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付属資料 1 . T / R(タームズオブレファレンス)

1. T/R (タームズオブプレファレンス)

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDIES

Date of entry August year 2000

Applicant : the Government of Thailand

1. Project digest

Project Title : Acid Deposition Control Strategy in Thailand

Location : Thailand

Implementing Agency : Air Quality and Noise Management Division

Pollution Control Department

Ministry of Science, Technology and Environment

Number of Staff of the Agency : 130 persons (division's staff) ;

permanent staff 73 , temporary staff 57 persons

Budget allocated to the Agency : approximately 90 million bahts for the
fiscal year 2001 (division's budget)

Justification of the Project

Recently, the development activity in Thailand has been spectacular. Along with this development has come a vast expansion in the need for energy, industrial, and agricultural goods and services, and an expansion in the demand for the fuels and materials that help to supply these services. Future projections suggest that the growth of fossil fuel use in Thailand is likely to not only have major consequences for local air pollution in the country but for regional air pollution as well.

Of the many environmental concerns currently facing the East Asia countries, the problem of "acid rain" or "acid deposition" presents perhaps the most potent combination of immediate and ongoing impact and regional scope. Acid rain in Asia has already been implicated in the declining health of some of the region's forests, in the premature weathering of metals and other man-made materials, and in the degradation of irreplaceable cultural monuments. "Wet" acid deposition is primarily the result of the reaction of oxides of sulfur and nitrogen (SOx and NOx) . The acid gases with water or water vapor, yielding sulfuric and nitric acids that fall with rain. "Dry" deposition of SOx and NOx and of particles and compounds including sulfur and nitrogen oxides, also occurs. Acid gases can act as local air pollutants, or, depending on weather conditions and how they are emitted, can be transported for hundreds of kilometers or more.

Acid Deposition is transboundary and thus an international issue since it can occur at a substantial distance from the original sources of precursor emissions regardless of national boundaries. As emphasized in Chapter 9 of Agenda 21 (on transboundary atmospheric pollution), adopted at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, acid deposition is a problem that requires international cooperative efforts for its solution. Therefore, regional cooperative and collaborative actions need to be taken to address the acid deposition problem.

Recognizing the potential environment consequences of elevated levels of atmospheric acidity, many countries in the East Asian region have begun to address the acid deposition problem and to emphasize the importance of monitoring work to track the effects of changing emissions on atmospheric levels, deposition of acidic substances and their adverse impacts on aquatic and terrestrial ecosystems.

The 1st Intergovernmental Meeting held in Yokohama, Japan in March 1998 reviewed the draft documents for the Design of the Acid Deposition Monitoring Network in East Asia (EANET) and adopted the Implementation of Preparatory-phase Activities. Ten countries in the East Asia including Thailand have agreed to participate in the preparatory-phase activities. The network will then be established in the year 2000 taking into account the results of the preparatory-phase activities.

The activities of the Acid Deposition Monitoring Network in East Asia (EANET) is relevant to the 8th National Economic and Social Development Plan (1997-2001), by enlarge Thailand's role in international cooperation on environmental protection policy which emphasis be placed on technical cooperation to address international problems and concerns. It is also anticipated that the environmental aspects of the plan will be developed to strengthen existing policy by increasing the level of scientific education and competent manpower available in both the public and private sectors.

Concerning these problems, key to address the problems of air pollution in the region is the ability to estimate the emissions of major air pollutants under different assumptions as to future energy and environmental policies, and to determine the fate and potential impacts of those pollutants. In many cases, quantitative modeling of air pollution emissions, transport, deposition impacts, and mitigation measures is a crucial tool in understanding how pollution problems can be addressed.

Purpose of the Project :

1. Preparing the emission inventory for acid deposition
2. Set up and verify the appropriate model used for acid deposition
3. Evaluate the mitigation measures to address the acid deposition problem using the result from the model

Goal (long-term objective) of the Project :

The control strategy for the acid deposition and air pollution management for the country which data can be used both of the national and regional levels.

