

Inaugural Project of IGES Kansai Research Center  
International Forum 2001 on  
“Business and the Environment”

## International Workshop on “Environmental Accounting”

Inauguration of Environmental Management Accounting  
Network - Asia Pacific (EMAN-AP)



Thursday, September 27th 10:00 a.m. to 7:00 p.m.  
Shin Kobe Oriental Hotel, Kobe, Japan

Organized by: Institute for Global Environmental Strategies

Supported by: Ministry of Environment, Hyogo Prefecture, Asia-Pacific Network for Global Change Research (APN), International Center for the Environmental Management of Enclosed Coastal Seas, Hyogo Environmental Advancement Association, Hyogo Prefecture Liaison Conference for Air Environment Conservation, Hyogo Prefecture Liaison Conference for Environmental Conservation in the Seto Inland Sea, Environmental and Economic organizations in the Kansai Area (Kansai Council, Global Environment Forum-KANSAI, Kansai Economic Federation, The Federation of Chamber of Commerce and Industrial Association, The Hyogo Industrial Association, The Osaka Industrial Association, The New Industry Research Organization)

## Purpose

### International Forum 2001 on “ Business and the Environment ”

The Institute for Global Environmental Strategies (IGES) established the Kansai Research Center in June 2001 with strong support from the Hyogo Prefectural Government and with cooperation from businesses and organizations in the Kansai region (Kobe, Osaka, Kyoto, etc.). In cooperation with academic institutions and businesses in the Kansai region as well as domestic and international research institutions, researches, policy proposals and promotion activities based on the themes of “ Industry and the Environment ” are scheduled at the Kansai Research Center where IGES will make a base for the Kansai region. The first three years will be devoted to the study of the Business and the Environment Project, in which environmental accounting and detailed methods of sustainable management such as environmental information disclosure will be researched.

In commemoration of the opening of the Kansai Research Center, with the sponsorship by the Ministry of the Environment of Japan, an international symposium on “ Sustainable Management ” and a workshop on “ Environmental Accounting ” was held as the International Forum 2001 on “ Business and the Environment ”. Experts from the Asia-Pacific and many regions of the world joined together to hold discussions on up-to-date information regarding corporate efforts towards sustainable development and future management strategies.

### Workshop on Environmental Accounting

Environmental Management Accounting is considered as one of the most important tools of “ sustainable management. ” For the further progress in the method and dissemination in the Asia-Pacific region, experts and researchers in the region come together to report and exchange information on current situation in individual countries, research results, information and opinions on environmental management accounting. Environmental Management Accounting Network - Asia Pacific ( EMAN-AP ) is aiming to establish cooperation in the studies and information exchanges between experts and researchers for sustainable development.

## Workshop Scenes



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Inaugural Project of IGES Kansai Research Center  
International Forum 2001 on " Business and the Environment "  
International Workshop  
on " Environmental Accounting "

Inauguration of Environmental Management Accounting  
Network-Asia Pacific (EMAN-AP)

Date Wednesday, September 27<sup>th</sup>  
Place Shin Kobe Hotel, Kobe, Japan

### Program

10:00 ~ 10:30 Inaugural Session of Environmental Management Accounting  
Network for Asia Pacific (EMAN-AP)

Members of Steering Committee of EMAN-AP:

Katsuhiko Kokubu Project Leader, Business and the Environment Project Kansai Research Center, IGES / Professor of Social  
and Environmental Accounting, Graduate School of Business Administration, Kobe University, Japan

Roger Burritt Senior Lecturer, School of Business and Information Management, The Australian National University

Byung-Wook Lee Director, Environmental Management Center, POSCO Research Institute, Korea

Maria Fatima Reyes Chair, Environmental Accounting Committee, Philippine Institute of Certified Public Accountants (PICPA)

1st Session Environmental Accounting : Trends of Each Country

Chair: Jee In Jang Dean of Graduate School of International Management and Professor of Accounting at Chung-Ang University, Korea

10:30 ~ 11:00 Report 1: " Environmental Accounting Practices of Listed Companies in Japan "

Katsuhiko Kokubu Project Leader, Business and the Environment Project Kansai Research Center, IGES / Professor of Social  
and Environmental Accounting, Graduate School of Business Administration, Kobe University, Japan

Eriko Nashioka Research fellow, Kansai Research Center, IGES

11:00 ~ 11:30 Report 2: " Environmental Accounting in Korea : Cases and Policy Options "

Byung-Wook Lee Director, Environmental Management Center, POSCO Research Institute, Korea

11:30 ~ 12:00 Report 3: " Contemporary Environmental Management Accounting (EMA) Developments in Australia "

Roger Burritt Senior Lecturer, School of Business and Information Management, The Australian National University

12:00 ~ 13:00 Lunch

2nd Session Environmental Accounting : Operations of Each Country

Chair: Nobuyuki Miyazaki Professor of the College of Liberal Arts, International Christian University

13:00 ~ 13:30 Report 4: " EMA in the Philippines: Education and Corporate Application "

Maria Fatima Reyes Chair, Environmental Accounting Committee, Philippine Institute of Certified Public Accountants (PICPA)

Rene Jueco Mayol Assistant Vice President, Environment, Safety and Health, Lopez Group of Companies

13:30 ~ 14:00 Report 5: " Introducing EMA to the Indonesian Industries through Effluent Charge "

Liana Bratasida Executive Director, Indonesian Society of Environmental Professionals

14:00 ~ 14:30 Report 6: " Case Study of Japanese Companies' Environmental Accounting in Asia "

Shinichi Imai Senior Visiting Researcher, Kansai Research Center, IGES, Manager, Corporate Environmental Affairs  
Division, Matsushita Electric Industrial Co., Ltd.

