

合同評価報告書

JOINT EVALUATION REPORT  
ON  
THE JAPANESE TECHNICAL COOPERATION  
FOR  
THE INDUSTRIAL ENERGY CONSERVATION PROJECT  
IN THE ARGENTINE REPUBLIC

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
JAPAN

NATIONAL INSTITUTE OF INDUSTRIAL TECHNOLOGY (INTI)  
ARGENTINE REPUBLIC

APRIL 12, 2000

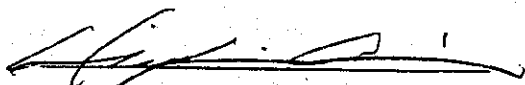
BUENOS AIRES, ARGENTINE REPUBLIC



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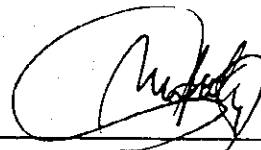
Mr. Hiroyuki ARAI

Leader

Japanese Evaluation Team

Japan International Cooperation Agency

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Ing. Leonidas J. F. Montaña

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National Institute of Industrial Technology

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## I. INTRODUCTION

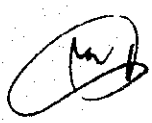
### 1. The Evaluation Team

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Hiroyuki ARAI, visited Argentine Republic from March 29 to April 13, 2000, for the purpose of joint evaluation with the Argentine Evaluation Team (hereinafter referred to as "the Argentine Team") on the achievement of the Japanese technical cooperation for the Industrial Energy Conservation Project in Argentine Republic (hereinafter referred to as "the Project") on the basis of the Record of Discussions signed on March 21, 1995 (hereinafter referred to as "R/D").

Both teams discussed and studied together the efficiency, effectiveness, impact, relevance and sustainability of the Project in accordance with the JICA Project Cycle Management (hereinafter referred to as "JPCM) method.

Through careful studies and discussions, both sides summarized their findings and observations as described in this document.

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## 2. Schedule of Joint Evaluation

- March 29, 2000 Arrival of a consultant in Buenos Aires  
Courtesy call on Embassy of Japan, JICA Office
- March 30, 2000 Meeting with Japanese Experts  
Interview with Argentine Counterparts in CIPURE
- March 31, 2000 Interview with INTI Executives  
Interview with Argentine Counterparts in CIPURE  
Interview with Japanese Experts
- April 1, 2000 Information analysis
- April 2, 2000 Information analysis and documentation
- April 3, 2000 Visit and collect answer sheet for the questionnaire from factories (Cargill)
- April 4, 2000 Interview with Argentine Counterparts in CIPURE  
Visit and collect answer sheet for the questionnaire from factories (Quilmes)
- April 5, 2000 Information analysis and documentation  
Arrival of other members of the Japanese Team in Buenos Aires  
Courtesy call on Embassy of Japan, JICA Office
- April 6, 2000 Courtesy call on INTI Executives: Ing. Montaña (President), Ing. Córdoba,  
Ing. Marqués, Ing. Pedelaborde  
Courtesy call on the Ministry of Foreign Affairs  
Investigation of equipment provided by JICA
- April 7, 2000 Courtesy call on INTI Executives: Ing. Martini, Ing. Dmitruk, Ing. Galliano  
Interview with Argentine Counterparts in CIPURE  
Meeting with Japanese Experts  
Joint meeting between the Japanese and Argentine Teams: exchange  
opinions regarding achievements and evaluations of the Project  
Observation of the facilities and equipment of the CIPURE
- April 8, 2000 Information analysis
- April 9, 2000 Information analysis and documentation
- April 10, 2000 Joint meeting between the Japanese and Argentine Teams: discussion  
regarding the evaluation results of the Project
- April 11, 2000 Joint meeting between the Japanese and Argentine Teams: discussion  
regarding the evaluation results of the Project
- April 12, 2000 Discussion on draft of Evaluation Report  
Signing of the Evaluation Report and Minutes of the Discussions  
Report of the evaluation results to JICA Office
- April 13, 2000 Report of the evaluation results to Embassy of Japan

### 3. Members of the Evaluation Teams

#### 3-1. Japanese Team

Mr. Hiroyuki ARAI	Leader of Japanese Evaluation Team Director of Planning and Financial Cooperation Division, Mining & Industrial Development Cooperation Department, JICA
Mr. Kenichiro KOREEDA	Member in charge of Technical Cooperation Planning International Affairs Office, Coal and New Energy Department, Technical Agency of Natural Resources and Energy, MITI
Mr. Shinichi SHIBUSAWA	Member in charge of Technology Transfer Program Executive/Director of Kashima Division, Sumitomo Management Co., Ltd.
Mr. Takeshi SEKIYAMA	Member in charge of Energy Conservation Technology General Manager, International Engineering Department, The Energy Conservation Center, Japan (ECCJ)
Ms. Hisae OSHIKANE	Member in charge of Project Management Staff, Second Technical Cooperation Division, Mining & Industrial Development Cooperation Department, JICA
Mr. Tomoyuki YAMASHITA	Member in charge of Data Compilation and Analysis Assistant Section Chief, Overseas Business Center, Overseas Engineering Department, Tokyo Electric Power Services Co., Ltd.

#### 3-2. Argentine Team

Mr. Leonidas J. F. Montaña	Leader President National Institute of Industrial Technology (INTI)
Mr. Edgardo Martini	Vice-President No.1 in charge of General Manager, National Institute of Industrial Technology (INTI)
Mr. Daniel Marqués	Manager for Quality and Environment, National Institute of Industrial Technology (INTI)
Mr. Andrés Dmitruk	Manager for Development, National Institute of Industrial Technology (INTI)
Mr. Alfredo Galliano	Manager for Marketing, National Institute of Industrial Technology (INTI)
Mr. Alfredo Córdoba	Manager for Economic and Institutional Cooperation, National Institute of Industrial Technology (INTI)
Mr. Pablo Alvarez	Vice-President of CIPURE Executive Committee, San Bernardo Electric, Public Works and Services Cooperatives Ltd.

## II. METHODOLOGY OF EVALUATION

### 1. Method of Evaluation

The evaluation study was conducted in accordance with the JICA Project Cycle Management (JPCM) method.

- The Project Design Matrix (PDM) was agreed by both sides as a basis of the evaluation.
- Achievement of the Project was studied by collecting data of the Objectively Verifiable Indicators set in the PDM
- The Project was evaluated on five aspects described below.

### 2. Aspects of Evaluation

The Project was studied and analyzed on the following five aspects:

- 1) Efficiency : Evaluate how the results stand in relation to the efforts and resources, how economically the resources were converted to the outputs, and whether the same results could have been achieved by other better methods.
- 2) Effectiveness : Evaluate the extent to which the purpose has been achieved or not, and whether the project purpose can be expected to happen on the basis of the outputs of the project.
- 3) Impact : Foreseeable or unforeseeable, and favorable or adverse effect of the project upon the target groups and persons possibly affected by the project.
- 4) Relevance : Evaluate the degree to which the project can still be justified in relation to the national and regional priority levels given to the theme.
- 5) Sustainability : Evaluate the extent to which the positive effects as a result of the project will still continue after external assistance has been concluded.

### 3. Information for Evaluation

Following sources of information were used in this study.

- 1) Documents agreed by both sides prior to and/or in the course of the Project implementation;
  - R/D
  - Minutes of the Discussions
  - Tentative Schedule of Implementation (TSI)
- 2) The Project Design Matrix (Annex-1)
- 3) Record of inputs from both sides and activities of the Project
- 4) Statistics
- 5) Interviews with and questionnaires to counterparts, INTI Executive, Japanese Experts and several factories\* which dispatched workers to the technical training courses and/or had energy audits executed by CIPURE.

\* Approx. 11 questionnaires were sent to the factories, out of which 3 collected.



### III. BACKGROUND AND SUMMARY OF THE PROJECT

#### I. Background of the Project

Argentina is rich in natural resources such as oil, natural gas, fertile soil, hydropower and fishery. Energy situation of the country, however, had become worse by the following reasons:

- The estimated amounts of oil and gas deposit in the country would be exhausted within about 10 years and 15 years respectively, taking volumes of oil/gas drilling, domestic consumption, and export amounts into consideration,
- Amount of energy consumption in the country had kept on increasing,
- Due to superannuated equipment in industrial areas, efficiency of energy utilization had been in low level, and so on.

Additionally, in order to settle the country's international debt by saving domestic oil consumption and export it as an acquisition source of foreign currency, the country had to promote policies regarding energy conservation and new energy development. In the industrial sector, technological development, guidance for factories and investigation of energy consumption in factories were tried by National Institute of Industrial Technology (INTI). The situation, however, never be better since lacking of energy audit technology, shortage of materials/equipment and so on in INTI. Under the circumstances, the Government of Argentina formally requested to the Government of Japan for development study to make a plan regarding rational utilization of energy in industrial areas. Then, "The Study on the Rational Use of Energy in Industry in Argentine Republic" was executed from December 1987 to January 1989.

Based on the results of the Master Plan Study, the Government of Argentina had made a plan for establishing Energy Management Training Center in INTI, and formally requested to the Government of Japan for technical cooperation regarding the following matters in July 1991.

- Technology transfer to the Counterparts in INTI in order them to be leaders/promoters of energy conservation,
- Provision of Technical Training Courses for energy managers in industrial areas,
- Execution of energy audits and consultation services for factories,
- Accumulation of technical information regarding energy conservation,
- Conduction of public relations, and
- Making recommendation for energy conservation policy.

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In response to the request, the Government of Japan, through JICA, dispatched the Preliminary Study Team followed by the Experts Study Team and the Implementation Study Team. The Record of Discussions (R/D) was signed in March 1995.

In accordance with the R/D, five-year technical cooperation had started from July 1, 1995, with a purpose of expanding the functions of the Department Energy of INTI enable it to effectively lead and promote energy conservation in industrial area in Argentine Republic.

The Department Energy of INTI has been altered to Center of Research and Development for Rational Use of Energy (CIPURE) from September 1997. The name of the institution, at which the Project has been implemented, is referred to as CIPURE hereinafter.

## 2. Chronological Review of the Project

A chronological review of the Project is summarized in Annex-2.

## 3. Objective of the Project

Objective of the Project in the R/D was:

By expanding the functions, the Department Energy of INTI is enable to effectively lead and promote energy conservation in industrial areas.

Since the Department Energy had been altered to CIPURE in INTI in September 1997, the objective of the Project was also modified slightly shown as the following:

By expanding the functions, CIPURE is enable to effectively lead and promote energy conservation in industrial areas.

## 4. Tentative Schedule of Implementation

The Tentative Schedule of Implementation (TSI) is attached in Annex-3.

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#### IV. RESULTS OF EVALUATION

##### 1. Summary

###### Efficiency

The scale of cooperation as well as the timing of the cooperation, supporting system and linkage with other activities was almost appropriately planned and inputs were efficiently converted to outputs. Dispatch of the Short-term Experts might have been more efficiently if the timing of dispatch was accordance with the progress in activities and if the experts' fields were more carefully determined.

The technical transfer as well as the conversion of input to output could have been more efficient if all activities and facility/equipment provision was on the schedule.

###### Effectiveness

Appropriate technology for CIPURE to expand the function and enable to effectively lead and promote energy conservation in industrial areas have been transferred effectively. As a result, the Project Purpose will be achieved by the end of cooperation period.

The Project Purpose would have been more effectively achieved if relation with both public and private organizations, such as the Secretariat of Energy, FONTAR, other Centers in INTI, private companies in the Executive Committee and so on, had been strengthen.

###### Impact

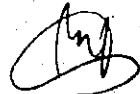
Execution of training courses, seminars and lecture meetings by counterparts has contributed to promote not only energy conservation but also activities of CIPURE in the industrial sector.

Energy audit carried out by CIPURE was admired as excellent level by factories and some of them have followed the recommendation of CIPURE and achieved considerably high energy conservation. In addition, at two countries in Mercosur, Paraguay and Chile, energy audits of power plants were executed by the counterparts.

###### Relevance

Social background has been drastically changed during the project period, such as privatization of national enterprises that caused depreciation of energy prices. The project purpose, however, was relevant to the needs of the sector in Argentina from the point of view in the modernization of industrial sector and the environmental impact mitigation.

The Overall Goal, "Industrial energy conservation is promoted in Argentine Republic" is also relevant as a long-term aim, but will be better achieved with establishment of energy conservation law. Continuous approach from CIPURE to the policy-making organization regarding energy, the Secretariat of Energy, is required to fulfill the Overall Goal.



### Sustainability

Although counterpart organization's capability of promotion and financial management need to be enhanced by its own efforts for aiming increase in number of supporting enterprises/energy audits/participants to training courses, and expansion of adaptable industrial field, necessary technology/knowledge to continue project activities have been transferred successfully.

Technical level of counterparts has been developed to sufficient to maintain and develop future activities of CIPURE.

Necessary budgets have been sufficiently earned by energy audits and training courses to manage and operate CIPURE, assuming that salary for staff members, which include those currently hired as well as those will be hired in the future, and expenditures for new installations are continuously provided by INTI.

### Future prospects

The project is expected to achieve its target by the end of June 2000. Much efforts by CIPURE and strong support from both public and private organization, such as the Secretariat of Energy, FONTAR, other Centers in INTI, private companies in the Executive Committee and so on, are essential to develop the capacity of CIPURE to achieve the Overall Goal of the Project.

