two different institutions are presented in relation to environmental sectors and vice versa. The main tasks and obligations of the institutions are briefly described.

Environmental sector **Dept./Div./Institution**	**Air**	**Waste**	**Water**	**Chemicals and GMO`s**	**Nature Conserv.**	**Industrial Pollution**	**Noise**	**Nuclear Safety**
Ministry of Environment								
Nature Protection Department					x			
Air Division	x							
Waste Division		x						
Water Division			x					
Chemical Substances Division				x				
Protected Areas Div.					x			
Environmental Technologies Div.						x		
Radioactive Substances Div.								x
Public Relation Div.								x
Dept. of Statistics	x	x	x			x		
Custom Dept. (MoF)				x				
Public Health Dept. (MoH)	x		x					
Civil Safety Dept.								x
Joint Research Centre (MoE)	x	x	x			x		x
Water Resource Dept. (MoE)			x					
Regional Environmental Protection Depart.s (MoE)	x	x	x		x	x		
Staet Environmental Protection Inspection (MoE)								x
HydroMet (MoE)	x		x					x
Institute of Physics	x							
Geological Survey (MoE)			x					
Private enterprises	x	x	x	x		x		
Municipalities		x				x		
Marine Research Centre (MoE)			x					
State Non-Food Insp.				x				
Inst. of Ecology					x			
Inst. of Botany					x			

Forestry Institute/ Forestry Monitoring Laboratory.					x			
Institute of Water Economy					x			
Certification Centre Building Products							x	
Acoustic Lab./Inst.							x	
State Nuclear Energy Safety Insp.								x
Radiation Protection Centre								x

Nature Protection Department collects and evaluates data on nature resources and use of natural resources. End-of-pipe reporting to is undertaken to secretariats of Bern and Rio de Janeiro Convention and, upon request, to secretariats of Bonn (Migration Species) and Washington (CITES) Convention. The Department co-operates with EEA regarding nature protection.

The *Air Division* collects and evaluates environmental data on ambient air quality and is end-of-pipe reporter to UNLRTAP, EMEP, UNCCC, IPPC (Integrated Pollution Prevention and Control), UNECE, EEA (European Environmental Agency) and HELCOM (Helsinki Commission). Furthermore the Air Division reports to Eurostat/OECD through Lithuanian Dept. of Statistics.

The *Waste Division* participates in the preparation of statistical data and collects and evaluates data on waste. End of pipe reporting to the secretariat of the Basel Convention and to Eurostat/OECD (through Lithuanian Dept. of Statistics) is undertaken.

Within the water sector the *Water Division* collects and evaluates data on water and reports directly to HELCOM and indirectly to Eurostat/OECD through Lithuanian Dept. of Statistics. Lithuanian law designates corporation with European Environmental Agency (EEA) regarding water quality and emissions.

The *Chemical Substance Division* is responsible for end of pipe reporting to the secretariat of Vienna Convention and collects information from enterprises using questionnaires in cooperation with Customs Department in Ministry of Finance (MoF).

Environmental Technology Division is responsible for policies in the industrial pollution sector, but at present no reporting is carried out.

Radioactive Substance Division coordinates all policies concerning EU directives, conventions, treaties and Lithuanian legal acts for radioactive substances. It handles permits for import, export and transit of radioactive substances and coordinates the procedure for accounting of radioactive substances.

In relation to obligations and tasks within departments and divisions of the MoE the *Public Relation Division* is obliged to provide information to the public. The Division is expected to be responsible for preparation of implementation procedures and strategies concerning the Aarhus Convention.

Environmental Impact Assessment Division will be responsible for reporting on horizontal directives concerning Environmental impact assessments when appropriate legal obligations are introduced.

The newly established *Water Resources Department* (WRD), under the Ministry of Environment, is responsible for water resources management, including development and maintenance of river, lake and pond registers, coordination and implementation of water treatment projects, development of river basins and water resources protection, water supply programmes as well as drafting of legal acts.

The *Service of Protected Areas,* under the Ministry of Environment, collects information and provides reports for the RAMSAR convention (typically for periodically arranged conferences). The institution is responsible for management of register of protected areas.