14:30 ~ 15:00 Coffee Break

3rd Session The Role of Environmental Management Accounting in the Asia-Pacific Region

15:00 ~ 17:00 Chair: Katsuhiko Kokubu Project Leader, Business and the Environment Project Kansai Research Center, IGES / Professor of Social  
and Environmental Accounting, Graduate School of Business Administration, Kobe University, Japan

Commentator:

Martin Bennett Principal Lecturer in Financial Management at Gloucestershire Business School, Cheltenham and Gloucester College  
of Higher Education, UK / Chair of the Environmental Management Accounting Network-Europe (EMAN-EU)

Tomoko Kurasaka Certified Public Accountant

Jongdae Kim Associate Professor, School of Business of The Chungbuk National University, Korea

17:00 ~ 19:00 Buffet Dinner



## Katsuhiko Kokubu

Project Leader, Business and the Environment Project Kansai Research Center, IGES / Professor of Social and Environmental Accounting, Graduate School of Business Administration, Kobe University, Japan / Steering Committee Member of Environmental Management Accounting Network - Asia Pacific (EMAN-AP)

Completed Ph.D. at Osaka City University. Formally appointed as Associate Professor at Osaka City University, Visiting Scholar at London School of Economics (LSE) and Associate Professor at Kobe University. Has been involved with many governmental projects on environmental accounting. Has served as member of the Study Group on Development of Environmental Accounting Systems and the Committee on the Revision of Environmental Reporting Guidelines, and an advisor of the Study Group on Corporate Environmental Accounting Practices (these three projects are led by Ministry of the Environment). Also he has been a Chairperson of the Environmental Accounting Committee of Japan Environmental Management Association for Industry led by Ministry of Economy, Trade and Industry. Currently appointed as Visiting Researcher at IGES, International Associate of the Centre for Social and Environmental Accounting Research at University of Glasgow, Director of Environmental Economics and Policy Association, Director of Corporate Social Accounting and Reporting Association. His publications include "Environmental Accounting" (Shinseisha, 2000), "Social and Environmental Accounting" (Chuokeizaisha, 1999), "Environmental Disclosure and Corporate Strategy" (Toyokeizai Shinpo-sha, 1998), and "Social Investment" (Nihonkeizai Hyoronsha, 1988).



## Eriko Nashioka

Research fellow, Kansai Research Center, IGES

Obtained a master degree from The Graduate School of Policy and Management (major in Environmental Management), Doshisha University in 1997. Prior to joining IGES, she worked at Century Ota Showa & Co. (1991-2000). Her major research interests are analysis of the status of environmental accounting in Japanese corporations, "impact" of environmental accounting and environmental accounting for environment-related businesses. A member of the Environmental Accounting Expert Committee of the Management Research Study Group of Japanese Institute of Certified Public Accountant, the Electrical and Electronics Engineering Working Group for the Study Group on Corporate Environmental Accounting Practices and the Study Group on Guidebook for Environmental Accounting led by the Ministry of the Environment, and the Environmental Performance Evaluation and Indicators Study Group of the Environmental Accounting Committee of Japan Environmental Management Association for Industry which Ministry of Economy, Trade and Industry entrusts their research. She is also a member of GRF (Green Reporting Forum) and involved in activities in APANAC (Asia Pacific NPO Assistance Club). Her published work, "Global Environment and Roles of Certified Public Accountant - The New Earth Project" (JICPA Journal, January 1993) received the Best Paper Award of the Technical Training Course of Japanese Institute of Certified Public Accountant. Her main publications include "Environmental Accounting for Corporate Management" edited by Japanese Institute of Certified Public Accountant (authored by the Environmental Accounting Expert Committee of the Management Research Study Group of Japanese Institute of Certified Public Accountant) (Nikkei BP, December 2000), "What is the Environmental Accounting? - A Guideline of Ministry of the Environment 2000" (Sangyo-Noritsu Journal, September 2000).



## Byung-Wook Lee

Director, Environmental Management Center, POSCO Research Institute, Korea / Steering Committee Member of Environmental Management Accounting Network - Asia Pacific (EMAN-AP)

Ph.D. in Environmental Management, Manchester School of Management, University of Manchester Institute of Science and Technology (UMIST), U.K.. After working as Planning Manager, ICI Korea Ltd., he has been in his present position. Visiting Professor, Graduate School of Environmental Studies, Seoul National University, a member of the Presidential Commission for Sustainable Development (PCSD), Director of the Korea Environmental Policy and Administration Society, Director of the Korean Society for Life Cycle Assessment, and Advisor to the Ministry of Environment and many other public institutions. His publications include "Environmental Management" (a textbook in Korea) and "Waste Costing for a Korean Steel Producer".



## Roger L. Burritt

Senior Lecturer, School of Business and Information Management, The Australian National University, Steering Committee Member of Environmental Management Accounting Network for Asia Pacific (EMAN-AP)

After having completed the Master of Philosophy in Management Studies at Oxford University, U.K. in 1975, Roger gained experience as Lecturers/Senior Lecturers in Accounting and Finance at the University of Lancaster, U.K., the University of Sydney, Australia and the University of Canterbury, Christchurch NZ. Since 1988 he has been appointed to his present position. His main research interests include environmental accounting and accountability in the public and private sectors of developed and developing countries; management accounting and related subjects. Roger is a Fellow of CPA

Australia, an Associate of the Institute of Chartered Accountants in Australia, and an Associate of the Chartered Institute of Bankers, UK. He qualified as a Certified Management Accountant (CMA) in 2000. His publications include "Contemporary Environmental Accounting: Issues, Concepts and Practice" (2000) with Professor Stefan Schaltegger and many other studies. He has also made recommendations to the national / local government bodies.



## Maria Fatima Reyes

Chair, Environmental Accounting Committee, Philippine Institute of Certified Public Accountants (PICPA), Steering Committee Member of Environmental Management Accounting Network for Asia Pacific (EMAN-AP)

Certified Public Accountant from the Philippines. Completed M.B.A. in Business Administration degree from De la Salle University, Manila, Philippines, 1999. Professor of accounting and finance in several schools and universities in Manila. Member of the Steering Committee of EMAN-AP. Taking part of affluent environmental accounting-related projects: a) As a member of an international consulting team working as part of a UNEP project of Financing Cleaner Production Investments, she conducted the "Profiting from CP" course in Hanoi and Ho Chi Minh, Vietnam in 2001; b) Involved the project of

Environmental Accounting Training in Singapore, 2000; and As a Philippine manager of the USAID/CSG funded project to develop and deliver a course on cleaner production profitability for facility accountants and engineers in the Philippines. Her recent published works include "The Greening of Accounting: Putting the Environment in the Agenda of the Accountancy Profession in the Philippines", (The Accountant's Journal. 3rd and 4th Quarter Issue, 2000), "Why Environmental Accounting?", (Philippine Pollution Prevention Roundtable Newsletter. Oct-Dec 2000), and "International Accounting Standards Relating to Environmental Issues in Business", (The Accounting Times. March 2000).