2. Achievement of the Plan

Narrative Summary	Verifiable Indicators	Result
<p><u>Overall Goal</u> Industrial energy conservation is promoted in Argentine Republic.</p>	<p>1. The number of enterprises carrying out energy conservation activities increase.</p> <p>2. Energy efficiency is improved in the top 10 industries.</p>	<p>1. Energy conservation activities, such as trial for obtaining ISO 14000, realization of recommendations as results of CIPURE's energy audits, have been increased especially in medium and large-sized enterprises.</p> <p>2. Energy audits have been executed in 3 industrial areas.</p>
<p><u>Project Purpose</u> By expanding the functions, CIPURE is enable to effectively lead and promote energy conservation in industrial areas.</p>	<p>The number of enterprises that participate in activities of CIPURE increase.</p>	<p>Since CIPURE's services have gained public favor from factories and getting famous by mouth-to-mouth advertising, brochures, and so on, the numbers of enterprises participate in the services will be expected to increase.</p>
<p><u>Output</u></p> <p>1. Counterparts who lead and promote energy conservation are developed.</p> <p>2. Energy managers in industrial areas are trained by developed counterparts.</p> <p>3. Energy conservation awareness and knowledge in industrial areas is promoted by developed counterparts.</p>	<p>1-1 C/P's knowledge and technology level reaches to necessary standard.</p> <p>1-2 Training equipment are made effective use of.</p> <p>2. The number of enterprises, which apply for training course, increases.</p> <p>3-1 The number of audit order increases.</p> <p>3-2 The number of consultation increases.</p> <p>3-3 The number of supporting members to CIPURE increases</p> <p>3-4 Various kinds of public relations are conducted.</p> <p>3-5 Information like statistical and technical data are accumulated.</p> <p>3-6 Some progress is made in the energy conservation policy.</p>	<p>1. Training courses and energy audits with charges were planned and implemented by C/Ps. Safety operation of the training plant is possible. C/Ps' operation techniques of audit equipment became in high level.</p> <p>2. Numbers of courses have been held during the project period are shown on the following: -Energy Management Course: 6 times with total 89 participants -Boiler Operation Course: 9 times with total 199 participants</p> <p>3-1 Total number of energy audits executed during the project period was 17.</p> <p>3-2 Total number of consultations executed during the project period was 139.</p> <p>3-3 Supporting members for CIPURE have not increased: 6 companies at the present.</p> <p>3-4 Seminars and lecture meetings have been executed totally 24 times with 761 participants. Internet homepage was created. Periodic magazine ("Con Energia": 4 times/year) has been published by 13 issues.</p> <p>3-5 The framework of database system has accomplished.</p> <p>3-6 Energy conservation level needs to be indicated on electrical appliances from May 2000.</p>

Activities	Inputs	
	R/D	Result
<p>1. The Japanese side carries out the following activities in cooperation with the Argentine side:</p> <p>1-1 Formulates plans for counterpart training programs.</p> <p>1-2 Prepares for counterpart training materials.</p> <p>1-3 Provides guidance and makes lectures to counterparts.</p> <p>2. The Argentine side carries out the following activities with advice and guidance from the Japanese experts:</p> <p>2-1 Formulates plans for training courses.</p> <p>2-2 Prepares materials for training courses.</p> <p>2-3 Recruits trainees.</p> <p>2-4 Provides training courses.</p> <p>3-1 Recruits factories to receive audits and consultations.</p> <p>3-2 Performs factory energy audits.</p> <p>3-3 Performs factory improvement consultations.</p> <p>3-4 Collects, processes and provides information.</p> <p>3-5 Conducts technical public relations.</p> <p>3-6 Recommends plans for appropriate measures.</p>	<p><u>The Japanese Side</u></p> <p>1) Experts -Long-term: 4 persons -Short-term: Number of persons depends on necessity</p> <p>2) C/P training in Japan About 4 persons per annum</p> <p>3) Machinery and equipment -Training plant for energy conservation -Diagnostic equipment and instruments -Information system -Audiovisual equipment -Technical printed matters</p> <p><u>The Argentine Side</u></p> <p>1) Counterpart personnel</p> <p>2) Local costs</p> <p>3) Facilities of project-site</p>	<p><u>The Japanese Side</u></p> <p>1) Experts -Long-term: 4 persons (cumulatively 8) -Short-term: 23 persons (among which 7 for installation and trial operation of the training plant)</p> <p>2) C/P training in Japan -Individual Course: 14 C/Ps -Group Course: 3 C/Ps</p> <p>3) Machinery and equipment Approx. 483.5M Yen [US\$3.67M] (exclude equipment carried by Experts)</p> <p>4) Local Cost Approx. 33.5M Yen [US\$0.32M]</p> <p><u>The Argentine Side</u></p> <p>1) Counterpart personnel 19 persons (among which 4 for administration staffs)</p> <p>2) Facilities Construction of Laboratory /Training building</p> <p>3) Local costs Approx. US\$2.4M (among which US\$0.4M from CIPURE's own revenue source)</p> <p>4) Facilities of project site Maintenance of training plant and audit equipment</p>

3. Details

3-1 Efficiency

	Content	Reference
Timing, Quality and Quantity of Inputs	<ul style="list-style-type: none"> <li>- Dispatch of a Japanese Long-term Expert in charge of electric management technology was delayed for 4 months. The activities of technology transfer regarding public relations and technical information integration were also delayed from the original schedule.</li> <li>- Installation works of training plant started behind the schedule, since the construction of the training center building completed about two years late for the original plan. As a result, utilization of the training plant in the training courses also delayed by November 1998.</li> <li>- Equipment for energy audits were provided in appropriate timing by JICA and utilized them effectively in the project activities.</li> <li>- Acceptance of five C/Ps to training program in Japan, prior to the dispatch of the first Long-term Expert in 1995, was inadequate from the point of views of the C/Ps' capacity building and efficiency. After the third year of the project, however, the training program in Japan has been useful for technology transfer to C/Ps since the program was modified to satisfy each C/P's requests.</li> </ul>	<p>Annex-5</p> <p>Annex-3</p> <p>Annex-3 &amp; 7</p> <p>Annex-10</p>
Level of Outputs Compared with Quantity and Quality of Inputs	<ul style="list-style-type: none"> <li>- Although the numbers of Long-term and Short-term Experts dispatched to the project were adequate, about 40% of Short-term Experts were exhausted in installation works of training plant in addition to much effort and valuable time of the Long-term Experts. Also, Short-term Experts' dispatch in charge of energy audits was limited to 3 industrial areas among 10 in the plan.</li> <li>- As the training plant is an article specially made to order, maintenance work is essential taking utilization conditions into account.</li> <li>- The equipment for energy audits provided by JICA have been utilized effectively in the project activities.</li> <li>- Enough numbers of C/Ps have been assigned to the project. Appropriate C/Ps, however, needed to be assigned to the project.</li> <li>- Total numbers of C/Ps accepted to the training program in Japan were adequate: 15 C/Ps and among which 2 C/Ps attended the program twice.</li> <li>- While 138 million Yen (US\$1,1M) was invested for the construction of the training building, utilization of the building is not frequently.</li> </ul>	<p>Annex-5</p> <p>Annex-7</p> <p>Annex-7</p> <p>Annex-4 &amp; 9</p> <p>Annex-10</p> <p>Annex-14</p>

Supporting System for the Project	<p>- The Joint Coordinating Committee has never been held by the present. Executive Committee of CIPURE, which organized in July 1998, however, considers as the alternative of the Joint Coordinating Committee. The Executive Committee consists of INTI, Secretariat of Energy and 5 private enterprises.</p>	
Linkage with Other Cooperation Projects	<p>- Efforts have been made to cooperate and coordinate with other projects/organizations such as the followings:</p> <ol style="list-style-type: none"> <li>1) "Energy management and conservation program for small and medium sized industries" which started in Secretariat of Energy in cooperation with GTZ from November 1999.</li> <li>2) Universities in urban area, such as the University of Buenos Aires.</li> <li>3) Industrial Chamber/Society.</li> <li>4) European Union (EU).</li> </ol> <p>- Energy audits have been executed in neighboring countries, such as Paraguay and Chile, by the C/Ps developed in the project. In the future, acceptance/dispatch of C/Ps from/for countries Mercosur as the Third-country Training Program, Technical Cooperation Among Developing Countries and so on will possibly be considered.</p>	Annex-17

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3-2 Effectiveness

	Level of Achievement and Obstacles in Achieving the Initial Plan	Reference
Output Level	<p>In general, outputs have been achieved to a satisfactory level.</p> <ul style="list-style-type: none"> <li>- 26 items of technology have been transferred to C/Ps.</li> <li>- 67 training materials in both English and Spanish have been prepared for C/Ps.</li> <li>- Guidance and lectures to C/Ps were provided individually in the first term (1996-97) and in a group with an interpreter in the second term (1998-2000).</li> <li>- From November 1997, training courses have been provided by the C/Ps themselves. By the present, the energy management courses were held in 6 times with 89 participants, in addition to the boiler operation courses in 9 times with 199 participants.</li> <li>- C/Ps became enable to plan and implement training courses complying with private factories' needs/requests, although abilities regarding recruitment of attendants for the courses and financial management need to be enhanced.</li> <li>- C/Ps visited more than 139 companies, among which energy audits were executed for 17 factories. Requests for CIPURE's energy audit from factories have been increasing.</li> <li>- Seminars and lecture meetings have been executed 24 times with 761 participants, as public relations. Internet homepage was also created. In addition, 13 issues of the periodic magazine "Con Energia" and brochures of CIPURE's activities have been published.</li> <li>- The framework of database system has accomplished.</li> </ul>	<p>Annex-13 Annex-16</p> <p>Annex-14</p> <p>Annex-17</p> <p>Annex-17</p>
Project Purpose Level	<ul style="list-style-type: none"> <li>- The project purpose is expected to achieve by the end of cooperation period. Technical level of CIPURE has been developed to a level, which is sufficient to conduct training courses, energy audits and conventional maintenance for the training plant. C/Ps acquired confidence in their technology.</li> <li>- CIPURE has gained public favor from enterprises/factories which dispatched workers for training courses and received energy audits /consultations. The numbers of enterprises participate in the CIPURE's services are expected to increase.</li> <li>- On the other hand, CIPURE needs to enhance abilities regarding public relations, technical information integration and financial management</li> </ul>	<p>Annex-13</p> <p>Annex-14</p> <p>Annex-12</p>
Factors Affected to Achievement of Project Purpose on the Basis of Outputs	<ul style="list-style-type: none"> <li>- Technology transfer items were limited for technician level of C/Ps.</li> <li>- Energy conservation law has not been established in the country, although the energy conservation level becomes to be indicated on electrical appliances from May 2000. Since Secretariat of Energy is the competent authority regarding the energy conservation law, CIPURE should have more firmly cooperated with it.</li> <li>- Managers of enterprises/factories give higher priority to productivity, quality control and financing than energy conservation. Since even measuring instruments are not equipped in the factories, accumulations of energy consumption data are troublesome.</li> <li>- Less priority was assigned to public relations and technical information integration in the project, which did not contribute for CIPURE's revenue.</li> </ul>	



3-3 Impact

	Content of impact	Reference
Direct Impact (Project Purpose Level)	<ul style="list-style-type: none"> <li>- As the only organization, which equips with training plant, CIPURE is getting famous in Mercosur. Requests of training courses and energy audits have increased for CIPURE from not only domestic industrial sector but also neighboring countries. Energy audits, such as in a power plant, were actually carried out in Paraguay and Chile by the C/Ps of CIPURE.</li> <li>- Technique of C/Ps regarding energy audit is admired as high level by factories which received services from CIPURE. Thus, CIPURE became famous rapidly as an official organization, which leads and promotes energy conservation, in the domestic industrial sector by mouth-to-mouth advertising.</li> <li>- No negative direct impact is observed at the project purpose level. Management and maintenance fees for the training center building and the training plant, however, need to be prepared by CIPURE from now on.</li> </ul>	Annex-17
Indirect Impact (Overall Goal Level)	<ul style="list-style-type: none"> <li>- It is not possible to evaluate indirect impact as a contribution of the Project. However, it can be considered as one of the indirect impacts that domestic public organizations and foreign donor organizations started to consider the effective use of the training center, training plant and so on for the energy conservation activities.</li> <li>- Requests of effectiveness tests for boiler and turbine became increase from an electric company. These activities contribute not only for the energy conservation in electric power sector but also for the reduction of electricity fee.</li> <li>- Importance of energy conservation in order to achieve reduction of carbon dioxide emission becomes to be recognized in industrial areas, as the numbers of factories which try to obtain ISO14000 certification increase. Requests of consulting services regarding energy management for CIPURE have been increasing under this circumstance.</li> </ul>	Annex-17

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3-4 Relevance

	Content	Reference
<p><u>Overall Goal</u> Relevance with - National Policy</p>	<ul style="list-style-type: none"> <li>- Stable energy supply has been emphasized rather than energy conservation in the national policy since the project beginning. Energy conservation, however, will be more important from the point of view in the modernization and competitiveness of industrial sector and the environmental impact mitigation.</li> <li>- In the industrial sector, financial stability is the greatest concern. In order to cut down production cost, however, factories are interested in the energy conservation, especially on electricity. Since the Project has been contributed to the power plants' audit and improvement of generation efficiency, the Overall Goal still relevant to the sector's needs.</li> </ul>	
<p><u>Project Purpose</u> Relevance with - Needs of Center - Overall Goal</p>	<ul style="list-style-type: none"> <li>- As an implementation organization of actual activities, CIPURE/INTI have been cooperated with Secretariat of Energy, which is the policy-making organization, in the cooperation programs donated by foreign organization. Therefore, CIPURE was the suitable C/P organization for the technology transfer of energy conservation, such as training courses' provision and audits' service technique, of this Project. The Project Purpose, expansion of the function, also fulfilled the needs of CIPURE/INTI as to be a leading and promoting organization regarding energy conservation in industrial areas.</li> <li>- Since the industrial enterprises, the beneficiary group of the Overall Goal, did not involved in the Executive Committee of the Project so much, enormous effort was made in the promotion activities. At the present, the ending stage of the Project, it is still uncertain whether assistance from the industrial enterprises can be obtained for the future promotion of energy conservation.</li> </ul>	
<p><u>Rationale of Project Planning</u></p>	<ul style="list-style-type: none"> <li>- In order for CIPURE to be training, leading and promoting center of energy conservation, planned activities in R/D shown on the followings were relevant:               <ol style="list-style-type: none"> <li>1) Capacity building of C/Ps by technology transfer from JICA Experts.</li> <li>2) Provision of the training courses for energy managers of private factories/enterprises.</li> <li>3) Execution of energy audits/consultations for factories.</li> <li>4) Integration of technical information in a database.</li> <li>5) Promotion of industrial energy conservation.</li> </ol> </li> <li>- Regarding management expenditures at the initial stage of the Project, such as preparation cost of training materials, recruitment cost for participants of training courses, traveling cost of factories' visit and so on, were not considered in the plan. Since all activities' costs of the Project were assumed to obtain from the service charges for private factories/enterprises, preparation of expenditures at the initial was the hardship.</li> <li>- Numbers of both JICA Experts and C/Ps planned in the R/D were relatively not enough for the various activities needed in the project. Especially, simultaneous execution of training courses and energy audits was impossible, since main activities were concentrated to the particular C/Ps.</li> <li>- The training plant was important equipment in order to utilize in the training courses. System for the maintenance/preservation of equipment should have been established.</li> </ul>	

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*(Signature)*

Factors Affected	<ul style="list-style-type: none"><li>- During the project period, social/economic environment and energy condition have been changed drastically which affected industrial sector's needs and priority in the policy. In the industrial sector, technical support, preparation of financing system, improvement of productivity/quality and so on are the recent needs.</li><li>- Target group of the present energy law is not energy consumers but suppliers. Energy conservation law has not established in the country. Therefore, industrial energy conservation depends on decisions of private factories/enterprises as energy consumers.</li></ul>	
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### 3-5 Sustainability