The *Lithuanian Department of Statistics* (LDS) is end-of-pipe reporter for Eurostat/OECD by sampling and compilation of data for reports from the Ministry of Environment, JRC and other Ministries.

Joint Research Centre (JRC), under the Ministry of Environment, supervises environmental monitoring activities in Lithuania and is responsible for environmental quality dada collection and provision of information to internal and international organizations, mainly within the air, water, waste and nuclear safety sectors. The Joint Research Centre also carries out the state analytical control of emissions.

The eight *Regional Environmental Protection Departments* (REPDs) are responsible for enforcement and implementation of environmental policies in the regions. Departments collect data and provide environmental reports on the regional environment within five environmental sectors.

State Environmental Protection Inspectorate (SEPI) is responsible for controlling permits, emissions and effluents and co-operate with the *Regional Environmental Departments*

Lithuanian Hydro-Meteorological Service (LHMS), under the Ministry of Environment, is responsible for air and water monitoring, among others to prepare weather forecasts. LHMS evaluates river discharges and other parameters using a monitoring stations network with sampling stations located to facilitate environmental monitoring as well.

Air information concerning surface ozone is collected by the *Institute of Physics. Institute of Physics* undertakes regularly monitoring programmes agreed on with Joint Research Centre.

Lithuanian Geology Survey (LGS), under the Ministry of Environment, is responsible for organization and exploration of onshore and offshore localities of Lithuania. It also provides the necessary data on geological structure, state, processes and resources, and regulates utilization and protection of underground resources (including groundwater). LGS is responsible for management of state ground register.

Private enterprises have to report within the sectors of air, waste, water, chemicals/GMO`s and industrial pollution according to law. They are obliged to keep records on emissions to air, to establish a primary waste recording of statistical data and send these to REPD, to provide statistical reports on water effluents, to monitor impacts and to provide data on chemicals, which are produced, imported, exported or used in production. They report to *Regional Environmental Departments* and *the State Environmental Inspection.*

Within the waste and industrial pollution sector *municipalities* are obliged to run their own waste management plans, including accounting. They report to the *Regional Environmental Departments.*

Marine Research Centre (MRC), under the Ministry of Environment, is responsible for monitoring and research within various characteristics of the Baltic Sea and the Curonian lagoon.

State Non-Food Inspectorate is responsible for supervision of chemical substances and their production. It provides data for meeting requirements of the Vienna Convention requirements of EU legislation.

A number of research institutions, universities and NGOs supply data within the nature conservation sector. Among these organizations are:

- Institute of Ecology
- Institute of Biology
- Institute of Botany
- Institute of Forestry
- Vilnius University

- Vilnius Pedagogical University
- University of Agriculture
- NGOs (Societies of ornithology, teriology, entomology)

In the noise sector MoE is responsible for policy issues. Two other institutions are participating in implementing policies:

- The public enterprise *Lithuanian Certification Centre of Building Products*
- *Laboratory of Acoustics*, Institute of Thermal Isolation.

Two institutions provide information to MoE within the radioactive safety sector: *Radiation Protection Centre* and *Civil Safety Department.*

Review of existing main databases and principles of data management, guidelines for integrated information system development

In the scope of the project "Long Term Assistance on Information and Reporting" Information management programme were prepared. Information management programme have been designed to meet the reporting requirements in compliance with EU legislation and requirements of International conventions. Information management programme covers bodies involved in assembling, transmitting and using data for 8 environmental sectors (except waste). According this programme a clear action plan for meeting EU requirements for information management system were prepared. This project suggested the strategy of Information management system extension.

The interviews in the different institutions during the DEPA financed project "Long-term assistance on information and Reporting" have revealed that the current information systems are very inhomogeneous and in many cases based on outdated software, that only with difficulty can meet the future demands for exchange of information and reporting.

Lots of efforts are done gathering data and storing data in an organized way and to produce information to the ministries, national and international institutions. Even though the reporting requirement is limited and well defined, there are only few automatic/computerized functions for these purposes and therefore most of the reporting is performed manually.