## Liana Bratasida

Executive Director, Indonesian Society of Environmental Professionals

Completed Master Degree of Environmental Science and Technology. Has working experience at Cellulose Research Institute (1971-87), Industrial Research and Development Agency, Ministry of Industry (1988-90), Environmental Impact Management Agency (1990-2000), and Industrial Research and Development Agency, Ministry of Industry and Trade (2000-June 2001) in Indonesia. Since 1999 has been an APO expert on Green Productivity. She also has been giving many lectures related Environmental Affairs at corporations and Universities.



## Shinichi Imai

Senior Visiting Researcher, Kansai Research Center, IGES, Manager, Corporate Environmental Affairs Division, Matsushita Electric Industrial Co., Ltd.

Graduated from Faculty of Electrical Engineering, Faculty of Science and Engineering, Waseda University in 1971. Joined Matsushita Electric Industrial Co., Ltd. In the same year. Had engaged in products designing, technical management and products planning in Air-conditioner Division. Has been in his current position since 1998 and has been in charge of introduction and promotion of environmental accounting into Matsushita Group and promoting recycling of the used products. His publications include "Environment Friendly Production and Recycling in Matsushita Electric Industrial Co., Ltd." collaborated with Takao Tanaka (Toshimondai Kenkyu. Vol.51 No. 1, Nov. 1999), "Matsushita

Group's Activity with Environmental Accounting" (Kankyo Kanri. Vol.35 No.12, 1999), "Matsushita Electric: Background of the Introduction of Environmental Accounting and Environment Related Cost" (Denshi Gijutsu. Vol. 41 No.13, Dec. 1999), "Matsushita Electric Industrial Co., Ltd." (Environmental Accounting Guidebook. issued by Environmental Agency, Mar. 2000), "Recycling Home Appliances" collaborated with Koji Gamo and Koji Nitta (Electronics Communication. No.16, 2000)

# 1st Session

Environmental Accounting :  
Trends of Each Country

## 1. Introduction

The number of Japanese corporations which publish environmental reports has been increasing very rapidly. According to the “ A Survey of Environmentally Corporate Behavior ” [Ministry of the Environment (2001a)], the proportion of listed corporations surveyed<sup>1)</sup> which disclosed environmental information showed a rising trend from 35.7 per cent (1998) to 40.9 per cent (1999) to 51.0 per cent (2000). Out of these companies the proportion of those which published environmental reports also increased from 30.9 per cent (1998) to 37.3 per cent (1999) to 45.9 per cent (2000). This sort of trend is likely to increase further, judging from the publication of “ Environmental Reports Guidelines (Fiscal 2000) ” by the Ministry of the Environment (MOE) in February 2001 and the “ Environmental Reporting Guideline for Stakeholders ” by the Ministry of Economy, Trade and Industry (METI) in June 2001.

The number of companies which disclose environmental accounting information in their environmental reports is also on the increase. During the first half of the 1990s when the word “ environmental accounting ” was not in general use, only a handful of corporations measured environmental costs. However, according to the MOE’s survey (2001a), out of the above-mentioned listed corporations which replied that they disclosed environmental information, the proportion which disclosed environmental accounting information showed a steeply-rising trend from 10.4 per cent (1998) to 20.9 per cent (1999) to 27.0 per cent (2000). Concerning the question on the introduction of environmental accounting, 17.3 per cent replied that they had already introduced it, while 34.2 per cent replied that they were considering its introduction. These trends were obviously influenced by the environmental accounting guideline published by the Environmental Agency (now the Ministry of Environment : MOE) in May 2000. The draft guideline was published in 1999. Furthermore, both of the MOE’s and the METI’s environmental reporting guidelines recommended environmental accounting information disclosures in the environmental reports. Therefore, more and more companies are expected to introduce and publish environmental accounting.

Although such guidelines are likely to have a considerable influence on environmental accounting and reporting practice, they are not mandatory rules, but voluntary. The methods

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\*\* Institute for Global Environmental Strategies, Kansai Research Center, Research Fellow/C.P.A.

1) The number of listed companies which gave valid answers was 1,051 in 1998, 1,147 in 1999 and 1,170 in 2000.

and procedures for environmental accounting in the MOE's guideline are quite flexible and even ambiguous. The guideline leaves much discretion to companies. This means that how and to what extent the guideline influence environmental accounting practice becomes an important research issue. The object of this study is twofold : to clarify the special characteristics of Japanese environmental accounting practice by examining the environmental accounting information disclosure by Japanese corporations; and to analyze the influence on Japanese corporations by the MOE environmental accounting guideline. Before examining these issues, some main governmental initiatives on environmental accounting and previous studies on Japanese environmental accounting practices are briefly studied.

## 2. Environmental Accounting Initiatives in Japan

Environmental accounting practice is voluntary for companies in Japan. However, a number of efforts are being made to support and encourage companies' endeavors. Some of important initiatives from governments and professional bodies will be examined.

### 2.1. Initiatives of the Ministry of Environment (MOE)

The MOE published "Developing an Environmental accounting System (2000 Report)" in May, 2000. The most part of this report consists of "Guideline for Introducing an Environmental Accounting System (2000 version)" (referred to as the "guideline" henceforth). This is a final document for the guideline draft published in the previous year as mentioned above. However, MOE adds such words as "2000 report" as the title of the report. This is because "considering the current situation where research of environmental accounting and installation conditions are progressing steadily, we considered necessary the future reinforcement of the contents of the report as required" (MOE, 2000, p.3). Therefore, the guideline is expected to be revised in the future as required, however, the timing of the review is not indicated clearly.