<p>Institutional Aspects</p>	<ul style="list-style-type: none"> <li>- Although both CIPURE/INTI and the Secretariat of Energy are affiliated to the Ministry of Economy and Public Services, policy-making regarding energy is not CIPURE/INTI's responsibility but the Secretariat of Energy's. Therefore, in order for CIPURE to expand the activities and promote energy conservation further, close cooperation with the Secretariat of Energy is essential. The cooperation system has been established since the Secretariat of Energy joined to a supporting member of the CIPURE in June 1998, and prosperity of CIPURE will be expected.</li> <li>- As they have been regarded as a part of important functions and have contributed to the large part of income of CIPURE, continuance of the activities executed in the project will be anticipated.</li> <li>- Among the C/Ps developed in the project, several can be the core persons to proceed the activities. Stability of these C/Ps will be one of the important assumptions for sustainability of CIPURE's activities.</li> <li>- In order for CIPURE to expand the training courses and the energy audit services as an energy conservation business, more knowledge/experience regarding strategy making, personal management and so on need to be enhanced.</li> </ul>
<p>Financial Aspects</p>	<ul style="list-style-type: none"> <li>- CIPURE's all expenditure, necessary to the execution of the activities, has been earned by the charges for training courses and energy audits provided to private factories/enterprises. Therefore, profitable management is essential for the sustainable activities and function of financial management needs to be enhanced in CIPURE.</li> </ul>
<p>Technical Aspects</p>	<ul style="list-style-type: none"> <li>- Technology transfer to C/Ps has been implemented sufficiently to maintain and develop further activities. Training materials and equipment have been prepared as a fruit of the project. Operation and maintenance manuals of the training plant have been also ready.</li> <li>- It is possible for C/Ps to provide the training courses by themselves, meeting with the needs of the industrial sector. C/Ps have also been trained enable to handle a variety of measurement equipment and CIPURE's energy audits have been gained public favor from factories/enterprises.</li> <li>- By executing periodical maintenance/preservation, based on the manuals provided by JICA Experts, numbers of trouble and breakdown of equipment can be minimized.</li> </ul>

## V. CONCLUSION

In conclusion, the project has been successfully implemented and will achieve its Project Purpose by the end of the Project period. Although delay of the schedule and some problems were observed, the project has tried to catch up and solve them by taking flexible measures. The counterpart organization, now converted to the CIPURE from Department of Energy, has acquired capacity to be self-reliant in the future, although efforts are required to maintain and develop its capability. Expansion of activity fields in the industrial area is also necessary for CIPURE to achieve the Overall Goal of the Project in the future.

## VI. RECOMMENDATION

From the point of view in sustainability, the following recommendations are provided to the counterpart organization:

- Enhancement of CIPURE's functions regarding business promotion of chargeable services and financial management is necessary for sustainable operation.
- Since financial support and legal assistance are essential to proceed industrial energy conservation activities, relation with other public organizations, such as Secretariat of Energy and FONTAR, needs to strengthen.
- Challenging for expansion of both training course programs and industrial fields of energy audits is encouraged for aiming an increase in financial revenue which enable CIPURE to hire more staffs, provide incentives, procure spare parts and so on.
- More efficient procurement system regarding spare parts, expendable supplies and additional equipment by CIPURE's own revenue needs to be established.
- Execution of periodical maintenance/preservation, based on the manuals provided by JICA Experts, will contribute to minimize the numbers of trouble and breakdown of the equipment.
- Information sharing, "among staff members in CIPURE" and "between CIPURE and other Centers in INTT", is essential to effective execution of activities. In order to strengthen these information-sharing systems, utilization of database provided by the Project and/or introduction of schedule management system of each staff members are recommended.
- The core persons to proceed the activities need to be educated by developed counterparts in the Project. Simultaneous execution of both training courses and energy audits will improve CIPURE's financial conditions.
- Effective utilization of transferred technology and provided equipment, such as providing lectures for university students, lending of equipment/facilities to universities/private companies and so on, is desired.
- Cooperation with other projects/donors actively, such as "Energy management and conservation program for small and medium sized industries" with GTZ, is highly recommended by utilizing provided knowledge/equipment in the Project
- In the future, acceptance/dispatch of C/Ps from/for countries Mercosur as the Third-country Training Program, Technical Cooperation Among Developing Countries and so on will possibly be considered.
- After the Project period, continuous contact with JICA Argentina Office is recommended to inform the latest condition of CIPURE and request support if necessary.

## VII. LESSONS LEARNED

Following lessons are derived from the Project:

- In order to proceed the project smoothly, target group should be involved in a part of the project as many as possible, such as in a member of the Joint Coordinating Committee/supporting enterprises in charge with promotion of the activities.
- Establishment of exclusive organization and assignment of full time counterparts for the project are suitable for effective technology transfer to counterparts and efficient project execution.
- Securing necessary and suitable JICA Experts, counterparts as well as supporting staff, is essential in order to implement the project efficiently, to meet the volume of activities.
- Although the project supposing financial self-reliance of counterpart organization, initial cost at the beginning of the project, such as preparation cost of training materials, recruitment cost for participants of training courses, traveling cost of factories visit, need to be considered in the plan.
- Technology transfer of the maintenance/preservation of equipment and the business administration should be involved in the project activities.
- Outputs of the project need to be narrowed taking counterpart organization's responsibilities/tasks into account.

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- ANNEX-2 Chronological Review of the Project
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- ANNEX-4 Organization Chart of CIPURE/INTI
- ANNEX-5 List of Dispatched Japanese Experts
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## ANNEX-1 Project Design Matrix (PDM) for Evaluation

Narrative Summary of the Project	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal</b></p> <p>Industrial energy conservation is promoted in the Argentine Republic.</p>	<p>1 The number of enterprises carrying out energy conservation activities increase.</p> <p>2 Energy efficiency is improved in the top 10 industries.</p>	<p>National statistics</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with INTI Executives, C/Ps and JICA Experts.</p>	<p>The national policy on energy conservation remains in force.</p> <p>There is no big drop in energy price.</p>
<p><b>Project Purpose</b></p> <p>By expanding the functions, CIPURE is able to effectively lead and promote energy conservation in industrial areas.</p>	<p>The number of enterprises that participate in activities of CIPURE increase.</p>	<p>Statistical records of enterprises served by CIPURE.</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with INTI Executives, C/Ps and JICA Experts.</p>	<p>The Argentine Government keeps supporting the project.</p> <p>The function of CIPURE does not undergo a considerable change.</p>
<p><b>Output</b></p> <p>1 Counterparts who lead and promote energy conservation are developed.</p>	<p>1-1 C/P's knowledge and technology level reaches to necessary standard.</p> <p>1-2 Training equipment are made effective use of.</p>	<p>1-1 List of technology transfer subjects with C/P's understanding level.</p> <p>Interviews with C/Ps and JICA Experts.</p> <p>1-2 Utilization report of training equipment.</p> <p>Interviews with C/Ps and JICA Experts.</p>	<p>The industrial sector takes a collaborative stance to the Project.</p> <p>Developed C/Ps stay in their jobs.</p>
<p>2 Energy managers in industrial areas are trained by developed counterparts.</p>	<p>2 The numbers of enterprises which apply for training course increase.</p>	<p>2 Statistical records of participants for the training courses.</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with C/Ps and JICA Experts.</p>	
<p>3 Energy conservation awareness and knowledge in industrial areas is promoted by developed counterparts.</p>	<p>3-1 The number of audit order increases.</p> <p>3-2 The number of consultation increases.</p> <p>3-3 The number of supporting members to CIPURE increases.</p> <p>3-4 Various kinds of public relations are conducted.</p> <p>3-5 Information like statistical and technical data are accumulated.</p> <p>3-6 Some progress is made in the energy conservation policy.</p>	<p>3-1 Statistical records of the energy audits.</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with C/Ps and JICA Experts.</p> <p>3-2 Statistical records of the consultations.</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with C/Ps and JICA Experts.</p> <p>3-3 List of CIPURE sponsors.</p> <p>Interviews with/questionnaires to the industries.</p> <p>Interviews with INTI Executives, C/Ps and JICA Experts.</p> <p>3-4 CIPURE annual activity report.</p> <p>Interviews with C/Ps and JICA Experts.</p> <p>3-5 Technical information databases.</p> <p>Interviews with C/Ps and JICA Experts.</p> <p>3-6 Interviews with INTI Executives, C/Ps and JICA Experts.</p>	



Inputs (1995 - 1999)	
Activities	The Japanese Side
<p>1 The Japanese side carries out the following activities in cooperation with the Argentine side:</p> <p>1-1 Formulates plans for counterpart training programs.</p> <p>1-2 Prepares for counterpart training materials.</p> <p>1-3 Provides guidance and makes lectures to counterparts.</p> <p>2 The Argentine side carries out the following activities with advice and guidance from the Japanese experts:</p> <p>2-1 Formulates plans for training courses.</p> <p>2-2 Prepares materials for training courses.</p> <p>2-3 Recruits trainees.</p> <p>2-4 Provides training courses.</p> <p>3-1 Recruits factories to receive audits and consultations.</p> <p>3-2 Performs factory energy audits.</p> <p>3-3 Performs factory improvement consultations.</p> <p>3-4 Collects, processes and provides information.</p> <p>3-5 Conducts technical public relations.</p> <p>3-6 Recommends plans for appropriate measures.</p>	<p>The Argentine Side</p> <p>1) Counterpart personnel 19 persons (among which 4 for administration staffs)</p> <p>2) Facilities Construction of Laboratory/Training building</p> <p>3) Local costs Approx. US\$2.4M (among which US\$0.4M from CIPURE's own revenue source)</p> <p>4) Facilities of project site Maintenance of training plant and audit equipment</p>
	<p>The Japanese Side</p> <p>1) Experts (Long-term 4 persons (cumulatively 8) /Short-term 23 persons 2) C/P training in Japan Individual Course: 14 C/Ps Group Course: 3 C/Ps 3) Machinery and equipment Approx. ¥483.5M [US\$3.67M] (exclude equipment carried by Experts)</p> <p>4) Local Cost Approx. ¥33.5M [US\$0.32]</p>
	<p><u>Pre-conditions</u></p> <p>* The approval and disbursement of FONTAR loan, and the construction of the new building proceed smoothly.</p>

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ANNEX-2 Chronological Review of the Project

Year	Month/Date	Item
1991	July	The Argentine Government submitted a request for a Project-type Technical Cooperation to the Government of Japan
1992	February	Dispatch of Project Formulation Team
1994	April 4 – April 16	Dispatch of Preliminary Survey Team
	August 19 – September 11	Dispatch of the Experts Survey Team
1995	March 12 – March 25	Dispatch of the Implementation Survey Team
	March 21	Sign of the Record of Discussions (R/D)
	July 1	Start of the Term of the Cooperation
	September – November	Training of the 1 <sup>st</sup> Argentine Counterparts in Japan
	October 4	Dispatch of the 1 <sup>st</sup> Japanese Long-term Expert
1996	March 16 – March 29	Dispatch of the Consultation Team
	December	Publication of the 1 <sup>st</sup> periodic magazine “Con Energia”
1997	May 17 – May 29	Dispatch of the Technical Guidance Team
	June	Execution of the 1 <sup>st</sup> Energy Audit (edible oil factory)
	September	Alternation from Department of Energy to CIPURE
		Opening of Laboratory Building
	November	Provision of the 1 <sup>st</sup> Training Course by the C/Ps
1998	March	Opening of Internet Homepage
	May 15	Opening of the Training Center
		Establishment of the Executive Committee of CIPURE
	July 11 – July 24	Dispatch of the Advisory Team
	November	Starting utilization of Boiler equipment for practical training program
2000	March 28 – April 15	Dispatch of the Evaluation Team
	June 30	Completion of the Project-type Technical Cooperation (scheduled)

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ANNEX-3 Tentative Schedule of Implementation (TSI)

Calendar Year	19 94				19 95				19 96				19 97				19 98				19 99				20 00							
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Term of Technical Cooperation																																
Japanese Side																																
1. Dispatch of Survey Team																																
① Preliminary Survey Team																																
② Experts Survey Team																																
③ Implementation Survey Team																																
④ Consultation Team																																
⑤ Technical Guidance Team																																
⑥ Consultation Team																																
⑦ Advisory Team																																
⑧ Evaluation Team																																
2. Dispatch of Experts																																
(1) Long Term Experts																																
① Chief Adviser																																
② Coordinator																																
③ Plant Management Technology																																
④ Electric Management Technology																																

Planned Executed

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Calendar Year Japanese Fiscal Year	19 94			19 95			19 96			19 97			19 98			19 99			20 0 0		
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
(2) Short Term Experts 96 (1) Industrial Control System								11/27-12/20 K. Furuya													
(2) Industrial Control System								2/28-3/27 M. Watanabe													
(3) Productivity & Energy management																					
(4) Process in specific Industrial Field																					
(5) Project Management																					
97 (1) Rational Use of Energy in Petroleum Refining Industry																					
(2) Productivity and Energy management																					
(3) Rational Use of Energy in Petroleum Refining Industry																					
(4) Chief Supervisor of Plant Installation for INTI																					
(5) Rational Use of Energy in Petroleum Refining Industry																					
(6) Combustion Furnace Installation and Function Test																					
(7) Steam Unit Installation and Function Test																					
(8) Boiler Function Test																					
(9) Installation and function Test of the Flow Calibration System																					
98 (1) Rational Use of Energy in Petroleum Refining Industry																					
(2) Rational Use of Energy in Petroleum Refining Industry																					
(3) Rational Use of Energy in Combustion Technology and Heat Balance																					
(4) Rational Use of Energy in Petroleum Refining Industry																					
(5) Combustion Furnace Function Test and Operation																					
(6) Energy Management																					

Planned Executed

Planned Executed

Calendar Year Japanese Fiscal Year	19 94		19 95		19 96		19 97		19 98		19 99		20 00
	I	II	III	IV	I	II	III	IV	I	II	III	IV	
99 (1)Regenerative Burner Technology (2)Pilot Plant Operation and Management (3)Technical Information Improvement (4)Factory Energy Audit Technology(Textile) (5)Factory Energy Audit Technology(Food) (6)Energy Conservation Policy													
3. Training of C/P in Japan 95 (1)Policy of Energy (2)Energy Management (3)Energy Management (4)Energy Management (5)Policy of Energy				9/24-10/15 M.Ogata 9/24-11/1 J.Fiora 9/24-11/1 M.Silvosa 9/24-11/1 P.Cozza 9/28-30 S.Portnoy								9/17-11/17K.Takahashi 9/30-12/21 Y.Kuwana 10/14-11/12 N.Fukushima 11/20-12/18Iloghiwara	
96 (1)Technical Measurement (2)Industrial Control System (3)Pilot Plant Operation & Maintenance													
97 (1)Energy Conservation Technology (Data gathering Technology) (2)Energy Conservation Technology (Data Base) 98 (1)Pilot Plant and Electric Control (2)Energy Conservation & Industrial Furnace													
99 (1)Electric Energy Control in the Industry (2)Energy Management in the Small & Medium Enterprises													
4.Provision of Machinery and Equipment													

