Japan International Cooperation Agency (JICA)
Board of Investments (BOI)
of Department of Trade and Industry(DTI)

The Study on Environmental Management with Public and Private Sector Ownership (EMPOWER) in the Republic of the Philippines

Final Report

Volume I

September 2003

EX Corporation

Japan International Cooperation Agency (JICA)
Board of Investments (BOI)
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OF
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ON
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WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY-
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, March7, 2002

for Erlinda F. Arcellana
Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

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Introduction

The Steering Committee was held on 7 March 2002 at the Board of Investments. Ms.Erlinda F. Arcellana, Director of Office for Industrial Policy, Board of Investments, opened the meeting and explained the objectives of the meeting as follows:

- To know and meet the various agencies to be involved in the project
- To explain what the project is all about - its nature, activities to be undertaken, timeframe and schedule of activities, expected outputs
- To present the roles of the study team and the participating agencies
- To level-off understanding on Industry Environmental Management (IEM)
- To solicit comments on the project stakeholders how the project will be implemented and undertaken considering the mandates and roles of the public and private sectors to be involved

The Study Team distributed the Inception Report to the participants, and Mr. Masato OHNO, Leader of the JICA Study Team, explained the rationale of the project and how it was conceptualized. Accordingly, Dr. Marlito Cardenas, member of the JICA Study Team presented the Inception Report.

Issues and Decisions

During the explanation of the Inception Report, several issues were raised, discussed, and clarified, as summarized below.

1. During the discussion on the various organizations to be surveyed in the study, the following were suggested by the members of the Steering Committee (Ms. Liza Antonio, Ms. Dolora Nepomuceno) for consideration in addition to the list identified by the Study Team:

   - Industry Associations

     -MAP (Management Association of the Philippines)
     -PEPP (Philippine Environmental Partnership Program)
     -U LAP-Dept. of Interior and Local Government (DILG)

   - Academe as Environmental Service Industry Associations
     -Asian Institute of Management (AIM)
     -Ateneo/ De Ia Salle University
     -UP Los Baños -SESAM -PATTLEPAM -Environmental Education Network of the Philippines (EENP)
     -University of Asia and the Pacific

   - Public Organizations
     -Laguna Lake Development Authority (LLDA)
     -Pasig River Rehabilitation Commission (PRRC)
     -Technology Livelihood Research Center (TLRC)
     -National Economic Development Authority (NEDA-ICC/ PCSD)

- Dept. of Labor and Employment (DOLE)/ Occupational Safety Health Center (OSHC)
-Department of Finance (DOE)

- Financing Institutions

-World Bank (WB) - Related World Bank IEM funded projects
-Asian Development Bank (ADB) - Manila Segment on Air Quality Project

In addition, it was suggested to the Study Team to examine any National Declaration on Regulatory Relief/Assistance to industries by public organizations.

2. A question was raised on targets for priority areas and pilot projects. The Study Team clarified that the Study shall consider both large and small/medium size enterprises.

3. Ms. Antonio informed the group about the Business Agenda 21 Convention in June 2002. The convention could be an opportunity for the Study Team to be acquainted and know the various industries and their activities on environmental management. Attendance to the convention will help the Study Team to identify industries where pilot projects should be undertaken.

4. On Strategy and Policy to Advance Einvironmental Management in Industry Sector, it was suggested that guidelines for the development of measures be industry specific or sector specific to be more effective and efficient and based on needs of industries.

5. Questions were raised on who will prepare the action plan and what kind of support from the government organizations and the Study Team will be available for the implementation of the national action plan. The Study Team clarified that it will prepare the draft national action plan support from the government organizations and the Study Team would be on the dispatching of lecturers for seminars conducted by industry associations.

Conclusion

After the presentation of the Inception Report, the Committee members have deepened their understanding of objectives and scope of the Study and shown strong interest in involvement in and support for the Study. The Committee has set the next meeting schedule in the afternoon of March 22, 2002 for presentation on the progress of the Study including draft selection criteria for priority areas.

Attendants List

NAME	AGENCY/ASSOCIATION
Ms. Erlinda F.Arcellana	Director, Office for Industrial, Policy, BOI
Ms. Raquel Echague	Supervising Investment Specialist, Office for Industrial Policy, BOI
Ms. Liza Antonio	Executive Director, PBE
Mr. Manny Sabater	Project Coordinator for IISE, DENR-EMB
Mr. Emmanuel Pineda	Support Service Department, PEZA
Ms. Dolora Nepomuceno	Deputy Director, LLDA
Mr. Masaharu Tamaki	Japan Desk/Investment Advisor, BOI
Mr. Kiyoto Kobayashi	JICA Philippine Office
Mr. Masato Ohno	Leader, JICA Study Team
Mr. Tad Tanaka	Member, JICA Study Team
Mr. David Williams	Member, JICA Study Team
Dr. Marlito Cardenas	Member, JICA Study Team
Ms. Priscilla Rubio	Member, JICA Study Team
Ms. Kaoru Oka	Member, JICA Study Team
Ms. Pamela Gendrano	Assistant, JICA Study Team

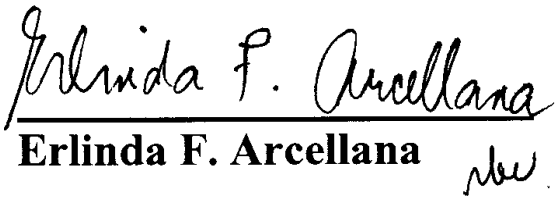
MINUTES OF THE SECOND MEETING OF THE STEERING COMMITTEE

ON THE PROGRESS OF THE STUDY

ON ENVIRONMENTAL MANAGEMENT WITH PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER) IN THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY-
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, March 22, 2002



Erlinda F. Arcellana

OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno

Team Leader
JICA Study Team

Introduction

The 2nd Steering Committee meeting was held on March 22, 2002 at the Board of Investments (BOI) to discuss the progress of the EMPOWER Study as a result of the Study Team's activities in the Philippines from March 7 to 22, 2002. Ms. Corazon Halili, OIC.-Office for Industrial Policy, Board of Investments, presided over the meeting. The Committee adopted the Agenda (shown below), and reviewed, corrected and adopted the Minutes of the previous meeting (shown as Attachment II, as corrected) of the Steering Committee held on March 7, 2002 at the BOI.

Agenda

1.0 Review and Adoption of the Minutes of the previous meeting
2.0 Study Progress Presentation
- Data collection: interviews conducted with Public Organizations. Banking Institutions, Academe, Business Associations and industries

3.0 Discussion on the Draft Policy and Criteria for the Selection of Priority Areas
4.0 Discussion on the First Seminar Plan
- Objectives
- Participants and Number
- Date and Venue
- Seminar Topics
- Resource Persons
- Other logistical requirements

5.0 Future Activities
6.0 Other Matters

The list of the attendees is shown as Attachment I.

Issues and Decisions

Several issues were raised, discussed, and clarified, as summarized below:

1. On the Review and Adoption of the Minutes of the previous meeting (March 7, 2002)
   1.1 Dr. Marly Cardenas clarified that the Union of Local Authorities (ULAP) - DILG should be listed under Public Organizations instead of industry Association as appearing in the Minutes. No other issues/comments were raised, and the Committee approved and adopted the Minutes with the correction as cited.

2. On the Study Progress Presentation
   2.1 Mr. M. Ohno presented to the Committee the list of selected public and private organizations the Team has interviewed during the period March 13-22, 2002 shown as Attachment III. Public organizations include DOE, PNOC-ERDC, NEDA, PEZA, DOH, DENR- EMB, LLDA, DOST-ITDI, DILG-ULAP, DILG- WSS, MMDA and PRRC; while the private sector includes members of the academe, industry associations, financial institutions and some selected multinational corporations.

2.2 Dr. Cardenas further elaborated the approach and methodologies conducted by the study team. From the initial discussions on the various criteria to be considered and as suggested in the Inception Report and the 1st Steering Committee meeting, the study team drew a list of organizations and institutions to be considered for the initial study.

2.3 For the second study phase, the 100 individual companies will be studied. Small-medium enterprises (SMEs) and foreign Chambers of Commerce and Industry will be considered on the priority list for this phase, which will start in June, 2002.

3. On the Draft Policy and Criteria for the Selection of Priority Areas

3.1 Ms. Kaoru Oka presented the draft policy and criteria for the selection of priority areas (Attachment IV). As presented, Priority Areas are areas where implementation of a specific Industrial Environmental Management (IEM) element in one or several industry sectors is supposed to reduce environmental load effectively. Some of the comments raised by the members of the Committee were (1) establishment of weights in each of the criteria, and (2) inclusion of human health impact and magnitude of environmental load in the weights.

3.2 Ms. Oka commented that the Team would prepare a draft matrix allocating weights to each of the criteria and employ a method to consolidate various opinions on the weights; another meeting will be scheduled for the discussion of the priority areas. Several Committee members suggested that data from the following could serve as reference for putting weight/values on the criteria:
- LLDA
- EMB-PAB Cases
- Database established by IEMIP
- MEIP (Industrial Pollution Component)
- BOI (Ten Revenue Streams of DTI)

(4 Revenue Sectors under BOI: motor vehicles, electronics, food & marine) - Listings of IISE (manufacturing toxic chemicals, hazardous waste generators and users)

3.3 Committee members could submit further comments to the Team through BOI on or before April 5, 2002.

4. On the First Seminar Plan

4.1 Ms. Rubio discussed about the first seminar being planned by the Team (Attachment V), which will be tied up with that of PBE's 3-day Business Agenda 21 Convention in Cebu City in mid-June 2002. The objectives of the seminar are (1) to notify relevant parties of the objectives of EMPOWER (preparation of IEM action plan with emphasis on private sector and investors and strengthening capacities); (2) to identify industry sector's current practices in environmental management; and (3) to identify the needs for the advancement of environmental management in the industry sector. As presented, the sponsors for the seminar include BOI, JICA, PBE, EMIB and PEZA. Mr. Manny Sabater commented that "Sponsor" should be replaced by "Partner" because the former connotes "cost sharing."

4.2 About 100 participants will be invited to the seminar that include representatives from BA 21 industry associations (65), government agencies (15), academe (5), financial institutions (5), JICA (2)/JICA Study Team (8). The highlights of the activities include discussion on the results of the PRIME and IISE projects and case studies from about four (4) Philippine corporations. The final schedule of the seminar will still have to be coordinated with PBE.

4.3 The members clarified whether JICA would provide for transportation, accommodation and other incidental expenses for the members of the Steering Committee since the seminar will be held outside Metro Manila. Ms. Oka responded that at the moment, the Team has not allocated necessary budget for such expenses. However, the Team will submit a proposal to JICA for consideration.

5. On the Future Activities

5.1 The Team informed the Committee about the timetable for future activities, as follows:

Date	Activities
June 2002	Preliminary selection of priority areas
July-August 2002	Prepare draft project pilot plan Summarize info on IEM practice by public and private sectors
End of August 2002	Selection of priority areas Finalize the pilot project plan

6. Other Matters

6.1 The next Steering Committee meeting is tentatively scheduled on June 10, 2002.

Conclusion

The Steering Committee members were informed of the progress and future activities of the EMPOWER project. The basic policy of the EMPOWER project has also been cleared, i.e., to promote implementation of IBM elements. Steering Committee members agreed that the selection of priority areas are to be further discussed based on the proposal being prepared by the JICA Study Team. In connection with the first seminar, the JICA Study Team will clear with JICA Office about the availability of financial resources for incidental expenses and remuneration for speakers.

Attendants List

NAME	AGENCY/ASSOCIATION
Ms. Corazon Halili	OIC-Office for Industrial, Policy, BOI
Ms. Raquel Echague	OIC- Environmental Matters Division, OIP, BOI
Mr. Manny Sabater	Project Coordinator for IISE, DENR-EMB
Mr. Dahlia D. Luna	Engineer , PEZA
Ms. Dolora Nepomuceno	Deputy Director, LLDA
Mr. Masaharu Tamaki	Japan Desk/Investment Advisor, BOI
Mr. Masato Ohno	Leader, JICA Study Team
Mr. Tad Tanaka	Member, JICA Study Team
Mr. David Williams	Member, JICA Study Team
Dr. Marlito Cardenas	Member, JICA Study Team
Ms. Priscilla Rubio	Member, JICA Study Team
Ms. Kaoru Oka	Member, JICA Study Team
Ms. Pamela Gendrano	Assistant, JICA Study Team

MINUTES OF THE MEETING
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PROGRESS OF THE STUDY
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ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY-
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, June 28, 2002

Erlinda F. Arcellana
OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The Steering Committee meeting was held on June 28, 2002 at the Board of Investments. Ms. Raquel Echague, OIC-Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the agenda, and reviewed/adopted the minutes of the 2nd Steering Committee meeting held on March 22, 2002.

Issues and Decisions

1. Ms. P. Rubio reported the methodology of the business association/industry survey, and current status of the responses. Out of 15 industry associations to which the questionnaire have been sent, seven associations responded; one claimed that it is members' responsibility to answer the question; remaining seven have not responded (some associations deemed the survey to be inapplicable to their operations, and refused to answer). PULPAPEL chairman is willing to participate in the project, and shared his concerns on consistency of policy implementation, apparent duplication of efforts, and need for more coordination between LLDA, DENR, and BOI. Out of nine private industries, three have responded; out of five industrial estates or parks, four gave information. Through the survey, contact information based on BA 21 directory was found not updated.

2. As for interview survey on individual companies, Mr. T. Tanaka presented a list of priority industry sectors from which interviewees (about 100 companies) are selected. The Committee studied the list and based on pollutants produced, level of awareness, economic situation, and capacity to improve environmental performance, selected the following manufacturing sectors:

    1) Machinery and tool manufacturing
    2) Metal foundry and forging
    3) Electroplating and metal finishing (e.g. jewelry)
    4) Chemical products (industrial and agrochemical)
    5) Pharmaceutical
    6) Petroleum products (only one company producing lubricants)
    7) Cement
    8) Glass and glass products
    9) Plastics and rubber
    10) Pulp and paper
    11) Printing
    12) Spinning, textile and dyeing
    13) Soap and detergents/cleaning agents
    14) Cosmetics
    15) Sugar milling and refining
    16) Coconut-based milling, refining, and spirit distillation
    17) Food processing (tuna and small-scale food processing)
    18) Beverage

Mr. Tanaka will confirm with Mr. Ohno about the selected 18 sectors. During the discussion, Ms. Lisa Antonio of PBE suggested the inclusion of other sectors such as recycling, dry cleaning/laundry operations, ceramics/potteries, and hotel/resorts. Mr. Tanaka agreed that the sectors are important but clarified that EMPOWER covers only manufacturing sectors. Prior to the selection, Mr. D. Williams informed the Committee about a WB-USEPA study which analyzed industrial emissions by sector and the severity of their inputs on water, air, and land (as related to human health and economic inputs). These indices could be applied to the Philippines industrial statistics data to indicate extent and location of inputs from emissions.

3. The Committee discussed the First EMPOWER Seminar to be held on August 1, 2002. Venue is tentatively set at AVR Penthouse, BOI, but other venues will be studied. The speakers from the industry will be from medium enterprises such as Nutrilicious (food sector), Redisol (chemical company), Mactan Rock and Industries (water purification for industry use), and international companies such as Bayer (chemical company), Fujitsu (computers), and Honda (automotives). A list of 100 potential invitees was presented and additional agencies were added (SMED/DTI, AIM, UNDP). BOI will send invitations next week, and there are concerns that one-month lead-time may not be enough for industries to respond.

4. Mr. Tanaka informed the Committee that JICA Study Team for EMPOWER is considering technical and financial support to the "Ecolabelling" Program under the DTI-Shell Project in coordination with the Bureau of Product Standards and Clean and Green Foundation as one of the pilot projects under EMPOWER. Cleaner Production and waste minimization shall be proposed by BOI through the Steering Committee as a pilot project under EMPOWER.

Conclusion

The Committee has been informed of the progress of the EMPOWER project at the meeting. The Committee agreed on the First EMPOWER Seminar plan and that the venue will be determined based on the study on options. The Committee also identified priority sectors from which 100 companies are selected for the interview survey. The Committee will discuss pilot projects under EMPOWER at the next meeting.

Attendants List

NAME	AGENCY/ASSOCIATION
Raquel Echague	OIC, Office for Industrial Policy, BOI
Dolora Nepomuceno	Deputy Director, LLDA
Lisa Antonio	Executive Director, PBE
Tonylin Lim	Engineer, PEZA
Manny Sabater	Project Coordinator for IISE, EMB/DENR
Tad Tanaka	Member, JICA Study Team
Precy Rubio	Member, JICA Study Team
David Williams	Member, JICA Study Team

MINUTES OF THE MEETING
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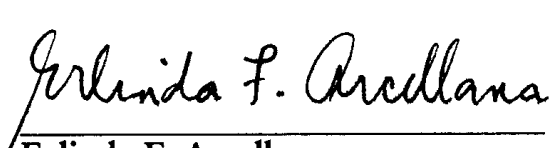
AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY-
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, August 8,2002



Erlinda F. Arcellana
OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The 4th Steering Committee meeting was held on the 8th of August 2002 at the Board of Investments Penthouse. Ms. Erlinda Arcellana, OIC - Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the agenda and reviewed/adopted the minutes of the 3rd Steering Committee meeting held on the 28th of June 2002. The meeting started at 10:00A.M.

Issues and Decisions

1 Ms. P. Rubio of the JICA Study Team reported the highlights of the 1st EMPOWER Seminar held at Astoria Plaza, August 1, 2002. A total of 81 people participated (including JICA/Empower team members and BOI personnel); 54% came from the industries and 26% from the government. Thirteen priority areas were represented and representatives of eight business associations participated.

Ten speakers from the government, JICA, and private sector presented various topics to the participants, to make them aware of the importance of industrial environmental management. Two SMEs (Nutrilicious Foods Corporation and Redisol, Inc.) improved their environmental performance because of DENR/LLDA warnings. Three multinationals (Bayer Philippines, Inc., Fujitsu Computer Products Corp. of the Phil., and Honda Phils.) implemented EMS because of parent company direction. Some of the issues raised during the Open Forum by the participants were the following:

- Information needs of industries - research, regulation, financial resources, and capacity building for SMEs.
- Service providers - PATLEPAM, PCAPI, TLRC and DOST offer services for advocacy, training and publications.
- Other EMS promoters that should be considered - LGU's, DA, DECS for the promotion of IEM
- Programs that should be promoted - Ecolabelling for export industries and Responsible Care Program for suppliers.
- Sustainability of projects - need for local funding sources.
- IEM case studies should include other aspects - Process analysis and optimization in order to maximize economic benefits.
- Driving forces to promote IEM - legal requirements, cost savings, and improved productivity are the main drivers for EM promotion.
- Incentive benefits to further IEM - tax break and reduction in production cost and government procedures.
- Impediments to the growth of IEM - lack of information and technology, financial resources, staff, and conflicting government policies or bureaucratic procedures.

2 Mr. Tad Tanaka of the JICA Study Team discussed the progress of the interview survey of 100 companies. Sample questionnaire was presented to the Committee. The team is verifying contact addresses, and the interview will be started next week. The survey will determine the current environmental management practices of industries. The Committee did not raise any issue on the survey forms.

3 Ms. Kaoru Oka of the JICA study Team discussed the plan for pilot projects following agreements reached in the 2nd Steering Committee meeting held last March 22, 2002. Based on the paper "Draft Policy on Selection of Priority Areas and Pilot Projects, " a

number of stakeholders, e.g. banks, government agencies are concentrated with IEM and will demand for better environmental performance of industries. The stakeholder demand, information on effective IEM and other incentives are likely to influence business decision on adopting IEM. Five areas of intervention to empower Philippine companies to improve their environmental performances are:

(1). enhancement of Philippine companies' ability to integrate environment into business strategies
(2). increase in quality and credibility of environmental services that support Philippine companies' IEM activities
(3). fostering environmental businesses that provide environmental equipment and recycling services
(4). increase in quality and quantity of information on effective IEM
(5). increase in other incentives for IEM promotion.

A set of criteria was developed to select priority areas (areas of intervention and industry sectors). To select pilot projects, the following criteria will apply
(1). within priority areas
(2). no required facility/capital investment
(3). completed within 6 months with concrete results
(4). strong interest/commitment of prospective implementing bodies
(5). expected continuation/expansion of the activities

Ms. Oka added that they want more domestic enterprises involved in Industrial Environmental Management. Pilot projects would also be chosen from priority areas.

On the request of Ms. Erlinda Arcellana for budget ceiling of each pilot project, Ms. Oka said JICA would still decide on the budget allocation. It is likely that low-cost funding and technical assistance will be available. Infrastructure and large capital equipments are out of their scope since the EMPOWER project targets the promulgation of IEM to Small and Medium Enterprises (SME's).

Ms. Raquel Echague, OIC-Chief, Environmental Matters Division requested for assistance towards BOI's certification for ISO 14001. Although the JICA Study Team concedes that the certification is important for BOI's advocacy for EMS, its qualification to the priority areas was not apparent and therefore needs further discussion. It will be one of the agenda items for the next Steering Committee Meeting.

Ms. Lisa Antonio of PBE suggested to the Committee that strong demonstration of willingness of the industries involved be one of the criteria to select industry sectors for priority areas. Mr. Emmanuel Pineda of PEZA seconded the premise and stated that it is everyone's task to pitch-in in order to attain sustainable environmental growth.

4. Ms. Oka presented four Ideas on Pilot Projects under EMPOWER and the Committee members gave clarifications/information, as follows:

- *ECO-Labeling and Green Procurement:* Ms. Arcellana said this is the thrust of SPIK (Samahan sa Pilipinas ng mga Industriyang Kimika or Chemical Industries Association of the Philippines) under the Responsible Care Program. SPIK will hold with ASEAN Chemical Industries Club a conference on October 15 or 16, 2002, and one. . of the topics is ecolabeling. Ms. Lisa Antonio further commented that more

attention should be given to the green procurement idea than Eco-labeling since the Clean and Green Foundation and the Bureau of Product Standards have already various initiatives on Ecolabeling. She also informed the Committee members that home appliances manufactures and Philippine food exporters tried to establish ecolabling schemes for their products in the past.

- *Waste Minimization/Zero Emission:* Since PBE is proposed to be the implementing agency, Ms. Antonio reported that 400 enterprises are registered in their waste exchange program and 1,300 are involved also in the program. For EMPOWER pilot project, 20 additional Philippine companies, preferably those with 100% domestic capital, are needed for the waste minimization pilot project. Those with EMS or certified could be part of the program. At the end of the discussion, PBE accepted the offer to be the implementing body.
- *Accreditation System of Experts in Emironmental Business:* Since there are accreditation systems for environmental auditors, EIA professionals, and PCOs, the pilot project will target those who conduct environmental sampling/analysis and environmental engineering.
- *The Philippine EMS Accreditation System:* The Bureau of Product Standards or BPS has to be recognized by the Pacific Accreditation Council before it could accredit local companies offering EMS services. Mr. Emmanuel Pineda of PEZA shared his idea on National Award for EMS for its promotion. Ms. Lisa Antonio commented that it would be better to specify the area for recognition such as EMS for Competitiveness in order to avoid any claim from the public if the awarded companies found not complying with all the government regulations.

5 The next Steering Committee Meeting will be held on August 20, 10 AM at the BOI. One of the agenda items in the meeting is the 2nd Seminar Plan that is scheduled during the 3rd week of October. The Team plans to target 100 Business Executives for a whole day activity featuring some Japanese experts on IEM. Ms. Antonio suggested that the seminar be divided into two sessions: one for the CEOs and the other for PCOs/technical staff. This is based on PBE's experience that CEOs prefer breakfast meetings with interesting speaker(s) rather than a whole day affair.

6 On Other Matters, Ms. Raquel Echague reported on the results of the IISE (Industrial Initiative for Sustainable Environment) First Seminar-Dialogue on government-industry partnership on EMS and resource conservation held on July 2, 2002 in Mactan, Cebu. She said the EMPOWER Project could derive information from the dialogue. A total of 30 companies participated: 13 IISE-assisted companies and 17 BOI-registered. The industries came from furniture and plastics manufacture, metal finishing/electroplating, port development, craft aluminum, marine exports, and food processing. Only four out of 13 IISE-assisted companies are still pursuing EMS. Assistance needed are technical or technology information (16%), training on EMS and alternative technologies (11%), financial (9%), seminars/awareness on EMS, P2/CP (9%), and orientation of various environmental laws.

7 The Meeting was adjourned at 1:30PM.

Conclusion

The Committee has been informed of the progress of the EMPOWER project on the 1st seminar the interview survey, and plans for pilot projects at the meeting. Definite plans and decisions or the pilot projects will be made in the next Committee meeting.

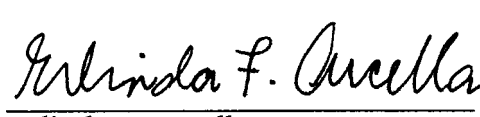
Attendees

NAME	DESIGNATION/AGENCY
Kiyoto Kobayashi	Assistant Resident Representative, JICA
Masato Ohno	Team Leader, EMPOWER
Tad Tanaka	Team member, EMPOWER
Kaoru Oka	Team member, EMPOWER
Satoshi Sugimoto	Team member, EMPOWER
Precy Rubio	Team member, EMPOWER
Jun Godornes	Project Officer, JICA-Phil. Office
Erlinda Arcellana	OIC-Director, BOI
Raquel Echague	OIC-Env. Div., BOI
John Erwin Furagganan	Technical Staff, BOI
Lisa Antonio	Executive Director, PBE
Emmanuel Pineda	Support Services Dept. Manager, PEZA
Ritchie Anne Guzman	Exec. Asst. II, EMB-DENR

MINUTES OF THE MEETING FOR CONFIRMATION OF PILOT PROJECTS UNDER THE STUDY ON ENVIRONMENTAL MANAGEMENT WITH PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER) IN THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY - BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, August 20, 2002



Erlinda F. Arcellana
OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The 5th Steering Committee meeting was held on the 20th of August 2002 at the Board of Investments Penthouse. Ms. Erlinda Arcellana, OIC - Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the agenda and reviewed/adopted (with corrections related to the ASEAN Chemical Industries Club convention with SPIK on October 15 or 16, 2002 in which ecolabeling is one of the topics) the minutes of the 4th Steering Committee meeting held on the 8th of August 2002. The Committee welcomed Dr. Christopher Silverio of ITDI/Department of Science and Technology as the newest member.

Issues and Decisions

1 JICA Study Team discussed the 2nd EMPOWER Seminar Plan. The seminar will be held on October 18, 2002 with the objective of presenting the following: (a) the framework of the IEM Action Plan, (b) the pilot projects, (c) current status of information on technologies/methods to reduce waste and improve productivity; and (d) current efforts and trends in IEM promotion. In addition to the participants of the first seminar, managers of the companies being surveyed will be included. Ms. Lisa Antonio suggested the addition of Philfoodex and Clean andGreen Foundation.