Desirable or Scheduled time of the commencement of the Project : January 2001

2. TERMS OF REFERENCE

FOR STUDY ON ACID DEPOSITION CONTROL STRATEGY IN THAILAND

I. INTRODUCTION

Problems associated with acid deposition are expected to become more serious in East Asia, a region experiencing rapid economic growth. In response to this situation, Japan proposed the inclusion of acid deposition as a cooperation field of its comprehensive environmental ODA package entitled the "Initiative for Sustainable Development toward the 21st Century (ISD)". With a review toward solidifying this idea, Japan took the lead in establishing the Acid Deposition Monitoring Network in East Asia, which currently has 10 member countries. The network has been playing a key role in creating an acid deposition monitoring system that is shared by all of the countries of the East Asian region.

In addition to the above-mentioned monitoring system, the Japan International Cooperation Agency (JICA) cosponsored the "Workshop on Acid Deposition in East Asia" with the Pollution Control Department (PCD) of Royal Thai Government in October 1999. Several recommendations results from this workshop, including (i) donor nations should be encouraged to provide cooperation to combat the problem, and (ii) 2 to 3 demonstration projects should be implemented to develop measures and action plan aimed at developing inventories related to acid deposition, applying simulation models, and preparing control strategies. Based on the basic conclusions of the workshop (i.e. the formulation of projects that respond to the problem on a region-wide basis), and with an eye to realizing the recommendations presented by the workshop, it is essential to undertake a demonstration project that comprehensively address the acid deposition problem by developing an acid deposition control strategy.

II. OBJECTIVES OF THE STUDY

The major objectives of the study are as follow:

- (i) To strengthen the acid deposition monitoring network in the country;
- (ii) To develop/elaborate the emission inventories of substances that cause acid deposition in the whole country;
- (iii) To apply a model for long-range transboundary air pollution, based on the latest emission inventories developed in (ii) above;
- (iv) To review possible technical options to mitigate substances that cause acid deposition, based on the results of the model for the long-range transboundary air pollution, and develop an acid deposition control strategy for consideration by the Royal Thai Government; and
- (v) To train the technical staff of the relevant government agencies on the above subjects.

III. STUDY AREA

The study area shall cover the whole country of Thailand.

IV. STUDY DURATION

The study duration shall be 12 months.

V. SCOPE OF THE STUDY

The following items shall be covered under the study:

Data Collection

- (i) National administration on acid deposition control
 - National legislation related to acid deposition monitoring and control of substances that cause acid deposition; and
 - Institutional/organizational arrangements related to acid deposition monitoring and control of substances that cause acid deposition.
- (ii) Acid deposition monitoring in the country
 - Present situation of the air quality/acid deposition monitoring in the country; and
 - Monitoring data of the acid deposition and relevant air quality in the previous years in the country.
- (iii) Emission inventories
 - Existing emission inventories related to substances that cause acid deposition.
 - On-going activities to develop emission inventories;
 - Flue gas monitoring;
 - Study on emission factors
 - Activity data collection
 - Capacity building program
 - Future plans to develop emission inventories
- (iv) Modeling on long-range transboundary air pollution
 - Existing simulation models;
 - Relevant simulation models developed in the country;
 - Application of existing simulation models
 - On-going activities to develop simulation models; and
 - Future plans to develop simulation models
- (v) Mitigation measures
 - Existing mitigation measures for/air pollution/acid deposition; and
 - Future plans.

(vi) Socio-economic conditions

- projections of socio-economic factors related to air pollution/acid deposition, e.g., urbanization, population growth, registration of motor vehicles, etc.;
- Economic development factors related to air pollution/acid deposition, e.g., economic growth rate, growth rates of industrialization; and
- Energy policy, e.g., source of energy, growth rate of energy consumption of respective energy sources.

(vii) Cooperation with international organizations and bilateral aid agencies

- Existing cooperation; and
- Future plans.