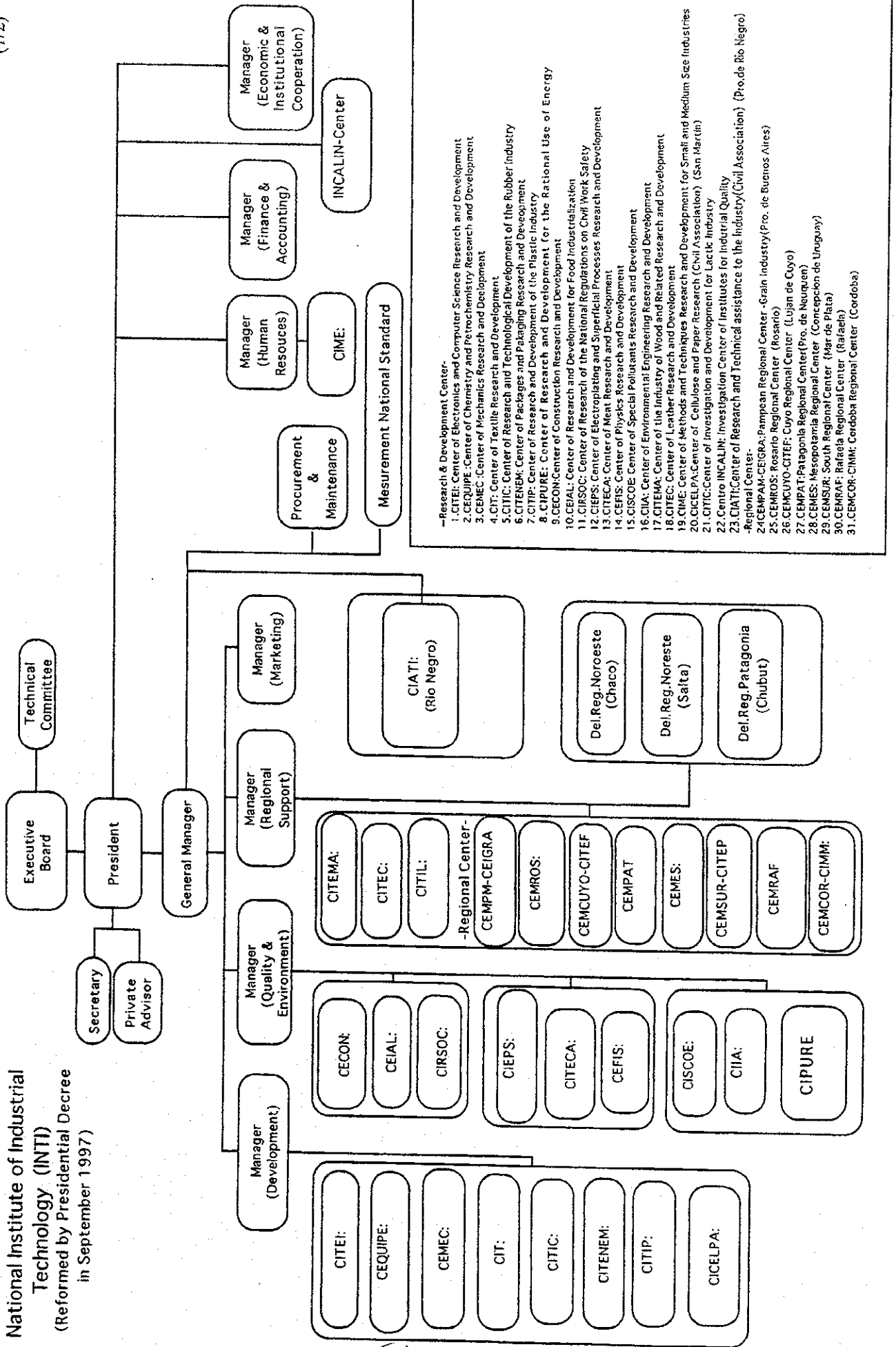
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ANNEX-4 Organization Chart of CIPURE/INTI

[Organization Chart of INTI]

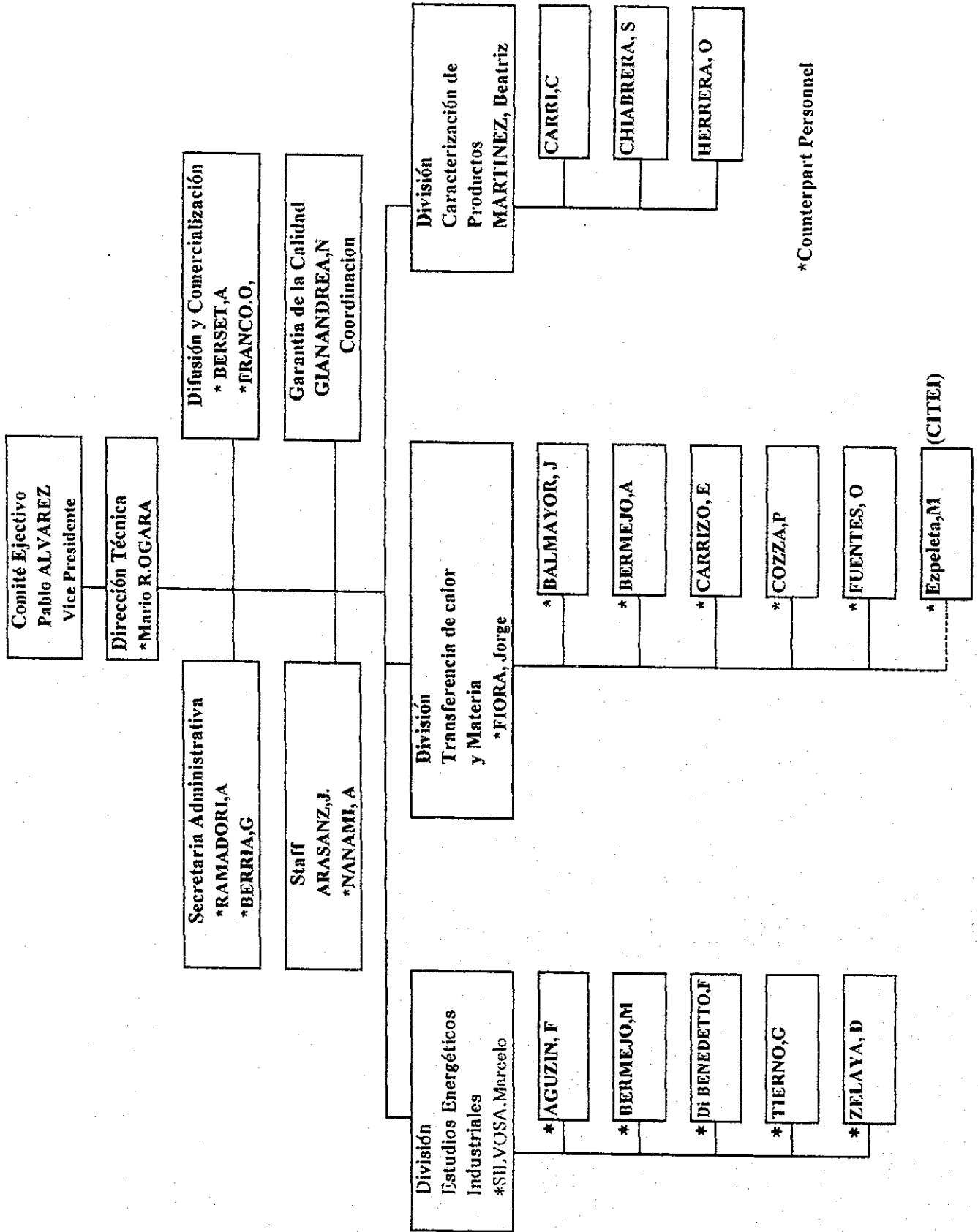
(1/2)

National Institute of Industrial  
Technology (INTI)  
(Reformed by Presidential Decree  
in September 1997)



[ Organization Chart of CIPURE ]

(2/2)



\*Counterpart Personnel

(CITEI)

ANNEX-5 List of Dispatched Japanese Experts

(1/2)

[Long-term]

No	Speciality	Name	Period	Profession or Occupation
1	Chief Adviser	Shinichi HORIGUCHI	1995.11.8~1997.11.07	Japan International Cooperation Agency
2	Chief Adviser	Kiyoshi YOSHIMOTO	1997.12.15~2000.06.30	Japan International Cooperation Agency
3	Coordinator	Mitsuo YOSHIDA	1995.10.04~1999.06.01	Japan International Cooperation Center
4	Coordinator	Noriaki KARIYA	1999.05.13~2000.06.30	Japan International Cooperation Center
5	Heat Management Technology	Hiroshi MURATA	1995.12.01~1998.03.03	Inter.Energy Environmental System Develop.Consultant
6	Heat Management Technology	Hiroshi MIZUTA	1998.01.17~2000.06.30	Sumikin Management Co.,Ltd.
7	Electrical Management Technology	Tadayuki KOMADA	1996.03.18~1998.03.17	Nippon Steel ELEX Co.,Ltd.
8	Electrical Management Technology	Tetsuomi NAWA	1998.02.20~2000.06.30	Oita Cooperative Thermal Power Company Incorporated

[Short-term]

No.	Speciality	Name	Period	Profession or Occupation
1	System for Automation and Control	Kunihiko FURUYA	1996.11.27~1996.12.20	retired from Yokogawa Denki Co.,Ltd.in September,1996
2	Industrial Control Systems	Mitsuhito WATANABE	1997.02.28~1997.03.27	Yokogawa human Create Corporation
3	Rational Use of Energy in Petroleum Refining Industry	Tanetomo YAMAMOTO	1997.06.05~1997.07.07	Nissinseiyu Co.,Ltd.
4	Productivity and Energy Management	Hisatsugu KIHARA	1997.06.20~1997.07.18	Oita Cooperative Thermal Power Company Incorporated
5	Rational Use of Energy in Petroleum Refining Industry	Tanetomo YAMAMOTO	1997.10.04~1997.10.26	Nissinseiyu Co.,Ltd.



(2/2)

No.	Speciality	Name	Period	Profession or Occupation
6	Chief Supervisor of Plant Installation for INTI	Soichi KONDO	1998.01.17~1998.07.03	Ishikawajima Technology Institute Co.,Ltd.
7	Rational Use of Energy in Petroleum Refining Industry	Taichiro KAWASE	1998.02.20~1998.03.16	The Energy Conservation Center
8	Combustion Furnace Installation and Function Test	Yoshitake AZUMA	1998.03.21~1998.05.13	Nippon Furnace Kogyo Kaisha Ltd.
9	Steam Unit Installation and Function Test	Tomonori MARUTA	1998.03.21~1998.05.13	TLV Co.,Ltd.
10	Boiler Function Test	Ichiro FUNAMOTO	1998.04.10~1998.05.04	IHI Packaged Boiler Co.,Ltd.
11	Installation and Function Test of the Flow Calibration System	Mitsunari KIMURA	1998.04.10~1998.05.04	Tokico Ltd. Kawasaki Works
12	Rational Use of Energy in Petroleum Refining Industry	Kunio NAKAI	1998.08.28~1998.09.25	Idemitsu Engineering Co.,Ltd.
13	Rational Use of Energy in Petroleum Refining Industry	Yukimasa AIZAWA	1998.08.28~1998.09.25	Idemitsu Engineering Co.,Ltd.
14	Rational Use of Energy in Combustion Technology and Heat Balance	Akira NAYUKI	1998.10.10~1998.11.30	Sumikin Management Co.,Ltd.
15	Rational Use of Energy in Petroleum Refining Industry	Yukimasa AIZAWA	1998.12.06~1998.12.25	Idemitsu Engineering Co.,Ltd.
16	Combustion Furnace Function Test and Operation	Yoshitake AZUMA	1998.12.06~1998.12.26	Nippon Furnace Kogyo Kaisha Ltd.
17	Energy Management	Shimichi SHIBUSAWA	1999.04.08~1999.04.29	Sumikin Management Co.,Ltd.
18	Regenerative Burner Technology	Kesao TAKAHASHI	1999.09.17~1999.11.17	Nippon Furnace Kogyo Kaisha Ltd.
19	Pilot Plant Operation and Management	Yutaka KUWANA	1999.09.30~1999.12.21	Nippon Steel Corporation
20	Technical Information Improvement	Norio FUKUSHIMA	1999.10.14~1997.11.12	The Energy Conservation Center
21	Factory Energy Audit Technology(Textile)	Tadashi HAGIWARA	1999.11.20~1999.12.18	Office of Consulting Engineer for Textiles

ANNEX-6 Japanese Study Teams Dispatched by JICA

Period: 1994.04.04 ~ 1994.04.16 (13days)

(1/3)

Preliminary Survey Team

No	Area in charge	Name	Occupation
1	Leader	Takahiko KAZAMA	Deputy Director, Mining and Industrial Development Cooperation Dept., JICA
2	Technical Cooperation Planning	Tadatsit YAMAMOTO	Leader of Termal Energy Applicants, Thermal Energy & Combustion Engineering Dept., National Institute for Resources and Environment, MITI
3	Technical Transfer Planning	Masyoshi MORITA	General Manager, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
4	Energy Conservation Technology	Tetsuo NAKAGAWA	General Manager, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
5	Energy Conservation Technology	Yoshikatsu TAKAHASHI	Technical Adviser, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
6	Project Management	Tomomi ORITA	Staff, Technical Coop. Div., Mining & Industrial Development Coop. Dept., JICA

Experts Survey Team

Period: 1994.08.19 ~ 1994.09.11 (24days)

No	Area in charge	Name	Occupation
1	Technology Transfer	Masyoshi MORITA	General Manager, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
2	Practical training program	Yoshikatsu TAKAHASHI	Technical Adviser, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
3	Energy Conservation Technology	Kenji KAZUMA	Manager, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
4	Equipment Supply	Ikuo NASU	Head, Procedure Div., Technical Cooperation Dept., Japan International Cooperation System

Implementation Survey Team

Period: 1995.03.12 ~ 1995.03.25 (14days)