2 JICA Study Team reported the progress of the interview survey of 100 companies. Two (2) small companies producing polyethylene elastimer and paper products were visited and interviewed. Both companies claim not to produce too much waste, but their major concern is saving energy and reducing water consumption. The company producing paper products is not considering ISO 14001 certification but will do so upon economic improvement. The company prefers to use funds for improvement in production rather than certification. The elastimer producing company will not apply for certification because its customer is mainly the domestic market.

Ms. Dolly Nepomuceno of LLDA noted that compliance with DENR regulations does not mean that the firm is not polluting if the firm's pollution load is above zero but below the threshold and standards. Ms. Lisa Antonio of PBE suggested to include in the questionnaire if the firm has a corporate environmental policy.

3 JICA Study Team discussed the basic framework of the IEM Action Plan. The framework considers the overview of IEM activities, current issues of IEM, and criteria for identification of IEM priority areas. Current issues of concern are (1) limited enforcement of established environmental laws/regulations due to lack of available resources, (2) limited and useless economic financial incentives, (3) awareness/information gap among industrial enterprises of IEM, and (4) limited capacity of environmental service providers. Selection criteria of industries to be considered are: magnitude of environmental impact, potential of win-win PC measures, and awareness/experience in IEM activities. EMPOWER action plan is

divided into two priorities, based on time available for EMPOWER implementation. First priority is information/knowledge/awareness-based instruments, with the objective of promoting sell-reliant IEM activities by industrial sector under private sector initiatives. Second priority is given to economic/financial instruments and legal/regulatory instruments in order to promote further development of IEM activities. Pilot projects are based on first priority.

JICA Study Team suggested that the framework should identify when the threshold of assistance is reached, considering the magnitude of industrial pollution problems, various stakeholders and players. Ms. Lisa Antonio of PBE suggested some rewording of identified issues on findings to recognize project- based and company-initiated trainings such as Greening Supply Chain and continuing seminars conducted by groups such as PBE and PCAPIMs. She noted that IEM in the Philippines has progressed significantly in the last several years, and this positive development should be highlighted in the discussion of the framework She also suggested that the EMPOWER project emphasize potential impact on SMEs and of voluntary self-monitoring by industry. Dr. Chris Silverio of ITDI/DOST added that the framework should include performance indicators to measure the company's implementation of IEM.. Some suggestions, clarifications were also expressed on the contents of the framework which the Study Team agreed to adopt or consider.

4 JICA Study Team presented three revised Pilot Projects under EMPOWER, as follows:

- *Waste Minimization/Zero Emission:* PBE and DOST will be the implementing agency.

- *Enhancement of information on IEM Promotion:* PBE will be the implementing agency. Accreditation of environmental service providers could be part of this project. De la Salle University offered to coordinate the discussion process. PAEAP and PCAPI have not communicated their interest to be part of the process.

- *ECO- Labeling and Green Procurement::* Clean and Green Foundation will be the implementing body. This is the same project presented in the 4th Steering Committee Meeting, but with the expected results clarified. One of the results, "BOI will adopt the green procurement," could be hinged on EMPOWER assistance for BOI's ISO 14001 certification. JICA's feedback 'will determine whether the assistance will be provided.

The Committee agreed on the above Pilot Projects for endorsement to JICA. JICA Study Team also presented draft PDM for each pilot project and workshop plans; the workshops will be held in conjunction with the pilot projects (waste minimization and eco-labeling). The Committee agreed that the finalization of the PDM will be discussed at the next Committee meeting and that workshop plans

5 JICA Study Team gave the EMPOWER Project Member's schedule. Most members will be back October 6 but communications will continue. Pilot projects will commence in middle September once JICA gives the approval.

6 The next Steering Committee Meeting will be held on October 11, 2002 at 10 AM in the BOI. Two of the agenda items in the meeting are the pilot projects approved by JICA and the Interim Report (mainly the IEM Action Plan).

Conclusion

The Committee has agreed on the 2nd EMPOWER Seminar plan, and JICA Study Team and BOI will prepare for the seminar. The Committee has been informed of the progress of the industry survey and the framework of the IEM action plan. JICA Study Team will reflect the comments on the framework from the Committee members and present it at the next Committee meeting before it is discussed at the 2nd seminar. The Committee has agreed on the proposed pilot projects and the framework of the workshop plans. JICA Study Team will prepare documents on the pilot projects for JICA's approval and will work on the detailed workshop plans with the implementing bodies of the corresponding pilot projects. The Committee has been informed of PDM for the pilot projects and will finalize the PDM at the next Committee meeting, which will be held on October 11, 2002 at 10AM

Attendants List

NAME	DEIGNATION/AGENCY
Kiyoto Kobayashi	Assistant Resident Representative, JICA- Phil. Office
Masato Ohno	Team Leader, EMPOWER
Tad Tanaka	Team Member, EMPOWER
Kaoru Oka	Team Member, EMPOWER
Satoshi Sugimoto	Team Member, EMPOWER
Precy P. Rubio	Team Member, EMPOWER
Marlito L. Cardenas	Team Member, EMPOWER
Jun Godornes	Project Office, JICA- Phil. Office
Erlinda F.Arcellana	OIC- Director, BOI
Raquel B. Echague	OIC- Env. Div.BOI
John Erwin O. Furagganan	Technical Staff, BOI
Dolora N. Nepomuceno	Asst. Gen. Mgr., LLDA
Liza Antonio	Executive Director, PBE
Emmanuel Pineda	Support Service Dept. Manager, PEZA
Christopher M. Silverio	Chief, ITDI- DOST
Ritchie Anne S. Guzman	Exec. Asst. II, EMB- DENR

MINUTES OF THE MEETING
ON
THE PROGRESS OF THE STUDY
ON
ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY -
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, October 11, 2002

Erlinda F. Arcellana
OIC- Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The 6th Steering Committee meeting was held on the 11th of October 2002 at the Board of Investments Penthouse. Ms. Erlinda Arcellana, OIC - Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the agenda and the minutes of the 5th Steering Committee meeting held on the 20th of August 2002, comments of which were solicited in advance. Members can still submit any comments on the minutes to the Office for Industrial Policy. The Committee welcomed the staff of Clean and Green Foundation, Inc. (Imelda Sarmiento, Joy Chaneco and June Alvarez). The meeting started at 10:25A.M.

Issues and Decisions

1. The JICA Study Team discussed the alteration of the scope of EMPOWER based on the contract negotiation with JICA. The implementation of pilot projects, workshops, round table, environmental events were considered, hence the project is extended until August 2003. JICA provided an additional $180,000 for the pilot projects and four study members from Japan.

2. The JICA Study Team presented an outline of the EMPOWER Interim Report which will be composed of two parts. The first part will summarize an overview of the Philippine Industry and its environmental pressures, current status and issues of environmental management in the country, and the planning framework of national action plan on industrial environmental management. The second volume describes the pilot project plan. The Study Team will present the interim report to the BOI before the end of the study work in the Philippines (October 25).

3. The JICA Study Team reported on the interim results of the IEM survey/interview with 100 private sector enterprises. The report covered the determination of the industry sectors, its selection, interviewing procedure, the questionnaire and the preliminary analysis of the survey results. The CEOs and PCOs of the companies were interviewed.

   Majority of the CEOs (63%) believes that their products are performing well in the market, but profits have not increased in the past five years. Several companies have sections or departments dealing with productivity improvement (60%), quality control (84%), and environmental management (59%). Only 51-53% have company-wide committees for productivity improvement and quality control, while 37% have committees for environmental management. Forty percent of the companies gather all inputs and outputs for each process or production line. Most CEOs (85%) do not believe that meeting environmental standards decreases company's competitiveness.

   Sixty to sixty three percent of the companies do not have ISO 9000 (quality management) or EMS, but several PCOs prepare environmental reports (49%), calculates cost reduction from saving energy (50%), water and waste minimization (3 5%). Majority (47-74%) is not aware of green products or green procurement.

4 The JICA Study Team updated the Committee on the progress of the Pilot Projects. JICA has advised the Study Team of additional indicator results of the pilot project, focusing on BOI's role and usage of the results of the projects. Workshop programs

and schedules were provided. The Committee discussed several issues arising from the presentation, and these are (1) need to adjust budget and programming; (b) use the results of USE such as the environmental partnership and EMS for sustainability and institutionalization; (c) maintenance of website and ownership of the computer and software; (d) lack of control of Clean and Green Foundation over the EMS accreditation of BOI; (e) clarification of expected results (accreditation of product or progress towards the process, EMS certification or making BOL ready for EMS certification); and (f) need for a master plan for the Philippine ecolabeling program. When JICA approves the pilot project budget, the JICA study team will finalize the project plan based on further discussion with implementors.

5 The JICA Study Team discussed the progress of the preparation for the 2nd EMPOWER Seminar. The seminar will be held on October 16, 2002 with the objective of presenting the following: (a) the framework of the IEM Action Plan, (b) the pilot projects; (c) current status of information on technologies/methods to reduce waste and improve productivity; and (d) current efforts and trends in IEM promotion. BOI issued 200 invitations, but only 43 have responded. Ms. Lisa Antonio of PBE requested for equipment for her presentation and electronic copy of the invitation that she can forward to possible participants.

6 Ms. Lisa Antonio of PBE proposed the use of products with less environmental impacts (green products) such as recycled paper and non-toxic markers for the pilot projects as much as possible in order to promote green products, and the Committee agreed on the proposal.

7 The next Steering Committee Meeting will be held on November 22, at 10 AM in the BOI to discuss the pilot projects and the Interim Report.

8 The Meeting was adjourned at 1:00P.M.

Conclusion

The Committee has been informed of the progress of the EMPOWER project on the industry survey, the pilot projects, and plans for the 2nd Seminar. The JICA Study Team will submit the interim report before October 25 and finalize the detailed activities of the pilot projects based on the budget approved by JICA and discussions with the implementors. The JICA Study Team will make necessary contracts on the pilot projects.

Attendants List

NAME	DESIGNATION/AGENCY
Masato Ohno	Team Leader, EMPOWER
David Williams	Team Member, EMPOWER
Tad Tanaka	Team Member, EMPOWER
Marlito L. Cardenas	Team Member, EMPOWER
Precy P. Rubio	Team Member, EMPOWER
Satoshi Sugimoto	T eam Member, EMPOWER
Kaoru Oka	Team Member, EMPOWER
Erlinda F. Arcellana	OIC- Director, BOI
Raquel B. Echague	OIC- Env. Div., BOI
John Erwin O. Furagganan	Technical Staff, BOI
Dolora N. Nepomuceno	Asst. Gen. Mgr,. LLDA
Lisa Antonio	Executive Director, PBE
Emmanuel D. Pineda	Support Services Dept. Manager, PEZA
Christopher M. Silverio	Chief, ITDI-.DOST
Manuel Sabater	IISE Project Manager, EMB- DENR
Imelda P. Sarmiento	Executive Director, Clean&Green Fdn.
June M. Alvarez	Program Manager, Clean&Green Fdn
Joy Chaneco	Program Advisor, Clean&Green Fdn

MINUTES OF THE MEETING
ON
THE PROGRESS OF THE STUDY
ON
ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP
(EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY –
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, November 22, 2002

Erlinda F. Arcellana
OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The 7th Steering Committee meeting was held on the 22nd of November 2002 at the Board of Investments Penthouse. Ms. Raquel Echague, OIC - Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the agenda and the minutes of the 6th Steering Committee meeting held on the 11th of October 2002. Ms. Echague pointed out that the minutes of the 5th Steering Committee meeting was adopted with corrections. The meeting started at 9:30A.M.

Issues and Decisions

1. The JICA Study Team discussed the basic framework of IEM Action Plan and establishment of a Roundtable for discussion of the Plan. Seven factors deter IEM promotion, and these are (1) lack of information on environmental load by industry sector; (2) limited dissemination of IBM experience and knowledge; (3) limited compliance with laws and regulations; (4) limited economic and financial incentives/disincentives; (5) IEM awareness gap among industries; (6) limited capacity of environmental service providers; and (7) limited high level communication and coordination among stakeholders on IEM. The Action Plan will encourage self-reliant IEM activities through strengthened policy tool and instruments (information, technologies, incentives, laws and regulations). The plan will cover two to three years' activities for the manufacturing sector and selected agribusiness. Three priority actions were identified with corresponding steps: IEM information and promotion, review of current financial and economic incentives on IEM, and assessment of current legal and regulatory instruments to promote IEM.

   A series of roundtable discussions will be held until August 2003 to enable multisectoral review of (at working and policy making levels) and inputs to the Action Plan. Among the planned sectors to be consulted are government (BOI/DTI, DOST, EMB/DENR, DOF, NEDA. DOE, DBP, Land Bank), industry (business associations, PBE, PCCI, and other key industries), Environmental Service Providers (PCAPI, PABAP), commercial banks, NGOs and consumer groups. Ms. Lisa Antonio suggested the addition of the academe and network such as PATLEPAM; APRCP; donors such as UNDP, UNIDO, SIDA, CIDA and DTI's Bureau of Product Standards. Ms. Echague suggested the addition of DTI's Bureau of Small and Medium Enterprise Development or the SMED Council.

2. The JICA Study Team updated the Committee on the progress of the Pilot Projects. JICA approved the project design and budget. The delayed project implementation resulted in changes in schedule of activities such as workshops, and plant visit. End of project remained as scheduled.

3. Ms. Lisa Antonio of PBE reported on the 1st meeting of the Waste Minimization (WM) Steering Committee. Business associations such as the PULPAPEL, Philippine Metalcasting Association, PHILEXPORT, and Chemical Association (SPIK) are participating in the project. Large industries will be invited to participate to serve as waste minimization demonstration models. The San Miguel Corporation is eager to participate because of its partnership with Kim Brewery. Ms. Antonio informed the group that the Integrated IEM Information System Project would hold the initial committee meeting next week.

4. Ms. Imelda Sarmiento of Clean and Green Foundation reported the progress on the development of product criteria for tissue paper and detergents. Based on the needs of RA 9003, the project will also develop product criteria for household batteries and paper packaging materials. Ms. Echague added that the flexibles/laminate packaging industry is interested to be included in the ecolabeling project. The ELP Body will have a workshop with the Japanese consultant on December 12-13.

5. In response to the question of Ms. Lisa Antonio on the progress of BOI's IS014001, Ms. Echague reported that OIP is currently discussing with Mr. Gil Laquindanum who is the Environmental Management Representative (EMR) about the activities that need to be undertaken.

6. The next Steering Committee meeting will be on January 30, 2003, starting at 10 am. The Agenda will be (1) progress on the IEM Action Plan, (2) progress on the pilot projects, and (3) the 3rd EMPOWER Seminar Plan. Based on the preliminary design of the seminar, Ms. Echague suggested that a roundtable for discussion of the IEM Action Plan be held instead. Considering the schedules to be followed, progress of the pilot study, and need for feedback, the JICA Study Team will determine the most feasible seminar design.

7. The Meeting was adjourned at 10:30 A.M.

Conclusion

The Committee has been informed of the progress of the EMPOWER project on the IEM Action Plan and the pilot projects and agree on the establishment of the roundtable for discussion of the IEM Action Plan.

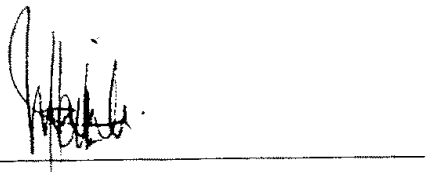
Attendants List

NAME	DEIGNATION/AGENCY
Masato Ohno	Team Leader, EMPOWER
Kaoru Oka	Team Member, EMPOWER
Tad Tanaka	Team Member, EMPOWER
Marlito L. Cardenas	Team Member, EMPOWER
Precy P. Rubio	Team Member, EMPOWER
Satoshi Sugimoto	Team Member, EMPOWER
Raquel B. Echague	OIC- Env. Div., BOI
John Erwin O. Furagganan	Technical Staff, BOI
Jun Godornes	Project Officer, JICA
Belinda Villanueva	Sr. Science Research Specialist, DOST
Irish Hormachuelos	Mgt. Audit Analyst II, LLDA
Lisa Antonio	Executive Director, PBE
Wilhelmina Y. Villanueva	Project Officer, PBE
Ghette Pascual Sison	Project Specialist, EPIC
Imelda P. Sarmiento	Executive Director, Clean&Green Fdn.
June M. Alvarez	Program Manager, Clean&Green Fdn

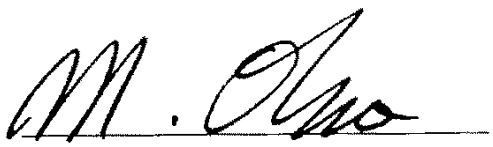
MINUTES OF THE 8th MEETING ON THE PROGRESS OF THE STUDY ON ENVIRONMENTAL MANAGEMENT WITH PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER) IN THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY-
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, January 31, 2003



Corazon H. Halili
Officer-in-Charge
Office for Industrial Policy
Board of Investments
Department of Trade and Industry



Masato Ohno
Team Leader
JICA Study Team

Introduction

The 8th EMPOWER Steering Committee meeting was held on the 31st of January 2003 at the Board of Investments 5th Floor Conference Room. Ms. Corazon Haul, GIC of the Office for Industrial Policy, Board of Investments, presided over the meeting. The members adopted the meeting agenda and the minutes of the 7th Steering Committee meeting held on the 22nd of October 2002. The meeting started at 10:15 A.M.

Issues and Decisions

1. The JICA Study Team discussed the 3rd Seminar Plan. It will be held on February 5, 2003 with the objectives of presenting an update of the pilot projects and the National IEM Action Plan, and gather feedback of participants. The mechanics of the technology of participation was explained. Presentation of pilot projects should be within 15 minutes and should include a brief background and significant accomplishments.

2. The JICA Study Team presented the IEM Action Plan, including the rationale and objectives, issues, strategies, activities and work and financial plan. Some of the questions raised were the difference between IEM vs. EMS, continuity of pilot projects, and linkage of policy and incentives. Ms. Nepomuceno of LLDA pointed the need to consider in the action plan the pending Congress bill on National Environmental Management Authority. Ms. Halili shared that BOI is working on the amendment of incentives, and the Action Plan could enhance their work.

3. The JICA Study Team announced the plan on the World Environment Day event. A trade exhibit will be held in Glorietta Square in Makati City to highlight the importance of IEM to consumers. Some ideas for the program are live presentation of environmental songs and launching of the IEM information website. The event will be promoted through trimedia and posters.

2. Ms. Lloly de Jesus of PBE reported on the progress of the Waste Minimization Pilot Project. With a start date on December 2002, the project accomplished the following: establishment of the Steering Committee, selection of 20 participating and model companies, pre-assessment of 11 potential volunteer companies, draft confidentiality agreement, outline for sector/industry-wide waste minimization plan, collection of information of good examples of waste minimization, outline of guidebook, and the 1st Waste Minimization Workshop. Ms. Dolly Nepomuceno noted her familiarity with the participating companies and asked the expectation of the project from LLDA. Ms. Lisa Antonio replied that the Waste Minimization Steering Committee would discuss LLDA role in its next meeting.

3 Ms. Mila Antofina of PBE reported the progress of the IEM Information System Pilot project, which started on November 2002. Among its accomplishments are the following: establishment of the Steering Committee with 10 member

organizations; identification of members of the Working Group; identification of needs/issues through survey and industry consultation; and contract agreement with a database service provider.

4 Mr. June Alvarez of the Green Choice Program reported that the seminar workshop with Mr. Seiji Taguchi of EcoMark of Japan on December 9-13, 2002 helped the staff and the ELP Body understand the requirements of the ecolabelling program. The project has developed the following: draft guidelines for application for certification; draft Executive Order for the establishment of a Green Procurement Program for all department and executive branches of the government; selection criteria for synthetic laundry detergent and tissue paper products; and proposed program for Green Choice Launching on March 10, 2003. The committee is requested to give their comments and suggestions on the draft guidelines and draft Executive Order.

5 Mr. Nel Almario of SAGIP Environment presented an overview of BOI's Green Procurement and EMS. The BOI Board approved a resolution that endorses the program on January 9, 2003. The Green Procurement policies in other countries have been collected.

6 The JICA Study Team announced that the next tour of duty is May 28-June 28. A series of roundtable discussion will be held and the information will be inputted to the second Draft IEM Action Plan. The 4th EMPOWER seminar will be held in June to present the EM Action Plan, results of the pilot projects, and follow on activities. The Team requested the Steering Committee to evaluate the pilot projects and recommend further actions in April even in the absence of most team members.

7 The next Steering Committee meeting will be on March 31, 2003, starting at 10 am. The Agenda will be a review of the progress on (1) the IEM Action Plan, (2) the pilot projects, (3) exhibit plans, and (4) the 4th EMPOWER Seminar Plan.

8 Two papers on Environment Awards were distributed for consideration in the IEM Action Plan. Among the comments of the committee members are the need for top level (Presidential) recognition of the award and institutionalization. BOI will explore the idea and develop a concept paper.

9 The Meeting was adjourned at 12:15 P.M.

Conclusion

The Committee has been informed of the progress of the EMPOWER project on the IEM Action Plan and the pilot projects. The Committee also discussed future activities.

Attendants List

NAME	DESIGNATION/AGENCY
Masato Ohno	Team Leader, EMPOWER
Tad Tanaka	Team Member, EMPOWER
Misako Takagi	Team Member, EMPOWER
Marlito L. Cardenas	Team Member, EMPOWER
Precy P. Rubio	Team Member, EMPOWER
Corazon Halili	OIC-OIP, BOI
John Erwin O. Furagganan	Technical Staff, BOI
Dolora U. Nepomuceno	Assistant Gen. Manager, LLDA
Jun Godornes	Project Officer, JICA
Christopher Silverio	Chief, Environment Division, ITDI-DOST
Lisa Antonio	Executive Director, PBE
Lloly de Jesus	Consultant, PBE
Mila S. Antofina	Project Manager, PBE
Imelda P. Sarmiento	Executive Director, Clean&Green Fdn.
June M. Alvarez	Program Manager, Clean&Green Fdn
Sol Retano	Technical Assistant, Clean&Green Fdn
Manuel Almario	Project Manager, SAGIP Environment
Inier Candor	CEO, Events Media Mktg.
Catherine Bagalayos	Account Executive, Events Media Mktg.

MINUTES OF THE 9th MEETING
ON
THE PROGRESS OF THE STUDY
ON
INDUSTRIAL ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP
(EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY –
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, March 31, 2003

for: Ma. Corazon H. Halili	Masato Ohno
Officer-in-Charge	**Team Leader**
Office for Industrial Policy	**JICA Study Team**
Board of Investments	
Department of Trade and Industry	

Introduction:

The 9th EMPOWER Steering Committee meeting was held on the 31st of Match 2003 at the Board of Investments, 4th Floor Conference Room. Ms. Raquel Echague, OIC of the Environmental Matters Division, Office for Industrial Policy, Board of Investments, presided over the meeting which started at 10:30 A.M.

Issues and Decisions:

1. Ms. Lloly de Jesus, the Project Consultant for the Waste Minimization Pilot Project (WMPP) reported on the progress of the project from February to March 2003. Four (4) model companies have already been selected, namely, Kemwerke, Incorporated, TSB Enterprises, Acetech Metal Industries Corporation, and Noah's Paper Mills, Inc. and confidentiality agreements with these companies have been signed. After a one-day assessment, the Waste Minimization (WM) Team shared their findings and initial recommended WM options for the companies to implement. The DOST expert and model companies set timetables of bimonthly visits. DOST is refining the WM Assessment Reports for the remaining sixteen (16) participating companies. The WMPP-Steering Committee approved the outlines for sector/industry-wide WM plan and guidebook. Dr. Chris Silverio of DOST reported that the model companies, especially from pulp and paper and foundry sectors were expecting the presence of JICA experts during the actual assessment for technical guidance. Ms. de Jesus added that the experts could still join the monitoring visits scheduled in May 2003.

2. Ms. Mila Antofina, the Project Manager for the Integrated IEM Information System Pilot Project reported on the progress of the project. The contract with Ayala Systems Technology, Inc. (ASTI) was already finalized and a dummy website is available for comments of the SC members. Among the initial comments of the SC members are the need to display the government-private sector logos to highlight this partnership, linkage with the DTI and other partner agencies' website, and Business Agenda 21. There will be a soft launching of the website during the EMPOWER Exhibit on June 6-7, 2003. Full launching will be on June 24, 2003.

3. Mr. June Alvarez, the Project Manager for Ecolabeling and Green Procurement Pilot Project reported on (a) establishment of system for Green Choice application and certification; (b) formal launching of Green Choice; (c) accreditation of product; (d) product criteria development; and (e) draft Executive Order on Government Green Procurement Policy. Pictures of the formal launching of Green Choice on March 10, 2003 and some news clippings about the Green Choice Launching were presented. Ms. Leny Abella of Philexport raised the industry concern regarding a misconception in the advertisement in the Manila Bulletin, which states that Ecolabeling is a requirement rather than a voluntary action. Mr. Alvarez will correct this with Manila Bulletin. The JICA Study Team inquired on how products are selected for ecolabeling, and Mr. Alvarez replied that these are based on requests from interested parties like the National Solid Waste Management Commission which requested for household batteries and plastic packaging materials in view of R.A. 9003. Standards are based on the guidelines of ISO 14024. Mr. Alvarez also commented on the difficulty of getting information from applicant companies on projected earnings from which the licensing fee will be based. SC members advised that audited financial reports submitted by companies to the Bureau of Internal Revenue should suffice for calculating the

licensing fee. Mr. Alvarez added that it is indeed necessary to extensively promote Green Choice or ecolabeling since the fees will be the key element for the sustainability of the program. Further, the draft Executive Order on Green Procurement for government office is still with the legal department of the Office of the President for thorough analysis.

4 Mr. Nel Almario of SAGIP Environment and Ms. Echague reported on BOI's EMS and Green Procurement Policy, respectively. The BOI Management approved the Green Procurement Policy on March 111, 2002. Action Plans and mechanism for implementation shall be drafted within 60 days. On the other hand, the consultant held meetings with BOI EMS core group and technical committees for the preparation of Operations Control Procedures Manual and the EMS Manual. The BOI EMS depends much on the commitment of its management and personnel, and Mr. Gil Laquindanum, the Environmental Management Representative is aware of this.

5 Events Media Marketing Inc. which serves as Secretariat for the EMPOWER Exhibit presented the plans and the program of activities for the event. The exhibit will be held at the Activity Center, Ground Floor, Atrium Building of SM Megamall in Mandaluyong City on June 6-7, 2003. Sixteen (16) booths are available for promotional exhibits of EMPOWER partners and co-sponsors. The Tentative program is as follows:

Day 1
Morning Opening Ceremony (starts at 10:30)

- National Anthem
- Welcome Remarks
- Acknowledgement of Participating Sponsors & Exhibitors

Message of Commitment from
- Government
- Private Sector or Industry
- NGO
- Funding Agency

Launching of the IEM Information Network Website
Exhibits from the Booths

Afternoon (Starts at 2:00)
Exhibits from the Booths
On-the-spot Poster-Making Contest for Kids
4th EMPOWER Seminar (5th Level Conference Room)

Day 2
Morning (Starts at 10:00)
Exhibits from the Booths

Afternoon Banda Para sa Kalikasan - a band concert featuring student finalists in the song-writing contest sponsored by EMB; Awarding of winners of the Poster-making Contest

6 Among the suggestions for the Exhibit are the development of a theme and a mascot (instead of poster-making contest), and seminar topics that will attract shoppers of the SM Megamall, e.g. waste minimization, IEM website, and green procurement. About 11 exhibitors signified commitment to the Exhibit, and these are DTI/BOI, PEZA, LLDA, PBE, CGFI, DOST, Philexport, and 4 WM model companies. EMB/DENR still has to be informed about the exhibit. If 12 will be given for free, 4 will be

available for a fee. Due to the urgency of finalization of the plan, the SC members decided to have a special meeting on April 25, 2003.