Development/elaboration of emission inventories for the whole country

(i) Review and elaboration of emission inventories for stationary sources

- Power generation sector
- Industrial emission sources

(ii) Review and elaboration of emission inventories for mobile sources

- Emission factors;
- Number of motor vehicles by automobile type; and
- Fuel consumption

(iii) Review and elaboration of area sources

- Small scale industries;
- Domestic sources; and
- Other area sources

(iv) Preparation of elaborated emission inventories

Development/elaboration and application of a model for long-range transboundary air pollution

(i) Review of existing simulation models

(ii) Selection of simulation model(s) for the study

- Hybrid approach may possibly be adopted for the study. In this case, a few models, one for long-range transboundary air pollution and a few more smaller scale area-wide models, may be selected for combination in the model.

(iii) Application of the model

- The new emission inventories developed in the study shall be used.
- Coordination with the similar study in other countries should be undertaken.

Development of acid deposition control strategy for the country

- (i) Review and identification of technical options to mitigate substances that cause acid deposition, possibly suitable for the country, based on the existing technical information;
- (ii) Selection of effective technical options, based on the results of the simulation modeling; and
- (iii) Development of an acid deposition control strategy for the country, taking account of the technical feasibility and cost effectiveness with possible timetables of mitigation actions.
 - Recommendations for the Royal Thai Government shall be prepared on this item.
 - Acid deposition control strategy may cover not only possible actions to mitigate emissions, but also public awareness programs, institutional strengthening and capacity building, and other relevant actions.
 - Possible timetable for actions, rough estimate of costs for mitigation actions may be included in the strategy.

National Workshop to disseminate the outcomes of the study

- After preparation of the draft final report, a national workshop shall be undertaken to disseminate the outcomes of the study and elaborate them with the views and comments by relevant government agencies, academies and environmental NGOs, etc.
- The duration of the workshop may be approximately 2-3 days and the participants may cover officials of relevant government agencies, experts in universities and research institutions, relevant international organizations, bilateral donors, relevant environmental NGOs etc. Available in the country.

VI. WORK SCHEDULE

The study will be conducted over a period of 12 months and in accordance with the work schedule presented in the Attachment.

VII REPORTING

The study team shall prepare and submit the following reports in English to the Pollution Control Department:

(i) Inception Report

This report will contain the program of the study with its schedule and twenty (20) copies of the report will be submitted at the beginning of the study.

(ii) Interim Report

This report will contain the progress and results of the study obtained during the five months after the submission of the Inception Report, mainly regarding data collection and development/elaboration of emission inventories. Twenty (20) copies of the report will be submitted within 6 months after the submission of the Inception Report.

(iv) Draft Final Report

This report will contain all the necessary items regarding the whole items of the study, except the national workshop. Twenty (20) copies of the report will be submitted within 6 months after the submission of the Interim Report. Pollution Control Department will provide the Study team with its comments on the Draft Final Report in English within one month after the receipt of the report.

(v) Final Report

Forty (40) copies of the report will be submitted within 2 months after the receipt of the comments of the Draft Final Report or one-month after the national workshop. The Study Team shall ensure that all the data, information, maps, drawings, materials and findings connected with the study are kept confidential and not disposed or revealed to any third party except with the prior written consent of the Royal Thai Government, immediately upon completion of the study. All the reports when finalized and submitted to the Pollution Control Department shall remain the property of the Pollution Control Department.

VIII CONSULTANT'S QUALIFICATION AND EXPERIENCES

It is expected that the study will require the service of a multi-disciplinary team of experts such as environmental specialists, monitoring specialists, air pollution control specialists, modelers, system engineers, socio-economists etc. with the necessary background and experiences in the field of acid deposition and relevant air pollution control.

IX. DATA MATERIALS AND FACILITIES TO BE PROVIDED

The following supporting staff and local facilities will be provided by the Pollution Control Department to assist the experts:

- (i) Local counterpart/staff, coordination officer
- (ii) Office, furniture, equipment and office supply for Japanese experts when they stay in Thailand for the study.

The Pollution Control Department will provide assistance for the Study Team in collecting data and information, upon request by making them available.

X. RELATED STUDIES

A number of related studies that can be used as basis for this study are available. The Study team will identify and make the best effort to collect all the related studies.