No	Area in charge	Name	Occupation
1	Leader	Usa KAKINUMA	Managing Director, Mining and Industrial Development Cooperation Dept., JICA
2	Technical Cooperation Planning	Seiichi USHIODA	Deputy Director of Management, Energy Conservation Policy Planning Office, Agency of Natural Resources Energy, MITI
3	Technical Transfer Planning	Masyoshi MORITA	Chairman, Project Supporting Committee in Japan
4	Energy Conservation Technology	Kenji KAZUMA	Manager, International Engineering Dept., Japan International Energy & Environment Cooperation Center, Energy Conservation Center, Japan
5	Project Management	Tomomi ORITA	Staff, Technical Coop. Div., Mining & Industrial Development Coop. Dept., JICA

Consultation Team

(2/3)

Period: 1996.03.16 ~ 1996.03.29 (14days)

No	Area in charge	Name	Occupation
1	Leader	Norio MATSUZAWA	Managing Director, Mining and Industrial Development Cooperation Dept., JICA
2	Technical Cooperation Planning	Teruo NARUSE	Chief, Business Management, Agency of Natural Resources and Energy, MITI
3	Technical Transfer Planning	Katsuo SHIROKO	Chairman, Project Supporting Committee in Japan
4	Energy Conservation Technology	Kenji KAZUMA	Manager, International Engineering Dept., Japan International Energy and Environment Cooperation Center, Energy Conservation Center, Japan
5	Project Management	Tomomi ORITA	Staff, 2nd Tech. Coop. Div., Mining & Industrial Development Coop. Dept., JICA

Technical Guidance Team

Period: 1997.05.17 ~ 1997.05.29 (13days)

No	Area in charge	Name	Occupation
1	Leader	Akira OKUYAMA	Director, Second Technical Coop. Div., Mining & Industrial Development Coop. Dept., JICA
2	Technical Cooperation Planning	Tetsuo DENUMA	Deputy Director, Economic Coop. Div., International Trade Policy Bureau, MITI
3	Technical Transfer Planning	Nobunaki MORI	President, International Engineering Div., Energy Conservation Center, Japan
4	Energy Conservation Technology	Kenji KAZUMA	Manager, International Engineering Dept., Japan International Energy and Environment Cooperation Center, Energy Conservation Center, Japan
5	Project Management	Suguru NAKANE	Staff, 2nd Tech. Coop. Div., Mining & Industrial Development Coop. Dept., JICA

Advisory Team

Period: 1998.07.11 ~ 1998.07.24 (13days)

No	Area in charge	Name	Occupation
1	Leader	Yoshiaki NAKAMURA	Development Specialist, Institute for International Cooperation, JICA
2	Technical Cooperation Planning	Toshio KAWASHIMA	Deputy Director, Technical Coop. Div., Economic Coop. Dept., International Trade Policy Bureau, MITI
3	Technical Transfer Planning	Taichiro KAWASE	General Manager, International Engineering Dept., Energy Conservation Center, Japan
4	Energy Conservation Technology	Takayuki HAYASHIBARA	General Manager, Maintenance Dept., Tonen Technology K.K.
5	Project Management	Suguru NAKANE	Staff, 2nd Tech. Coop. Div., Mining & Industrial Development Coop. Dept., JICA

(3/3)

Period: 2000.03.28 ~ 2000.04.15 (19days)

Evaluation Team

No	Area in charge	Name	Occupation
1	Leader	Hiroyuki ARAI	Director, Planning and Financial Cooperation Div., Mining & Industrial Development Coop. Dept., JICA
2	Technical Cooperation Planning	Kenichiro KOREEDA	International Affairs Office, Coal & New Energy Dept., ANRE, MITI
3	Technical Transfer Planning	Shinichi SHIBUSAWA	Sumikin Management International Engineering Co., Ltd., Kashima Division
4	Energy Conservation Technology	Takeshi SEKIYAMA	General Manager, International Engineering Div., Energy Conservation Center, Japan
5	Project Management	Hisae OSHIKANE	Staff, 2nd Tech. Coop. Div., Mining & Industrial Development Coop. Dept., JICA
6	Evaluation Analysis	Tomoyuki YAMASHITA	Assistant Section Chief, Overseas Business Centre, Overseas Engineering Dept., Tokyo Electric power Services Co., Ltd.

## ANNEX-7 List of Machinery and Equipment Provided by JICA

Fiscal Year (J)	Year	Month	Name of Manufacturer	Description of Equipment	Qty.	Price (US\$)	CIF	Use of Equip.	Others
1995	1997	5	NIPPON FURNACE KOGYO KAISHA LTD.	Combustion Furnace, Fab.:NIPPON FURNACE KOGYO KAISHA LTD, Max.Comb.Cap.: 3,000,000 kcal/h	1	684,185	2,274,484 (inc. Elec. Facility)	C	60,440 Electric Facility (included in total)
			Delivery from Japan						
	1997	5	ISHIKAWAJIMA PACKAGED BOILER Co.LTD	Boiler, Fab.:ISHIKAWAJIMA PACKAGED BOILER Co.LTD, Mod.KMH-03A	1	282,861		C	
			Delivery from Japan						
	1997	5	NIPPON FURNACE KOGYO KAISHA LTD.	Flow Calibration System, Fab.:NIPPON FURNACE KOGYO KAISHA LTD	1	337,660		C	
			Delivery from Japan						
	1997	5	TLV	Steam Unit & Condensate Recovery Unit, Fab.:TLV	1	433,559		C	
			Delivery from Japan						

A: Use frequently (Daily use)

B: Use often (once to three times per week)

C: Use periodically

[Equipment Provided in 1997]

Fiscal Year (J)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price/US \$	Use Freq.	Local Supplier
1997	1997	12	Factory Measurement	Siemens	VVVF SIEMENS, Mod.MicroMaster MM400/3 for 4kw	1	1,523.67	B	Elec.Pana
	1997	12		Siemens	VVVF SIEMENS, Mod.MicroMaster MM220/2 for 2.2kw	1	995.22	B	Elec.Pana
	1997	12		Siemens	VVVF SIEMENS, Mod.MicroMaster MM220/3 for 2.2kw	1	5,198.41	B	Elec.Pana
	1997	12		Siemens	VVVF SIEMENS, Mod.MicroMaster MM1500/3 for 15kw	1	4,089.59	B	Elec.Pana
	1997	12		Siemens	VVVF SIEMENS, Mod.MicroMaster MM750/3 for 7.5kw	1	2,512.97	B	Elec.Pana
	1997	12		Kanemax	Ammometer, KANOMAX, Mod. 6162 w/Trubes Mod. & Extender	1	6,330.00	B	Kanemax
	1998	1	Inform. System	Sony	Digital Camera, SONY, Mod.DKC-1D1	1	2,289.30	A	Cosentino
	1998	1		Sony	Memory Card (PCMCIA) for digital Camera	1	acc.	A	Cosentino
	1998	1	Factory Measurement	Elecond	Automatic PF factor corrector, ELECOND, Mod.2R-120	1	2,760.00	B	Elecond
	1998	1		Janitza	Energy Control Monitor, JANITZA, Mod.ECM200 w/Power suppl.Unit	1	4,340.00	B	Idur
	1998	1	Audio Visual System	Kodak	Slide Projector, KODAK Mod.EKimgraphic III BK	1	940.50	B	Sist.Graf
	1998	1		Kodak	Infrared remote control & 4 magazine for slides	1	359.00	B	Sist.Graf
	1998	2	Factory Measurement	Yokogawa	AC Voltage Current Standard, YOKOGAWA, Mod.2558.01	2	21,380.00	B	Hertig
	1998	2		Yokogawa	Digital Clamp-on Tester, YOKOGAWA, Mod.2343.04	2	1,192.00	B	Hertig
	1998	2		Yokogawa	Circuit Tester, YOKOGAWA, Mod.7544.01	2	1,074.00	B	Hertig
	1998	2		Yokogawa	Differential Pressure Transmitter, YOKOGAWA, Mod.EJ-110A, 500mm	2	1,607.00	B	Hertig
	1998	2		Yokogawa	Differential Pressure Transmitter, YOKOGAWA, Mod.EJ-110A, 5000mm	2	1,607.00	B	Hertig
	1998	2		Yokogawa	Differential Pressure Transmitter, YOKOGAWA, Mod.EJ-110A, 1000mm	2	1,607.00	B	Hertig
	1998	2		Yokogawa	Digital Power Meter, YOKOGAWA, Mod.WT-130, w/manuals	1	6,867.00	B	Hertig
	1998	2		Yokogawa	Synthesized Function Generator, YOKOGAWA, Mod.FG120 w/GPIB	1	6,766.00	B	Hertig
1998	2	Yokogawa		D/C Calibration Set, YOKOGAWA, Mod.2560 w/Voltage Unit Mod.2563	1	8,230.00	B	Hertig	
1998	2	Yokogawa		Hardness Meter, YOKOGAWA, Mod.SC82 w/probe	1	943.00	B	Hertig	
1998	2	Yokogawa	pH Meter, YOKOGAWA, Mod.PH81 w/probe K92	1	709.00	B	Hertig		
1998	2	IVECO	Velicite, IVECO Mod.49.10V	1	20,766.00	B	Iveco Argentina		

Fiscal Year (J)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price / US \$	Use Freq.	Local Supplier
	1998	2	Training Plant	Gaucheito	Lathe GAICJ1110 Mod.T-1000, w/micrometer set and accessories.	1	5,050.00	B	Termos Gauth
	1998	3		Compro	C/D Copier	1	4,350.00	C	Nisei
	1998	3	Audio Visual System	Hewlett Packard	PC Pentium 200MHz MMX, HP, Mod.Brio D5770	8	18,920.00	A	Datco
	1998	3		Hewlett Packard	Server Pentium II 266MHz, HP, Mod.Netsver E45 D5971	1	4,055.00	A	Datco
	1998	3		Hewlett Packard	Color Monitor ultra VGA 1280 17" HP, Mod.D2835	1	acc.	A	Datco
	1998	3		Hewlett Packard	High Speed Laser Printer B&W, HP, Mod.LaserJet 4000TN	1	1,722.00	A	Datco
	1998	3		Hewlett Packard	Color Laser Printer, HP, Mod.LaserJet 5P	1	5,680.00	A	Datco
	1998	3		Hewlett Packard	Scanner, HP, Mod.ScanJet 6100	1	780.00	A	Datco
	1998	3		Hewlett Packard	Hub, HP Advantastak	1	500.00	A	Datco
	1998	3		Lumir	UPS Cap.6000V/4200W, LUNAR, Mod.Sicoo 600	1	5,714.00	A	Datco
	1998	3		Siemens	CPU314EM, SIEMENS, Mod.Sinatics7300	4	24,530.00	A	Elec.Pan
	1998	3		Siemens	Power Supply, SIEMENS, Mod.SITOP power 2	5	acc.	A	Elec.Pan
	1998	3		Siemens	Operation Panel, SIEMENS, Mod.Sinatic OP3	2	acc.	A	Elec.Pan
	1998	3		Siemens	Switch, SIEMENS, MOD.3TG10-0B134	20	acc.	A	Elec.Pan
	1998	3		Siemens	Analogical Input/Output Module, SIEMENS, Mod.Sinatic S7	2	acc.	A	Elec.Pan
	1998	3		Siemens	Industrial Software, SIEMENS, Mod.Sinatic Step7-mini ver.4.01	4	acc.	A	Elec.Pan
	1998	3		Siemens	Logical Module, SIEMENS, Mod.logo1230RCL	1	acc.	A	Elec.Pan
	1998	3	Siemens	Industrial Software, SIEMENS, Mod.Sinatic Step7-Basis ver.4.01	1	acc.	A	Elec.Pan	
	1998	3	Siemens	Ind.Soft.Mod.Sinatic Operator Interface ProTech/Lite v.4.0	1	acc.	A	Elec.Pan	
	1998	3	Factory Measurement	Kainos	Trafo-Tenaza KAINOS Mod.E-16 400/5A	14	3,884.30	B	Kainos
	1998	3		Kainos	Trafo-Tenaza KAINOS Mod.E-32 2000/15A	12	2,462.72	B	Kainos
	1998	3		Kainos	Trafo-Tenaza KAINOS Mod.P-32 3000/20A	6	2,038.35	B	Kainos
	1998	3		Kainos	Trafo-Tenaza KAINOS Mod.P-16 600/5A	15	3,870.64	B	Kainos

1997

Fiscal Year (Y)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price / US \$	Use Freq.	Local Supplier
1997	1998	3	Audio Visual System	S.Sarco	Steam Trap Cut Model, SPIRAX SARCO, Mod. SIB30 3/4"	1	260.00	B	S.Sarco
	1998	3		S.Sarco	Steam Trap Cut Model, SPIRAX SARCO, Mod. FT14 3/4"	1	530.00	B	S.Sarco
	1998	3		S.Sarco	Steam Trap Cut Model, SPIRAX SARCO, Mod. MST21 1/2"	1	195.00	B	S.Sarco
	1998	3		S.Sarco	Steam Trap Cut Model, SPIRAX SARCO, Mod. ID42HA 1/2"	1	300.00	B	S.Sarco
	1998	3	Factory Measurement	Motroln	Handy Transceiver MOTOROLA, Mod. Radius SP50, with charger	9	4,650.00	A	Veltn
	1998	3	Audio Visual System	Sony	Rack for audio equipments	1	1,500.00	B	Viditec
	1998	3		Sony	Video Recorder Hi-8, SONY Mod.EVO-9500P	1	2,647.06	B	Viditec
	1998	3		Sony	Digital audio mixer, SONY Mod.MXP-210	1	2,058.82	B	Viditec
	1998	3		Sony	VHS Hi-Fi Video Recorder SONY Mod.SVO-1500P	3	735.29	B	Viditec
	1998	3		Sony	Video Presentation Stand SONY Mod. VID-P100	1	735.29	B	Viditec
	1998	3		Sony	UIIF synthesized diversity tuner SONY Mod. WRR-840A	1	5,972.51	B	Viditec
	1998	3		Sony	Power amplifier SONY Mod.SRP-P50	1	441.18	B	Viditec
	1998	3		JBL	Speaker JBL Mod.Control 28	2	590.40	B	Viditec
	1998	3		Sony	Signal interface switcher SONY Mod.PC-1271M	1	2,705.88	B	Viditec
	1998	3		Sony	UIIF Wireless microphone SONY Mod.WR F-810A	1	92.65	B	Viditec
	1998	3	Sony	Synthesized transmitter SONY Mod.WRT-820A	1	1,879.41	B	Viditec	
	1998	3	Sony	Interface Board SONY Mod.II/B-1000	2	750.00	B	Viditec	
	1998	3	Sony	Interface Board SONY Mod.II/B-20	1	455.88	B	Viditec	
	1998	3	Sony	UIIF antenna	1	169.12	B	Viditec	
	1998	3	Sony	Multiscan Projector SONY Mod.VPIL-G70QM	1	20,000.00	B	Viditec	
	1998	3	Sony	Screen, 100", SONY Mod.VPF-100FI	1	994.12	A	Viditec	
	1998	4	Factory Measurement	Agema	Infrared monitoring system, AGEMA, Mod.Thermovision 550 SBW	1	6,838.00	B	Technotel
	1998	4		Agema	Noncontact Thermometer, AGEMA, Mod.Thermopoint 90 manual w/soft	1	3,000.00	B	Technotel
	1998	4		Agema	Noncontact Thermometer, AGEMA, Mod.Thermopoint TPT 50	1	2,250.00	B	Technotel
	1998	5	Inform. System	Fairstone	UPS 560W, FAIRSTONE, Mod.P500F	1	acc.	B	---