7 The JICA Study Team presented the comments gathered from three roundtables on IEM Action Plan. The comments are incorporated to the plan where feasible.Follow-up activities include two roundtable discussions with industry associations, environmental service providers, and donor agencies; finalization of the action plan and project proposals; and presentation for review and approval of BOI Governing Board. Another roundtable with industry associations and environmental service providers is being scheduled by BOI on April 30, 2003.

8 Ms. Echague, Ms. Abella and Ms. Mary Ann Magadia reported on their IEM training in Japan on March 2-15, 2003. They studied the various agencies and affiliates involved in the formulation of environmental policies, the legal system for the construction of a recycling-oriented society, EMS audit and certification, and two corporations committed to environment. Their training will be useful for advocacy on IEM. They noted a previous study made for LLDA in 1997 by Japan Environmental Management Association for Industry (JEMAI) wherein it was recommended that the introduction of a pollution control managers system, which is an improvement of the existing pollution control officers system being administered by LLDA will improve pollution prevention efforts of the Philippines.

9 Ms. Echague reported that in one of the dialogues with industry, there was a suggestion to incorporate the IEM awards system to the current Philippine Quality Award (PQA) being administered by DTI/Center for Industry Competitiveness (CIC). This could be done through the addition of a special category for IEM for SMEs. In a meeting with CIC representative on 27 March 2003, it was found out that the PQA is now governed by R.A. 9013 and standards are based on Malcolm Baldridge awards in the U.S. Therefore, the incorporation of the IEM awards system is not feasible due to possible congressional requirements. The JICA Study Team added that the last two (2) roundtables conducted with various stakeholders had put emphasis on the need of industry for recognition with respect to environmental performance and institutions. Ms. Echague will take this matter up during the WMPP SC meeting scheduled on 02 April 2003 at the BOI.

10 The special Steering Committee meeting to discuss the plan for the Exhibit in June is scheduled on April 25, 2003, 10:00 A.M. at BOI.

11 The Meeting was adjourned at 1:25 P.M.

Conclusion

The Committee has been informed of the progress of the EMPOWER project on the IEM Action Plan, the three (3) pilot projects, and IEM training of BOI and Philexport. The Committee also discussed the plans for EMPOWER Exhibit in time for the celebration of the World Environment Day in June 2003.

Attendants List

NAME	DESIGNATION/AGENCY
Priscilla P. Rubjo	Team Leader, EMPOWER
Marlito L. Cardenas	Team Member, EMPOWER
Masaharu Tamaki	Japan Desk, BOI
Manuel Almario	Project Manager, Sagip
June M. Alvarez	Program Manager, Clean&Green Fdn
Christopher Silverio	Chief, Environment Division, ITDI-DOST
Mila S. Antofina	Project Leader, PBE
Lloly de Jesus	Consultant, PBE
Win Y.Villanueva	Project Coordinator,PBE
Guillermo E. Orgil	Representative, LLDA
J. Erwin O.Furugganan	Investment Specialist, BOI
Tonil n P. Lim	QIC, Environment Division, PEZA
Mary Ann Magadia	Investment Specialist, BOI
Leni D. Abella	Vice- President, Promotions, Philexport
Raguel B. Echague	OIC, EMD, BOI
Inier Candor	CEO, Events Media Mktg.
Catherine Bagalayos	Account Executive, Events Media Mktg.

MINUTES OF THE 10th MEETING
ON
THE PROGRESS OF THE STUDY
ON
INDUSTRIAL ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP
(EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY -
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, April 25, 2003

Erlinda F. Arcellana
OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno
Team Leader
JICA Study Team

Introduction

The 10th EMPOWER Steering Committee meeting was held on the 25th of April 2003 at the Board of Investments 5th Floor Conference Room. Ms. Raquel Echague, OIC of the Environmental Matters Division, Office for Industrial Policy, Board of Investments, presided over the meeting which started at 10:20 A.M. The Minutes of the 9th EMPOWER Steering Committee meeting was adopted.

Issues and Decisions

1. Mr. liner Candon of Events Media Marketing (EMM) presented the physical arrangements of the trade exhibit. According to him, the management of SM Megamall informed him that the venue is free and available only on June 9-11, 2003. Based on this information, K. Kobayashi of JICA Philippines raised his concerns since announcements have been made with Japanese companies that trade exhibit is on June 6-7, to coincide with World Environment Day. He added, however that he will honor whatever the Steering Committee decides on the date and venue considering the target audience. If needed, he will try to get the approval of JICA Headquarters for additional budget. A lengthy discussion followed on the target audience since it determines the venue and activities of the exhibit. EMM understood from the JICA Team that the general public should be made aware of IEM but the Steering Committee wants to target business executives and government agencies. SM Megamall is the proper venue if the general public is the target. A hotel will be more appropriate for business and government executives, thus the Steering Committee instructed EMM to provide R. Echague with a comprehensive plan if a hotel is considered as venue. Among the hotels considered are Dusit Hotel and New World which are both in Makati. R. Echague will then refer this to the Steering Committee members and JICA Philippines for comments and decision.
2. EMM said the JICA Study Team would market the trade exhibit to potential sponsors such as Japanese Chamber of Commerce, JETRO, UNDP, DBP, Land Bank, Philippine Chamber of Commerce and other industry associations. Each booth will cost P25, 000.
3. The JICA Study Team suggested that the Steering Committee decide on the general theme of the trade exhibit instead of individual exhibitor's theme. Among the suggestions are the following: Respect for the Environment in the Eyes of the Worker; Waste Minimization for a Clean Industrial Environment; IEM for Cleaner Environment; Environmentalism - the Way to Go: Cleaner Industries for Greater Competitiveness. After a lengthy deliberation, the Steering Committee decided that the general theme will be "Respecting Environment for Industrial Competitiveness." The theme will be part of the announcement in the media and banners. All participating booths will adopt to this general theme.
4. Regarding the mascot design contest for the trade exhibit, M. Candor suggested that due to time constraint, a poster-making contest is more appropriate. Ms. L.

Abella agreed but reiterated that the search for a mascot should start this early if we want to make use of it for next year's environment event.

5 R. Echague presented a Seminar plan, but the members proposed short presentations to give only overview of the Pilot Projects.

6 There will be Exhibitors' briefing meeting on May 30.

7 The Meeting was adjourned at 12:50 P.M.

Conclusion

The Committee discussed the plans for World Environment Day exhibit, but final decision on venue and date will depend on the inputs of the EMM and if JICA can provide additional budget.

Attendants List

NAME	DESIGNATION/AGENCY
Kiyoto Kobayashi	Asst. Resident Representative, JICA/Phil.
Hiroyuki Kojima	Expert, JICA
Wini Vilianueva	Project Coordinator, PBE
Raguel Echague	OIC, Environmental Matters Div., BOI
J. E. Furugganan	Investment Specialist BOI
Leonor D. Abella	VP Promotions, Philexport
Gigi Digal	Manager, Philexport
Priscilla Rubio	Team Member, EMPOWER
Marlito Cardenas	Team Member, EMPOWER
Tonilyn P. Lim	Acting Chief, Environmental Div., PEZA
Diana Daus	Trainee, Events Media
Catherine Bagalayos	Account Executive, Events Media
Iiner Candon	CEO, Events Media
Ulysses Lobaton	Engr. II, LLDA
Reymond Lombos	Media Division, Events Media
June Alvarez	Programme Manager, Clean & Green Fdn.

MINUTES OF THE 11th MEETING ON THE PROGRESS OF THE STUDY ON INDUSTRIAL ENVIRONMENTAL MANAGEMENT WITH PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER) IN THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY –
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, May 21, 2003

Erlinda F. Arcellana

OIC-Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno

Team Leader
JICA Study Team

Introduction

The 11th EMPOWER Steering Committee meeting was held on the 21st of May 2003 at the Board of investments, 5th Floor Conference Room. Ms. Erlinda F. Arcellana, OIC- Director, Office for Industrial Policy, Board of Investments, presided over the meeting which started at 10:20 A.M. The Minutes of the 10th EMPOWER Steering Committee meeting was adopted "en toto."

Issues and Decisions

1. Mr. Inier Candor of Events Media Marketing (EMM) discussed the physical arrangements and PR/media plan of the EMPOWER Project exhibit on June 9-10, 2003. The exhibit will be held in two venues: Manila Peninsula Hotel (MPH) and SM Megamall. EMPOWER will have to share exhibit space with the Management Association of the Philippines in MPH, hence resulting in smaller booths that can accommodate only posters, banners and printed materials. After some discussions, booth assignments for exhibitors (11 non-paying and one paying) were given. Some exhibitors may share booths, e.g. BOI and JICA. Press releases will be published in Business World (June 5), Manila Times (May 26, June 2 & 9), and Philippine Daily Inquirer (June 9). Radio announcements will be aired from June 2 to 9. EMM is requesting the exhibitors to submit company profiles for inclusion in the press releases. LLDA plans to issue its own press release, but will coordinate with EMM for a uniform story. A meeting will be held with exhibitors on May 29 in order to review their exhibit designs and materials. The JICA Study Team and Event Media asked all exhibitors to announce our event in the homepage and also bring their guests to the event held in SM Megamall.

2. R. Echague discussed the Program of Activities on June 9 and 10. At the Manila Peninsula Hotel on June 9, the morning program will include a brief presentation of EMPOWER pilot projects and IEM Action Plan, formal opening of the exhibit, and launching of the IEM Knowledge Network website; target audience will be the top-level executives and CEOs who are members of the Management Association of the Philippines. The afternoon program will target the government agencies to advocate green purchasing and ecolabelling, present the IEM Action Plan, and demonstrate the IEM Information website.

3. The JICA Team reported on the progress of the IEM Action Plan. The last roundtable discussion was held on April 30, 2003 with Management Association of the Philippines (MAP), PBE, Philippine Institute of Certified Public Accountants (PICPA), Philexport, and Madecor Environmental Management Service, Inc. (MEMSI). Among the comments are the interest of industries in recycling and incentives, concern with BOI's downgrading of environmental projects, non-competitive interest charges on environmental loans, and need of studies on tax structuring for promoting the recycling industry. Follow up actions include write-up of final draft IEMAP, preparation of selected project proposals, BOI's review and approval of IEMAP, and roundtable discussion with official development assistance agencies.

4. M. Antofina of PBE reported on the progress of IEM Information System Pilot Project. The framework and design of the system was approved by the project's

Steering Committee. The website is being developed: the logo and its copyright, database updating and debugging, test for the speed and the interactive ability. A brochure is being developed, and the website will be uploaded by June 2 and fully operated by June 23.

5 Regarding the progress of Waste Minimization Pilot Project, W. Villanueva reported on the monitoring visits to model companies, action plans of two industry associations (PMAI and PULPAPEL), and the first draft of the WM guidebook. R. Echague added on the progress of BOI policy dialogue with industry. Four model companies will be given recognition of IEM promotion at the top management seminar. BOI will develop a concept paper to discuss the mechanism of award system and coordination with other award bodies.

6 J. Alvarez reported that the final draft of the guidelines for Green Choice (GC) certification will be presented to the Ecolabelling Board. The GC Operations Manual is being drafted to guide the selection of product category, development of product criteria and selection of members of the Technical Committee and Technical Working Groups. The Technical Working Group for Household Batteries visited the facilities of Matsushita Electric Philippines Corporation (maker of National Panasonic batteries). The Technical Committee approved the next product categories for the development of product criteria: personal car products, air-conditioner, refrigerator, automotive battery, paint, multi-layered paper packaging, plastic packaging (other than polyethylene), resins, and cleaning agents.

7 R. Echague reported that BOI had ratified the Green Procurement Policy on March 11. An Action Plan that will ensure compliance with the policy is being reviewed by BOI's Executive Directors. The four products initially targeted for Green Procurement are bond and tissue paper, pens, and computers. BOI review Action Plan annually and increase the number of target products in the future.

8 K. Oka presented a proposed JICA Training on Cleaner Production (CP). The objective is to enhance coordination of the public and private sectors to promote IEM and increase their awareness towards CP. Training will be held in Japan covering information sharing, overview of CP, Japanese experiences in CP, industry-specific CP, industry-wide action plan and measures to promote CP. Prospective participants may be selected by a special committee to be establishec to monitor the IEM Action Plan and will be required to hold an echo seminar. Those from the industry sector are representatives of the industry associations that have prepared an industry-wide action plan. Dr. Silverio of DOST suggested the requirement of a country report, and shorter period of training (3-4 weeks only instead of 8 weeks). The SC members were invited to give further comments or the proposal.

9 The schedule of the JICA Study Team was announced. Meetings with the steering committees for pilot projects will be held for preliminary evaluation of the projects in June. The final EMPOWER Steering Committee will be held in August to discuss the draft final report and establish the special committee that will monitor the progress of the IEMAP.

10 The Meeting was adjourned at 12:30 P.M.

Conclusion

The Committee discussed the plans for World Environment Day exhibit and top management seminar, the progress of the pilot projects and IEM Action Plan, and the follow-up activities. BOI will send an invitation letter to prospective participants of the top management seminar. Exhibitors are requested to submit brief company profile, official name of their organization and contact details to the secretariat of the Environment Exhibit by May 27. The preparation meeting for the Environment Exhibit will be held at the conference room (5th floor) at BOI from 14:00 on May 29, and exhibitors are expected to prepare contents of the panel presentation as concrete as possible by then.

Attendants List

NAME	DESIGNATION/AGENCY
Erlinda F. Arcellana	OIC-Director, OIP-BOI
Raguel B. Echague	OIC- Environmental Matters Div., OIP-BOI
Kaoru Oka	Team Member, EMPOWER
Priscilla P. Rubio	Team Member, EMPOWER
Misako Takagi	Team Member, EMPOWER
Christopher Silverio	Chief SRS, ITDI-DOST
Napoleon Halili	LLDA
Maricel A. Santiago	Head, PILL, LLDA
Mila S. Antofina	Program Manager IEM Information Systems Pilot Project, PBE
Wini Villanueva	Program Manager IEM Information Systems Pilot Project, PBE
June Alvarez	Program Manager Ecolabeling Pilot Project, Clean and Green
Sol Rejano	Technical Assistant Ecolabeling Pilot Project, Clean and Green
Gigi Digai	Manager, Philexport
Hiroyuki Kojima	Project Formulation Advisor, JICA
Daisy L. Sugapong	Sr. Investment Specialist, OIP-BOI
Inier Candor	CEO, Events Media Mktg
Cathy Bagalayos	Account Executive, Events Media Mktg
Tino Calzado	Sr. Sales Executive, Centrex

MINUTES OF THE 12th MEETING
ON
THE RESULTS OF THE STUDY
ON
INDUSTRIAL ENVIRONMENTAL MANAGEMENT
WITH
PUBLIC AND PRIVATE SECTOR OWNERSHIP (EMPOWER)
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
DEPARTMENT OF TRADE AND INDUSTRY –
BOARD OF INVESTMENTS
AND
JICA STUDY TEAM

Manila, August 13, 2003

Erlinda F. Arcellana

OIC- Director
Office for Industrial Policy
Board of Investments
Department of Trade and Industry

Masato Ohno

Team Leader
JICA Study Team

Introduction

The 12th EMPOWER Steering Committee meeting is aimed to discuss the results of the project and the implementation of the IEM Action Plan. It was held on the 13th of August 2003 at the Board of Investments, Audio-Visual Room, Penthouse. Ms. Erlinda F. Arcellana, OIC-Director of the Office for Industrial Policy, Board of Investments, presided over the meeting that started at 10:25 A.M. The Minutes of the 11th EMPOWER Steering Committee meeting was reviewed and adopted "en toto)'

Issues and Decisions

1. M. Ohno of the EMPOWER Team reported that the EMPOWER draft final report consists of 10 chapters with Chapters 1 and 2 for the IEMAP, Chapters 3 to 9 for the Pilot Projects and Chapter 10 for the Recommendations. He welcomed additional comments to the draft final report from the committee members that can be coursed through R. Echague until August 25, 2003.

2. Among the accomplishments of the Ecolabelling program, based on the report of J. Alvarez of CGFI, are the (1) Master Plan, (2) Development of Product Criteria of Household Batteries and Plastic Packaging, (3) Guidelines on Green Choice Certification, (4) First Ecolabelled Product (Pride Detergent Powder and Bar), and (5) Increased Awareness of some 1,500 individuals and 300 companies. The development of product criteria for engine oil is ongoing. A seminar on product criteria development will be held on August 28, 2003 at BOI.

3. BOI has approved and is now implementing the Green Procurement Policy. The operating manual required for EMS implementation has been prepared, and BOI is ready for the implementation phase, depending on availability of funds. NEDA is planning to develop its green procurement policy for which BOI and C&GF will support their efforts. Likewise, EMB is planning to develop a green procurement policy as a part of their on-going EMS implementation.

4. According to L. Antonio of PBE, the IEM information system pilot project resulted in the development of the framework of integrated IEM information system (INDENET) and the launching of the website www.iem.net.ph. The website was promoted through seminars and brochure to industries and environmental service providers. Securing financial resources for the INDENET is the main issue.

5. Llolly de Jesus, the Project Consultant for Waste Minimization Pilot Project (WMPP) reported that, except for the publication and dissemination of the guidebook which will take place in September 2003, most of the targets of WMPP were accomplished and some were even exceeded. The guidebook includes the experiences of the model companies and industry-specific recommendations. M. Cardenas mentioned that the WM action plans developed during the pilot project could serve as the format for the Environmental Management Plan (EMP) that will be required by DENR under its recently issued DENR Administrative Order (DAO) 2003-14, re: Philippine Environmental Partnership Program or PEPP. On the establishment of the awards systems, R. Echague reported that the WMPP Steering Committee decided to disregard this award system since existing awards, such as the Philippine Quality Award (PQA) being given by DTI, and the new award that

will be created under the PEPP seem adequate. PQA already incorporates environmental considerations in the criteria while PEPP will also focus on environmental management. After the presentation, T. Tanaka commented that transfer of WM technologies is not easy; it took Japan 30 years to clear its environmental pollution. He said that the key to waste minimization efforts is strong will and practice of top management.

6. One of the main comments from JICA on the draft final report was an analysis on the extent of empowerment of the stakeholders. L. Antonio suggested that a table be prepared to show what the stakeholders have before and after the pilot projects. PBE and DOST will monitor project impact on the firms' environmental performance after one year.

7. S. Sugimoto of the JICA Study Team presented the final version of the IEMAP. L. Antonio said that recycling is a high priority, especially among PBE member companies that have formed a cluster for resource recovery. Based on the question of M. Sabater of EMB, the IEMAP is BOI's action plan for partnership with stakeholders. BOI will act as coordinator, catalyst, fund manager, and network builder. In this case, there is a need for a dialogue between BOI and DENR in order to clarify the partnership, especially in support of the PEPP.

8. E. Arcellana said that BOI plans to use EPIC as an umbrella program for environmental projects in order to facilitate implementation of new projects. The IEMAP will be consolidated and repackaged to ensure that projects and activities are harmonized and not duplicated.

9. K. Oka of the JICA Study Team discussed the 3-year plan for the JICA Training on Cleaner Production, which is proposed to start in January 2004. The training will take place in Japan for 5 weeks and will be composed of 10 participants each time. Participants will come from government (DTI-BOI, BSMED, DOST-ITDI, DENR-EMB, LLDA, PEZA, DBP, LBP) and private sector (e.g., industry associations, model companies, NGOs, consultants, academe). A Multi-sectoral Committee, with DTI-BOI as head, is proposed to monitor the implementation of the IEMAP and to select participants to the said training based on set criteria. The EMPOWER Steering Committee members gave various comments and suggestions such as flexibility in age requirement, inclusion of graduate students and representatives from the academe in the possible list of participants, and equivalent percentage weight per criterion in screening deserving participants. L. Antonio suggested the submission of case studies of nominees as one of the requirements based on a prescribed format, which can be published later. Due to time constraints, JICA Study Team was requested to clarify whether the proposed JICA training is notified through NEDA which will require a regular procedure.

10. BOI proposed to maintain the current EMPOWER homepage within the BOI web and transform it into "Environmental Management Corner" (or other appropriate name that may be suggested later) to handle all environmental issues of industries. The IEM Action Plan, BOI's green procurement policy, and presentations on WM and IEM pilot projects will be uploaded to the home page which will be linked to www.iem.net.ph. JICA will assist in the change of the home page, and BOI will provide the maintenance.

11. A Roundtable with donor agencies and institutions has been scheduled in the afternoon of 13 August 2003 at BOI to discuss possible partnership under the IEMAP. The EMPOWER Steering Committee members will be informed of the outcome of the Roundtable later.

12. As a conclusion, PBE, CGFI, BOI, JICA and the EMPOWER Study Team expressed appreciation for each other's support, cooperation and commitment for the Project.

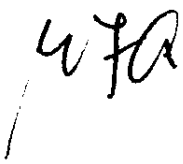
13. Meeting was adjourned at 12:35 P.M.

Conclusion

The Committee was informed of the results of the EMPOWER project and remaining activities. Steering Committee members were requested to submit comments on the Draft Final Report of the EMPOWER Project to R. Echague by 25th of August 2003, and the JICA Study Team will revise the draft final report based on these comments and others from JICA by September 2003. BOI will organize a Multi-sectoral Committee to monitor the implementation of the IEMAP and to select participants to the JICA Training on Cleaner Production based on set criteria. The BOI proposed to maintain the current EMPOWER homepage within the BOI web and transform it into "Environmental Management Corner" (or other appropriate name that may be suggested later). The webpage will handle all environmental issues of industries that include the IEM programs and activities under the EMPOWER.

Attendants List

NAME	DESIGNATION/AGENCY
Suzita S. Oredina	Supvg. Science Research Specialist, ITDI-DOST
Solon C. Rativo	Sr. EMS, EMB-DENR
Sol Rejano	Technical Assistant, CGFI
June Alvarez	Program Manager, CGFI
Ime P. Sarmiento	Executive Director, CGFI
Hiroyuki Kojima	Project Formulation Advisor, JICA
Kiyoto Kobayashi	Asst. Resident Representative, JICA
Wini Villanueva	Project Coordinator, PBE
Erlinda Arcellana	OIC-Director, OIP, BOI
Raquel Echague	OIC- Environmental Matters Div., BOI
Llolly de Jesus	WM Project Manager, PBE
Manuel Sabater	CENRO, EMB- DENR
Lisa Antonio	Executive Director, PBE
Satoshi Sugimoto	Study Team Member, JICA Study Team
Priscilla Rubio	Study Team Member, JICA Study Team
Marlito Cardenas	Study Team Member, JICA Study Team
Kaoru Oka	Study Team Member, JICA Study Team
Tad Tanaka	Study Team Member, JICA Study Team
Masato Ohno	Study Team Leader, JICA Study Team



Annex 2
Survey on Current Status of Industrial Environmental Management in Manufacturing Industry in the Philippines

ANNEX 2.1

Survey on Current Status of Industrial Environmental Management in Manufacturing Industry in the Philippines

1. Summary of the Survey

1.1 Object of the Survey

The objective of the survey was to identify current status of Industrial Environmental Management (IEM) in local firms – manufacturing, in terms of levels of internalisation, motivations, and future perspectives.

The survey also aimed to identify issues of IEM implementation in individual companies for basis of development strategy in the future. The gathered information was also used for identifying issues on implementing pilot projects.

1.2 Selection of Target Industry

The survey was targeted for 100 local companies which were considered as advanced industry in Philippines. Industries that have already known to have adopted environmentally sound management, i.e. electricity, semiconductors, iron and steel, and leather industries, as well as companies which were reluctant to participate in this survey were excluded.

1.3 Methods and Details of the Survey

With support from BOI, local consultants carried out interviewing survey to CEOs and Pollution Control officers (PCO) of selected companies. (Refer to questionnaire form attached in the end of this report.)

Following topics were covered in the survey:

For CEOs

1. Business Management

1-1 Business Environment
1-2. Productivity Improvement
1-3. Quality Control
1-4. Investment

2. Business Management and Environment

2-1. Recognition of environmental management
2-2. Motive for Promotion of IEM
2-3. Implementation of Environmental Management
2-4. Recognition of Results of Practicing Environmental Management
2-5. Future Agenda for Promoting Environmental Management

For PCO

1. General Information

1-1. Production Inputs
1-2. Characteristics of Environmental Impacts

2. Institution and organization

2-1. Environmental Section
2-2. PCO

3. Environmental Management System (EMS)

3-1. EMS
3-2. Environmental report

4. Activities for Enhancing Environmental Performance

4-1. Energy saving
4-2. Water conservation/ Effluent control
4-3. Emission Control
4-4. Non-hazardous Industrial Solid Waste and Hazardous Industrial Waste Management
4-5. Management of Toxic Chemicals
4-6. Noise/ Vibration
4-7. Green Products
4-8. Green Procurement
4-9. Other Environmental Management
4-10. Issues

2. Summary of Surveyed Companies

2.1 Size of Companies

Surveyed companies are consist of 30 food firms including beverage, coconuts oil, food processing, and sugar, 30 chemical industries including pharmaceuticals, soaps & cosmetics and chemicals, and 10 metal industries including forging and plating. Also included in the list of surveyed companies are 5 firms each from pulp & paper, cement and machinery industries. The rest of 15 surveyed companies are 3 ceramics (glass), 5 plastics, 3 textiles, 1 petroleum-product, and 3 printings.

As shown in Table 2.1, 72 percent of these companies are considered as SMEs. 22 companies have 'fewer than 50' workers, and 51 companies have 50-300 workers. The rest, or 27 percent of the surveyed companies, were large size companies consisting of over 300 workers.

Table 2.1 Number of Workers of the Surveyed Companies by Sub-sectors

	Sub-sectors	Fewer than 50 workers	More than 50 and fewer than 300	300 and more workers	Total
01	Beverage	2	1	2	5
02	Cement Manufacturing	0	3	2	5
03	Chemical Products (Industrial and Agrochemical)	4	11	0	15
04	Coconut-based Industries, Edible Oil and Spirit Distillation	2	2	1	5

	Sub-sectors	Fewer than 50 workers	More than 50 and fewer than 300	300 and more workers	Total
05	Cosmetics	1	3	1	5
06	Electroplating and Metal Finishing	3	2	0	5
07	Food Processing (Tuna and Small-scale Food Processing)	2	8	5	15
08	Glass and Glass Products	0	1	2	3
09	Machinery and Tool	3	2	0	5
10	Metal Foundry and Forging	0	4	1	5
11	Petroleum Products (only one company producing lubricants)	0	1	0	1
12	Pharmaceuticals	3	2	0	5
13	Plastics and Rubber	0	5	0	5
14	Printing (offset)	1	0	2	3
15	Pulp and Paper	0	2	3	5
16	Soap and Detergents	1	2	2	5
17	Spinning, Textile and Dyeing	0	1	2	3
18	Sugar Milling and Refining	0	1	4	5
	Total	22	51	27	100

The table above cab be re-categorized as Table 2.2 by industry types. Apparatus industry of ceramics (cement and glass) industry holds large number of workers. Food processing industry also employs relatively large number of workers. Chemicals, metal and machinery employ small number of workers.