The Geological Survey of Lithuania (Water Sector) and the Radiation Early Warning, (Nuclear Safety Sector) has both implemented advanced information systems, based on use of the Internet and relational databases. Especially LGS has come very far and the work done in this institution fits well into the architecture of an information management system described in this document.

In general the flow of information within sectors are insufficient both because of lack of software, hardware and because of poor or no connections. There are no defined standards for exchange of data and information between institutions or with other external stakeholders. There are good examples of existing systems where the flow of data is systemized e.g. in the Water sector. Data is captured in databases at the regional level and then on regular basis transmitted by use of e-mail to a central database in the JRC. The system works but it is based on old DOS technology and the "same" data is stored in many different places. In other sectors data is stored in databases that have no common interface, this means that exchange of data often is done by use of emails, diskettes or written on paper. The databases vary between small DOS based databases as FoxPro, Paradox, but spreadsheets as Excel are extensively applied as well as Oracle and MS SQL-Server. Excel spreadsheets are widely used to process and report data. Finally some sectors have no electronic databases instead data is kept only on paper or in reports (Word documents).

The general impression is that the databases often are implemented in old database software, which have no sufficient tools or power to fulfil the current and future requirements for processing and transmitting of information. In many cases the databases are implemented in a DOS environment, with only poor or no possibilities to establish systems, which are able to fulfil the future reporting requirements. The problems are shown in the following table 1.

Database	Type	Institution	Sector
Air emissions database	FoxPro	Joint Research Centre (JRC)	Air
Water consumption and emissions database	FoxPro	JRC	Water
VANMON (Water quality)	FoxPro	JRC	Water

Database	Type	Institution	Sector
Hidrochemija (Hydro chemical information)	Oracle	Lithuanian Geological Survey (LGS)	Water
Water levels	Oracle	LGS	Water
Ground water resources	Oracle	LGS	Water
Hydrological observations	Excel	Marine Research Centre (MaRC)	Water
Baltic sea and Coronian Lagoon coastal observations	Excel, Word, Surfer	MaRC	Water
Hydro biological observations	Excel, FoxPro, Excel, MC	MaRC	Water
Hydro chemical observations	FoxPro	MaRC	Water
Ecotoxicological observations	FoxPro, Excel	MaRC	Water
Biodiversity	Paradox 4.5	Inst. of Ecology	Nature protection
Register of Dangerous objects in accordance with Government Resolution No. 1386 (2000.11.08)	Not computerized	Civil Protection Department (CPD)	Industrial Pollution
Register on operational permits issued for enterprises in accordance with paragraph 4.20 of Ministry of Environment Order No. 387 of 1999.11.30	Not computerized	Regional Environmental Protection Department (REPD)	Industrial Pollution
Producers, traders and storekeepers of dangerous substances	Not computerized	REPD	Chemical and GMO's
Permits for use of natural resources	Not computerized	REPD	Chemical and GMO's
Certificates of biocides and household chemicals	Not computerized	State Public Health Centre (SPHC)	Chemical and GMO's
Imported/Exported/produces chemicals		Dept. of Statistics	Chemical and GMO's
Certificates for PPPs	Not computerized	State Plant Protection Services (SPPS)	Chemical and GMO's
Import of PPPs	Not computerized	SPPS	Chemical and GMO's
Permitting of production & usage and trade of PPPs	Not computerized	SPPS	Chemical and GMO's
Radiation Early Warning (PMS)	MS SQL Server	JRC	Nuclear Safety
Database of spectrum analysis	Not computerized	Radiological Laboratory	Nuclear Safety
Radioactive sources	Foxpro	Radiation	Nuclear Safety

Database	Type	Institution	Sector
Register on users of radioactive sources	Foxpro	Protection Centre (RPC) RPC	Nuclear Safety

Table 1 Main databases available within sectors

Architecture and functions of a future information management system

Until now systems have been developed to store well-defined data and to process the data in an often specialized and complex way, and the maintenance of the database and the reporting of data have been carried out in a particular office or institution, very often much dependent on specific persons. This has caused and is still causing a lot of trouble, concerning availability and exchange of data. Future information management systems are aiming at storing data in distributed databases to enable sharing of data and functions in a unique and advanced - but also easy way.