Fiscal Year (J)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price/US\$	Use Freq.	Local Supplier	
1997	1998	6	Audio Visual System	Siemens	PID controller, SIEMENS, Mod. Simatic 6ES7 355-0V110-0AE0	3	acc.	B	Elec. Pan	
	1998	6		Siemens	PC Adapter, SIEMENS, Mod. Simatic 6ES7972-0CA21-0XA0	5	acc.	B	Elec. Pan	
	1998	6		Siemens	Manuals for Simatics	28	acc.	B	Elec. Pan	
	1998	6	Factory Measurement Inform. System	Hanna	Total Hardness and pH meter, HANNA, Mod. HI93725	1	425.00	B	Inst. Cientifica	
	1998	6		Math. Wks	Software Matlab ver. 5.2, THE MATH WORKS INC.	1	13,376.00	B	Math. Wks	
	1998	7	Factory Measurement	Fuji	Portable Ultrasonic Flowmeter, FUJI, Mod. FJCS2011 & Printer	1	7,460.00	B	Conar	
	1998	7		Fuji	Sensor for U. Flowmeter, FUJI, Mod. FLD220Y1-A	1	1,280.00	B	Conar	
	1998	7		Fuji	Sensor for U. Flowmeter, FUJI, Mod. FLD320Y1-A	1	8,134.00	B	Conar	
	1998	7		Fuji	Sensor for U. Flowmeter, FUJI, Mod. FLD120Y1-A	1	1,280.00	B	Conar	
	1998	7	Training Plant	Kawateksu	Thickness Indicator, KAWATEKSU ADV. TEC. Mod. TI-12A	1	6,376.00	B	Conar	
	1998	10		HI from Japan	Gas Valve Unit (49 parts)	1	18,518.37	B		
	1998	10		HI from Japan	Spacer & Annubar Connection (45 parts)	1	27,322.19	B	\$2,799 (CIF)	
	1998	10		HI from Japan	Potter Meter (3 pcs)	1	18,518.37	B		
	1998	8		Factory Measurement	Fujitwan from Japan	Folding carrier, FUJIWAA	6	7,978.13	B	1,461,606 including CIF
	1998	8			Malaya from Japan	Cord Reel, HATAYA, Mod. SAP-302E	8	2,243.55	B	
	1998	8		ASME	PTC (Performance Test Code), ASME	1	3317.08	B	ASME	
	1998	8		Kainos	Trafo-Tonaza KAINOS Mod. L-16-40/5A	1	277.45	B	Kainos	

[Equipment Provided in 1998 & 1999]

Fiscal Year (J)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price/US \$	Use Freq	Local Supplier
	1998	7	Factory Measurement	TLV	Steam Trap(Cut Model), TLV, Mod.SS3V-21	1	---	B	
	1998	7		TLV	Steam Trap(Cut Model), TLV, Mod.J3X-10A1326	1	---	B	
	1998	7		TLV	Steam Trap(Cut Model), TLV, Mod.P46SR	1	---	B	
	1998	7		TLV	Steam Trap(Cut Model), TLV, Mod.L2 1SB25	1	---	B	
	1998	7		TLV	Steam Trap(Cut Model), TLV	1	---	B	
	1998	7		TLV	Steam Trap(Cut Model), TLV, Mod.3-N	1	---	B	
	1998	12		Siemens	Connector, SIEMENS, 15015824 & 15015823	19	1,130.60	B	Elec.Pan
	1998	12		Fluke	Power Harmonics Analyzer, FLUKE, Mod.41B	1	4633.36	B	Viditec
	1998	12	Fluke	AC current Oscilloscope Probe, FLUKE, Mod.801-1000s	3	87,464.00	B	Viditec	
	1999	1	Zera	3-Phase Precision Measuring Instrument, ZERA, Mod.TPZ-303	1	53,127.40	B	ARO	
	1999	1	Zera	3-Phase Power Supply, ZERA, Mod.VCS-320-1	1	acc	B	ARO	
	1999	1	F.San Tel	Electric Welding Machine MIO 180A, Mod.DECAMIG 520E	1	1,500.00	B	F.San Tel	
	1999	1	Peugeot	High Speed Grinder 7", PEUGEOT, 2000W 180mm	1	209.33	B	Sat-Don	
	1999	1	U.Cleann	Plastic Poles(safety area marking)	12	2,022.50	B	U.Cleann	
	1999	3	Factory Measurement	Fuji	Diff.Pressure Transmitter, FUJI, Mod.FKKT35V1-LDCYY-AA 0-3200mm	2	1,756.20	B	CONAR
	1999	3		Fuji	Diff.Pressure Transmitter, FUJI, Mod.FKCT34V2-LDCYY-AA 0-6400mm	2	2,021.67	B	CONAR
	1999	3		Fuji	Diff.Pressure Transmitter, FUJI, Mod.FKKT33V1-LDCYY-AA 0-3200mm	1	1,004.13	B	CONAR
	1999	3		Fuji	Diff.Pressure Transmitter, FUJI, Mod.FKKT12V1-LDCYY-AA 0-600mm	1	1,213.84	B	CONAR
	1999	3		Fuji	Detector for Ultrasonic Flowmeter, FUJI, Mod.FLD510Y1-A	1	3,560.00	B	CONAR
	1999	3		Dist.Mayo	Set of Gas Welding Machine, w/ 2 gas cylinders	1	1,500.00	B	Dist.Mayo
	1999	3		Yokogawa	Calibrator for Diff.Press. Trans., YOKOGAWA, Mod.BT-200-N00	1	2,840.00	B	Hertig
	1999	3		Panasonic	Transducer between PAL-N & PAL-BY DJGIWAVE, Mod.BN3520	1	140.00	B	Sist.Graf

1998

Fiscal Year	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price/US \$	Use Freq	Local Supplier	
1998	1999	1	Audio Visual System	Panasonic	Electronic Print Board, PANASONIC, Mod. KX-B730A.	1	3,958.08	B	Sist. Graf.	
	1999	3		Panasonic	Electronic Print Board Soft & Interface to connect with printer and PC	1	1,684.00	B	Sist. Graf.	
	1999	3		Panasonic	Battery Charger for Paniguide, PANASONIC	2	1,587.69	B	Sumitomo	
	1999	3		Panasonic	Receiver, PANASONIC, Mod. RD-550Z	25	8,010.97	B	Sumitomo	
	1999	3		Panasonic	Wireless microphone, PANASONIC, Mod. WX-1500 C-14	2	0.00	B	Sumitomo	
	1999	3		Panasonic	Caring Suitcase, PANASONIC	2	0.00	B	Sumitomo	
	1999	3		Panasonic	Wireless transmitter w/condenser microphone, Mod. WX-1600 C-14	1	310.84	B	Sumitomo	
	1999	3		Panasonic	Wireless microphone, PANASONIC, Mod. RD-M550Z	1	278.96	B	Sumitomo	
	1999	3		Panasonic	Wireless microphone, PANASONIC, Mod. WX-1500 C-13	1	278.96	B	Sumitomo	
	1999	3		Qjawn	Steam Calorimeters, OGAWA SAMPLING KAISYA	1	4,052.91	B	Sumitomo	
	1999	3		Measurement Technical	Sony	Stereo Cassette Deck, SONY, Mod. TC-WE305	1	—	B	
	1999	3		Material Preparation Public relat.	Ricoh	Photocopier, RICOH, FT-4220 w/sorter	1	—	A	
	1999	3			Ricoh	Sheet Feeder, RICOH, FID-57	1	—	A	
	1999	4	Factory Measurement	Acoustical	Thickness Indicator (high temp), ACOUSTICAL, Mod. ATG-300	1	1,970.00	B	Hertig	
	1999	4		Okano	Dustack Sampler Central Control Unit, OKANO, Mod. ESA-701	1	29,332.73	B	Hertig	
	1999	4		Okano	Probe Unit, OKANO, Mod. EP-27G1-304	1	2,630.20	B	Hertig	
	1999	4		Okano	Dns Pretreatment Unit, OKANO, Mod. EW-100N	1	1,315.10	B	Hertig	
	1999	4		Shimogawa	Gas Meter (dry type), SHIMAGAWA, Mod. DC-2	1	1,753.47	B	Hertig	
	1999	4		Sinku kiko	Suction Pump, SHINKU KIKO, Mod. DA-60S	1	1,315.10	B	Hertig	
	1999	3		Yokogawa	Input Board for equip. mod. 2531A	1	4,750.00	B	Hertig	
1999	6	Mitsubishi	Forklift Trucks, MITSUBISHI, Mod. 2FBC15	1	23,976.00	B	San Blas			
1999	6	Exide	Battery Charger for Forklift, maker Exide	1	acc.	B	San Blas			
1999	7	Shimazu	Portable Analyser COCCO2/CH4 SHIMAZU, Mod. CG1-7000	1	30,389.00	B	Jenk S.A.			
1999	7	Shimazu	Unit of Pre-treatment for Sample SHIMAZU Mod. CFP-306	1	6,373.00	B	Jenk S.A.			
1999	7	Sony	Video Recorder, SONY Mod. SVT-1520P with remote control	1	930.00	B	Sist. Graf			
1999	7	Sony	White Screen for Projector DA-Lite Mod.B	2	720.00	B	Sist. Graf			

1998

Physical Year (Y)	Year	Month	Area of Activity	Manufacturer	Description of Equipment	Qty.	Price / US \$	Use Freq	Local Supplier
	1999	10	Factory Measurement	Fuji	Silicone Grease(G40M),CONAR, DWG.TK707984C1	40	1,900.00	A	Comar
	1999	10		Fuji	Silicone Grease(KS62M),CONAR,DWG.TK707983C1	40	5,640.00	A	Comar
	1999	11		Yokogawa	Insulation Tester, YOKOGAWA, Mod.321345	1	471.90	B	Iertig
	1999	12		Nissan	Motor Assy, Sinter for NISSAN Civilian ED-33, Mod.23300-19009	1	1,142.70	A	Electronica matsushita
	1999	12		Nissan	Brake Assy Center for NISSAN Civilian, Mod.36100-18003	1	135.40	A	Electronica matsushita
	1999	12		Nissan	Drum Center Brake for NISSAN Civilian, Mod.36130-18100	1	52.70	A	Electronica matsushita
	1999	12		Nissan	Cable Assy, Parking Brake for NISSAN Civilian, Mod.36430-S9000	1	43.00	A	Electronica matsushita
	1999	12		Nissan	Head Assy, Cylinder for NISSAN Civilian, Mod.11041-52100	1	1,154.70	A	Electronica matsushita
	1999	12		Nissan	Gasket, Roler Cover for NISSAN Civilian Mod.13270-02100	1	17.90	A	Electronica matsushita
	1999	12		Nissan	Cover Assy, Valve Rocker for NISSAN Civilian Mod.13265-19001	1	96.60	A	Electronica matsushita
	1999	12		Nissan	Pump Assy, Injection for NISSAN Civilian Mod.16700-19004	1	2,056.00	A	Electronica matsushita
	2000	1		Yokogawa	Power Line Monitor, YOKOGAWA, Mod.364023-S-R	1	12,600	A	Iertig
	2000	1		Yokogawa	Roll Chart, Mod.364994 14mmx25mts	1	100.00	A	Iertig
1999	2000	1		Magtrol	Blower Cooled Dynamometer, MAGTROL, Mod.IHD-825-8NA	1	23,362.00	A	Magtrol
	2000	1		Magtrol	Programmable Controller, Mod.5240A	1	5,225.00	A	Magtrol
	2000	1		Magtrol	Current Regulated Power Supply, Mod.5210A	1	610.00	A	Magtrol
	2000	1		Magtrol	Motor Test Software with Source Codes, Mod.SW-M Test-WS	1	2,391.50	A	Magtrol
	2000	1	Magtrol	19 Track Adaptor Kit for 5230,5240,5410 &5420, Mod.73A017	1	85.00	A	Magtrol	
	2000	1	Magtrol	3:1 Manually Switch Box, Mod.5300	1	838.00	A	Magtrol	
	2000	1	Magtrol	GP1B Cable(2Meter), Mod.88M048	1	221.00	A	Magtrol	
	2000	1	Magtrol	Card GPIB for Windows 95, Mod.73M014	1	800.00	A	Magtrol	
	2000	1	Magtrol	AT-GPIB/TNT, Win 95(Pdf)	1	778.00	A	Magtrol	
	2000	2	Pressurements	Pressure Standards, PRESSUREMENTS, Mod.19006/1	1	7183.00	A	Ing. Capino	
	2000	2	Pressurements	Fracton of Weight, PRESSUREMENTS,	1	284.84	A	Ing. Capino	
	2000	2	Pressurements	Extimotor and Arranger of Angle, PRESSUREMENTS, Mod.14600	1	109.90	A	Ing. Capino	
	2000	2	Pressurements	Angle Adaptor 90, PRESSUREMENTS, Mod.13700	1	100.00	A	Ing. Capino	

[List of Technical Book Provided by JICA]