Table 2.2 Number of workers at the surveyed companies by sectors

	Fewer than 50	More than 50 and fewer than 300	300 and more	Total
Food	6	12	12	30
(%)	20.0	40.0	40.0	100.0
Ceramic	0	4	4	8
(%)	0	50.0	50.0	100.0
Chemical	9	19	3	31
(%)	29.0	61.3	9.7	100.0
Metal	3	6	1	10
(%)	30.0	60.0	10.0	100.0
Paper and Pulp	0	2	3	5
(%)	0	40.0	60.0	100.0
Machinery	3	2	0	5
(%)	60.0	40.0	0	100.0
others	1	6	4	11
(%)	9.1	54.5	36.4	100.0
Total	22	51	27	100

Table 2.3 shows the size of capitals of the surveyed companies by industry types. 27 companies have less than 10 million Philippine Pesos while 33 companies have 10 – 100 millions PhP. In other words, 60 percent of the surveyed companies are SMEs. Rest of the companies, or 40% of the surveyed companies, have PhP 100 millions or more capitals.

Table 2.3 Capitals of the Surveyed Companies

	Sector Name	Less than 10 million	10> >100	100>	Total
01	Beverage	2	0	3	5
02	Cement Manufacturing	0	0	5	5
03	Chemical Products (Industrial and Agrochemical)	5	4	6	15
04	Coconut-based Industries, Edible Oil and Spirit Distillation	1	1	3	5
05	Cosmetics	1	3	1	5
06	Electroplating and Metal Finishing	3	2	0	5
07	Food Processing (Tuna and Small-scale Food Processing)	4	8	3	15
08	Glass and Glass Products	2	1	0	3
09	Machinery and Tool	2	3	0	5
10	Metal Foundry and Forging	1	1	3	5
11	Petroleum Products (only one company producing lubricants)	0	1	0	1
12	Pharmaceuticals	1	2	2	5
13	Plastics and Rubber	1	2	2	5
14	Printing (offset)	1	1	1	3
15	Pulp and Paper	0	2	3	5
16	Soap and Detergents	2	0	3	5
17	Spinning, Textile and Dyeing	0	1	2	3
18	Sugar Milling and Refining	1	1	3	5
	Total	27	33	40	100

2.2 Products of the Surveyed Companies and their Environmental Impacts

Table 2.4 lists the products of surveyed companies. The table also summarises general characteristics of the industries' environmental impacts.

Table 2.4 Primary Products of the Surveyed Companies and their Environmental Loads

	Sector Name	No of companies in sector	Primary products	Effluent discharged	Gas emission / release of energy	Waste material
01	Beverage	5	Juice 3, Coca-Cola1, Beer 1	A	B	C
02	Cement Manufacturing	5	Portland cement	-	A	-
03	Chemical Products (Industrial and Agrochemical)	15	Phosphoric acid 1, Pharmaceuticals 1, Textile 1, hydrochloric acid / caustic potash 1, sulphuric acid 1, water cleanser 1, plastic resin 1, calcium 1, paints 1, fat acid 1, polystyrene 1, hazardous waste disposal 1, etc.	Depends on process	Depends on process	Depends on process
04	Coconut-based Industries, Edible Oil and Spirit	5	Oil 3, Alcohol 2	A	A	C

	Sector Name	No of companies in sector	Primary products	Effluent discharged	Gas emission / release of energy	Waste material
	Distillation					
05	Cosmetics	5	Cosmetic products, Powder	C	C	C
06	Electroplating and metal Finishing	5	Plated material, surface treatment	A	C	A
07	Food Processing (tuna and small scale food processing)	15	Fruits, noodles, meats, ice creams, frozen shrimps, sauces, cooked foods, cakes, snacks, coffee, etc.	A	A	C
08	Glass and Glass Products	3	Glass wool 1, sheet glass, stained glass 1	-	A	
09	Machinery and Tools	5	Freezer parts 1, mining drills 1, radiators 1, brakes 1, others	Depends on process	Depends on process	Depends on process
10	Metal foundry and forging	5	Moulded products 2, Steel furniture 1, Zinc-plated pipes 1	-	A	C
11	Petroleum Products	1	Lubricating oil	A	A	C
12	Pharmaceuticals	5	Medical products 5	C	C	C
13	Plastics and Rubber	5	Plastic containers 1, electronics parts 2, sandals 1, rubber parts for automobiles 1	C	B	C
14	Printing (offset)	3	Printings 3	-	C (Carbon Hydride)	-
15	Pulp and Paper	5	Used paper 5	A	A	A
16	Soap and Detergents	5	Detergents, soaps	A	B	C
17	Spinning, Textile and Dyeing	3	Spinning 1, cleanings 1, dyes 1	Depends on process	Depends on process	Depends on process
18	Sugar Milling and Refining	5	Sugar products, Refined sugar	A	A	C

Note: Alphabets in the three right columns indicate seriousness of environmental impacts. A: very serious, B: serious, and C: less serious.

2.3 Current Status of Businesses in the Market

According to the survey, 64% of the firms responded said their products are performing well in the market while 24% answered 'fare.' The remaining 12% of the surveyed firms said their products are not performing well in the market. As for the profits in last five years, 49 % of the companies said they have seen some gains.

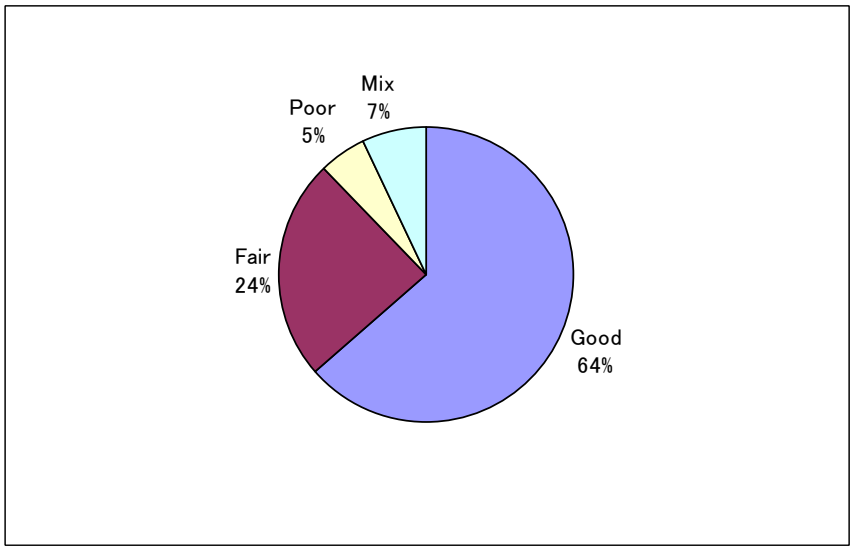


Figure 2.1 Current Status of Business Management in Surveyed Firms

2.4 Issues on Business Management among Surveyed Firms

This section summaries product managements, including productivities and quality control, of the 100 surveyed companies. Area of priority issues in business management for the surveyed companies is shown in Table 2.5 – less scores, more important.

Table 2.5 Priority in the Business Management

Rate	Interests in management							
	Item A	Item B	Item C	Item D	Item E	Item F	Item G	Item H
1	21	21	2	9	8	14	21	1
2	32	24	4	5	6	12	9	1
3	20	16	6	11	12	12	13	1
4	11	11	18	9	10	16	8	0
5	3	8	24	15	12	12	7	0
6	2	9	21	13	11	11	6	1
7	1	0	9	22	18	2	16	0
8	0	1	0	1	0	1	0	3
Total	90	90	84	85	77	80	80	7
Average rate	2.5	2.9	4.9	4.7	4.5	3.6	3.7	

A. Productivity improvement
B. Quality improvement
C. Implementation of environmental management
D. Expand productivity and products
E. Development of new products and technology
F. Marketing strategies and networking
G. Improvement of financial situation
H. Other

Productivity improvement, quality improvement, marketing strategies and networking were selected as the most important business agenda by 21 companies respectively. Based on the average ranking score, business agenda is prioritized as below.

1. Productivity improvement : 2.5 (21 companies)
2. Quality improvement : 2.9 (21 companies)
3. Marketing strategies and networking : 3.6 (21 companies)
4. Improvement of financial situation : 3.7 (14 companies)
5. Development of new products and technology : 4.5 (9 companies)
6. Expand productivity and products : 4.7 (8 companies)
7. Implementation of environmental management : 4.9 (2 companies)

Note: Numbers represent the total ranking score divided by numbers of respondents ranked the corresponding options.

As one can expect, productivity and quality improvement are ranked high while environmental management is hardly considered as a business agenda.

3. Productivity and Quality Management

3.1 Productivity Management

Although large companies tend to have a section specially designed for productivity improvement, all of the companies in the survey have some types of systems for improving productivity.

Table 3.1 Systems for Productivity Management

Size of Company (# of employees)	No of companies (A)	Dedicated section for Productivity management (B)	B/A (%)	Productivity committee by relevant section(C)	C/A (%)
Less than 50	22	10	45.5	11	50.0
50-300	51	30	58.9	28	54.9
300 and more	27	20	74.1	14	51.2
total	100	60		53	

Survey asked the companies whether recording data for product management either by process or by plant as a whole. 44 % of the surveyed companies, mostly large companies with over 300 workers, said that data on material flow is recorded by each process (see Table 3.2). 41% of the smaller companies also accounted the material flow by processes, though smaller companies use relatively simple process which makes easy to track and record such data. When add the companies that recorded the data from factory as a whole to the figure, 60% of smaller companies keeps material flow data while larger companies employing 300 and more workers, 71% of them recorded for the same items. 78% of surveyed companies manage the flow data by process and/or factory as a whole. The figure jumps to 96% for large companies.

Table 3.2 Data Management for Production management

Size of Company (# of employees)	No of companies	Data Management on Production Control					No. of Answers
		Type 1	Type 2	Type 3	Type 4	Type 5	
Less than 50	22	9	5	3	2	2	21
		0.41	0.23	0.14	0.09	0.09	
50-300	51	20	7	9	8	2	46
		0.39	0.14	0.18	0.16	0.04	
300 and more	27	15	4	6	1	0	26
		0.56	0.15	0.22	0.04	0	
Total	100	44	16	18	11	4	93

Note: Description of each data management type

1. All the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by each process or production line
2. All the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by plant (not by each process or production line)
3. Some of the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by each process or production line
4. Some of the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by plant (not be each process or production line)
5. None

3.2 Quality Control

84 companies had sections for product Quality Control (QC). Nonetheless, only 29 were qualified for ISO9000. 31 companies are considering applying for ISO9000 in the future.

Table 3.3 Product Quality Control

	Special section for Quality Control	In-house Quality Control Committee	Acquisition of ISO9000	Plans for applying ISO9000
Yes	84	51	29	31
No	11	37	63	15
No Answer	5	12	8	25

The survey revealed QC is seen as very important for all companies in their business activities and conducting following QC efforts.

1. Identification of crucial factors that affect quality of products 85
2. Development and continuous improvement of quality assurance policy 72
3. Development and continuous improvement of standard procedures for operation of production line. 82
4. Using checklist or keeping records to assure actual operation follows the standard procedures 83
5. Inspection of products 90
6. Other 18

3.3 Overall Assessment

The survey gave scores according to responses collected for both productivity and product quality control. The companies that succeeded in their material flow data management at wider range at their production were given higher score, and lower scores to those did not.

Q4. Is there a section or department in your company that is specifically assigned to work on productivity improvement?	1. Yes --> 50 2. No --> 0
Q5. Is there a company-wide committee comprised of employees to work on productivity improvement?	1. Yes --> 50 2. No --> 0

Q6. What information does your company collect to monitor resource productivity? Please select one from the following options.	1. All the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by each process or production line --> 200 2. All the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by plant (not by each process or production line) --> 150 3. Some of the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by each process or production line --> 100 4. Some of the input (energy, water, raw materials) and output (emissions, effluent, solid waste) by plant (not be each process or production line) --> 50 5. None --> 0
Q7. Is there a section or department in your company that is specifically assigned to work on quality control?	1. Yes --> 50 2. No --> 0
Q8. Is there a company-wide committee comprised of employees to work on quality control?	1. Yes --> 50 2. No --> 0
Q9. What activities does your company take to assure product quality? Please check all the actions that your company takes.	1. Identification of crucial factors that affect quality of products --> 50 2. Development and continuous improvement of quality assurance policy --> 50 3. Development and continuous improvement of standard procedures for operation of production line --> 50 4. Using checklist or keeping records to assure actual operation follows the standard procedures --> 50 5. Inspection of products --> 50 6. Other --> 50
Q10. Has your company obtained ISO 9000 (quality management)?	1. Yes -->100 2. No--> 0

Note: Full score was 1,050

The average score gained by companies at each size is shown in Table 3.4. It can be said that the larger companies were apt to have higher sores, although there seemed to be no distinguished differences regardless of their sizes.

Table 3.4 Productivity Management Scores by company size

Size of Company (# of employees)	50＜	50≦ ＜300	≦300	Average score of all	Max Highest Score
Productivity Management	177	186	224	195	300
Product Quality Management	273	315	337	312	450
Total	450	501	561	507	750
Ratio of the score	56.2%	62.6%	70.1%	63.4%	100.0%

The result shows about 30% of all the companies marked below 400 points. On the other hands, more than half of the all survey takers scored 500 point or more. (See Table 3.5 and Figure 3.1)

Table 3.5

Score range	Frequency	Ratio in the group
100~200	6	6.0%
200~300	8	8.0%
300~400	14	14.0%
400~500	21	21.0%
500~600	26	26.0%
600~700	20	20.0%
700~800	5	5.0%
	100	

MAX	750
MIN	150
σ	155
MEDIAN	550

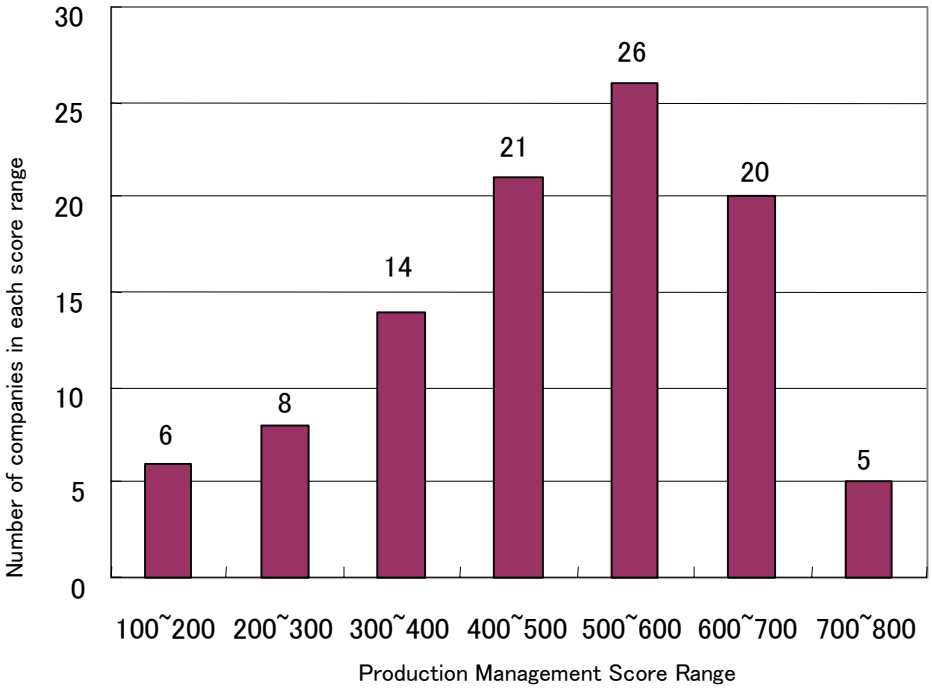


Figure 3.1 Number of Companies Implementing Production Management by Score

It is clear, as shown in Table 3.6, that pulp & paper, food processing, chemicals, and ceramic industries scored high for productivity management while machinery and metal industries scored low. For product quality control, pulp & paper stands out with high scores.

Table 3.6 Average scores at each industry on production management

Industry Type	Productivity Management	Product quality Management	Production Management as a whole
Foods	213	298	512
Ceramics	200	256	456
Chemicals	203	318	521
Metals	145	300	445
Pulp & paper	270	430	700
Machinery	80	280	360
Others	177	341	518
Total	195	312	507

4. Environmental Management

4.1 Environmental Impacts by Industrial Activities

In the survey, the companies showed the highest interest in water pollution among environmental impacts their company causes. The other environmental impacts that concerns are non-hazardous waste, air pollution, and noise in the order of interest. Other environmental impacts showed low interest among the survey takers.

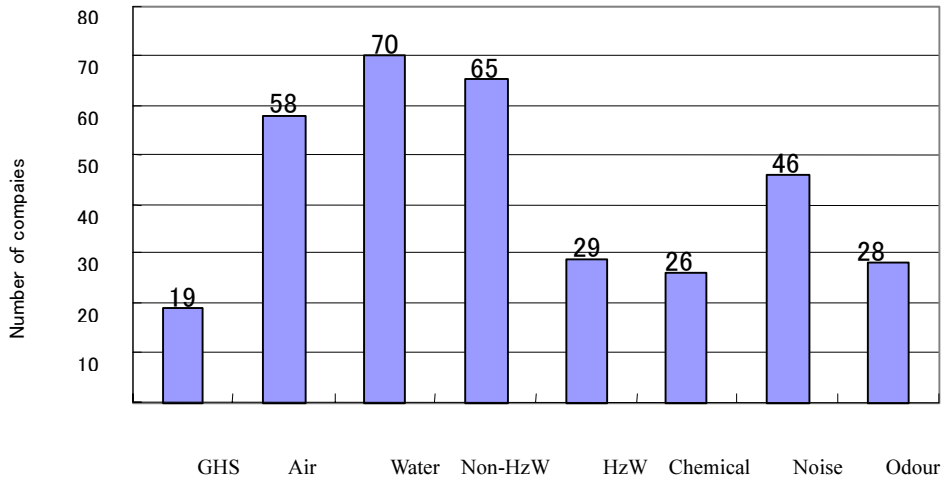


Figure 4.1 Number of Responses to Environmental Impacts

The result of above survey can be shown in Table 4.1.

Table 4.1 Interest in Environmental Impacts by Industry Types (Average)

	GHS	Air	Water	Non-HzW	HzW	Chemical	Noise	Odour
Food	4.86	1.87	1.70	2.52	4.78	4.00	4.53	4.38
Ceramic	2.40	1.57	2.80	3.00	6.00	7.00	3.29	6.00
Chemical	4.00	2.13	1.65	2.45	3.13	3.60	4.63	5.00
Metal	-	2.75	1.75	2.86	1.75	3.80	3.20	3.00
Pulp & paper	8.00	2.00	1.00	3.67	7.00	6.00	4.00	3.50

	GHS	Air	Water	Non-HzW	HzW	Chemical	Noise	Odour
Machinery	-	4.00	3.00	2.00	-	-	1.40	2.00
Others	-	2.60	1.50	1.80	4.00	3.00	2.80	4.00
Average	4.11	2.09	1.74	2.57	4.07	4.00	3.71	4.43

Concerns about environmental impacts varied among industries. Food processing and pulp & paper industries are concerned about water contamination since these industries inevitably discharged large amount of organic wastewater into the environment. Likewise, chemical and metal industries, for they were main sources of inorganic wastewater, are also concerned about the water pollution. All industries, except machinery, showed their interest towards air pollution because of the Clean Air Act enacted recently.

Hazardous wastes were concerning matters to the metal, chemical and industries using chemicals. Noise pollution is the main interest for machinery industry.

Individual companies' degree of interest - ratio of respondents checked - in various environmental issues by industry type is shown in Table 4.2.

Ceramic industry, including cement industry, which is responsible for large amount of CO_2 emissions, showed high interest in GHG emissions. Interest in air pollution is obviously corresponding to usage of thermal equipment/facilities; food, metal processing, chemical, paper & pulp, and foundry industries were also highly concerned about the problem. As for water pollution, food, metal, chemical, pulp & paper, foundry industries had high interest.

Hazardous waste and chemical substances did not draw much attention from all industries. Machinery industry showed high interest in noise and vibration but not in other environmental problems. Industries that are pollution sources are highly concerned about the pollution.

Table 4.2 Individual Companies' Degree of Interest (ratio of respondents checked)

	GHS	Air	Water	Non-HzW	HzW	Chemical	Noise	Odour	No. of companies in industry
Foods	0.233	0.767	0.900	0.700	0.300	0.167	0.500	0.433	30
Ceramics	0.625	0.875	0.625	0.875	0.500	0.250	0.875	0.125	8
Chemicals	0.194	0.484	0.645	0.645	0.258	0.323	0.258	0.290	31
Metals	0.000	0.400	0.800	0.700	0.400	0.500	0.500	0.100	10
Pulp & Paper	0.200	0.600	0.600	0.600	0.200	0.200	0.200	0.400	5
Machinery	0.000	0.200	0.200	0.400	0.000	0.000	1.000	0.200	5
Others	0.000	0.455	0.545	0.455	0.273	0.273	0.455	0.091	11
Total	0.190	0.580	0.700	0.650	0.290	0.260	0.460	0.280	100

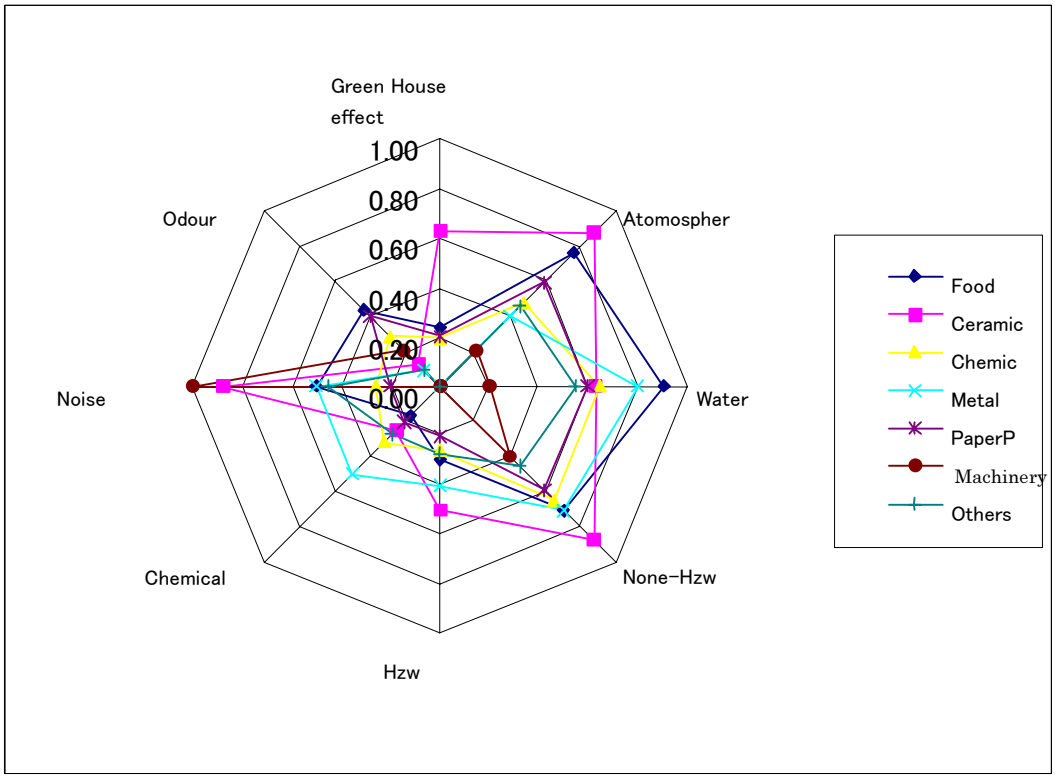


Figure 4.2 Degree of Interest in Environmental Problems by Industry Types

4.2 Environmental Management

4.2.1 Structure for Environmental Management and its Implementation

(1) Structure for Environmental Management

Organizational structure for environmental management within a company is shown in Table 4.3. The company that has neither environmental management section nor internal committee takes up approximately 35% while the company that has both environmental section and corresponding internal committee is 31%. All companies in ceramic industry and pulp/paper industry categorized as apparatus industry possess some kind of environmental management system. Four out of five companies in the machinery industry that are small and have no continuous manufacturing process do not have any means of environmental management system at all.

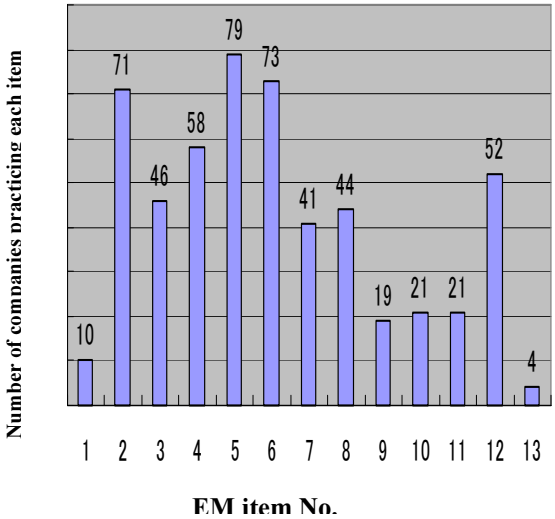
Table 4.3 Ratio of Companies with Environmental Management System

Industry Type	Both	One of two	Neither	No. of Companies
Food	8	11	11	30
Ceramic	5	3	0	8
Chemicals	10	9	12	31
Metals	0	6	4	10
Pulp & Paper	3	2	0	5
Machinery	0	1	4	5
Others	5	2	4	11
Total	31	34	35	100

(2) Environmental Management Implementation

The following Figure 4.3 shows the number of companies implementing environmental management. 10 companies have acquired ISO 14001. 'Implementation of waste minimisation (item 5),' 'implementation of energy saving (item 6),' or 'setting numerical targets for reduction in environmental load (item 3)' were implemented by 70-80 percent of the surveyed companies.

In addition to these sections, 'facility investment to control emission and effluents (item 4)' had been implemented by 58 companies. However, when it comes to the important items for environmental management; Item 3 and Item 8, fewer than half of these companies practise these items, 48 companies and 44 companies respectively.