XI. PROJECT STUDY COORDINATION/MONITORING

The Pollution Control Department will establish a Steering Committee to supervise the study activities and give general guidance to the Study team. A technical Committee will also be established for the vetting of the technical aspects of the study and to advise the Steering Committee on these matters.

In order to promote the implementation of the detailed plan, the PCD, Ministry of Science, Technology and the Environment will collaborate with the Study Team in organizing the national workshop. Relevant officials from related agencies will be involved to participate in the workshop.

3. Facilities and Information for the Study

- Assignment of counterpart personal of the implementing agency for the study : 7 persons (1 doctorate, 3 master, 3 bachelor graduated)

4. Global Issues (Environment, Women in Development, Poverty, etc.)

- Environmental components of the project
Environmental Management and Pollution Control
- Anticipated environmental impacts (both natural and social) by the project
None
- Women as main beneficiaries or not
No
- Project components which require special considerations for women
No
- Anticipated impacts on women caused by the project
No
- Poverty alleviation components of the project
No
- Any constraints against the low-income people caused by the project
No

5. Undertaking of the Government of Thailand

In order to facilitate the smooth and efficient conduct of the Study, the Government of Thailand shall take necessary measures:

- (1) to secure the safety of the Study Team,
- (2) to permit the members of the Study Team to enter, leave and sojourn in Thailand in connection with their assignment therein, and exempt them from foreign registration requirements and consular fees,
- (3) to exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Thailand for the conduct of the Study,
- (4) to exempt the Study Team from income tax and charges of any kind imposed on or in connection with the implementation of the Study,
- (5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in Thailand from Japan in connection with the implementation of the Study,
- (6) The Government of Thailand shall bear claims, if any arise against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team,
- (7) The Pollution Control Department shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study,
- (8) The Pollution Control Department will, as the executing agency of the project, take responsibilities that may arise from the products of the Study,

The Government of Thailand assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

On behalf of the Government of Thailand

Date

Proposed Work Schedule

Submission of the Incineration Report (within one month from the beginning of the study)

Data Collection

Development/elaboration of emission inventories for the whole country (5 months)

Submission of the Interim Report (within 6 months from the beginning of the study)

Development/elaboration and application of a model for long-range transboundary air pollution

Development of acid deposition control strategy for the country (5 months)

Submission of the Draft Final Report (within 11 months from the beginning of the study)

Comments on the Draft Final Report by the Thai Government (within one month from the submission of the report)

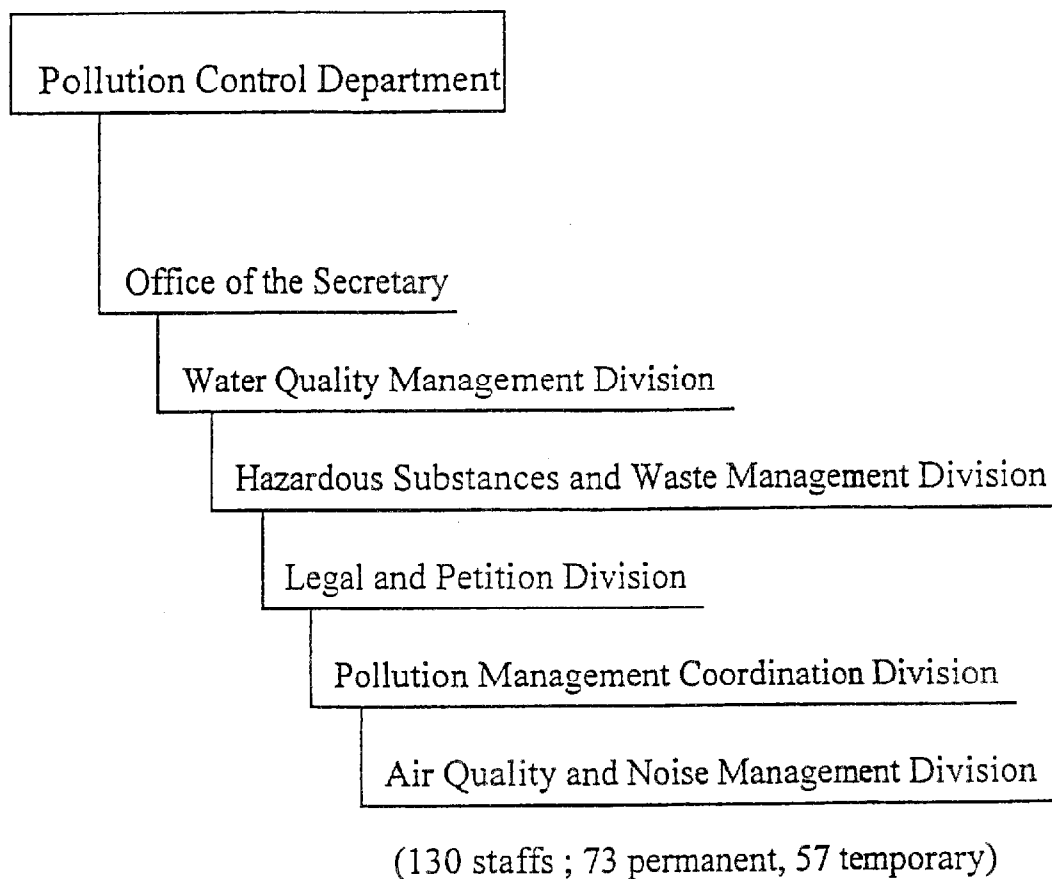
National Workshop to disseminate the outcomes of the study