Physical Year (J)	Year	Month	Supplier	Name of Book/author	Qty.	Price (US\$)	Use Freq.	Others
	1997	4	B.Diaz	Power & Process Control System/M.J.G.Polanyi	2	130.00	A	
	1997	4	B.Diaz	Calculations for Engineering Economic Analysis/M.Kurtz	1	87.00	A	
	1997	4	B.Diaz	A Practical Guide to Steam Turbine Technology/H.P.Bloch	1	98.00	A	
	1997	4	B.Diaz	HVAC Systems Design Handbook/R.W.Haines	1	97.00	A	
	1997	4	B.Diaz	Boiler Operations Questions & Control/P.Chattopadhyay	1	92.00	A	
	1997	4	B.Diaz	Instrumentation and Control/C.L.Nichelilgal	1	145.00	A	
	1997	4	B.Diaz	The Image Processing Handbook/J.C.Russ	1	140.00	A	
	1997	4	B.Diaz	The Electrical Engineering Handbook/R.C.Dorf	1	150.00	A	
	1997	4	B.Diaz	Mechanical Design Handbook/H.A.Rothbart	1	140.00	A	
	1997	4	B.Diaz	Jurim's Quality Control Handbook/J.M.Jurn	1	130.00	A	
	1997	4	B.Diaz	Plumbed Maintenance for Productivity & Energy Conservation/J.W.Criswell	1	73.00	A	
	1997	4	B.Diaz	How to implement waste-to-energy projects/M.J.Rogoff	1	70.00	A	
	1997	4	B.Diaz	Field inspection handbook/D.S.Brock	1	86.00	A	
	1997	4	B.Diaz	Centrifugal pump sourcebook/J.W.Dufour	1	69.00	A	
	1997	4	B.Diaz	Chemical Process Design/R.Smith	1	90.00	A	
	1997	4	B.Diaz	Lighting Efficiency Applications/A.Humann	1	83.00	A	
	1997	4	B.Diaz	Control valves for the chemical process industries/Fitzgerald	1	88.00	A	
	1997	4	B.Diaz	Process/Industrial Instruments & Controls Handbook/Considine	1	140.00	A	
	1997	4	B.Diaz	Statistical Quality Control con SPC EX 2.2 en PD 3.57B Grant	1	86.00	A	
	1997	4	B.Diaz	Mark's Standard Handbook for Mechanical Engineers/A.Avalone	1	110.00	A	
	1997	4	B.Diaz	Handbook of Airconditioning & Refrigeration/S.K.Wang	1	120.00	A	
	1997	4	B.Diaz	HVAC Control and Systems/ J.L.Levenhagen	1	72.00	A	
	1997	4	B.Diaz	Standard Handbook of Engineering Calculations/T.G.Hicks	1	140.00	A	
	1997	4	B.Diaz	Standard Handbook for Electrical Engineers/D.G.Fink	1	140.00	A	
	1997	4	B.Diaz	Standard Handbook of Plant Engineers/R.C.Rosler	1	140.00	A	
	1997	4	B.Diaz	Electronic Trouble Shooting Handbook/J.D.Lenk	1	120.00	A	
	1997	4	B.Diaz	Electronic Testing Handbook/J.D.Lenk	1	95.00	A	
	1997	4	B.Diaz	Pump Handbook/I.J.Karassik	1	145.00	A	
	1997	4	B.Diaz	Process Instrumentation Applications Manual/B.Council	1	93.00	A	
	1997	4	B.Diaz	Boiler Operator's Guide/ A.L.Kohari	1	70.00	A	
	1997	4	D.Cuspidate	Electrochim/P.Akalite	1	45.00	A	
	1997	4	D.Cuspidate	Manual Diseño Calefaccion, Ventilacion y A.A.N.R.Grimm	1	30.00	A	
	1997	4	D.Cuspidate	Hornos Industriales de Resistencia/J.Astigarra	1	32.00	A	
	1997	4	D.Cuspidate	Manual de Hidraulica/J.M.Azevedo	1	30.00	A	
	1997	4	D.Cuspidate	Quality Control/D.H.Bestfield	1	27.00	A	
	1997	4	D.Cuspidate	Mecanica de Fluidos/R.C.Binder	1	28.00	A	
	1997	4	D.Cuspidate	Manual de Aire Acondicionado/Carricr	1	165.00	A	
	1997	4	D.Cuspidate	Air Pollution Control Engineering/N.De Nevers	1	27.00	A	
	1997	4	D.Cuspidate	Mecanica de Fluidos/A.G.Hansen	1	50.00	A	
	1997	4	D.Cuspidate	Manual de Hidraulica/King	1	36.00	A	
	1997	4	D.Cuspidate	Principles of Heat Transfer/J. Kreth	1	59.00	A	
	1997	4	D.Cuspidate	Automatic Control Systems/B.C.Kuo	1	37.00	A	
	1997	4	D.Cuspidate	HVAC Controls and Systems/ J.L.Levenhagen	1	34.00	A	
	1997	4	D.Cuspidate	Electronica Industrial/T.J.Molchey	1	36.00	A	
	1997	4	D.Cuspidate	Mecanica de Fluidos Aplicada/R.L.Moht	1	27.00	A	
	1997	4	D.Cuspidate	Electrical Engineering/Schwarz	1	35.00	A	

1996

Fiscal Year (€)	Year	Month	Supplier	Name of Book/author	Qty.	Price (US\$)	Use Freq.	Others
	1997	4	D.Cuspid	Mecanica de Fluidos/L.I. Shames	1	60.00	A	
	1997	4	D.Cuspid	Process Control System/V. G. Shinkey	1	111.00	A	
	1997	4	D.Cuspid	Sistemas de Control de Procesos/F.O. Shinkey	1	36.00	A	
	1997	4	D.Cuspid	Mecanica de Fluidos/T.M. White	1	52.00	A	
	1997	4	D.Cuspid	Mecanica de Fluidos/J. Williams	1	10.00	A	
	1997	4	D.Cuspid	Basic Technical Mathematics/A. J. Washington	1	77.00	A	
	1997	4	D.Cuspid	Turbomquinas Termicas/C. Malaix	1	132.00	A	
	1997	4	D.Cuspid	Teoria de las turbinas de gas/H. Cohen	1	91.00	A	
	1997	4	D.Cuspid	Control Sisi Dinamicos con Retroalimentacion/Franklin	1	51.00	A	
	1997	4	D.Cuspid	Mastering Internets Windows 95/NT con CD-ROM/Coleman	1	75.00	A	
	1997	4	D.Cuspid	OSL Server Training ver.6.5/Microsoft	1	225.00	A	
	1997	4	D.Cuspid	Inside Mani. con CD ROM/De la Cruz	1	60.00	A	
	1997	4	D.Cuspid	Signals and System/A. V. Oppenheim	1	47.00	A	
	1997	4	D.Cuspid	Discrete-Time Control System/K. Ogata	1	40.00	A	
	1997	4	D.Cuspid	Neural & Concurrent Real-Time Systems/B. Soucek	1	97.00	A	
	1997	4	D.Cuspid	The 8086/8088 Family/J. Drenbeck	1	33.00	A	
	1997	4	D.Cuspid	Error Control & Coding/P. Sweeney	1	27.00	A	
	1997	4	D.Cuspid	Modern Operation System/A. S. Tanenbaum	1	30.00	A	
	1997	4	D.Cuspid	Digital Control of Dynamic Systems/G.F. Franklin	1	80.00	A	
	1997	4	D.Cuspid	Neural Networks, Theory & Applications/R.J. Mammone	1	45.00	A	
	1997	4	D.Cuspid	Numerical Methods & Software, con FD 5.25/D. Kalnauer	1	37.00	A	
	1997	4	D.Cuspid	The Intel Microprocessors/B.B. Brey	1	47.00	A	
	1997	4	D.Cuspid	Neural Networks/S. Haykin	1	67.00	A	
	1997	4	D.Cuspid	Applied Fuzzy Systems/T. Terano	1	84.00	A	
	1997	4	D.Cuspid	Essentials of Fuzzy Model & Control/R. Yager	1	49.00	A	
	1997	4	D.Cuspid	A. Include to Neural Networks/J.M. Mendel	1	97.00	A	
	1997	4	D.Cuspid	Theoretical Aspects Fuzzy Control/H.T. Nguyen	1	57.00	A	
	1997	4	D.Cuspid	Adv. Alg. for Neural Networks C++ con FD 3.5"/T. Masters	1	105.00	A	
	1997	4	D.Cuspid	Robust Control, con FD 3.5"/S.P. Bhattacharya	1	71.00	A	
	1997	4	D.Cuspid	Understanding Neural Networks V.2/M. Gaudill	1	90.00	A	
	1997	4	D.Cuspid	Understanding Neural Networks V.1/M. Gaudill	1	40.00	A	
	1997	4	D.Cuspid	Fuzzy Logic CD-ROM Library/Ed. AP/Professional	1	37.00	A	
	1997	4	D.Cuspid	Artificial Intelligence/S. Russel	1	67.00	A	
	1997	4	D.Cuspid	Computer Networks/A.S. Taubenbaum	1	169.00	A	
	1997	4	D.Cuspid	MS Windows 95 Resource Kit, con CD-ROM/Microsoft Press	1	115.00	A	
	1997	4	D.Cuspid	Windows NT 4.0 Server Resource Kit, con CD-ROM/Microsoft Press	1	129.00	A	
	1997	4	American B	Heat Transfer Equipment/N.P. Chertoprisonoff	1	108.00	A	
	1997	4	American B	Copeneration & Small Power Production Manual/S.A. Spiveak	1	95.00	A	
	1997	4	American B	Pipeline Risk Management Manual/W.K. Mulhalbanter	1	149.00	A	
	1997	4	American B	The Combustion of Solid Fuel & Wastes/D.A. Tillman	1	108.00	A	
	1997	4	American B	Process Industrial Instruments & Control Handbooks/Considine	1	160.00	A	
	1997	4	American B	Diccionario Tecnico Bilingue espanol-ingles/F. Beigbeder	1	99.00	A	
	1997	4	American B	Flow Measurement Engineering Handbook/R.W. Miller	1	104.00	A	
	1997	7	B.Diaz	Pipeline Rules of Thumb Handbook/E. W. McAllister	1	67.00	A	
	1997	11	B.Diaz	Pipeline Design vol 1/Rip Weaver	1	120.00	A	
	1997	11	B.Diaz	The McGraw-Hill Handbook of Essential Engineering Inf & Data	1	95.00	A	
	1997	11	B.Diaz	Handbook of Industrial Power and Steam Systems/Paul N. Gary	1	86.00	A	
	1997	11	B.Diaz	A practical guide to compressor technology/Hein P. Bloch	1		A	
	1997	11	B.Diaz	Unit Operations of chemical engineering/McCabe-Smith-Harriott	1		A	

1996

Fiscal Year (J)	Year	Month	Supplier	Name of Book/author	Qty.	Price (US\$)	Use Freq.	Others
1998	1999	1	D.Cuspidé	Manual de Instal. Electricas Residenciales e Ind./E.Harper	1		A	
	1999	1	D.Cuspidé	Elementos de Diseño de Instal. Electricas Ind./G.E.Harper	1		A	
	1999	1	D.Cuspidé	Ventilacion Ind.Ciuculo y Aplicaciones/Carnicer Royo	1		A	
	1999	1	D.Cuspidé	Eficiencia Energética/F.Godoy Arceola	1		A	
	1999	1	D.Cuspidé	Electronica Industrial(armarido)/J.J.Humphries & L.P.Sheats	1		A	
	1999	1	D.Cuspidé	Electronica Industrial(azul)/J.J.Humphries & L.P.Sheats	1		A	
	1999	1	D.Cuspidé	Motors de Combustion Interna/Edward F.Oberl	1		A	
	1999	2	D.Cuspidé	The Internal Combustion Engine, vol.1/Charles F.Taylor	1		A	
	1999	2	D.Cuspidé	The Internal Combustion Engine, vol.2/Charles F.Taylor	1		A	
	1999	4	B.Diaz	Air Quality Control/ Russel	1		A	
	1999	4	B.Diaz	Adaptive Predictive Control/ J.M.Martin Sanchez & J.Rodellar	1		A	
	1999	7	B.Diaz	Engine Emissions and Emissions Measurement/SAE	1		A	
1999	1999	12	B.Diaz	Combustion & Emissions in Diesel Engines SP.	1		A	
	1999	12	B.Diaz	Model Predictive Control/Garvia	1		A	
	1999	12	D.Cuspidé	Fundamentos de Mecanismos y Maquinas para Ingenieria/Chalero	1		A	
	1999	12	D.Cuspidé	Analisis y Gestion Energetica de Edificios/Cleak	1		A	
	1999	12	D.Cuspidé	Hornos de Arco para Fusion de Acero/Astigarra	1		A	
	1999	12	D.Cuspidé	Developing Real-Time Embedded Soft/Ellison	1		A	
	1999	12	D.Cuspidé	Distributed Control Application Development Using Visual/Maloney	1		A	
	1999	12	D.Cuspidé	Engineering Formulas/Greek	1		A	
	1999	12	D.Cuspidé	Instalaciones Electricas de Alumbrado e Industrial/Martinez	1		A	
	1999	12	D.Cuspidé	EXPL in Parallel Distrib Process/McClelland	1		A	
	1999	12	D.Cuspidé	Maquinas Electricas 5ta Edicion/Fitzgerald	1		A	
	2000	1	D.Cuspidé	Seguridad en las Instalaciones Electricas Cf/Guerrero	1		A	
	2000	1	D.Cuspidé	Chemical Process Control/Stephanoopolis	1		A	
	2000	1	D.Cuspidé	Problemas de Diseño de Automatismos/Ojeda	1		A	
	2000	1	D.Cuspidé	Instalaciones Electricas de Lineas y Centros de Transformacion/Toledano	1		A	
	2000	1	D.Cuspidé	Refrigeracion Compresion y envasado de Alimentos/Madrid	1		A	
	2000	1	D.Cuspidé	Motors Electricos Automatismo de Control/Roldan	1		A	
	2000	1	D.Cuspidé	Studies in computational Science/Brunch Hansen	1		A	
	2000	1	D.Cuspidé	Pararell Programming/Baker	1		A	
	2000	1	D.Cuspidé	Developing COM/Active X Components with Visual Basic 6/Applemann	1		A	
	2000	2	D.Cuspidé	Las celulas Solares/Juster	1		A	
	2000	2	D.Cuspidé	Hornos Industriales de Induccion/Astigarra	1		A	
	2000	2	D.Cuspidé	Control Electronico con el PC/Oguit	1		A	
	2000	2	D.Cuspidé	Control por Computador/Ojeda	1		A	
2000	2	D.Cuspidé	Instalacion Electricas de Lineas y Centros de Transformacion/Toledano	1		A		
2000	2	D.Cuspidé	Calculo Modular de Maquinas Electricas/Corrales	1		A		
2000	2	D.Cuspidé	Circ Basicos de Cables Neumaticos y Electroneumaticos/Ladonosa	1		A		
2000	2	D.Cuspidé	Control de Motores Electricos/Enrique	1		A		
2000	2	D.Cuspidé	Simulacion y Control de Procesos	1		A		
2000	2	D.Cuspidé	Visual Basic 6 Secretos	1		A		
2000	2	D.Cuspidé	Perry's Chemical Engineer's Platinum Edition/Perry	1		A		
2000	2	D.Cuspidé	Electricity & Controls for Heating, Ventilation & Air/Herman	1		A		
2000	2	D.Cuspidé	An Introduction to Computer Simulation Methods/Gould	1		A		
2000	2	D.Cuspidé	Practical Machinery management for Process Plants Vol/Booth	1		A		
2000	2	D.Cuspidé	Electric Energy Systems/Nasar	1		A		
2000	3	D.Cuspidé	ADV Thermodynamic for Engineers	1		A		
2000	3	D.Cuspidé	Air Pollution Control Engineering	1		A		
2000	3	D.Cuspidé	Anal. Termodinamic Plantas Electricas/Haywood	1		A		