Item in our survey on Environmental Management Implementation
1. ISO 14001 Certification
2. Identification of environmental load (emissions, effluents, wastes,)
3. Setting numerical targets for reduction in environmental lo
4. Facility investment to control emissions and effluents
5. Implementation of waste minimization
6. Implementation of energy-saving
7. Evaluation of environmental performance of the company (target monitoring)
8. Preparation and dissemination of environmental reports
9. Environmental accounting
10. Green purchasing
11. Green product design
12. Staff training on environmental management
13. Other

Figure 4.3 Number of Companies Implementing Env. Management by Items

It can be noted that 19 companies practised environmental accounting (item 9), and 21 companies implemented green procurement (item 10). Also 21 companies practiced environmental designing (item 11).

Table 4.4 shows rate of the environmental management implemented by above industry. 10 companies (5 ceramics, 4 chemicals, and 1 food processing companies) acquired ISO14001 (item 1). All industry had been systemising waste minimization (item 5), energy saving (item 6), and identification of environmental load (item 2). Food processing, ceramics, chemicals and pulp & paper industries not only allocate more budgets than others industries for dealing with exhaust gas emission and effluents but also training their stuffs actively (item12).

Table 4.4 Rate of Environmental Management Implementation by Industry

Industry Type	1	2	3	4	5	6	7	8	9	10	11	12	13	# of companies in industry
Food	0.033	0.833	0.600	0.667	0.900	0.867	0.400	0.467	0.067	0.267	0.267	0.633	0.133	30
Ceramic	0.500	0.750	0.375	0.625	0.625	0.625	0.500	0.500	0.250	0.250	0.125	0.625	0.000	8
Chemicals	0.161	0.677	0.452	0.613	0.774	0.677	0.484	0.548	0.323	0.226	0.226	0.452	0.000	31
Metals	0.000	0.700	0.200	0.400	0.700	0.700	0.400	0.200	0.100	0.000	0.100	0.300	0.000	10

Industry Type	1	2	3	4	5	6	7	8	9	10	11	12	13	# of companies in industry
Pulp & Paper	0.000	0.800	0.800	0.800	0.800	0.600	0.800	0.600	0.000	0.200	0.200	0.600	0.000	5
Machinery	0.000	0.000	0.000	0.000	0.600	0.600	0.000	0.200	0.200	0.000	0.000	0.200	0.000	5
Others	0.000	0.727	0.455	0.545	0.818	0.727	0.182	0.273	0.273	0.273	0.273	0.636	0.000	11
Total answered	10	71	46	58	79	73	41	44	19	21	21	52	4	100

Note: The numbers in the first row reflect item numbers in Figure 4.3.

Setting numerical targets, or items 3, that are an important element for EMS, are established among mostly pulp & paper and food processing industries. More pulp & paper, ceramics, chemicals, and food processing industries implemented item 8, or preparation and dissemination of environmental reports, and item 9, or environmental accounting than machinery and metal companies which were poorly performing in these items.

Item 9, environmental accounting, was also incorporated into some of the companies' managements: 10 companies in chemical sector, 2 food companies, 2 ceramic companies, 1 machinery company and 3 others. 8 food processing, 2 chemical companies, 2 ceramic companies, one pulp & paper company answered that they practised section 10, green procurement and item 11, green product design.

Figure 4.4 shows performance of those environmental management items by industry types. Pulp & paper and food processing industries that inevitably hold high environmental burden by their organic wastewater, practised EMS more than other industries. Machinery companies, on the other hand, had not employed as much since their environmental burden by their effluent and/or gas emission may be limited.

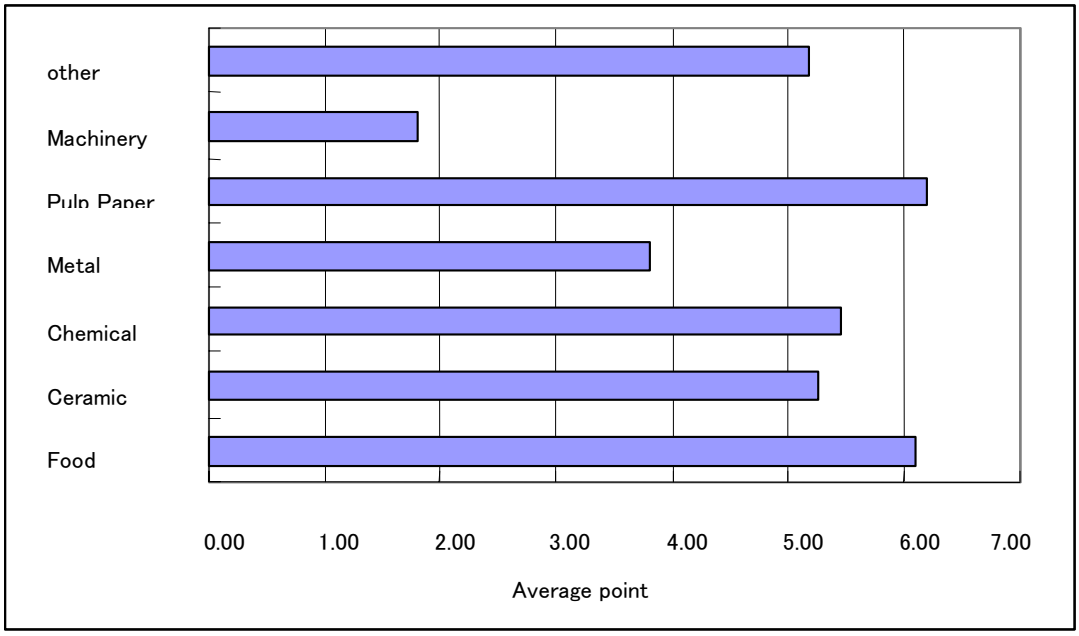


Figure 4.4 Average Number of Environmental Management Implemented by Industry

(3) PCO -- Pollution Control Officer

1) Appointment of PCO

Although DAO92-26 of DENR requires any enterprises emitting pollutants to appoint PCO, only 73 companies answered that they have PCOs.[1] The companies with no answer are those not having PCOs. When there is no PCO, a business owner or company staff answered the questions prepared for PCO from the PCO's viewpoint. Therefore, attention should be paid that all the responses to the questions for PCOs are not necessarily from PCOs.

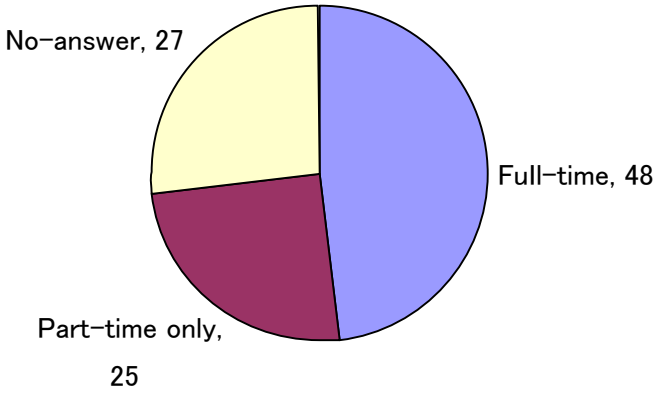


Figure 4.5 Ratio of Companies with Appointment of PCO

2) Establishment of Environmental Section

As answers by PCOs, 52 companies responded that there is a section specifically managing environmental matters while as answers by business owners/top executives, 59 companies responded so. The former is slightly less than the latter.

Ratio of the companies with the environmental section against the companies surveyed in the same sector is shown in Figure 4.6. The ratio of the pulp and paper industry is 1.0, which means all the companies surveyed in the said sector have established an environmental section. The ratio of the ceramic industry is 0.87. It is clear that a company in the apparatus industry is likely to establish an environmental section. The ratio of the machinery industry, which has less impact on the environment compared to others, is very low.

[1] Companies in the machinery industry that do not release pollutants are not required to appoint PCO.

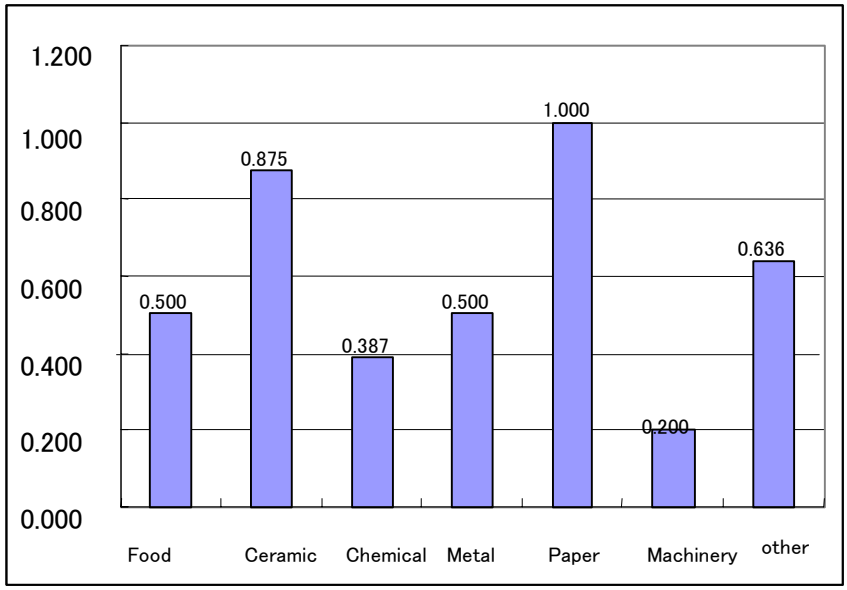


Figure 4.6 Ratio of Companies with Environmental Section by Industry

3) Roles of PCOs

Roles of PCOs are shown in Table 4.4. The survey was to find out a position of the PCOs in a company. It is observed that in general PCOs are not necessarily given an important status within a company. This can be said as the response to the item 4, or if a PCO chairs in-house committee on environmental management, was fairly low.

Similar point can be drawn from the lower points of Item 2 (develop an environmental management plan for the company) that PCOs at each company were not given high statuses in the management.

Table 4.5 Role of PCOs

	1	2	3	4	5	6	No. of companies in industry
Foods	0.80	0.63	0.67	0.33	0.70	0.17	30
Ceramics	0.50	0.63	0.50	0.38	0.50	0.13	8
Chemicals	0.65	0.55	0.65	0.42	0.71	0.00	31
Metals	0.60	0.50	0.50	0.20	0.70	0.00	10
Pulp & Paper	1.00	0.80	0.80	0.40	1.00	0.00	5
Machinery	0.20	0.20	0.20	0.00	0.20	0.20	5
others	0.73	0.55	0.36	0.27	0.55	0.00	11
	0.68	0.57	0.58	0.33	0.66	0.07	100

Note: questions given in this survey :
1. Advice cooperate managers on environmental issues for the company
2. Develop an environmental management plan for the company
3. Train other employees on environmental issues
4. Chair a company-wide committee comprised of employees to work on environmental issues
5. Coordinate different sections/departments of the company for environmental issues
6. Other

4.2.2 Environmental Management System

(1) Environmental Management System（EMS）

The number of the companies that have established EMS is 32, as shown in Figure 4.7; majority of the companies have not established yet.

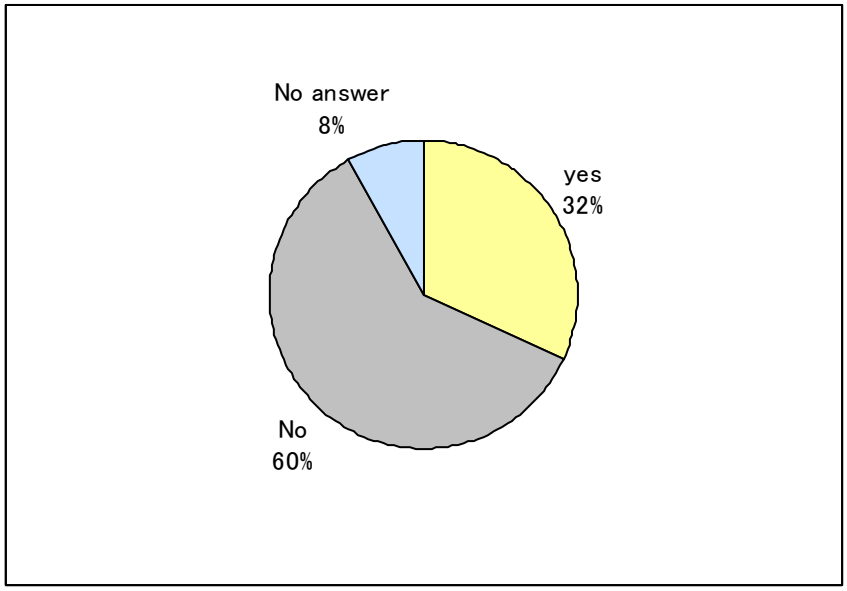


Figure 4.7 Ratio of Companies with Establishment of EMS

The ratio of the companies that have established EMS against the companies surveyed in the same sector is summarized in Table 4.6. The ratios of the ceramic industry and the pulp & paper industry that are the apparatus industry with high environmental load are low. Establishment of EMS is a challenge to many companies.

Table 4.6 Ratio of EMS Implementation by Industry

Industry Sector	# of Company Surveyed	Ratio of EMS Implementation	Ratio of Env. Report Published
Food	30	0.33	0.50
Foundry & forging	8	0.38	0.38
Chemical	31	0.39	0.55
Metal	10	0.40	0.50
Pulp & Paper	5	0.20	0.60
Machinery	5	0.00	0.20
Other	11	0.18	0.45
Total	100	0.32	0.49

As for the preparation of an environmental report, 49 companies responded that they prepare it as shown in Figure 4.8. Although the purpose of the report preparation was not surveyed, the report is assumed to be prepared for environmental management and reporting to the business owner/top executive. The report does not seem to be for public and customer relations because only 6 companies out of 49 make the report open to the public.

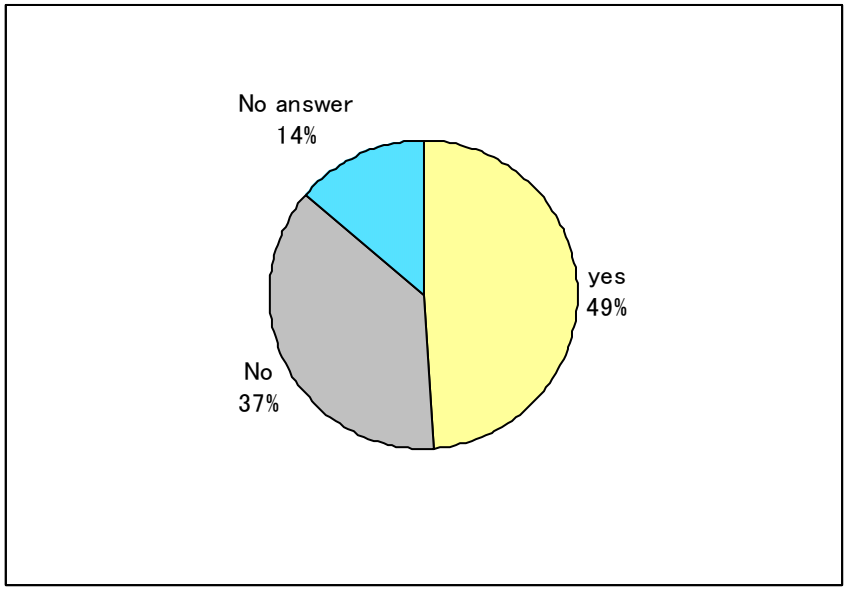


Figure 4.8 Ratio of Companies with Environmental Report Prepared

(2) EMS Implementation Level

Items on EMS surveyed are listed in Table 4.7. When a company responded that they implement all the 15 items, it gets EMS implementation level of 1.00.

Table 4.7 Questionnaire on Environmental Management System

1. Is there a unit or section in your company that is specifically assigned to work on environmental management?		1. Yes 2. No
2. Is there a company-wide committee comprised of employees to work on environmental management?		1. Yes 2. No
3. Has EMS been established in your company? (not necessarily require ISO 14001)		1. Yes 2. No
4. Does your company prepare an annual environmental report?		1. Yes 2. No
5. Is the report disclosed to the public?		1. Yes 2. No
Which items from the following have been implemented in your company?	6. ISO 14001 Certification	1. Yes 2. No
	7. Identification of environmental load	1. Yes 2. No
	8. Setting numerical targets for reduction in environmental load	1. Yes 2. No
	9. Evaluation of environmental performance of the company (target monitoring)	1. Yes 2. No
	10. Preparation and dissemination of environmental reports	1. Yes 2. No
	11. Environmental accounting	1. Yes 2. No
	12. Staff training on environmental management	1. Yes 2. No

13. Has your company estimated actual cost reduction due to energy conservation?	1. Yes 2. No
14. Has your company estimated actual cost reduction due to water conservation?	1. Yes 2. No
15. Has your company estimated actual cost reduction due to waste minimization?	1. Yes 2. No

Figure 4.9 shows number of companies by IEM implementation levels.

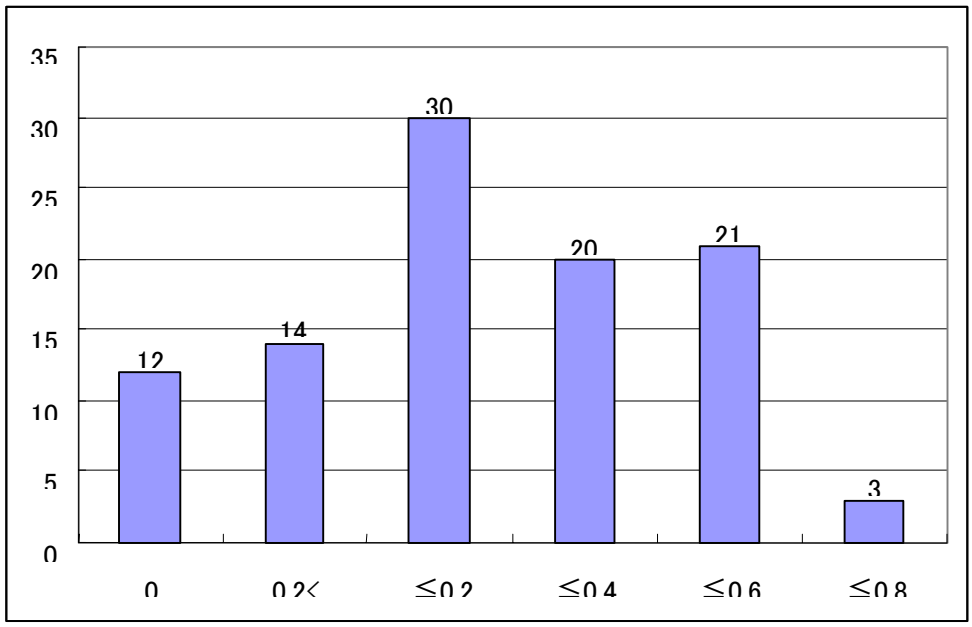


Figure 4.9 Number of Companies Implemented EMS by Implementation Level

Only 24 companies implemented nine or more items out of 15 (60% or more). There are only 44 companies implemented 6 or more items out of 15 (40% or more). The rest of the companies (56) are evaluated as low in EMS implementation level.

Actual numbers of the companies that implement each EMS item are shown in Figure 4.10. There are only 32 companies that establish EMS (those checked EMS item #3). As for the management of data, which is basics of EMS, majority (73 companies) identifies environmental load (item #7) but not cost reduction by IEM measures. Cost reduction by energy saving (item #13), water conservation (item # 14), and waste minimization (item #15) are practiced by 50, 35, 35 companies respectively. The companies surveyed seem to be weak in management of cost data relevant to environmental management.

Less than half of the companies surveyed set targets (item #8) and evaluate their environmental performance (item #9), which are important items to EMS; target setting and performance evaluation are practiced by 46 and 41 companies respectively.

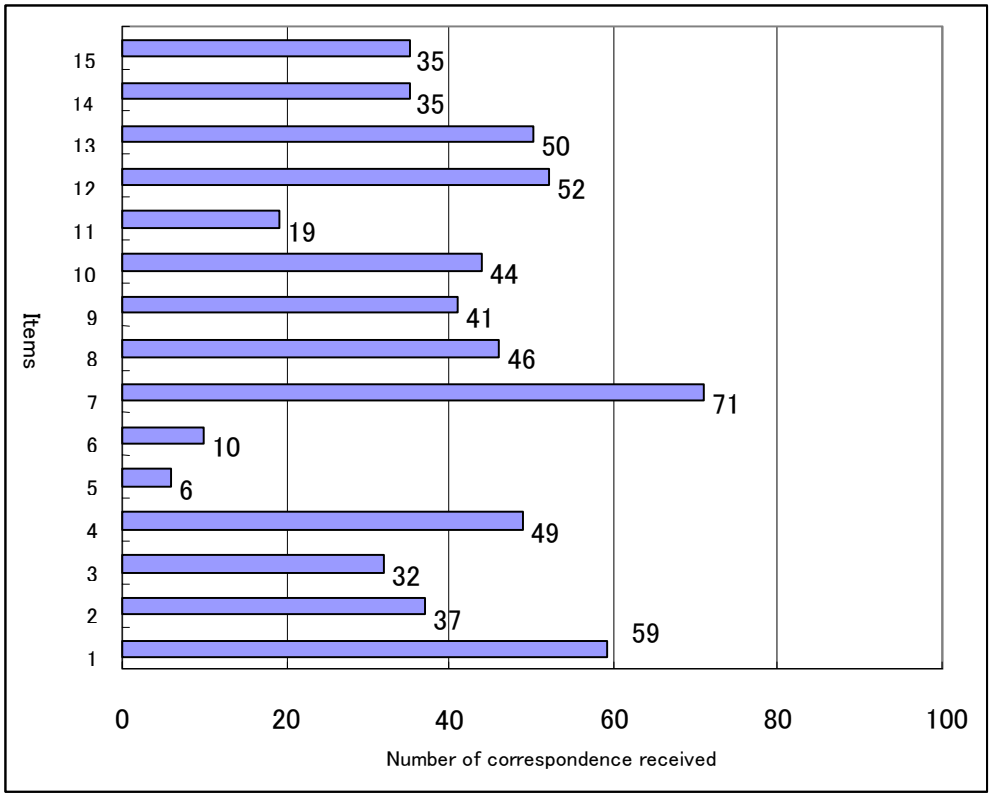


Figure 4.10 Number of EMS Implemented by Items

Note: Item # in the figure correspond to the number in Table 4.7

Table 4.8 shows average ratio of EMS items implemented by the companies by industry. As one can see, the ratio of the pulp and paper industry is higher than other industry sectors, and that of the metal processing industry and the machinery industry is lower than other industry sectors.

Table 4.8 Ratio of EMS Items Implemented by Industry

Industry sector	Average Ratio of EMS Items Implemented	Standardized Average Ratio (Total average = 1.00)
Foods	0.404	1.07
Ceramics	0.433	1.15
Chemicals	0.400	1.06
Metals	0.273	0.72
Pulp & Paper	0.547	1.45
Machinery	0.219	0.58
Others	0.367	0.97
Total	0.378	1.00

4.2.3 Implementation of Environmental Management

(1) Survey Items

There are many items identified in the survey; this section summarizes basic items relevant to environmental management. Table 4.9 shows the 21 items relevant to environment management. In general, the more a company selects the items, the better it implements environmental management. Attention should be paid however, a ratio of the items implemented by a company is low when it does not put so much environmental load.

Table 4.9 Selected Survey Items

Which items from the following have been implemented in your company?		1. Facility investment to control emissions and effluents
		2. Implementation of waste minimization
		3. Implementation of energy-saving
		4. Green purchasing
		5. Green product design
Water conservation/ Effluent control	What measures does your company implement to reduce water consumption?	6. Minimize water consumption by reviewing operation 7. Recycle used water
	What measures does your company implement to reduce water pollutants?	8. Reduce raw materials by reviewing production processes and lines 9. Use input materials with less toxic substances or precursors of pollutants 10. Reduce input materials by introducing cleaner production technology 11. Install wastewater treatment facility
Emission Control	What measures does your company implement to reduce air pollutants?	12. Reduce raw materials by reviewing production processes and lines 13. Use input materials with less toxic substances or precursors of pollutants 14. Use fuels with less toxic substances or precursors of pollutants 15. Reduce input materials by introducing cleaner production technology 16. Install gas treatment facility/ equipment
Non-hazardous Industrial Solid Waste and Hazardous Industrial Waste Management	What actions has your company been taking to properly manage waste?	17. Measure and record quantity of waste generated by waste type 18. Analyse chemical characteristics of wastes 19. Package and label HW for storage and transportation 20. Treat waste at on-site facilities 21. Check the off-site treaters to ensure proper final disposal of waste

(2) Level of Environmental Measures Implementation

Figure 4.11 shows distribution of ratios of the items implemented by the surveyed companies. The average ratio is 0.35. The companies whose ratio is equal to or more than 0.6 are only 11. Those equal to or more than 0.4 are still 33; the ratios of the items are by and large low.

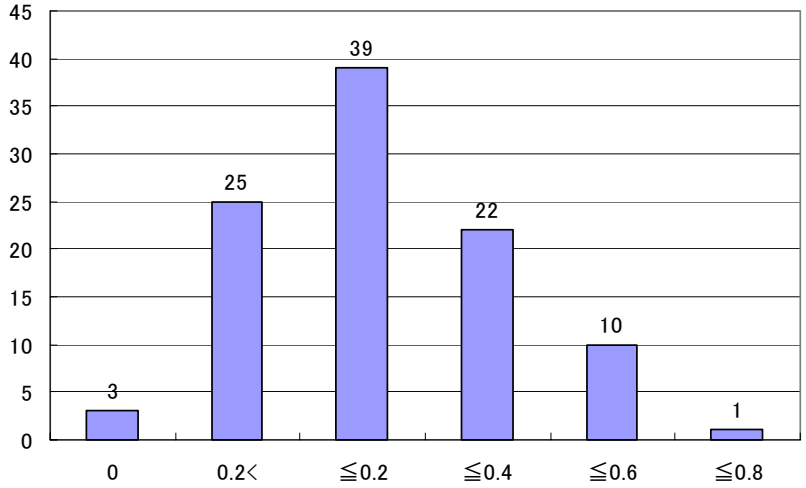


Figure 4.11 Number of Companies by Ratio of Environmental Management Items Implemented

Figure 4.12 shows number of the companies that practice the corresponding items in Table 4.9.