The key contents of the guideline can be summarized in the following three points :

- Environmental accounting system
- Environmental conservation cost
- Environmental conservation effects and economical effects

#### Environmental accounting system

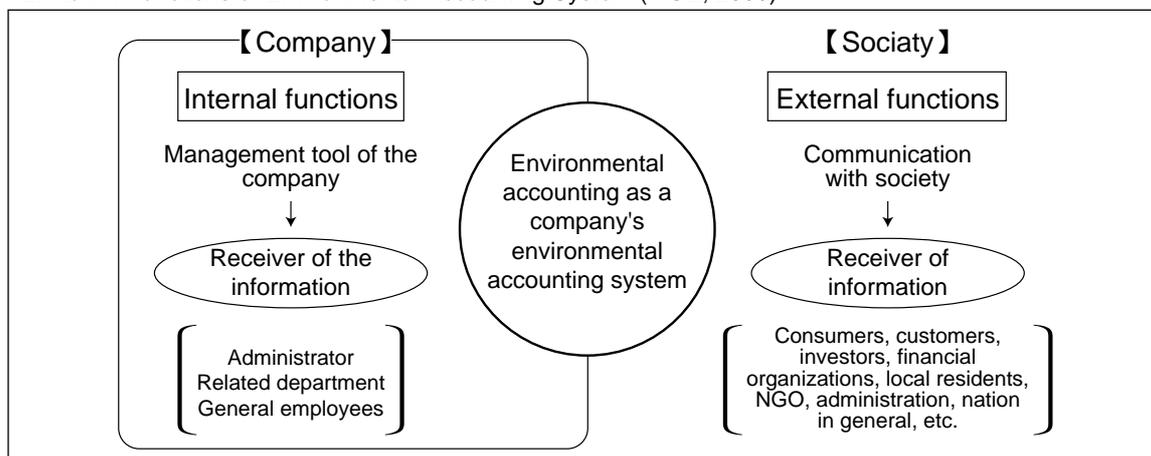
The guideline indicates two different functions of environmental accounting :an internal function for management and an external function for communication with various stakeholders (see Exhibit 1). However, the actual contents of the guideline are considered to be more oriented to external reporting, rather than internal management. This is not clearly indicated by the

guideline itself, but the following paragraph suggests its emphasized point.

This report is intended to enable comparison of information by environmental accounting as much as possible since the report summarizes the coherent concept regarding environmental accounting. Currently, only the framework of environmental accounting is incomplete and some limitation cannot be avoided due to the characteristics of the guideline that respect the independence of enterprises and diversity of individual business categories. However, in the future, we hope to develop a system that enables comparison of basic sections not only sequentially but also among enterprises. (MOE, 2000, p.5)

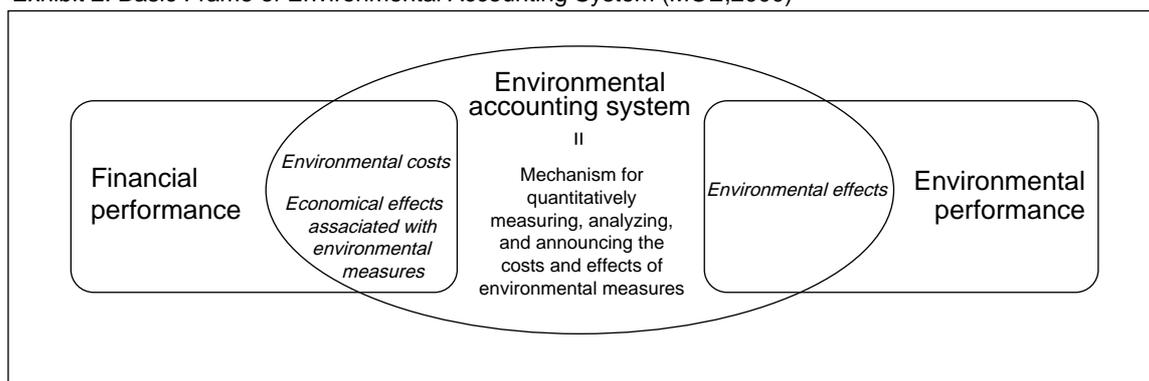
The media to be used for environmental accounting information disclosure in the guideline is an environmental report, not a financial report. The environmental accounting is supposed to be completely independent from any corporate financial accounting.

Exhibit 1. Functions of Environmental Accounting System (MOE, 2000)



The basic frame of environmental accounting system is indicated by Exhibit 2. Environmental accounting is defined as a system that integrates financial performance and environmental performance. In fact these performances are integrated by correlating the environmental conservation effects and economical effects associated with environmental measures. At the stage of the guideline draft, environmental accounting is more likely restricted to calculation of environmental conservation cost, however, in the guideline, the range of an environmental accounting system is expanded in order to be a fundamental tool for environmental conservation as well as corporate management.

Exhibit 2. Basic Frame of Environmental Accounting System (MOE,2000)



### Environmental conservation cost

The guideline expands the scope of environmental accounting, however, it still emphasizes calculation of the environmental conservation cost in the same way as for the guideline draft. The guideline defines environmental cost as the “ investment and cost for environmental conservation ”. For the definition of the investment and the cost, in principle, the definition of financial accounting is employed. The purpose of expenditure is adopted as criteria to identify what is environmental conservation cost or investment. If the purpose is considered to be environmental conservation, those costs and investments should be environmental. Concerning environmental conservation, three major activities, including pollution prevention, global environmental conservation, and resource circulation are indicated by the guideline.

Concerning measurement of environmental cost, a differential calculation is recommended as a basic method when environmental cost incurred as a composite one. This method requires excluding the cost incurred not for environmental conservation from the total amount of each environmental cost item. If this method is difficult, company can employ some simple calculations. For example they are allowed to adopt some predetermined allocation ratio such as 25%, 50% or 75% in order to distinguish the amount for environmental conservation from amount for the other purposes. This often happens when companies buy some facilities that have not only environmental protection function but also some other functions.

The guideline classifies environmental cost into the following six categories.