Submission of the Final Report (within 12 months from the beginning of the study)

TENTATIVE SCHEDULE

			1	2	3	4	5	6	7	8	9	10	11	12	13	14
Development/elaboration of emission inventories																
Development/elaboration and application of model			←	→	→	→	→									
for long-range transboundary air pollution								←	→	→	→	→				
Development of Acid deposition control strategy													←	→	→	
REPORTS			▲ IC/R				▲ I/R					▲ IT/R		▲ IDF/R	▲ F/R	

Organization Chart

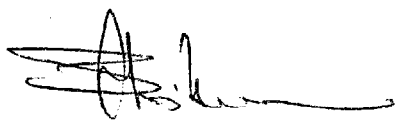


付属資料 2 . S / W(Scope of Work)

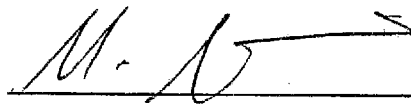
2. S/W (Scope of Work)

***SCOPE OF WORK
FOR
THE STUDY
ON
THE ACID DEPOSITION CONTROL STRATEGY
IN
THE KINGDOM OF THAILAND
AGREED UPON BETWEEN
POLLUTION CONTROL DEPARTMENT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY***

Bangkok, 31 October, 2001



Mr. Sirithan Pairoj-Boriboon
Director General
Pollution Control Department, Ministry
of Science, Technology and Environment
Kingdom of Thailand



Mr. MORIMOTO Masaru
Resident Representative
Japan International Cooperation Agency
Thailand Office
Japan

I . INTRODUCTION

In response to the official request of the Government of the Kingdom of Thailand (hereinafter referred to as " GOT "), the Government of Japan (hereinafter referred to as " GOJ ") decided to conduct the Study on the Acid Deposition Control Strategy in the Kingdom of Thailand (hereinafter referred to as "the Study") in accordance with the Agreement on Technical Cooperation between the GOJ and the GOT signed on November 5th, 1981.

Accordingly, The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the GOJ, will undertake the Study in close cooperation with the authorities concerned of the GOT.

The present document sets forth the Scope of Work with regard to the Study.

II . OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to develop/elaborate the emission inventories of substances that cause acid deposition in the whole country;
2. to apply a long-range transport model, based on the latest emission inventories developed in 1. above;
3. to review possible technical options to mitigate substances that cause acid deposition, based on the results of the simulation by the long-range transport model, and develop an acid deposition control strategy for consideration by the Royal Thai Government;
4. to train the technical staff of the relevant government agencies / institutions on the above subjects; and
5. to review the acid deposition monitoring network in the country.