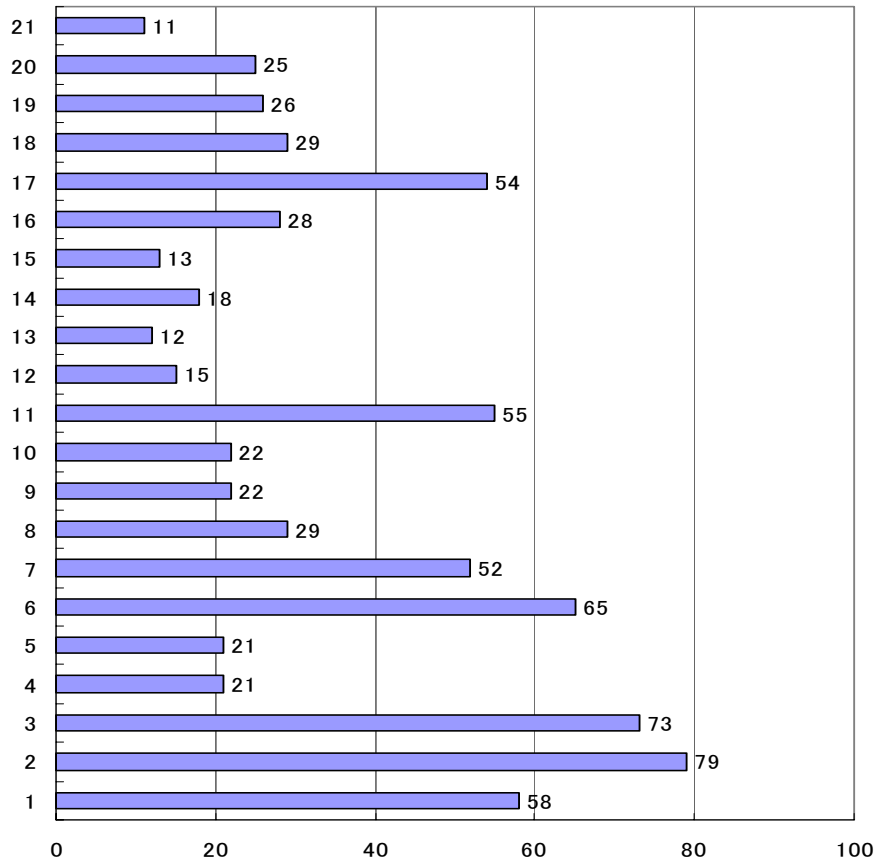


Figure 4.12 Number of Companies Implementing Environmental Management by Measure type

There are 56 companies that invested in pollution control facilities according to the survey. The number corresponds to the 55 companies that installed the wastewater treatment facility (item 11). Companies implementing waste minimization (item 2), and energy saving (item 3) are79 and 73, respectively; most of the companies are implementing these two measures. In addition, those conducting rationalization of water consumption (item 6 and 7) are 65 and 52 respectively.

The items 8 through 11 are relevant to wastewater management. Among the measures, installment of a wastewater treatment facility (item 11) was carried out by 55 companies while the reduction of environmental load in the production process (items 8, 9, 10) was by less than 30 companies.

The items 12 through 16 are relevant to air pollution management. Among the measures, installment of gas treatment facility/equeipment (item 16) was implemented the most (28 companies) while cleaner production was implemented by only 13 companies.

The items 17 through 21 are relevant to industrial waste management. Identification of waste quantity by waste type (item 17) was conducted by more than half of the companies (54), but other management items were practiced by less than 30 companies. Although confirmation of proper waste disposal by off-site treater in (item 21) is an important item in environmental management, it was conducted by only 11 companies.

Table 4.10 shows rate of environmental measures implemented by industry types. Pulp & paper shows relatively high implementation rate followed by food processing and ceramics. Machinery and other industries responded low.

Table 4.10 Average Rate of Environmental Measures Implementation by Industry

Industry Type	Average in the industry	Ratio in all industry
Foods	0.39	1.12
Ceramics	0.39	1.12
Chemicals	0.33	0.96
Metals	0.34	0.99
Paper and Pulp	0.49	1.40
Machinery	0.31	0.88
Others	0.29	0.82
Total	0.35	1.00

4.2.4 Environmental Measures

(1) Energy usage

As Figure 4.13 shows, electricity is main source of energy to most of companies. Coal which 4 companies used in the figure is only in cement industry. In general, diesel fuel is used more than heavy oil as it is used for diesel powered generators.

13 companies use other source of energy; 4 of which were bagasse used in the food sector. 64 companies have thermal facilities.

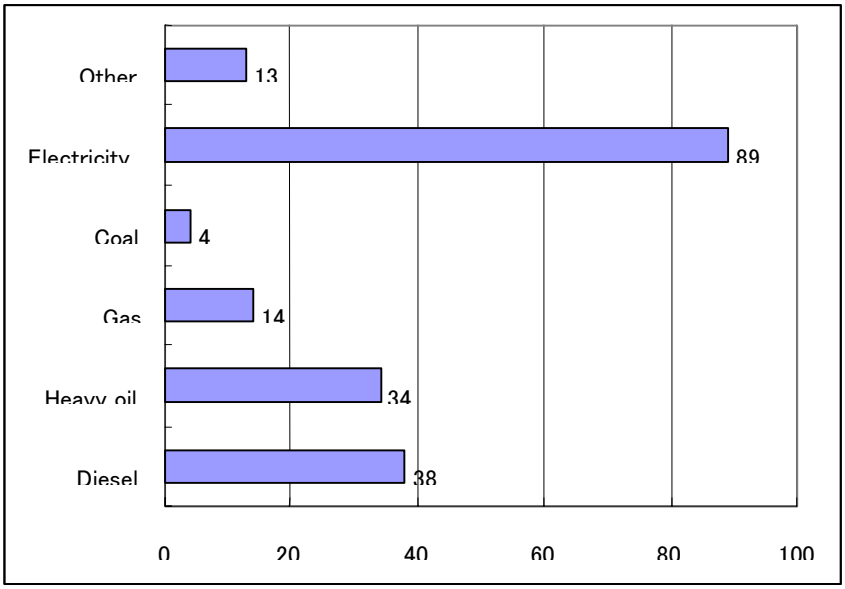


Figure 4.13 Number of Energy Use by Energy Types

Usage of energy consuming facilities by industry types is shown in Figure 4.14. Most companies in food processing, ceramics, and pulp & paper industries use thermal facilities. Industrial furnaces are utilized among cement and glass in ceramic industry as well as forging in metal industry. All other industries use their own boilers and/or generators. Food, chemicals, and pulp & paper make use of process steam. Other industries that use no heat during production process do not have thermal facility.

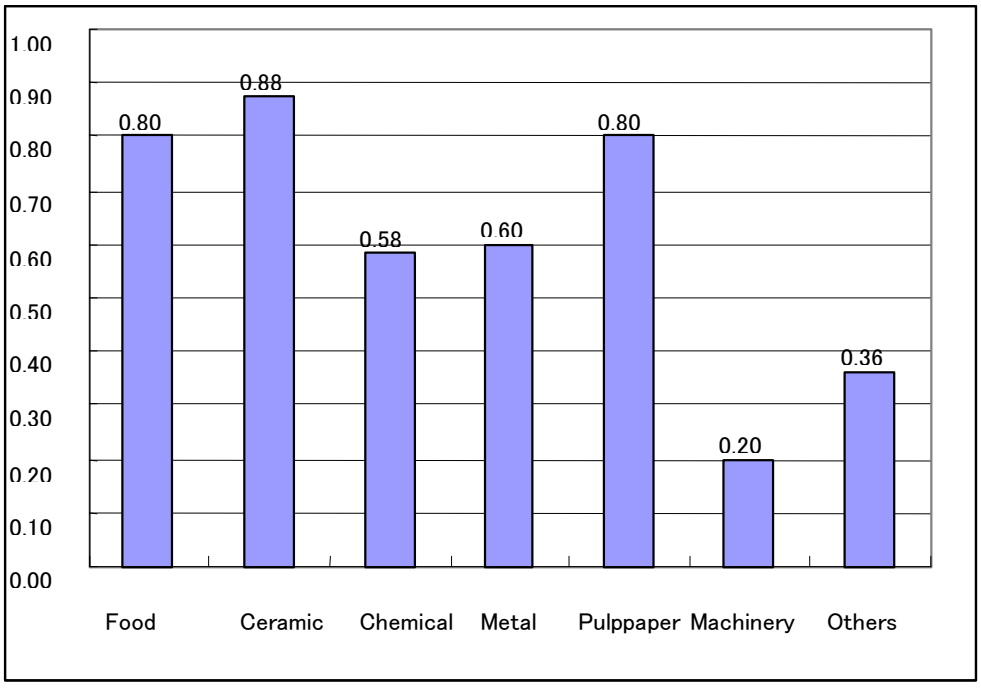


Figure 4.14 Rate of Companies using Thermal Facilities by Industry Types

(2) Energy Saving

Energy saving measures include identification of energy consumption, proper operation

management and rationalization of lightings. Installation of heat recovery facilities (item 4), use of facility with high heat efficiency (item 5), and process improvement (item 6) are implemented at specific factories that use heat recovery system; consequently, the number of measures implemented remains relatively low.

Table 4.11 Energy Saving Measures Implemented by Surveyed Companies

	1	2	3	4	5	6	7	Number of companies in industry
Foods	0.63	0.83	0.60	0.57	0.47	0.37	0.10	30
Ceramics	0.63	0.75	0.38	0.38	0.50	0.13	0.13	8
Chemicals	0.58	0.61	0.45	0.26	0.39	0.32	0.03	31
Metals	0.50	0.60	0.60	0.10	0.50	0.00	0.30	10
Pulp & paper	0.60	0.60	0.80	0.40	0.40	0.60	0.20	5
Machinery	0.60	0.20	0.60	0.20	0.20	0.20	0.00	5
Others	0.73	0.64	0.45	0.27	0.09	0.45	0.27	11
	61	67	53	35	39	31	12	100

Items
1. Identification of energy consumption by facility and energy type
2. Proper operation control (checking temperature, O_2%, fuel feed rate, leakage, etc.)
3. Rationalization of lighting
4. Installation of facilities to recover waste heat
5. Installation of energy efficient facilities (burners, furnace, boilers, etc.)
6. Change in production process with less energy requirement
7. Other

Energy saving effort can not properly be assessed without managing cost data associated with the measures. As Figure 4.15 shows, only half of the surveyed company have practiced the cost management on energy savings. This figure is very small considering the fact that energy cost effects production cost dramatically. It might be said that the respondents to this survey was PCOs who may not be responsible for energy management; that may be the reason for such a low number.

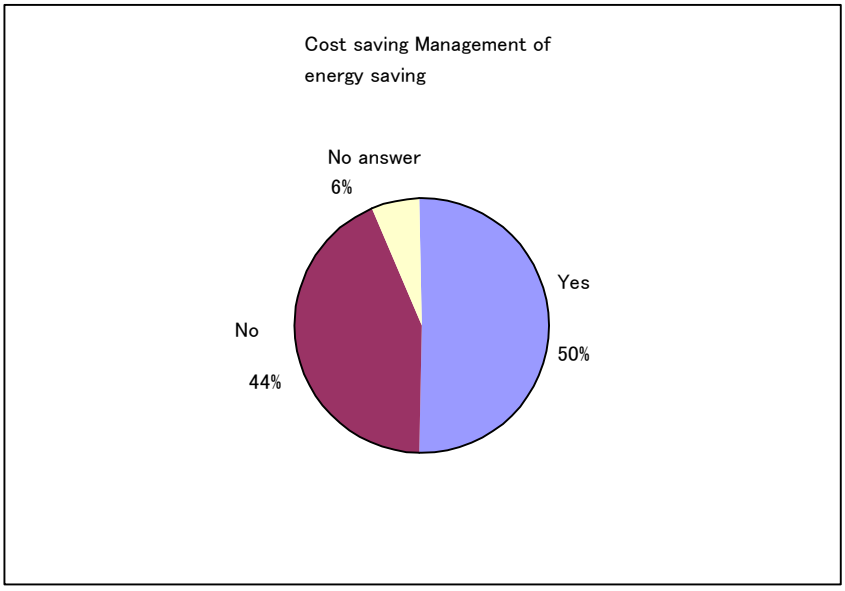


Figure 4.15 Cost Management for Energy Savings Effort

(3) Water Management

65 of the surveyed companies have implemented water conservation measures (item 1). Approximately half of the companies recycle their used water although they are only recycling cooling water, except the pulp & paper industry that reuses water from cleansing process.

Table 4.12 Rationalizing Use of Water

	1	2	3	4	5	No. of companies for industry
Food	0.77	0.57	0.20	0.13	0.03	30
Ceramic	0.50	0.75	0.13	0.00	0.00	8
Chemical	0.61	0.48	0.10	0.06	0.13	31
Metal	0.70	0.50	0.20	0.10	0.00	10
Pulp & Paper	0.60	1.00	0.20	0.20	0.00	5
Machinery	0.60	0.40	0.00	0.00	0.60	5
Others	0.55	0.18	0.00	0.09	0.09	11
	65	52	13	9	9	100

1. Minimize water consumption by reviewing operation
2. Recycle used water
3. Utilize rainwater
4. Other
5. None

Table 4.13 shows the most wastewater control methods employed by the surveyed companies are introduction of wastewater treatment facility (item 6) that counted 55 companies, mainly pulp & paper, food processing, plating, chemicals, and textile dyeing. These facilities utilize large quantity of water that raises the necessity of having such system in order to meet effluent standards.

Table 4.13 Means of Wastewater Management

	1	2	3	4	5	6	7	8	No. of companies for industry
Food	0.37	0.13	0.23	0.20	0.10	0.73	0.03	0.10	30
Ceramic	0.38	0.13	0.13	0.63	0.25	0.38	0.13	0.00	8
Chemical	0.16	0.19	0.16	0.26	0.16	0.52	0.03	0.19	31
Metal	0.30	0.60	0.30	0.00	0.10	0.70	0.00	0.00	10
Pulp & paper	0.60	0.60	1.00	0.60	0.00	0.60	0.20	0.00	5
Machinery	0.40	0.00	0.00	0.40	0.40	0.00	0.00	0.40	5
Others	0.18	0.18	0.09	0.00	0.00	0.36	0.09	0.45	11
	29	22	22	24	13	55	5	16	100

1. Reduce raw materials by reviewing production processes and lines
2. Use input materials with less toxic substances or precursors of pollutants
3. Reduce input materials by introducing cleaner production technology
4. Recycle pollutants as input materials to your company
5. Recycle pollutants as input materials to other companies
6. Install wastewater treatment facility
7. Other
8. None

For managing cost data on water management, only 35% of all surveyed company have managed such data. Availability of inexpensive groundwater as industrial water in Philippines may contribute to this percentage. Cost management on water and wastewater is usually an important element of production management, especially for industries using mass of water. However, role of PCOs are limited to environmental management; that may in turn resulted that PCOs are not familiar with such data. Companies that do not integrate water-,

effluent-, and relevant cost management suggest that their level of environmental management is probably limited.

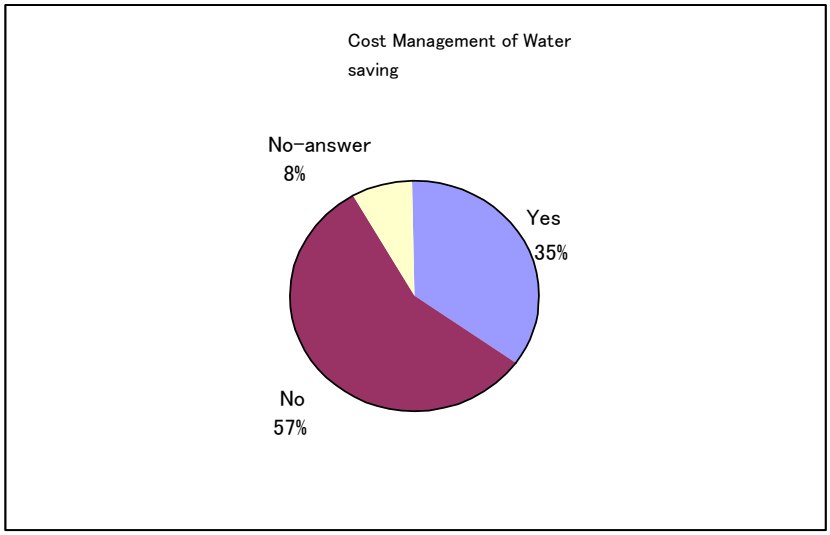


Figure 4.16 Cost management of Water Savings

(4) Gas Emission

Gas emission is often an issue to be dealt with in industries where furnaces are in operation. Table 4.14 shows means of emission control by industry types. The number in the table indicates the number implemented per equipments. 64 companies have furnaces whereas only 28 installed gas treatment system out of the 64 companies. Ceramics industry that have industrial furnace, especially cement kilns, melting furnace, and heating furnace, as well as chemical industry tend to have gas treatment system. Only 18 companies put effort on fuel measures.

The table also shows that there are 22 cases of not having any emission control at all. This may indicate that no measures are taken for small-scale boilers and/or diesel powered generators.

Table 4.14 Types of Air Pollution Control by Industry

Industry Type	1	2	3	4	5	6	7	Number of companies having furnace / boiler(s)	Number of companies in industry
Food	0.13	0.13	0.38	0.13	0.33	0.13	0.33	24	30
Ceramic	0.57	0.29	0.43	0.29	0.71	0.00	0.00	7	8
Chemical	0.11	0.17	0.22	0.22	0.67	0.28	0.39	18	31
Metal	0.33	0.50	0.00	0.17	0.33	0.33	0.00	6	10
Pulp & Paper	0.50	0.25	0.25	0.00	0.25	0.25	0.25	4	5
Machinery	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1	5
Others	0.25	0.00	0.00	0.75	0.00	0.75	1.25	4	11
Total	15	12	18	13	28	15	22	64	100

1. Reduce raw materials by reviewing production processes and lines
2. Use input materials with less toxic substances or precursors of pollutants
3. Use fuels with less toxic substances or precursors of pollutants
4. Reduce input materials by introducing cleaner production technology
5. Install gas treatment facility/ equipment
6. Other
7. None

(5) Waste Management

1) Waste Minimization Implementation

79 companies answered that they had implemented waste minimization. As Table 4.15 shows most of the practice is done by segregation and recycling of the waste stream.

Table 4.15 Number of Waste Minimization Practiced by the Surveyed Companies

		# (B)	(B)/(A)
What measures does your company implement to minimize generation of waste?	1. Proper stock management (matching supply to needs)	43	0.54
	2. Proper process control	44	0.56
	3. Use of less toxic chemicals	15	0.19
	4. Change in production processes	14	0.18
	5. Process integration	14	0.18
	6. Segregation and recycling	65	0.82
	Total Number (A)	79	1.00

Note: This table was made from data of 79 companies that answered they were practising WM.

Table 4.16 shows measures taken for waste minimization by industry types. The answers were given by PCOs, though all companies have some types of waste management.

Table 4.16 Measures for Waste Minimization by Industry Types

	1	2	3	4	5	6	7	8	Number of Companies in industry
Food	0.70	0.57	0.20	0.10	0.13	0.77	0.13	0.00	30
Ceramic	0.75	1.00	0.13	0.13	0.13	0.75	0.00	0.00	8
Chemical	0.48	0.48	0.13	0.13	0.23	0.74	0.06	0.00	31
Metal	0.50	0.40	0.30	0.30	0.00	0.80	0.00	0.00	10
Pulp & Paper	0.40	0.80	0.40	0.20	0.20	1.00	0.00	0.00	5
Machinery	0.60	0.40	0.00	0.20	0.20	0.80	0.20	0.00	5
Others	0.36	0.55	0.18	0.27	0.27	0.64	0.18	0.00	11
	56	56	18	16	17	76	9	0	100

1. Proper stock management (matching supply to needs)
2. Proper process control
3. Use of less toxic chemicals (for hazardous waste)
4. Change in production processes
5. Process integration
6. Segregation and recycling
7. Other
8. None

When it comes to cost reduction management by the waste minimization effort, only 35 companies, or 35%, committed themselves into the task (see Figure 4.17). Considering one of main tasks of PCO is to deal with waste minimization, the managing the cost data is more important than that of water saving. Not having cost management is an equivalent of not having environmental management at all. Or one can say that the waste minimization as an element of environmental management is not considered as of business importance for those companies

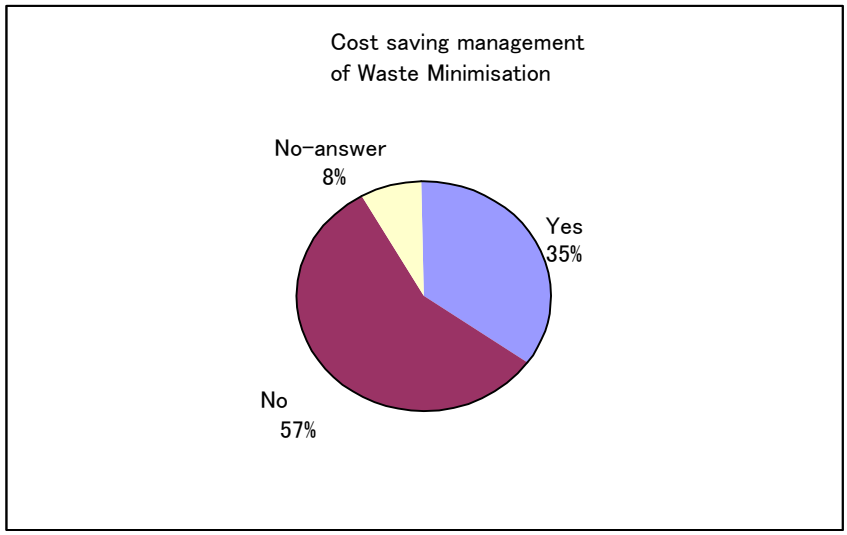


Figure 4.17 Cost Saving Management by Waste Minimization

It can be assumed that level of environmental management for the companies without cost management is low.

(6) Hazardous Substances

Table 4.17 shows how hazardous substances were treated at each company. 32 companies had not implanted any measures for the hazardous substances.

Table 4.17 Measures for Hazardous Chemicals

	1	2	3	4	5	No. of companies in industry
Food	0.33	0.30	0.33	0.07	0.13	30
Ceramic	0.38	0.50	0.63	0.00	0.50	8
Chemical	0.39	0.48	0.45	0.03	0.26	31
Metal	0.50	0.30	0.50	0.10	0.30	10
Pulp & paper	0.20	0.40	0.20	0.00	0.40	5
Machinery	0.00	0.20	0.00	0.20	0.40	5
Others	0.18	0.18	0.18	0.00	0.00	11
	8	33	36	37	32	100

1. Identification of types and quantity of chemicals used and emitted/discharged
2. Preparation of MSDS
3. Dissemination of knowledge about proper use of chemicals and emergency response
4. Other
5. None

(7) Noise

Table 4.18 shows that 22 companies have no measures for noise. 16 companies installed insulations for noise (item 3). 23 companies measure noise and vibrations. Regular inspection of the plant is the most common, though it is very basic measure.

Table 4.18 Measures for Noise by Industry Types

	1	2	3	4	5	Number of factories
Food	0.13	0.57	0.13	0.23	0.20	30
Ceramic	0.50	0.75	0.50	0.00	0.25	8
Chemical	0.26	0.48	0.13	0.16	0.32	31
Metal	0.30	0.50	0.10	0.10	0.10	10
Pulp & paper	0.40	0.40	0.20	0.40	0.20	5
Machinery	0.40	0.20	0.20	0.40	0.00	5
Others	0.00	0.27	0.09	0.55	0.18	11
	23	49	16	23	22	100

1. Measurement of noise and vibration
2. Periodical check on performance of plant facilities
3. Installation of noise insulation
4. Other
5. None

4.2.5 Environmentally Conscious Activities

Development of environmentally sound products, green procurements, and implementation of take back systems for used products are examples of environmental activities. LCA and environmental accounting are tools for implementing EMS.

39 companies (40 percent of all) were practising development of green products. When limited the response from the CEOs, the number drops to 21 companies. This gap illustrates that PCO's definition of green products is much broader than that of CEOs. Table 4.19 shows lists of products the survey takers named as Green products which suggests there is a confusion as to the meaning of 'Green product' among these companies as many food processing companies listed toxic chemical free and longer life as their green products. Longer life of a product would be applicable to metal and machineries. As for recyclable products, it means converting hard-to-recycle material/products to the ones that are easily recycled. It is hard to apply this concept to products from pulp & paper, metals, and ceramics.

Table 4.19 Types of Green Products Developed by the Surveyed Companies

	Number of Surveyed companies	Toxic chemical free	Longer life	Easy for recycling	Simple packaging	Produced from recycled materials	Requires less energy while it's in use	Other
Food	14	11	7	4	9	2	1	1
Ceramic	3	1	2	1	1	3	2	0
Chemical	10	5	2	6	6	3	2	0
Metal	4	3	3	2	2	0	1	1
Pulp & Paper	4	3	0	3	1	3	0	0
Machinery	1	1	0	0	0	0	0	0
Others	3	4	3	4	2	1	1	0
	39	28	17	20	21	12	7	2

Although the above result indicates the survey could have been improved beforehand, the PCOs are un-doubtfully aware of importance of green products.

For a question of whether a company has a policy or criteria on green procurements, 15 PCOs answered they have the policy or criteria while 21 CEOs answered their companies have them. CEOs and PCOs, again, hold different viewpoint in the same issue; there are only 8 cases where both CEOs and PCOs shared the same view.

It is, nonetheless, a positive sign to see 15% of PCOs showed motivations for green procurement. 30 PCOs answered they would practice green procurement in the future, indicating the importance of the green procurements has started to spread in the industries.

For implementing take back systems for used products in relation to Extended Producer Responsibility (EPR), the survey received as many as 35 positive responses. Figure 4.18 shows food processing companies returned high result. Though the food industry may collect and reuse beers and beverages bottles, they seem to include the containers that send back to suppliers to this item. Obviously, this is a misunderstanding of the concept of take-back system for used product. Pulp & paper companies' responds also threw a doubt that these companies might have considered that their efforts to recycle waste paper and collection of used papers fall into this concept. In other words, the survey result for this item should be taken with caution as there are good chances that the result does not reflect the real current status.

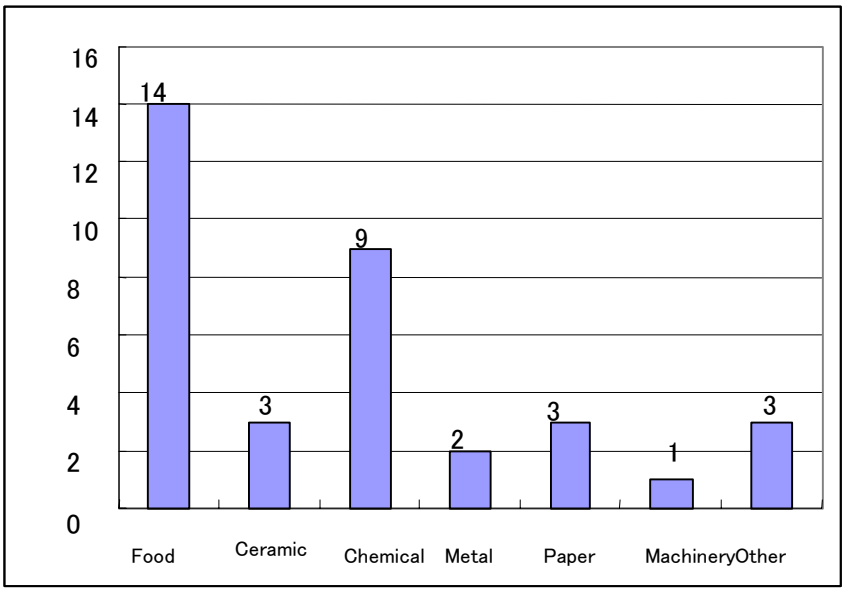


Figure 4.18 Number of Cases of Take Back Systems for Used Products

The result of LCA and environmental accounting are as follow.