- (1) Environmental conservation cost for controlling the environmental impacts that are caused within a business area by production and service activities (Abbreviated as business area cost)
- (2) Environmental cost for controlling environmental impacts that are caused in the upstream or downstream as a result of production and service activities (Abbreviated as Upstream/Downstream cost)
- (3) Environmental cost in management activities (Abbreviated as management activity)

cost)

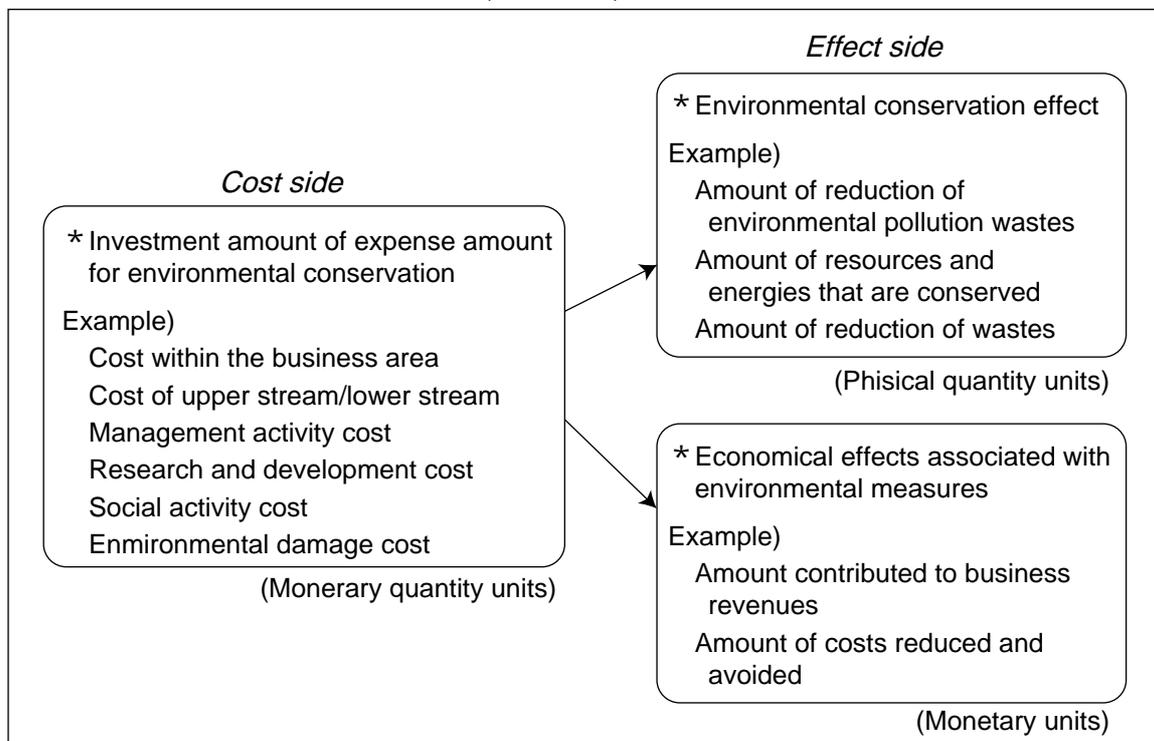
- (4) Environmental cost in research and development activities (Abbreviated research and development cost)
- (5) Environmental cost in social activities (Abbreviated as social activity cost)
- (6) Environmental costs corresponding to environmental damages (Abbreviated as environmental damage costs)

The scope of the guideline is very comprehensive. However, companies do not have to calculate all cost categories in the first stage, but can choose relevant cost categories for them. Another feature of the classification is that lifecycle thinking is introduced to the classification between category (1) and (2).

#### Environmental conservation effects and economical effects

The most significant features of the guideline compared with the former guideline draft are environmental conservation effects (benefits) and economical effects (benefits) introduced in the environmental accounting system. This revision is to overcome the limitation of the guideline draft, which is unable to clarify how efficiently or effectively environmental conservation activities are implemented. The guideline shows the relationship between costs and effects (benefits) by Exhibit 3.

Exhibit 3. Environmental Costs and Effects (MOE, 2000)



Effects of environmental conservation measures are classified into an environmental conservation effect that indicates improvement of environmental performance and an economical effect that contributes to financial performance. Basically, the former is measured by the physical unit and the latter is measured by monetary units. Among these effects, the environmental conservation effect is to be checked first as a higher priority because environmental conservation cost should be spent mainly for environmental conservation not for economical effects.

For environmental conservation effects, the guideline classifies them into three categories, (1) environmental conservation effect occurring within the business area, (2) environmental conservation effect occurring in the up/down stream, and (3) other effects. The guideline provides some examples of actual index for each category. This category of environmental conservation effects is, in principle, associated with the category of the environmental conservation cost that was described before. However, since environmental conservation effects corresponded to the environmental conservation cost other than the cost within the business area and the up/down stream cost often cannot be measured easily, these effects are summarized as “ other effects ”. Measurement methods of environmental conservation effects should be standardized so that the information can be compared when the effects are reported externally. However, the guideline does not provide for the measurement methods in detail.

Corporate environmental protection activities should mainly pursue reduction of environmental impact, that is, improvement of environmental performance. However, companies should simultaneously pursue economical benefits as well. For instance, in the introduction of an environmental management system, the emphasis was rather placed on the economical benefits such as cost saving by energy saving or waste reduction. The economical benefits specified by the guideline are classified into “ economical effects calculated based on credible basis ” and “ economical effects based on hypothetical calculation ”. Only the former is expected to be disclosed externally and the latter is not requested to be disclosed. When the latter is reported publicly, however, the effects are to be distinguished from the “ effects based on credible basis ” and the calculation ground and/or method are to be disclosed. As the “ economical effects calculated based on credible basis, ” substantive effects such as recycle income and cost saving by energy saving are indicated, and the “ economical effects based on hypothetical calculation ” include effects by avoidance of contingent risks and profit contribution assumption effects.

#### Disclosure Format

The guideline provides three types of formats as an environmental accounting statement to be disclosed.