III . STUDY AREA

The Study area shall cover the whole country of Thailand, with special attention to the Bangkok Metropolitan Region (hereinafter referred to as "the BMR"). The target substances are Sulfur (S) for the whole country of Thailand, and S and NO_x for the BMR.

IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the scope of work for the Study shall cover the following items.

1. Initial Seminar

2. Data Collection

- (1) National administration on acid deposition control
- (2) Acid deposition monitoring data in the country
- (3) Emission data
- (4) Meteorological data
- (5) Long-range transport model
- (6) Control measures
- (7) Socio-economic conditions
- (8) Cooperation with international organizations and bilateral aid agencies

3. Development/elaboration of emission inventories

- (1) Review and elaboration of emission inventories for the base year, including those for stationary, mobile and area sources;
- (2) Development of future scenarios for the target year; and
- (3) Review and elaboration of emission inventories for the target year.

4. Application of a long-range transport model

- (1) Review of and training on the simulation models
RAINS-ASIA ATMOS module (the original model) for the whole country of Thailand and Grid model of the Airviro system for the BMR
- (2) Improvement of the models, base year simulations and model validations
- (3) Target year simulations and analysis of the simulated results

5. Intermediate Seminar

6. Development of acid deposition control strategy for the country

- (1) Review of technical options to control substances that cause acid deposition, possibly suitable for the country;
- (2) Development/selection of potential projects;
- (3) Selection of target priority projects, based on the simulation results; and
- (4) Development of an acid deposition control strategy for the country with possible timetables of priority projects

7. Final, International Seminar

V. STUDY SCHEDULE

The Study will be carried out in accordance with the tentative schedule as attached in the appendix. The schedule is tentative and subject to be modified when both parties agree upon any necessity that will arise during the course of the Study.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the GOT.

1. Inception Report:

Twenty (20) copies at the commencement of the Study.

2. Progress Report

Twenty (20) copies will be submitted within 6 months after the submission of the Inception Report.

3. Interim Report:

Twenty (20) copies will be submitted within 3 months after the submission of the Progress Report.

4. Draft Final Report:

Twenty (20) copies at the end of the Study. The GOT shall submit its comments within one (1) month after the receipt of the Draft Final Report.

5. Final Report:

Final Report will consist of Main Report, Supporting Report, Data Book and Summary. Forty (40) copies will be submitted within one (1) month after the receipt of the comments on the Draft Final Report.

VII. UNDERTAKINGS OF THE GOVERNMENT OF THAILAND

1. Specific privileges and other benefits to the Japanese Study Team (hereinafter referred to as "the Team") necessary for the conduct of the Study will be provided in accordance with the Agreement on Technical Cooperation between the GOJ and the GOT signed on November 5th, 1981.
2. Pollution Control Department (hereinafter referred to as "PCD") shall act as a counterpart agency to the Team. PCD shall act also as a coordinating body among the other governmental and non-governmental organizations with smooth implementation of the Study.
3. To facilitate smooth conduct of the Study, to the extent possible, PCD shall take necessary measures in cooperation with other relevant organizations as follows:
 - (1) to cooperate in secure the safety of the Team, when and as it is required in the course of the Study,
 - (2) to cooperate in secure permission entry into private properties or restricted areas for the implementation of the Study,
 - (3) to cooperate in secure permission for the Team to get access to all data, documents and information necessary for the execution of the Study, and
 - (4) to assist the members of the Team to get medical services as needed. Its expenses will be chargeable on members of the Team.
4. PCD shall, at its own expenses, provide the Team with the followings in cooperation with other organizations:
 - (1) available data and information related to the Study,
 - (2) counterpart personnel,
 - (3) suitable office space with necessary equipment, and
 - (4) credentials or identification cards.

VIII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, study teams to Thailand, and
2. to pursue technology transfer to the Thailand counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA and PCD shall consult with each other in respect of any matter that may arise from or in connection with the Study.

TENTATIVE SCHEDULE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Data collection															
Development/elaboration of emission inventories															
Application of a long-range transport model															
Development of Acid deposition control strategy															
National / International Seminar															
REPORTS	▲						▲		▲				▲		▲
	IC/R						P/R		IT/R				DF/R		F/R