Life-Cycle Assessment (LCA) is an integrated approach to assess the environmental performance by comprehending environmental burden a product or service carry during its life cycle from taking raw materials from earth, to production process, consumption, and even when the product becomes a waste. LCA is very complex and requires various data. Table 4.20 shows 27 companies, including 12 food companies and 7 chemicals, already implemented the LCA. Although it may not be realistic to think that all 27 companies have introduced the LCA method in full scale, global companies with foreign funds seemed to have implemented the LCA.

18 PCOs claimed they practice Environmental Accounting (EA) while 19 CEOs said they implemented EA. Those figures do not throw large gaps between PCOs and CEOs in regard to the understanding of EA. Nonetheless, close look at the table tells a different perspective. Although 12 CEOs and PCOs shared a same answer, answers from 6 PCOs and 10 CEOs are from different companies. In other words, unified viewpoint for environmental management has not been shared within some of the surveyed companies. Within the 12 companies that CEOs and PCOs shared same perspectives, 10 companies have established the environmental management systems.

When looked at the 18 companies who claimed EA is implemented closely, only 10 companies have managed cost data for water reduction effort and only 9 have managed cost efficiency of waste minimization efforts. These contradictions suggest the low credibility of PCOs' understanding level.

Table 4.20 Utilization of Advanced Environmental Management Tools

	Number of answers on LCA	Number of answers on EA	Number of answers from CEOs on EA	# of Company Surveyed
Food	12	3	2	30
Ceramic	1	2	2	8
Chemical	7	10	10	31
Metal	4	1	1	10
Pulp & Paper	2	2	0	5
Machinery	0	0	1	5
Others	1	0	3	11
	27	18	19	100

4.3 Production Management, Environment Management System, Environmental Measures

(1) Production Management and EMS

Figure 4.19 shows relationship between production management level and environmental management system level. The figure indicates that the companies scoring high in product management do not necessarily means they also have established high level of EMS.

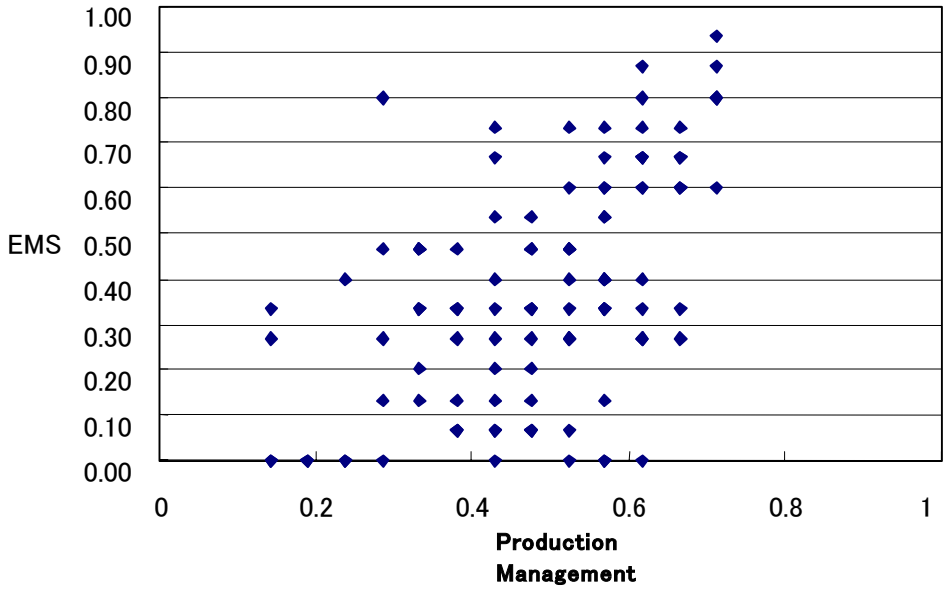


Figure 4.19 Relationship between Production Management level and EMS level

(2) Production Management and Implementing Environmental Measures

Figure 4.20 shows level of productivity management and environmental measures.

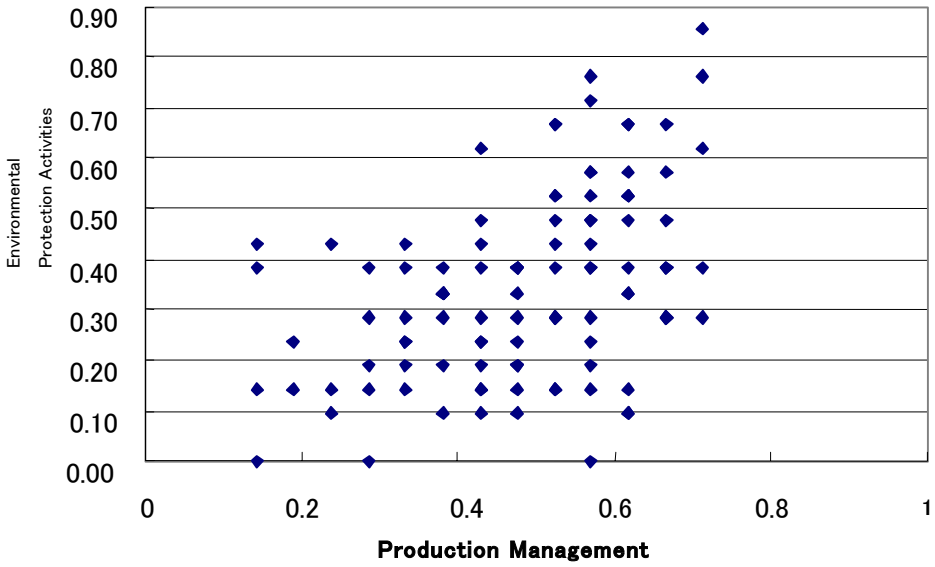


Figure 4.20 Relationship between Level of Productivity Management and Environmental Measures

It clearly shows that the companies with low production management level are lower in the environmental activity level (EAL) as well. However, high production management level does not necessarily reflect high EAL of the company either. Some of the companies scoring high in production management score poorly in EA.

(3) EMS and Environmental Measures

Figure 4.21 shows relationship between levels of EMS implementation and environmental measures. Although there are some cases where environmental measures level is low while EMS implementation level is high, one can see a trend that the higher the EMS implementation level, the higher the environmental measures level.

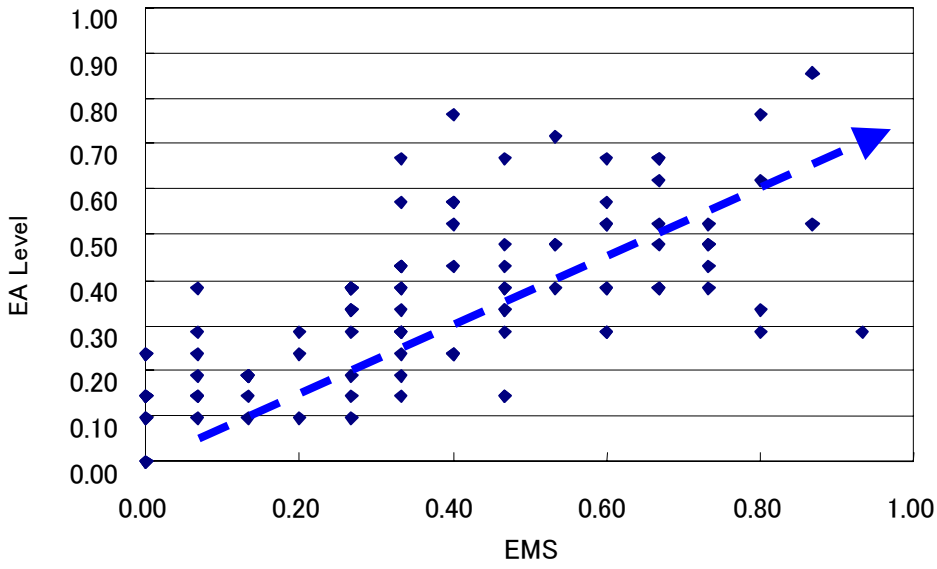


Figure 4.21 Relationship between Level of EMS and Environmental Measures

The most important items among EMS are target setting for reduction in environmental loads, monitoring and evaluation of environmental performance, and preparation and disclosure of environmental reports; they are considered as essential. Levels of production management and environmental management vary by implementation of these items. Table 4.21 shows companies' EMS implementation levels by implementation of the three primary environmental management items.

Table 4.21 Companies Implementing the Three Primary Environmental Management Items and EMS

Implementation of the Three Primary EM Items (A)	Number of companies (A)	Production Management scores	Establishment of Env. Section (B)	Ratio (B/A)	EMS Implementation (C)	Ratio (C/A)	ISO14001 Acquisition
3 items	29	579	23	0.79	19	0.66	8
2 items	12	492	10	0.83	3	0.25	1
1 item	20	488	11	0.55	6	0.30	1
None	39	465	15	0.38	4	0.10	-
Total	100	506	56	0.56	31	0.31	10

Note: PCOs' answers are used for EMS Implementation (C).

The companies implementing the three primary environmental management items are 29; they have higher score in production management and higher ratio of establishment of an environmental section as well as EMS implementation. Among the 10 companies with ISO 14001 accreditation, eight are those implementing the three items. The companies implementing two of the three primary environmental management items have a considerably lower ratio of EMS implementation compared to those implementing the three items; this might be a recognition gap regarding environmental management between CEO and PCO.

There are 41 companies that implement two or more of the three primary items and 31 EMS. Among the 100 companies surveyed, 30 to 40% of them have reached at a certain level of EMS while the rest of the companies have room to promote EMS.

There are 'Environmental Accounting,' 'Green Procurement' and 'Environmental Designing' as an advanced level of EMS. As Table 4.22 shows, most companies conducting the three advanced items are also the companies that implementing the three primary items for environmental management.

Table 4.22 Companies Implementing the Three Primary Environmental Management Items and Advanced Measures

Three Primary EM Items	Number of companies	Environmental Accounting	Green procurement	Environmental designing
3 items	29	13	13	11
2 items	12	1	2	3
1 item	20	4	3	4
None	39	1	3	3
Total	100	19	21	21

Table 4.23 shows the relationship between the companies implementing the three items and the hindering factors for promoting environmental management. According to the table, companies that practise the three primary items observe fewer obstacles than the others, except that external service providers seem to be a hindering factor. On the contrary to these companies practicing all three primary items, the companies without any of the primary items assert all of hindering factors, including lack of know-how and staffs, are preventing them

from environmental management.

Table 4.23 Companies Implementing Three Primary Items and Hindering Factors for Environmental Management

		Hindering factors for Environmental Management					
Implementation of the Three Primary EM Items	No of companies	1	2	3	4	5	6
3 Items	29	0.24	0.28	0.24	0.41	0.21	0.17
2 items	12	0.25	0.58	0.33	0.25	0.25	-
1 items	20	0.10	0.60	0.30	0.30	0.30	-
0 Items	39	0.62	0.49	0.51	0.36	0.38	-

Note: The figures in the 6 lines on the right, 4 rows from the bottom were percentage of answers that a concerned company recognised the item(s) as an obstacle in whole answers gained.

1. Lack of information and know-how about cost-effective measures to improve environmental performance
2. Lack of financial resources to implement necessary measures
3. Lack of staff with necessary knowledge and skills to plan and implement necessary measures
4. Lack of affordable external environmental services such as sampling/analysis, technical advices, planning on IEM, and environmental auditing
5. Lack of information about credible environmental service providers
6. Other

Therefore, it is vital for the companies without 3 primary items, i.e. the companies with low level of environmental management, to overcome the hindering factors that are lack of information on know-how and staffs.

4.4 Results of Implementing Environmental Management

CEOs ranked the achievement of the environmental management implementation (see Table 4.24).

Table 4.24 Results of Implementing Environmental Management

	A Best achieved point in EM in CEOs' answer	No. of answer in the ranks	Average ranks
1. Improved productivity (less input for the same output)	36	84	2.47
2. Cost reduction	22	82	2.79
3. Improved company image	24	86	2.98
4. Increased market competitiveness	11	71	3.83
5. Other	2	6	5.80
Total	95		

Note: no answers were counted as rank 6.

As the table shows, improved productivity was the best result of the environmental management followed by cost reduction and improved company image. The survey received high response for the question.

5. Motivation, Constrains, and Issues on Environmental Management

5．1 Factors Contributing to Promote Environmental Management

(1) Motivation for Environmental Management

Table 5.1.1 shows ranking of the driving forces for environmental management for business owners/top executives. When no answer was given, the owner/ top executives are thought to have low motivation for Environmental Management, therefore, ranked as 12th place outside of the ranking in the table.

Table 5.1 Driving Factors for Implementing Environmental Management by Industry

	Driving factors for implementing Environmental Management										
Industry type	1	2	3	4	5	6	7	8	9	10	11
Food	9.63	9.67	8.77	9.93	9.50	9.70	4.23	5.20	5.17	3.00	11.77
Ceramic	5.88	9.25	7.00	9.00	9.50	8.29	3.00	4.13	5.75	4.63	12.00
Chemical	8.42	10.42	9.52	9.71	9.45	9.03	4.16	5.97	6.39	4.61	12.00
Metal	10.40	12.00	8.70	9.60	10.80	9.70	4.20	7.50	7.60	2.20	10.90
Pulp & Paper	10.60	8.80	8.60	10.40	10.80	9.60	2.20	5.20	7.80	5.40	12.00
Machinery	11.00	12.00	8.60	8.40	12.00	10.80	6.20	7.60	8.00	7.60	12.00
Others	11.00	11.27	8.36	10.64	9.73	11.18	6.00	6.82	6.64	5.45	11.00
	9.30	10.35	8.79	9.78	9.83	9.61	4.30	5.88	6.27	4.18	11.71
Ranking	6	10	5	8	9	7	2	3	4	1	11
No. of answers	40	31	42	35	35	41	80	71	69	82	4

Note:
1. Request from shareholders
2. Request from financial institutions that provide loan to your company
3. Request from your parent company or commercial buyers of your products
4. Request from consumers association or consumers
5. Request from environmental NGOs
6. Involvement by your competitors (determination by industry association)
7. Internal motivation as part of social responsibility/corporate ethics
8. Cost saving due to reduction in use of energy and raw materials
9. Improved productivity
10. Legal requirements (regulatory compliance)
11. Other

Ranking of the driving forces for environmental management for business owners/top executives is as follows:

1：Legal requirements (regulatory compliance)	4.18
2：Internal motivation as part of social responsibility/corporate ethics	4.30
3：Cost saving due to reduction in use of energy and raw materials	5.88
4：Improved productivity	6.27
5：Request from your parent company or commercial buyers of your products	8.79
6：Request from shareholders	9.30
7：Involvement by your competitors (determination by industry association)	9.61
8：Request from consumers association or consumers	9.78
9：Request from environmental NGOs	9.83
10：Request from financial institutions that provide loan to your company	10.35
11：Other	11.71

Following table shows how many answers we received for each rank.

Table 5.2 Driving Factors of Implementing Environmental Management by Ranking

	Driving factors for implementing environmental management											
Ranking	1	2	3	4	5	6	7	8	9	10	11	Total
1st	5	2	6	1	1	0	37	8	6	28	2	96
2nd	6	2	2	0	5	1	10	22	13	23	0	84
3rd	1	0	9	4	4	3	13	21	18	7	0	80
4th	4	2	6	7	2	2	13	6	14	17	0	73
5th	8	2	6	7	3	10	3	3	8	1	0	51
6th	1	6	7	5	5	9	2	2	3	3	0	43
7th	4	3	3	3	4	5	1	3	3	1	1	31
8th	2	5	0	3	4	5	1	2	2	1	0	25
9th	5	4	2	2	2	4	0	2	1	0	0	22
10th	4	4	0	3	5	1	0	2	1	1	0	21
11th	0	1	1	0	0	0	0	0	0	0	1	3
Total	40	31	42	35	35	40	80	71	69	82	4	

1. Request from shareholders
2. Request from financial institutions that provide loan to your company
3. Request from your parent company or commercial buyers of your products
4. Request from consumers association or consumers
5. Request from environmental NGOs
6. Involvement by your competitors (determination by industry association)
7. Internal motivation as part of social responsibility/corporate ethics
8. Cost saving due to reduction in use of energy and raw materials
9. Improved productivity
10. Legal requirements (regulatory compliance)
11. Other

Legal requirement was ranked as the strongest driving force for environmental management, followed by corporate responsibility; these are basic items for companies to recognize necessity of environmental management, which reveals that most of the business owners/top executives are concerned about legal compliance. More than 70 percent of the surveyed companies recognized the two items as very important driving factors when combined with 1st to 4th ranks.

Cost reduction and productivity improvement is ranked as the 3rd and 4th. Only 14 companies ranked the item as the number one driving factor, though when combined with the companies that ranked to 2nd to 4th, more than 50 companies weigh highly the cost reduction and productivity improvement.

Items ranked 1st through 4th were mostly selected as driving forces for environmental management. The number of the business owners/top executives who selected the other items is very small; the items ranked 5th through 10th are considered to be equivalent in importance. Companies that give ‘request from parent company or supplier’ or ‘request from shareholders’ a high ranking are often joint venture companies with foreign fund. Companies that gives ‘request from environmental NGOs’ often manufactures the following products:

- phosphoric acid factory
- polypropylenes resin
- coconut oil (two companies)
- noodles
- coffee
- sound insulating material
- Lubricating oil
- Penicillin
- rubber parts for automobiles

- soaps
- textile (dyes)

Since just 4 companies of all these scored higher than 500, EMS of these companies were not high.

(2) Incentives for Environmental Management

Figure 5.1 shows incentives for implementing environmental management recognized by business owners/top executives. Cost reduction was selected by most of the companies (72), followed by tax break for good environmental performance (59 companies), and social recognition (55 companies). The companies that selected reduction in permission fees or other charges are 47, and they are mainly form the sectors with large wastewater load such as food processing, pulp and paper, textile (dyeing), and chemical manufacturing (lubricant, sulfuric acid, pharmaceuticals, cosmetics).

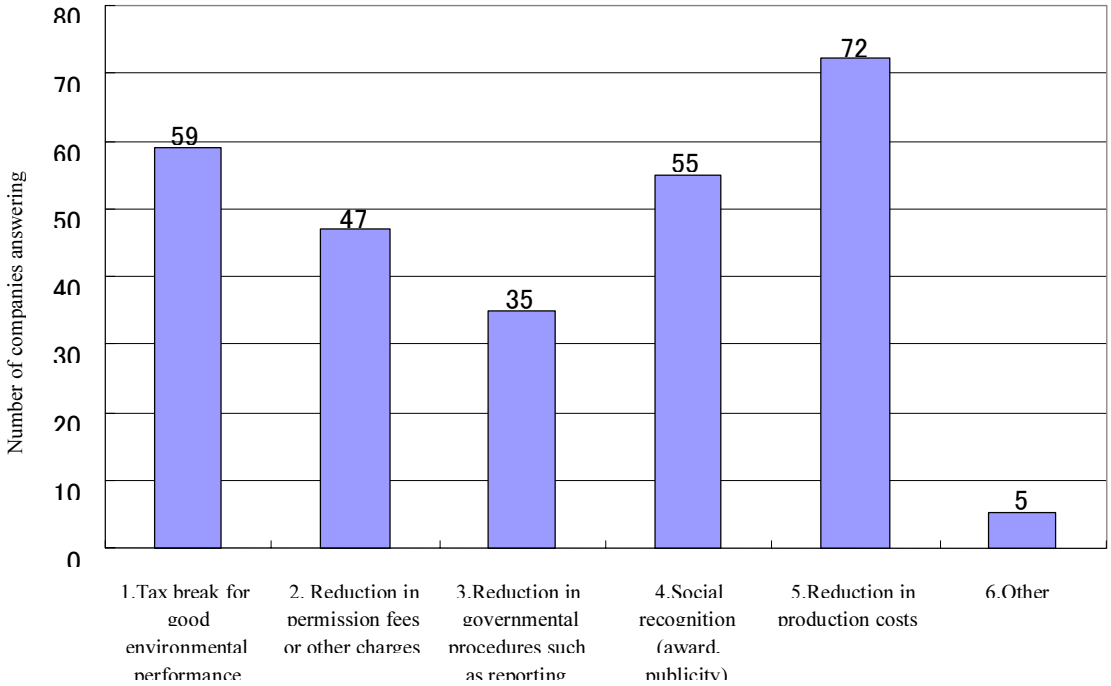


Figure 5.1 Incentives for Implementing Environmental Management

Table 5.3 Number of Companies that weighs Economic Incentives for Implementing Environmental Management

Industry type	Number of companies for each industry	Q17-2(B)	B/A
Food	30	18	60.0%
Ceramic	8	3	37.5%
Chemical	31	11	35.5%
Metal	10	5	50.0%
Pulp & paper	5	5	100.0%
Machinery	5	2	40.0%
Others	11	3	27.3%

Total	100	47	

5.2 Factors to Hinder Environmental Management

Many companies listed financial constraints as a factor to hinder environmental management (see Table 5.4). Lack of information and human resources were also selected by more than one-third of the respondents. Attention should be paid that more than 30% of the companies listed a lack of affordable external environmental services and information about credible environmental service providers as factors to hinder environmental management.

Table 5.4 Factors Hindering Implementation of Environmental Management by Industry

Industry type	Industry Total(A)	Items preventing factors from implementing Environmental Management					
		1	2	3	4	5	6
Food	30	12	15	13	10	11	1
Ceramic	8	1	4	0	2	2	1
Chemical	31	10	15	13	11	9	2
Metal	10	5	3	3	6	5	0
Paper & pulp	5	0	3	2	2	0	1
Machinery	5	3	1	2	1	2	0
Others	11	5	5	4	3	1	0
Total	100	36	46	37	35	30	5

Note: Description of the items here are followings

1. Lack of information and know-how about cost-effective measures to improve environmental performance
2. Lack of financial resources to implement necessary measures
3. Lack of staff with necessary knowledge and skills to plan and implement necessary measures
4. Lack of affordable external environmental services such as sampling/analysis, technical advices, planning on IEM, and environmental auditing
5. Lack of information about credible environmental service providers
6. Others

Figure 5.2 shows the distribution of the hindering factors.

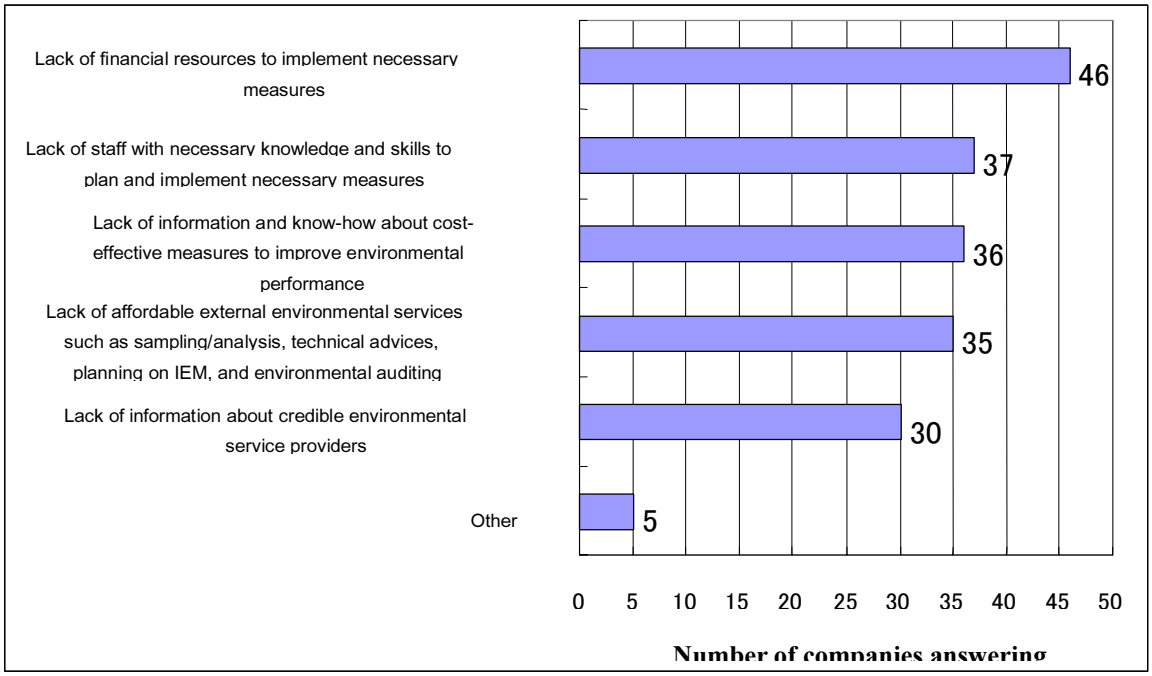


Figure 5.2 Factors Hindering Environmental Management

5.3 Future Agenda for Promoting Environmental Management

Results of the hearing from 77 companies on future agenda for promoting environmental management are summarized by environmental theme in Figure 5.3.

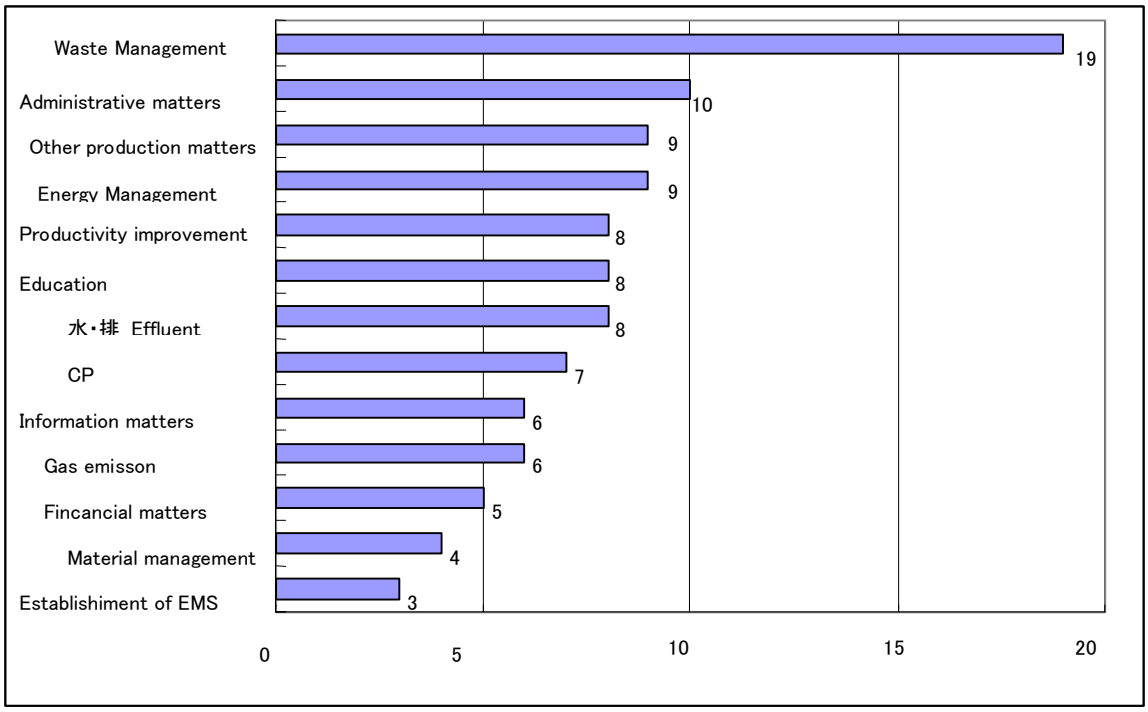


Figure 5.3 Issues for Promoting Environmental Management

The largest number of the companies (19) listed waste management (waste minimization, recycling, establishment of waste treatment facilities) as the future agenda. Ten companies listed problems regarding implementation of laws and regulations by the governments. Seventeen companies listed issues regarding production management and those regarding productivity improvement. Education, CP technology, and information were also listed by 8, 7, 6 companies respectively.