Format A : environmental cost only

Format B : environmental cost and environmental conservation effects

Format C : environmental cost, environmental conservation effects and economical effects  
(Exhibit 3)

Exhibit 4. Environmental Accounting Disclosure Format C

Aggregation scope: ( )  
Target period: from to  
Unit: ( ) yen

Environmental cost				Environmental effects		Comparative index
Category	Details of main implementation and the effects	Investment amount	Expense amount	Contents of effects	Index of environmental impact	
(1) Environmental costs for controlling environmental impacts occurring within a business area as a result of production and service activities (business area costs)				(1) Environmental effects occurring within business area (business area effects)		
Breakdown	1) Pollution prevention cost					
	2) Global environmental cost					
	3) Resource circulation cost					
(2) Costs for controlling environmental impacts occurring in the upper stream or lower stream associated with production and service activities (upper/lower stream costs)				(2) Environmental effects occurring in the upper/lower stream (upper/lower stream effects)		
(3) Environmental costs in management activities (management activity costs)				(3) Other environmental effects		
(4) Environmental costs in research and development activities (research and development costs)						
(5) Environmental costs in social activities (social activity costs)						
(6) Costs corresponding to environmental damages (environmental damage costs)						

When there are environmental costs that are not applicable to any of the categories from (1) to (6) and the costs are described as (7) other environmental costs (other costs), disclose the contents and the reason in order to clarify the scope.

Item	Contents	Amount
Total amount of investments for the period		
Total amount of research and development costs for the period		

Economical effects associated with environmental measures	
Contents of effects	Amount
Revenue obtained by recycling	
Reduction of costs achieved by energy conservation	
Reduction of waste processing costs achieved by recycling	

source: MOE(2000)

Format C is the most comprehensive one. When a company discloses environmental accounting information in their environmental reports, Format C is highly recommended if they can fulfill it.

Although there are some points to be improved in the future such as calculation methods of effects, the basic frame suggests a new framework of environmental accounting that integrates the environmental accounting in monetary units and environmental accounting in physical units. The environmental accounting statement such as Format C provided by the guideline must be regarded as a settlement document in an environmental report likewise the financial statement in a financial report.

## 2.2. Initiatives of the Ministry of Economy-Trade and Industry(METI)

It is also becoming an important issue for Japanese companies that introduce environmental accounting how to integrate the guideline to corporate decision-making. When management accounting is undeveloped, financial accounting is utilized for internal management as well. However, since decision-making in companies has its own specific purpose such as investment decision, price setting and performance evaluation, the integrated environmental conservation cost calculation system provided by the guideline cannot sufficiently meet such individual purposes.

In order to solve this problem, it is necessary to develop various environmental management accounting tools. While in Japan environmental management accounting practices have been slowly developed, Japanese companies started to recognize the importance of those tools for internal use. The project of METI described at the beginning of this paper targets the development of tools of environmental management accounting. In this sense, the MOE's project and the METI's projects should be complementary to each other.

The METI's project started in 1999 and has been working on a three year research plan. In the first year it held discussion from various perspectives including financial accounting, quality costing, life-cycle assessment and costing. It also conducted a research on related programs/tools of the world mainly in the US/Canada and Europe. The research results were published annually report by JEMAI(1999, 2000), which was entrusted with the research by the METI.

Based on the outcome of the first year research, four working groups (WG) were established in the second year to develop tools for specific management purposes. WG1 is developing for environmental capital investment decision-making. WG2 is investigating tools for environmental cost management. WG3 is going to develop tools for environmental and financial performance evaluation. WG4 is examining material flow cost accounting and conducting pilot testing with a Japanese company. Some of these tools will be developed in 2001 and the project will be concluded by March 2002.

As we have mentioned before, since the Japanese environmental practices are much inclined to external disclosure, the METI project should be important to develop the other aspect, internal use, of environmental accounting.

## 2.3. Initiatives of the Japanese Institute of Certified Public Accountants(JICPA)

JICPA has supported some MOE's projects on environmental accounting. They contributed to the environmental accounting guideline and guidebook, and sent advisors to the MOE's Corporate Environmental Accounting Practice Study Group. JICPA has conducted its original research projects. One of its main projects is a literature survey and case studies relating to

linkage between financial accounting and environmental accounting. As the first stage, the Management Research and Investigation Society Report No. 11 was published by JICPA on May 14th 2001, under the title “ International Research Trends and Japanese Issues in relation to ‘ Environmental Accounting within the Framework of Financial Accounting ’ - Accounting Procedures and Disclosure for Environmental Costs and Environmental impact. <sup>2)</sup>

JICPA is also carrying out research on the credibility of environmental information disclosure and in July 2000 it published “ Environmental Report Assurance Guidelines (draft) ” to ask for public comments.<sup>3)</sup> Much is expected in future of this research from the point of view of assuring the credibility of environmental accounting statements.

### 3. A Review of Previous Studies on Corporate Environmental Accounting in Japan

Previous studies on environmental accounting information disclosure by Japanese corporations include those by the Japan Accounting Association (2000) and Matsuo (2001).

The report by the Japan Accounting Association (2000) mainly outlines the establishment of micro and macro environmental accounting. The second chapter about micro environmental accounting written by H. Yagi investigates Japanese corporate environmental accounting. In March 2000 they asked 1,433 companies listed on the First Section of the Tokyo, Osaka and Nagoya Stock Exchanges to send copies of their environmental reports. 218 companies responded by the end of June 2000 and 194 companies' reports were recognized as an environmental report to be investigated. The items investigated were : disclosure of environmental conservation costs (environmental investment and environmental expense); disclosure of economic effects and environmental conservation effects of such costs; and environmental accounting guidelines and environmental reporting guidelines to which these reports conformed.

The results of the survey showed that 99 companies disclosed both expense and investment or one of the two for environmental costs, and 29 companies out of these disclosed some kind of information about effects (environmental conservations effects, economic effects.) Furthermore, in the survey relating to environmental accounting guideline, 15 companies based their accounting on the 1999 guideline draft, while 5 companies based theirs on the 2000 version of the guidelines. Since there was no specific mention of effects in the 1999 guideline draft it is not surprising that so few companies disclosed some kind of information about effects.

Looking only at these results, it is easy to receive the impression that companies do not regard the Fiscal 2000 MOE's guidelines in 2000 as important, but this has to do with the period

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2 ) JICPA Journal, August 2001

3 ) JICA Journal, October 2000

of the survey. The MOE's guideline was actually published in May 2000. Since the publication date for many companies' environmental reports is generally from the end of June till around September, it is likely that during the period of the Japanese Accounting Association's survey from March to June 2000, many companies were in the process of compiling their environmental reports, and then, most of those did not have enough time to reflect the guideline in 2000 in these reports.