Therefore the main idea is to establish a system of distributed databases with functions to maintain the databases and tools to derive information across both geographical and administrative borders. Coming information system in Lithuania and the rest of Europe must be flexible, scalable, portable and open. Not only for practical reasons with the purpose to raise the communication capability, but also in consequence of European legal demands and rights. In order to handle real time data and to secure data reliability, the system must be organized in a way so that specific information and data is stored in only one place.

The number of data providers will in the future increase, and we must expect that much more data will be gathered by use of different kinds of online equipment as special electronic monitoring devices, mobile telephones. Furthermore the system shall be prepared for use of processed information from online services, available from third part companies or organisations.

The system shall be able to exchange data both in a national and international environment, which is continuously changing. Therefore it must be prepared for adapting current international standards and language for exchange of data.

The users of data and the needs for further information will also increase. The ratification of the Aarhus Convention mean that the system potentially has all citizens of Lithuania as users.

Increasing demands on complex reporting makes the data exchange the most important issue to be solved. Institutions need to co-operate and to share data to be able to make the required reporting.

Requirements to the architecture must

- Facilitate that data can be made publicly available
- Ensure that data is stored and available in only one place
- Be manageable by the competent institutions
- Support easy data-flows between the institutions
- Provide security and stability
- Create transparency
- Ensure scalability
- Meet reporting requirements according to national and European standards
- Take into account a minimum of redundant development
- Be flexible to meet the demands of different data providers and suppliers

Future information system must be available to provide services for external as well as internal users and the system must be available to use functions/services provided by other institutions, to eliminate the amount of software development. A system of such interconnected applications sharing data and functions can be implemented based on international standards. Data can be kept only in one place and the procedures to store and maintain data will be able to handle real time data.

The architecture of information system should meet the requirements mentioned above and furthermore be designed to store information close to the staff, who has the highest technical and professional knowledge on the subject.

The architecture should be prepared for all kinds of users: browser based, special client software and special devices, which can communicate by use of XML (Extensible Marcup Language).

Planned fulfillment of activities for development and implementation of ICISEM by 1st of January, 2004

Activity	Percentage of fulfillment
1. Development of technical specification of ICISEM:	
1.1 Detailed analysis of existing information systems (identification of information flows, information management processes, internal and external links between computerised objects);	100
1.2 Identification of the main problems and main aims of IS;	100
1.3 Description of desired conditions of the integrated information system (identification of activities and information flows between them that should be improved according to the main aims of IS);	100
1.4 Preparation of action plan for information system development.	100
2. General design of ICISEM:	
2.1 Concretisation of IS technical specification (description of foreseen database structure, information and work flows, as well as information processing activities; specification of IS requirements for all IS components on technical level);	100
2.2 Preparation of a conceptual model of the information system (detailed description of all IS components and the processes affecting these components, preparing information and work flow diagrams and process maps using computerised IS designing tools);	100
2.3 Preparation of comprehensive project document for detailed design and implementation of the ICISEM.	100
3. Detailed design of ICISEM:	
3.1 Design and programming of necessary IS components (databases, applications and etc.), needed to implement the system as well as preparation of required documentation (source codes of programmed and components, instructions of installation and use and etc.);	85
3.2 Preparation of the list and price indications of software/hardware as well as specifications and other required documentation for the procurement of the equipment (IT equipment, software, data transferring facilities and etc.), which is needed for ICISEM implementation.	85
4. Implementation of Information system:	
4.1 Installation of IS and connection of all IS components;	60
4.2 Testing of IS and its components according to the requirements that were specified in technical IS specification;	40
4.3 Performance of IS trial exploitation and elimination of noticed defects (bugs).	10
5. Administrative and procedural arrangements for the system management.	60
5.1 Carrying out analysis of training needs.	80
5.2 Development and delivery of extensive training programs and other materials on using and managing IS;	50