6. Conclusion

6.1 Production Management

The survey emphasized on general matters, such as production management, product quality management as well as current status of flow-management of the raw materials at production level. The generality of this questionnaire lead to an assumption of high implementation rate in production management; that in turn was the most cases. However, approximately 30% of the survey companies have little or no production management; thus there still companies require strengthening their production management.

It can be noted that levels of production management in general remains low for industries with assembly or simple production process, eg. machinery, while industries with complex processes such as ceramics, food processing, sugar refining, cooking oil, and pulp & paper, have achieved high level of implementation. Especially quality control has also been

reached to certain levels by the later industrial sectors.

It is somewhat inevitable to see low level of production management for those industries or companies with simple production processes due to their production characteristics. Since those industries or companies are thought to hold comparably less environmental loads than some other industrial sectors, low implementation rate of production management should not necessary took as negative results.

It becomes an issue when a company with high environmental loads from its production processes have low level of production management. Companies that have insufficient production management and quality control tend to have very low environmental management system.

Important points in relation with production management and environmental load are the material flow management for productivity management of raw materials. It is necessary to have managed the data for implementation of proper environmental management, and all company have implemented some level of material flow data management according to the survey. However, there are only few companies that record amount of raw material as input and product as output per process, as well as waste including air, water, and waste materials.

As Table 3.2 shows, 44% of all the companies conducted the data management on material flow. Since the survey did not specify the quality of the data management, one can not evaluate the accuracy of the figure. Nevertheless, experiences of factory visits suggest that the number does not reflect the real status. Most of them used productivity per hour or work unit and rarely utilizing material productivity.

From viewpoint of environmental management, improving productivity management and associate data management including material flow data are the most important element to enhance level of environmental management.

6.2 CEO's Awareness on Environmental Management

Although CEOs are not experts on environmental management, the survey revealed that 65% of the surveyed companies have established the environmental management system. The figure is very encouraging as it illustrates the importance of environmental management is well recognized among CEOs. However, depth of the understanding and capacity to implement the environmental management may differ from this number. About 30 % of the surveyed companies are thought to have achieved high competency level while 30 to 40 % of them seems to reached some level, and rest of 30% remains at low level of understanding and or implementation. Awareness raising / deepening understanding of the CEOs toward environmental management is crucial in future development of environmental management in the Philippines.

6.3 Environmental Management System Implementation Level

Only 24 companies implemented nine or more items out of 15 (60% or more). There are only 44 companies implemented 6 or more items out of 15 (40% or more). The rest of the companies (56) are evaluated as low in EMS implementation level.

Recognition of an importance of implementing environmental management system seems progressing, especially for water and air. Wastewater treatment facilities have been install at many industries. Emission control devices, on the other hands, are installed by mainly ceramic industry only. Industries, especially using heavy oil, should take measures to tackle issues on air pollutants.

However, measures to reduce air and/or water pollutants discharged from production processes are implemented by limited companies, and should be spread to other firms.

Waste management is of highly interest to many companies, and all of them have implemented some types of measures. However, most of them remain to segregation and recycling of their wastes. Measures for minimizing waste generation during production process is still to come.

6.4 Future Direction of Environmental Management

There are two types of relationships between a industrial company and the environment: one is discharge of pollutants from production process, and other is environmental burden posed by products after they are sold or when discarded into the environment. It is important for companies to tackle the former relations with the environment. Companies with high environmental impacts should to begin with improving their data management practices as well as productivity management, especially Material Flow management. Though these management systems aim to spur raw material productivity, identifying the targets by evaluating the material flow data is an important step.

The primary level of IEM is where proper housekeeping of industrial activities and basic understanding of IEM are required. At this stage, compliance on relevant laws and regulation is main concern. When reached to the secondary stage, companies are to establish targets for material productivity for material flow management by systematically manage data on energy and raw material consumptions, amount of waste generated, effluent and emission load to the environment, and CO_2 emission per production prices and/or unit.

In order to set this target, it is necessary to manage data on material flow including waste quality, and systematically analyse data, carry out actions, evaluate and improve the measures, i.e. development of EMS. The EMS is already scandalized by ISO14001, and 10 companies in the survey have already qualified for the ISO14001. It is desirable that companies acquire ISO14001 although attaining the certificate itself should not be the ultimate goal of the environmental management. It is necessary to establish a system to systematically implement environmental management within a company as well as understanding of its importance by CEOs.

The secondary level of IEM is where production input and output are properly controlled through material flow management and IEM practices such as CP and waste minimization are systematically incorporated into the regular industrial activities under the organized environmental management mechanism like EMS.

The tertiary level involves shifting quality of Industrial Environmental Management, such as Environmental Reports (ER), Environmental Accounting (EA), Environmental Designing (ED), Life-Cycle management, and Green procurements.

There are various measures to promote IEM that can be utilized depending on the levels of IEM development within the individual industries. Figure 6.1 illustrates the hierarchy of IEM.

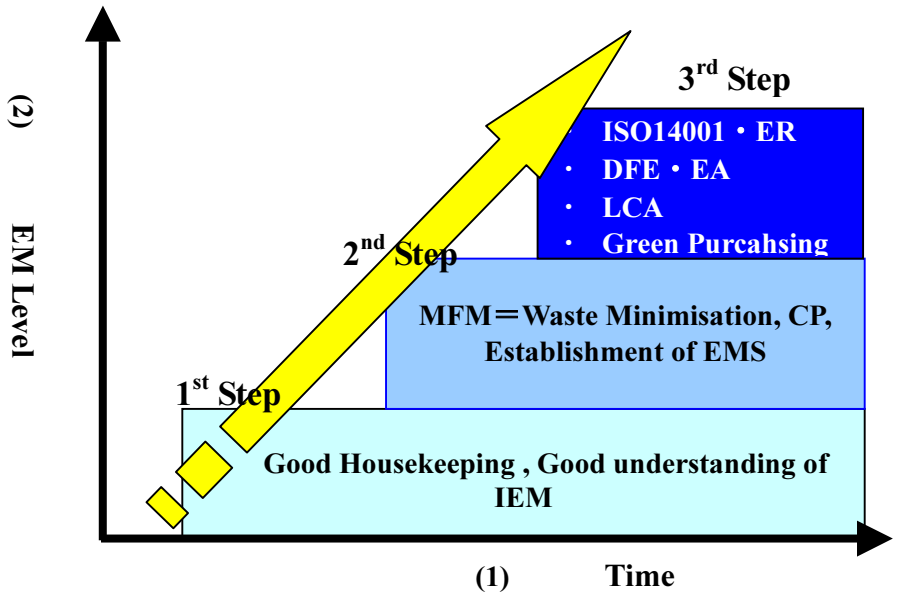


Figure 6.1 Hierarchy of IEM

Stepping up the stages in the above figure depends on understanding of environmental management by CEOs. Thus, priority should be placed on deepening CEOs' understanding toward environmental management.

Directory of Participating Companies

No.	Company	Category	Address	Respondent	Tel. No.
1	Accord Biolaboratories	Pharmaceuticals	54 Belen St., Gulod, Novaliches, Quezon City	Ms. Zenaida Esquerra *Plant Manager*	936-34-98
2	Aclem Paper Mills, Inc.	Pulp and Paper	2 Magsaysay Road, Bo. San Antonio, San Pedro Laguna	Mr. Robert Lim *Plant Manager*	847-63-24
3	Aichi Forging Company of Asia, Inc.	Machinery & Tool Manufacturing	Bo. Pulong, Sta. Cruz, Sta. Rosa, Laguna	Mr. Angel Serra III *VP - Production*	890-22-60
4	Albright and Wilson Chemical Industries, Inc.	Chemical Products	6/F Chemphil Bldg., Makati City	Mr. Roland Dhelly *COO & Gen. Mngr.*	817-34-19
5	Am-Europharma Corporation	Pharmaceuticals	Km. 16 West Service Rd., So. Superhighway, Parañaque City	Ms Edna Saur *Production Manager*	823-62-32
6	Apo (Rizal) Cement Company, Inc.	Cement Manufacturing	Sitio Tigbak Brgy. San Jose, Antipolo, Rizal	Mr. Hermil Calasang *Assistant Manager*	892-79-61
7	Asahi Glass Corporation	Glass and Glass Products	Bo. Pinagbuhatan, Pasig City	Mr. Renato Ermita *President*	641-19-81
8	Asia Pacific Insulation Corporation	Glass and Glass Products	Brgy. Real, Calamba, Laguna	Mr. Tomas Carasco *President*	(049) 545-10-02
9	Avon Products Manufacturing, Inc.	Cosmetics	150 E. Rodriguez Jr. Avenue, Quezon City	Mr. Zaldy Magalang *Plant Eng'g. Manager*	638-71-87
10	Basecom Sugar Corporation	Sugar Milling and Refining	San Fernando, Pampanga	Mr. Jose Muñoz *Plant Manager*	
11	Bohler Special Steel Products, Inc.	Metal Foundry and Forging	51 4th. Avenue, Bagumbayan, Taguig, Metro Manila	Mr. Oscar Laconsay *Plant Manager*	837-21-10
12	Cagayan De Oro Oil Company, Inc.	Coconut-based Milling & Spirit Distilation	16/F UCPB Bldg., Makati Avenue, Makati City	Mr. Reynaldo F. Blas *Treasurer & CFO*	892-79-61
13	Castillejos Agri-Farms, Inc.	Food Processing	656 Boni Avenue cor. Ligaya Alley, Mandaluyong City	Ms.Lourdes Labrador *President*	372-63-75

continuation of table…

No.	Company	Category	Address	Respondent	Tel. No.
14	Cathay Pacific Multi-Commodities Corporation	Food Processing	17 Clemente St. Bo. San Agustin, Novaliches, Quezon City	Ms. Gemma Perez *Plant Manager*	936-72-39
15	Centennial Plastics Corporation	Plastics and Rubber Products	CCOM Compound, Sucat, Parañaque City	Mr. Rogelio Licuan *Manager*	826-99-21
16	Central Azucarera De Tarlac	Sugar Milling and Refining	9/F, 119 J. Cojuangco & Sons Bldg., Legaspi Village Makati City	Mr. Romeo Israel *Pollution Control Officer*	818-39-11
17	Central Azucarera Don Pedro	Sugar Milling and Refining	Lumbangan, Nasugbu, Batangas	Mr. Jeffrey Mijares *Plant Manager*	810-89-01 loc 142
18	Central Macaroni Company, Inc.	Beverage	512 Mariano Marcos St., San Juan, Metro Manila,	Mr. Vincent Kawsek *Plant Manager*	724-49-55
19	Chowking Foods Corporation	Food Processing	Highlands, Muntinlupa, Metro Manila	Col. Rudy Rival *Plant Manager*	807-67-72
20	Chrome Dazzler Enterprises	Electroplating and Metal Finishing	P. Tuazon Ave., Cubao, Quezon City	Mr. Ruperto Magno *President*	721-29-61
21	Clean Chemicals Philippines, Inc.	Soap and Detergents	D01-44 San Vicente St., San Vicente, San Pedro Laguna	Mr. Romeo Apolega *General Manager*	847-61-86
22	Coca-Cola Bottler's Philippines, Inc.	Beverage	National Highway, Mandaue City	Mr. Edwin Enriquez *Dep't Head / PCO*	(032) 348-96-91
23	Colgate-Palmolive Philippines	Soap and Detergents	1049 J.P. Rizal Avenue, Makati City	Mr. Francis Davantes *Eng'g Div. Dept. Head*	895-94-44
24	Container Corporation of the Philippines	Pulp and Paper	60 Old Samson Road, Balintawak, Quezon City	Mr. Victor Pascual *Plant Manager*	361-98-01
25	Cool Spot Dairy Foods	Food Processing	N. Domingo St., San Juan, Metro Manila	Mr. Winston Cheong *Plant Manager*	722-90-12
26	Derm Pharmaceuticals	Pharmaceuticals	MGF Champaca Bldg,166 Armosolo St, Legaspi Vill, Makati	Mr. Bonifacio Sampaga *Quality Manager*	812-79-51
27	Directrix Industries, Inc.	Metal Foundry and Forging	55 Kanlaon St., Mandaluyong City	Mr. Timoteo Intalan *Plant Manager*	531-20-22

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No.	Company	Category	Address	Respondent	Tel. No.
28	Drug Makers Biotech Research Laboratories, Inc.	Cosmetics	E & E Complex, San Antonio, San Pedro, Laguna	Ms. Emelita Azores *Cosmetics Manager*	809-85-25
29	Durano Sugar Mill	Sugar Milling and Refining	Dunguan, Danao City	Ms. Carmelita Murillo *Dept. Head - Production*	(032) 200-38-88
30	Dyson Surface Coating Corporation	Electroplating and Metal Finishing	14 Golden Rd., Caloocan Ind'l Subd. Bo. Katbiga, Caloocan	Mr. Saturnino Dy *President*	937-40-10
31	F. Martinez and Company (La Pacita)	Food Processing	88 Garnet St., Mambungan, Antipolo City	Mr. Ariel Manansala *Pollution Control Officer*	646-69-40
32	Far East Alcohol Corporation	Coconut-based Milling & Spirit Distillation	Sitio Apalit, San Vicente, Apalit, Pampanga	Mr. Rodolfo Calgui *Fields Operation Mngr.*	(045) 302-59-04
33	Fastbrite Industrial Plating Corporation	Electroplating and Metal Finishing	913 M. Naval St., Bridge, Marcos Hi-way, Marikina City	Mr. Domingo Dy *Plant Manager*	645-56-84
34	Florence Foods Corporation	Food Processing	Gate 3 Amparo Bldg., Quirino Highway, Novaliches, Q.C.	Mr. Henson Laurel *President*	961-48-38
35	FMC - Marine Colloids Philippines, Inc.	Chemical Products	Ouano Compound, Looc, Mandaue City	Ms.Tita Tomayao *Plant Manager*	(032) 345-01-95
36	Foodsphere Inc.	Food Processing	560 West Service Road, Paso de Blas, Valenzuela City	Mr. Rolly Cruz *Vice President*	294-11-11
37	Fortune Textiles, Inc.	Spinning, Textile and Dyeing	Bo. San Jose, Montalban, Rizal	Ms. Cecilia Pajel *Plant Manager*	942-20-03
38	Freshtex Phil., Inc.	Spinning, Textile and Dyeing	South Superhighway, Muntinlupa, Matro Manila	Mr. Ruben Fuentes *General Manager*	850-06-31
39	Furusawa Rubber (Phil.), Inc.	Plastics and Rubber Products	Km. 32, National Highway, Nueva San Pedro, Laguna	Mr. Seth Felix *Assistant Manager*	847-56-09
40	General Milling Corporation	Food Processing	M.L. Quezon, Nat'l Highway, Lapu-lapu City	Mr. Rodrigo Becalso *Manager - Eng'g. Dept.*	(032) 340-88-88
41	Genetron International Marketing	Chemical Products	Suite 203, J.G.F. Bldg., 30 Scout Tuazon, Quezon City	Mr. Ricardo Oyteza *Pollution Control Officer*	372-38-45

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No.	Company	Category	Address	Respondent	Tel. No.
42	Granexport Manufacturing Corporation	Coconut-based Milling & Spirit Distilation	16/F UCPB Bldg., Makati Avenue, Makati City	Mr. Hermil Calasang *Assistant Manager*	892-79-61
43	GST Philippines, Inc.	Machinery & Tool Manufacturing	1 Labao St., Napindan, Taguig, Metro Manila	Mr. Max G. Paca *President*	641-60-11
44	HJR International Corporation	Food Processing	Riverside, Canduman, Mandaue City	Mr. Vicmando Suliva *HRD Officer*	(032) 346-10-86
45	INCHEM Environmental, Inc.	Chemical Products	Km. 32, McArthur Highway, Bo. Tuktukan, Guiguinto, Bulacan	Mr. Alfredo Reyes Jr. *VP - Manufacturing*	(044) 794-04-45
46	International Chemical Ind., Inc.	Chemical Products	Km. 32, McArthur Highway, Bo. Tuktukan, Guiguinto, Bulacan	Ms. Cecilia Mamaril *Assistant Vice Pres.1*	(044) 794-26-88
47	International Pharmaceutical, Inc.	Cosmetics	J. Luna Avenue, Mabolo, Cebu City	Ms. Lily Camacho *Production Manager*	(032)-231-26-85
48	IPI - Soapery Division	Soap and Detergents	Juan Luna Ave., Mabolo, Cebu City	Mr. David Wong *Production Manager*	(032) 231-26-85
49	K & A Metal Industries, Inc.	Metal Foundry and Forging	Western Cebu Ind'l Park, Balamban, Cebu	Mr. Jose de la Victoria *Safety & Env'l Mngr.*	
50	La Tondeña Distillers, Inc.	Coconut-based Milling & Spirit Distilation	Subangdaku, Mandaue City, Cebu	Mr. Mario Belonguel *Head - Tech'l Services*	(032) 345-04-14
51	Legaspi Oil Company, Inc.	Coconut-based Milling & Spirit Distilation	16/F UCPB Bldg., Makati Avenue, Makati City	Mr. Hermil Calasang *Assistant Manager*	892-79-61
52	Limay Grinding Mill Corporation	Cement Manufacturing	Unit 2011 Herrera Tower, Herrera cor Valero St., Makati City	Mr. Lorenzo Pangilinan *Comptroller*	753-25-59
53	Liwayway Publishing, Inc.	Printing Industries	2249 Chino Roces Avenue, Makati City	Mr. Renato Castillo *Plant Manager*	819-31-01
54	LMG Chemicals Corporation	Chemical Products	6/F Chemphil Bldg., Makati City	Mr. Jose Fernandez *Plant Manager*	641-08-91
55	Lorenzana Foods Corporation	Food Processing	551 M. Naval St., Navotas, Metro Manila	Ms. Merlinda Martin *Plant Manager*	282-45-01

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No.	Company	Category	Address	Respondent	Tel. No.
56	M - Plus Plastics, Inc.	Plastics and Rubber Products	LISP, Cabuyao, Laguna	Mr. Manolito Briones *Manager*	725-22-60
57	Mactan Rock Industries, Inc.	Chemical Products	Suba Masulog, Lapu Lapu City	Mr. Antonio Tompar *President / CEO*	(032) 492-33-69
58	Manila Bulletin Publishing Corporation	Printing Industries	Intramuros, Manila	Mr. Ramil Yumang *Plant Manager*	527-81-26
59	Manly Plastics, Inc.	Plastics and Rubber Products	CBT Condominium, 60 West Avenue, Quezon City	Mr. Jesus Amon Jr. *Plant Manager*	371-47-03
60	Medwell Laboratories	Pharmaceuticals	905 Epifanio de los Santos Ave., Quezon City	Ms. Assunta Magas *Asst. Gen. Manager*	926-94-07
61	Monde M. Y. San Corporation	Food Processing	534 Gracias St., Maric Subd., Cainta, Rizal	Mr. Raymond Oledan *President*	655-08-09
62	Moonbake, Inc.	Food Processing	KKK Packaging Cmpd., DBP Ave., FTI Taguig, Metro Manila	Ms. Ana Rene Manrique *VP - Operations*	
63	Motorco Industrial Development Corporation	Machinery & Tool Manufacturing	11-17 Pagataan St., San Francisco del Monte, Q.C.	Mr. Ferman Lao *Plant Manager*	364-74-36
64	P & R Parts and Machineries, Inc.	Machinery & Tool Manufacturing	National Road, Brgy. Bagumbayan, Teresa, Rizal	Mr. Noel Manatiga *Production Manager*	650-49-25
65	Papercon Philippines, Inc.	Pulp and Paper	29 Oliveros Drive, Balintawak, Quezon City	Mr. James Pek *President*	362-80-25
66	Petrochemicals Corporation of Asia Pacific	Chemical Products	2/F Chemphil Bldg., Arnaiz Ave. Legaspi Vill., Makati City	Honorato P. Diwa *Pollution Control Officer*	893-05-01
67	Premiere Printing Company, Inc.	Printing Industries	Epifanio de los Santos Ave., Mandaluyong City	Mr. Liberato Gomez *General Manager*	631-77-46
68	Presline Steel Products	Metal Foundry and Forging	Bldg. 4, Felina Cmpd., Arturo Drive, Bagumbayan, Taguig	Mr. Benedict Chan *Plant Manager*	838-63-53
69	Ram Food Products, Inc.	Food Processing	Km. 48, Bo. Pulo, Cabuyao, Laguna	Mr. Filemon Ramos *Vice President*	(049) 531-39-11

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No.	Company	Category	Address	Respondent	Tel. No.
70	Rigid Metal Manufacturing Corporation	Metal Foundry and Forging	M. Antonio St., Maysan Road, Valenzuela City	Mr. Art Dychao *Plant Manager*	292-46-19
71	Robles Heritage Corporation	Electroplating and Metal Finishing	Robles Bldg., Gonzales Cmpd., Almanza I, Las Piñas City	Mr Gideon Robles *President*	873-28-85
72	Robsen's, Inc.	Beverage	Pulilan, Bulacan	Mr. Tony Ding *VP - Operations*	(044) 676-15-40
73	Royal Industrial Development Corporation	Soap and Detergents	88 E. Rodriguez Jr. Avenue, Quezon City	Mr. David Lim *President*	636-16-17
74	SafeCo Environmental Services, Inc.	Chemical Products	9 San Gregorio St., Capitol 8, Pasig City	Mrs. Marilyn Hoese *President*	671-14-70
75	Saffron Philippines, Inc.	Spinning, Textile and Dyeing	Governor's Drive, Bo. Paliparan, Dasmariñas, Cavite	Mr. Alfredo Soon *Vice Pres. - Marketing*	(046) 972-01-21
76	San Jose Glass Corporation	Glass and Glass Products	East Bay, Wari Road, Bo. Pantok, Binangonan, Rizal	Mr. Archie Archille *Plant Manager*	289-10-98
77	San Miguel Beer Corporation	Beverage		Mr. Renato Solis *Manager - Q & P*	
78	San Miguel Foods, Inc. (B-MEG / Animal Feeds)	Chemical Products	Tawagan, Tayud, Consolacion, Cebu	Ms. Jeanette Perez *QA - Supervisor*	(032) 424-61-96
79	SC & C Cosmetech Company, Inc.	Cosmetics	Leviste Ave., West Service Rd., So. Superhiway, Parañaque Ctiy	Mr. Eduardo Cochua *Safety & Env'l Mngr.*	824-40-25
80	SCA Hygeine Products Corporation	Pulp and Paper	PCIE Governor's Drive, Langkaan, Dasmariñas, Cavite	Ms. Eliza Santos *Plant Manager*	(046) 402-01-94
81	Seaoil Petroleum Corporation	Petroleum Products	933 C. Castañeda St., Brgy. Namayan, Mandaluyong	Mr Sherwin Chua *Pollution Control Officer*	531-90-51
82	Solid Cement Corporation	Cement Manufacturing	Solid Cement Cmpd., Sitio Tigbak Brgy. San Jose, Antipolo City	Mr. Celestino de Leon *Plant Manager*	650-26-91
83	South Pacific Chemical Indusries, Inc.	Chemical Products	Cainta, Rizal	Mr. Henry Vy *Manager*	817-15-86

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No.	Company	Category	Address	Respondent	Tel. No.
84	Splash Manufacturing Corporation	Cosmetics	17 F. Lazaro St., Canumay West, Valenzuela City	Mr Herginio Porte *Plant Manager*	292-24-78
85	Sweet Crystals Corporation	Sugar Milling and Refining	Bo. Planas, Porac, Pampanga	Mr. Arturo Senining *Pollution Control Officer*	(045) 961-38-95
86	Swiss Pharma Research Laboratories	Pharmaceuticals	Bo. Pittland, Cabuyao, Laguna	Ms. Rosalina Nolasco *Sr. Vice President*	(049) 549-23-72
87	Taihei Alltec Construction (Phil.), Inc.	Electroplating and Metal Finishing	Nat'l Highway, Dita, Sta. Rosa, Laguna	Mr. Conrado Alinsod *Plant Manager*	(049) 534-12-22
88	Treasure Island Industrial Corporation	Chemical Products	Pilit, Cabangcalan, Mandaue City	Mr. Hector Soon *Logistics Manager*	
89	TSB Enterprises, Inc.	Beverage	148 Pinkian St., Phinland Subd., Tandang Sora, Quezon City	Mr. Bernie de Guzman *EMR*	931-97-44
90	Unilever Philippines, Inc.	Soap and Detergents	1351 United Nations Avenue, Manila City	Ms. Jenina Lindo *Purchasing Officer*	588-88-88
91	Union Cement Corporation	Cement Manufacturing	Bo. Matiktik, Norzagaray, Bulacan	Mr. Gene Sumbillo *Plant Manager*	870-01-00
92	United Coconut Chemicals, Inc.	Chemical Products	17/F UCPB Bldg., Makati Ave., Makati City	Mr. Pedrito Suministrado *Plant Manager*	815-41-04
93	United Pulp and Paper Company, Inc.	Pulp and Paper	Iba Este, Calumpit, Bulacan	Mr. Allan Dimson *Environmental Head*	(044) 202-43-01
94	Universal Robina Corporation	Food Processing	A. Rodriguez Ave., Rosario, Pasig City	Mr. Romulo P. Ison *Sr. Area Mfg. Manager*	641-30-98
95	URC - Bagong Ilog	Food Processing	Bagong Ilog, Pasig City	Mr.Melchor Bacsa *Senior Mfg. Mngr.*	671-29-35
96	URC - Biaxially Operated Polypropylene	Chemical Products	Brgy. Simlong, Batangas City	Ms. Joevilyn Bacolcol *Logistics Manager*	(043) 300-73-00
97	URC - Meat and Canning Division	Food Processing	E. Rodriguez Ave., Libis, Quezon City	Ms. Giselle Gonzales *Manufacturing Manager*	635-43-65

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No.	Company	Category	Address	Respondent	Tel. No.
98	VEMAVAL, Inc.	Chemical Products	1 Langka Road, FTI Complex, Taguig, Metro Manila	Mr. Jacinto Mantaring Jr. *President*	838-39-02
99	Viva Footwear	Plastics and Rubber Products	San Vicente St., San Pedro Laguna	Fr. Hendrix Javen *HRD/Legal Consultant*	869-02-37
100	VL Industech Corporation	Machinery & Tool Manufacturing	Marimil Subd., San Pedro, Laguna	Mr. Virgilio Lanzuela *Plant Manager*	808-59-01