This present study, bearing this point about the period in mind, made the deadline the end of December 2000. As a result the number of environmental reports which the survey looked at increased to 257 while the number of those who disclosed environmental accounting information had approximately doubled to 184. There was also an increase, to 106, in the number of companies which based their reports on the MOE's guideline, and the number of companies which based their reports on the 2000 version (87) greatly exceeded the number which based theirs on the guideline draft in 1999(19). A detailed examination is given in the next section.

Matsuo (2001) investigates whether or not the disclosure of environmental accounting information is influenced by industrial sector, company size and the MOE's guideline. Matsuo asked the 872 companies listed in the Fiscal 1999 Nikkei Environmentally Friendly Corporation Survey to send their environmental reports. Out of the 219 companies which replied, 142 companies published environmental reports. 98 companies disclosed environmental accounting information in their reports. Details about the period of the survey are not known. The survey investigated the company size, the industrial sector and the purpose of disclosure of those companies disclosing environmental accounting information. Company size was determined on the basis of sales, and as a result it was confirmed that the larger the size of a company is, the higher the environmental accounting information disclosure level is.

Industrial sector was also found to be an important factor influencing the disclosure of environmental accounting information. Approximately 90 per cent of companies disclosing environmental accounting information are occupied by such industries as chemicals, steel and metal, machinery and electric. This suggested that environmental practices depended on industrial sector. However, Matsuo(2001) does not employ any statistical analyses.

There is another study on the disclosure of environmental accounting information by Kokubu, Nashioka and Daikuara (2001). The study became the groundwork survey for the present study. The survey categorizes environmental accounting information disclosure in environmental reports by companies listed on the First Section of the Tokyo Stock Exchange as of November 2000 according to such aspects as purpose of environmental accounting, disclosure of environmental costs and effects. It also gives case studies of corporations which make the most advanced efforts especially with regard to effects. On the other hand, this present study investigates a broader range of categories and contents more deeply.

#### 4. An Analysis of Environmental Accounting Information Disclosure of Japanese Companies

This study collected and analyzed environmental reports published during 2000<sup>4)</sup> on companies listed on the First Section of the Tokyo Stock Exchange as of September 7, 2000 (1430 companies). 257 of the companies surveyed published environmental reports and 184 companies (71.6 per cent) disclosed some environmental accounting information.

##### 4.1. Characteristics of Corporations which Disclose Environmental Accounting Information

Among corporations which publish environmental reports, is there some difference in financial characteristics between companies which disclose environmental accounting information and those which do not? In order to examine whether there is any difference in sales, total assets, operating profits and return on total asset (ROA), Mann-Whitney U test (a median test) was conducted.<sup>5)</sup> The financial industry were excluded because they have a different accounting standard. The result is shown in Exhibit 5. No significant results were obtained for any variable. This suggests that the trend to disclose environmental accounting information among companies which publish environmental reports is unrelated to these companies' financial characteristics.

The quality of environmental accounting information disclosure varies widely from a simple mention of the total costs to detailed reports conforming to the MOE's guideline. Mann-Whitney U test was conducted for sales, total assets, operating profits and ROA, to find if there was any difference between companies which conformed to the MOE's guideline or their own independent standards in disclosing environmental accounting information and those which did not (with the exception of the financial industry).<sup>6)</sup> The results, shown in Exhibit 6, were

Exhibit 5. A Test of Median Between Company disclosing Environmental Accounting Disclosure and Non Disclosure(Mann-Whitney U test)

		Sales Amount		Total Assets		Operating Profit		ROA	
		Disclosure	non-Disclosure	Disclosure	non-Disclosure	Disclosure	non-Disclosure	Disclosure	non-Disclosure
Statistical Date	Number of Samples	181	69	181	69	181	69	181	69
	Average (million yen)	1329190.81	932103.64	1559256.82	1091003.19	53103.92	40511.75	0.0397	0.0427
A Test of Median	U	6847.50		6950.50		6760.50		5639.50	
	Z	1.18		1.38		1.01		-1.18	
	P (two tails)	0.24		0.17		0.31		0.24	

4) For companies which issued environmental reports twice during 2000, their later reports were surveyed

5) Since the normality of the sample data could not be assumed, the Mann-Whitney U test was adopted (for analyses as mentioned later, non-parametric analyses were conducted in case that the normality of data could not be confirmed)

6) This study's definition of conformity with the MOE's guidelines refers to cases where the account titles of environmental costs substantially follow the guidelines.

significant at the 1 per cent level for sales, total assets and operating profits. This shows that there are significant difference between companies which publish advanced environmental accounting reports based on some sort of guidelines in terms of the median of sales, total assets and operating profits.<sup>7)</sup> Nevertheless, there was no significant difference in terms of profitability as shown in ROA.

Exhibit 6. A Test of the Median Between Companies Based on any Guideline and no Guideline (Mann-Whitney U test)

		Sales Amount		Total Assets		Operating Profit		ROA	
		guidelines	no guidelines	guidelines	no guidelines	guidelines	no guidelines	guidelines	no guidelines
Statistical Date	Number of Samples	135	46	135	46	135	46	135	46
	Average (million yen)	1614690.44	491311.48	1847917.33	712100.98	62282.59	26166.52	0.0400	0.0387
A Test of Median	U	4242.00		4073.00		4042.00		3215.00	
	Z	3.70		3.15		3.05		0.36	
	P (two tails)	0.0002		0.0016		0.0023		0.72	

We analyze whether or not there is a difference in the disclosure of environmental accounting information among industrial sectors. Industries were divided into twelve categories (1 construction 2 food 3 textiles, paper/pulp, 4 chemicals, pharmaceuticals, petroleum and coal, rubber products 5 glass, cement, concrete, ceramic products, iron and steel 6 non-ferrous metals, machinery 7 transportation equipment, precision instruments 8 electric equipment 9 manufacture of other products 10 retail, wholesale, real estate, finance 11 land, marine and air transportation , communications 12 electricity, gas). Chi-square for independence test was conducted. As the results, in Exhibit 7, show the null hypothesis that there is no difference between specific industries was rejected at the 1 per cent level. However it must be remembered that this analysis was carried out on corporations which had published environmental reports and does not investigate the whole of the industry.