Fiscal Year (1)	Year	Month	Supplier	Name of Book/author	Qty.	Price (US\$)	Use Freq.	Others
1999	2000	3	D.Cuspidé	Digital Control of Dynamic System	1		^	
	2000	3	D.Cuspidé	Equipo Electricos Autonomos/Alvarez	1		^	
	2000	3	D.Cuspidé	Linux Programming	1		^	
	2000	3	D.Cuspidé	Manual del Ingeniero Mecanico 9/E /Baumeister	1		^	
	2000	3	D.Cuspidé	Maquinas Electricas 5ta Edición/Hitzgerald	1		^	
	2000	3	D.Cuspidé	Medicion y Pruebas Electricas Electron	1		^	
	2000	3	D.Cuspidé	Neural & Concurr Real - Time System	1		^	
	2000	3	D.Cuspidé	Objectifying Real - Time System/Ellis	1		^	
	2000	3	D.Cuspidé	Programming the Parallel Poy/Gadre	1		^	
	2000	3	D.Cuspidé	Convertidores de Frecuencia Autonomos	1		^	
	2000	3	D.Cuspidé	Tecnic Mantenimieto y Diagnostico Maq.Electrico Romitvas/Fernandez	1		^	
	2000	3	D.Cuspidé	Electric Utility System and Practices/Rustobkks	1		^	



ANNEX-8 Expenses by JICA

Local Expenses	Unit:peso						Total
	1995	1996	1997	1998	1999	2000	
1) Interpretation/Translations Cost	1,535.00	4,130.00	11,148.72	16,028.00			32,841.72
2) Material/Equipment Purchase Expenses	7,190.26	12,016.47	592.64	6,295.70			26,095.07
3) Expendable Supplies	2,025.76	2,706.28	6,076.17	3,307.82			14,116.03
4) Commuting Expenses	807.40	2,623.20	3,254.45	2,118.06			8,803.11
5) Travel Expenses	747.07	2,112.21	7,862.70	4,038.06	N.A	N.A	14,760.04
6) Communication Expenses	1,197.37	1,394.86	3,570.96	5,741.11			11,904.30
7) Printing Cost	0.00	2,720.05	5,250.00	8,330.00			16,300.05
8) Rental Cost	6,142.40	4,530.20	5,981.00	4,380.20			21,033.80
9) Personnel Expenses	800.00	0.00	565.00	2,949.39			4,314.39
10) Conference Cost	395.00	2,379.75	1,437.30	923.00			5,135.05
11) Others (plant maintenance and others)	3,827.49	4,744.39	588.92	15,476.32			24,637.12
<b>Total</b>	<b>24,667.75</b>	<b>39,357.41</b>	<b>46,327.86</b>	<b>69,587.66</b>	<b>63,000.00</b>	<b>2,990.00</b>	<b>245,930.68</b>

Training Course Material Preparation Cost	Unit:peso						Total
	1995	1996	1997	1998	1999	2000	
1) Translations Cost				20,361.49			20,361.49
2) Printing Cost				850.00	N.A		850.00
3) Others				2,183.51			2,183.51
<b>Total</b>	<b></b>	<b></b>	<b></b>	<b>23,395.00</b>	<b>27,600.00</b>	<b></b>	<b>50,995.00</b>

## ANNEX-9 List of Argentine Counterpart Personnel and Supporting Staff

No.	Area of Activity	Name	Allocation period	1995			1996			1997			1998			1999			2000			Training in Japan
				7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	
1	Project Management	Mario Ogara	1995.07.01~	*																		1995.09.24~10.15 2000.03.12~04.01 1995.09.24~11.01
2		Marcelo Silvosa	1995.07.01~	*																		
3		Angel Bermejo	1996.09.23~											*								1999.01.10~02.19
4	Thermal Energy Area	Raul Carballo	1996.08.15~1997.06.31																			
5		Miguel Bermejo	1995.07.01~			*																1996.10.29~12.06
6		Daniel Zelaya	1995.07.01~			*																1996.10.29~12.06
7		Fernando Aguzin	1996.08.01~			*																1997.05.24~07.10 (Group) 1999.10.11~11.11 1998.11.10~12.17
8	Electrical Energy Area	Guillermo Irieno	1995.07.01~										*									
9		Oswaldo Franco	1996.01.~																			
10		Jorge Fiora	1995.07.01~	*																		1995.9.24~11.01
11	Energy Auditing & Control System	Pedro L. Cozza	1995.07.01~	*																		1995.9.24~11.01
12		Eduardo Carrizo	1995.07.01~						*													1997.9.23~10.22
13		Margarita Ezpeleta	1995.07.01~			*																1996.10.29~12.06
14		Ismael Horton	1995.07.01~																			
15	Factory Consultation	Enrique Grunhut	1995.07.01~1999.06.30																			
16		Maria Lucia Gomez	1996.12.~1997.04.14																			
17		Alberto Betsel	1995.07.01~ (2000.1.28 return to job)																			1997.09.23~11.18
18	Information, Technical Public Relation	Susana Chabiera	1995.07.01~			*																1996.05.02~07.11 (Group)
19		Beatriz Martinez	1997.04.~																			

	Area of Activity	Name	Allocation period	1995		1996		1997		1998		1999		2000		Training in Japan			
				7	10	1	4	7	10	1	4	7	10	1	4		7	10	1
20		Juan C. Balmayor	1998.05.01~																
21	Maintenance	Raivo Di Benedetto Manuel POLO	1997.04.01~ 1999.03.01~1999.11.30																
22		Alberto Nanami	1996.02.27~																
23		Ana Kanadoni	1995.07.01~																
24		Oscar Fuentes	1995.07.01~																
25	Administration	Daniel Cisneros	1995.07.01~1997.07.31																
26		Beñia Graciera	1999.07.01~																
27		Silvia Portnoy	1995.07.01~1997.12.																
28	ex-President of INTI	Leonidas Montana	1997.12.02~																
29	President of INTI	Eduardo Martini	1997.12.~																
30	General Manager of INTI	Andres Dimitruk	1995.07.01~1998.06																
31	Development Manager	Daniel Marques	1998.06.~																
32	Environmental and Quality Control Manager	Carlos Pedelberde	1998.06.~																
33	Deputy Manager, Envir. and Quality Control																		

ANNEX-10 List of Argentine Counterpart Personnel Trained in Japan

No.	5 Fiscal year	Name	Training Field	Training Period	Training Institute
1	95	Mario Ogata	Policy of Energy	1995. 09. 24~10. 15	The Energy Conservation Center, Japan
2	95	Jorge Fiora	Energy Management	1995. 09. 24~11. 01	The Energy Conservation Center, Japan
3	95	Marcelo Silvosa	Energy Management	1995. 09. 24~11. 01	The Energy Conservation Center, Japan
4	95	Pedro L. Cozza	Energy Management	1995. 09. 24~11. 01	The Energy Conservation Center, Japan
5	95	Silvia Portnoy	Policy of Energy	1995. 09. 28~09. 30	The Energy Conservation Center, Japan
6	96	Susana Chiabrera	Energy Conservation (Group Training Course)	1996. 05. 02~07. 11	The Energy Conservation Center, Japan
7	96	Miguel Bermejo	Technical Measurement	1996. 10. 29~12. 06	The Energy Conservation Center, Japan
8	96	Margarita Ezpeleta	Industrial Control System	1996. 10. 29~12. 06	The Energy Conservation Center, Japan
9	96	Daniel Zelaya	Pilot Plant Operation & Maintenance	1996. 10. 29~12. 06	The Energy Conservation Center, Japan
10	97	Fernando Aguzin	Energy Conservation (Group Training Course)	1997. 05. 20~07. 10	The Energy Conservation Center, Japan
11	97	Eduardo Carrizo	Energy Conservation technology (Data gathering Technology)	1997. 09. 23~10. 22	The Energy Conservation Center, Japan
12	97	Alberto Berset	Energy Conservation technology (Data Base)	1997. 09. 23~11. 18	The Energy Conservation Center, Japan
13	98	Guillermo Tierno	Pilot Plant and Electric Control	1998. 11. 10~12. 17	The Energy Conservation Center, Japan
14	98	Angel Bermejo	Energy Conservation & Industrial Furnace	1999. 01. 10~02. 19	The Energy Conservation Center, Japan
15	99	Manuel Polo	Energy Conservation (Group Training Course)	1999. 05. 18~06. 08	The Energy Conservation Center, Japan
16	99	Fernando Aguzin	Electric Energy Control in the Industry	1999. 10. 11~11. 11	The Energy Conservation Center, Japan
17	99	Mario Ogata	Energy Management in the small & Medium Enterprises	2000. 03. 12~04. 01	The Energy Conservation Center, Japan

## ANNEX – 11 List of Machinery and Equipments Provided by CIPURE / INTI

Amount	Description
1	Ampere meter CC YEW model: 2011-37
1	CO and CO <sub>2</sub> Analyzer SHIMADZU model: CGT - 10 - 2 <sup>a</sup>
2	O <sub>2</sub> Gas Analyzer (KOMYO RIKA model: OM-5 and NGK model: RM101)
1	Anemometer KANOMAX model: 6161
1	Balance 0 - 300 mg – div 0,1g
2	Pressure Calibrator Set
1	Thermocouple Calibrator Set
2	Ultrasonic Flow meter FUJI DENKI Model: FLB20002
2	Density Meter from 0,7 g/cm <sup>3</sup> to 2 g/cm <sup>3</sup>
1	Steam Trap Tester TLV model: UC1
1	Gas sampling system DYNAPAK model 2010
1	Frequency-meter YEW model 2038-32
2	Lux-meter TOKYO KODEN model: ANA-999
1	Digital Micro Manometer OKANO mod.DP – 50A and Digital Manometer OKANO mod. POP – 201
14	Manometers several ranges
1	Condensate Flow Meter TLV model STPM
1	Conductivity Meter YEW model: 8015-00 (SC51)
1	Thermal Flow meter KYOTO DENSHI Model: HFM MA
1	pH Meter YEW model: PH81-11E
2	Electric Power Meter: MIDORI ANZEN models PFM 1000 and PHM 350
1	Electric Power Meter: YEW model 2531 A
1	Micro-Manometer ERITSU model: DLMI-10-15X2 range -50 to 50 mm H <sub>2</sub> O
1	Digital Multimeter SOAR model- 3430
1	Ampere meter CC YEW model: 2011-37
2	Pyrometer MINOLTA models: IR 510 and IR 0630 several ranges
1	Data Adquisition Hardware
3	Hybrid Recorder YEW model: 3087 -21/GP-IB
3	3 Pen Recorder YEW model: 3056-52
1	RPM-Meter YEW model 3632-00
47	Thermocouple several diameters and types
1	Thermal Video System AVIO
1	Pocket Thermometer YEW model 2542 – 41
2	Multiple thermocouple Thermometer YEW model: 2575 – 10
1	Psicrometer range 10°C – 50°C
1	Pulse Totalizer TAYLOR
2	Current transducer AC YEW model 2283-52
4	Electric Power Transducer YEW (3 wires and 4 wires)
2	Non effective Power transducer YEW 4 wires
7	Pressure Transducer (range 0-20 kg/cm <sup>2</sup> )
4	Differential Pressure Transducer TAYLOR several diameters and ranges
2	Voltage Transducer AC YEW model 2283-53
2	Transmitter Receiver

Amount	Description
10	Gas Sampling Tubes
20	Pitot Tubes several diameters and ranges
6	Pitot Tubes type ANNUBAR several diameters and ranges
3	Memory Unit YEW 3691-01
4	Thermo-Resistance PT - 100
1	Vehicle exhaust gas analyzer (CO, CO2, CH4)
1	Power and electricity meter
1	Combustion exhaust analyzer for CO and CO2
1	Combustion exhaust analyzer for NOx
1	Digital oscilloscope



ANNEX-12 Expenses by CIPURE/INTI

Item	1995	1996	1997	1998	1999	2000	Total	Resource
<b>1. Total Investments</b>								
Building(Training Plant, Classrooms)	0	0	310,000	157,068	24,052	plan	491,120	FONTAR
Other Facilities(Training Plant Equip. Installat)	0	0	98,000	60,751	0	0	158,751	INTI
Energy/CIPURE New Building	75,000	85,000	55,000	0	0	0	215,000	INTI
Machinery and Equipment	0	45,000	49,880	28,900	2,970	6,300	133,050	CIPURE
Sub-Total	<b>75,000</b>	<b>130,000</b>	<b>512,880</b>	<b>246,719</b>	<b>27,022</b>	<b>6,300</b>	<b>997,921</b>	
<b>2. Staff Charges</b>								
Salaries and Social Charges	67,500	172,500	265,500	252,000	256,000	228,440	1,241,940	INTI
Hired Personnel	4,200	24,164	38,500	32,500	32,500	14,850	146,714	CIPURE
Scholarship	0	4,250	0	0	0	0	4,250	INTI
Sub-Total	<b>71,700</b>	<b>200,914</b>	<b>304,000</b>	<b>284,500</b>	<b>288,500</b>	<b>243,290</b>	<b>1,392,904</b>	
<b>3. Running Costs</b>								
Administrative Costs	3,500	4,500	5,500	6,476	8,250		28,226	CIPURE
Services and Indirect Costs	8,500	18,000	22,000	23,500	24,200	22,000	118,200	INTI
Services	2,500	5,500	8,500	14,200	15,250	15,000	60,950	CIPURE
Training in Japan (Travel costs)	5,800	6,150	5,600	4,160	4,880	15,000	41,590	CIPURE
Equipment Maintenance	4,500	3,500	7,500	12,200	11,560	12,000	51,260	CIPURE
Technical Documentation	1,200	1,500	750	950	850		5,250	CIPURE
Sub-total	<b>26,000</b>	<b>39,150</b>	<b>49,850</b>	<b>61,486</b>	<b>64,990</b>	<b>64,000</b>	<b>305,476</b>	
Total(1+2+3) US\$	<b>172,700</b>	<b>370,064</b>	<b>866,730</b>	<b>592,705</b>	<b>380,512</b>	<b>313,590</b>	<b>2,696,301</b>	

Institucion	Monto(\$)	%
CIPURE	467,040	17
INTI	1,738,141	64
FONTAR	491,120	19
Total	2,696,301	100