Exhibit 7. Environmental Accounting Disclosure and Industry Sector : Chi Square Independence Test

	construction	food	textiles	chemistry/medicine	glass/pottery	non-ferros metals/machine	trasport/precision machine	electronic equipement	other manufactures	retail trade	traffic service	electric power/gas	total
Disclosure	6	6	12	9	38	15	17	20	31	15	5	10	184
Non-Disclosure	0	11	6	3	11	2	7	2	10	14	4	3	73
Total	6	17	18	12	49	17	24	22	41	29	9	13	257
percentage of company( % )	100.00	35.29	66.67	75.00	77.55	88.24	70.83	90.91	75.61	51.72	55.56	76.92	71.60

a test of independence  $\chi^2 = 28.12$  d.f. = 11  $p = 0.0031$

7 ) The study by Kokubu, Noda, Onishi and Shinabe (2001) obtained the result of logit analysis as to publication/non-publication of environmental reports that the proxy variable for the corporate size as represented by the number of employees has a significant influence on the publication of environmental reports.

#### 4.2. Environmental Cost Disclosure : Influence of the MOE § Guideline

Among the 257 companies which published environmental reports, 184 companies disclosed some kind of environmental accounting information. 106 of companies (57.6 per cent) conformed to the MOE § guideline. A breakdown of the 184 companies reveals that 87 companies conformed to the 2000 version of the MOE § guideline, 19 companies to the 1999 guideline draft, 31 companies had established their own independent standards, and 47 companies came under the “ other ” category where standards were unclear or still being drawn up or examined. It is clear that the MOE § guideline have a considerable influence.

As previously mentioned, while the MOE § guideline focuses on environmental costs, they also include some reference to environmental conservation effects and economic effects. Exhibit 8 shows an analysis of the ways in which the guideline influences disclosures of environmental costs and effects.

The MOE § guideline provides that the amount of “ cost ” and the amount of “ investment ” should be stated separately and not added together. This method, which is shown in Exhibit 8 as “ cost disclosure type a <sup>8)</sup> ” (hereinafter called “ type a ”), was adopted by 60 per cent of all companies.

Nearly all of these companies are ones which conform to the MOE § guideline or which have established their own independent guidelines. On the other hand, most of the companies which disclosed only the amount of investment, “ cost disclosure type d ” (“ type d ”) , had not yet prepared guidelines or were in the process of preparing or considering guidelines

Only 10 companies (5.4 per cent) added together the amount of expense and the amount of investment, “ cost disclosure type b ” (“ type b ”). “ Type b ” environmental accounting tries basically to deal with environmental outlay in terms of cash flow and is different in intent from the MOE § guideline which aims at clarifying the relationship between cost and effects (including physical quantities) of environmental conservation activities. Since it is likely that the MOE § guideline will be used more widely from now on, there will probably be no increase in this type, which will tend rather to decline.

“ Cost disclosure type c ” (“ type c ”) denotes cases where only the amount of cost is disclosed. 26 companies (14.1 per cent) were of this type and among these were companies such as Fujitsu and NEC Corporation, so-called environmentally -advanced corporations which had developed their own environmental accounting systems before the publication of the MOE § guideline.

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8 ) Type a includes cases where cost and investment are calculated separately, and added together in the total column only.

## Exhibit 8. Environmental Accounting and the MOE's Guideline

( number of company )

Guideline	Cost Disclosure Type ( * )	Environmental Conservation Effects		Economical Effects			Index			
		Physical Units	Monetary Units	Substantive Effects	Risk Avoidance	Profit Contribution				
Based on the MOE's 2000 Guideline	87	a	73	49	5	56	4	10	5	
		b	3	0	0	2	1	0	0	
		c	10	8	0	0	8	1	1	0
		d	1	0	0	0	0	0	0	0
Based on the MOE's 1999 Guideline Draft	19	a	11	4	0	9	1	4	0	
		b	2	1	0	2	0	0	0	
		c	6	2	0	0	3	0	1	0
		d	0	0	0	0	0	0	0	0
Companies Original Guideline	31	a	22	10	0	14	1	2	0	
		b	2	2	1	1	0	0	1	
		c	7	3	1	2	1	1	1	
		d	0	0	0	0	0	0	0	0
Based on no Guidelines	47	a	3	0	0	0	0	0	0	
		b	3	0	0	0	0	0	0	
		c	3	1	0	1	0	0	0	
		d	37	0	0	1	0	0	0	
		exception	1	0	0	0	0	0	0	0
None Environmental Accounting	73		-	-	-	-	-	-	-	
Total	257		184	80	7	99	9	19	7	

( \* ) Cost Disclosure Type

Cost	Disclosure type	Number of company ( % )		Notes
a	Cost and Investment Added Up Together	109	59.3%	Conformity to the MOE's Guideline(84) + Original(22) = 106 ( 57.6% )
b	Cost and Investment Separately	10	5.4%	
c	Cost only	26	14.1%	
d	Investment only	38	20.7%	Based on no guideline 37(20.1%)
exception	Others	1	0.5%	Indicate only specific project values
Total		184	100%	

#### 4.3. Relationship Between Environmental Costs and Companies 'Financial Data

The relationship between the amount of environmental costs and companies ' financial figures is investigated. At present even companies conforming to the MOE 's guideline leaves a lot of discretion for companies for recognizing and measuring environmental costs. Therefore, the comparability of environmental cost information is not so high. However, even with this limitation, a comparison in terms of environmental costs and financial figures such as sales is probably helpful in seeing trends in companies ' environmental conservation activities.

Out of the environmental cost information disclosed by companies conforming to the MOE 's guideline, we examine the relationship between the total of the three costs of " business area cost ", " upstream/downstream cost " and " management activity cost " and sales, total assets and operating profits. The reason for limiting the environmental costs to these items was that the provision of the other cost such as " R&D cost ", " social activity cost " and " environmental damage cost " were more ambiguous and to then offer much lower comparability.

For correlative analysis of environmental costs and those financial figures, environmental accounting information was divided into two groups : non-consolidated and consolidated<sup>9)</sup>. However, where it was not stated clearly whether the data were non-consolidated or consolidated, it was assumed that non-consolidated data was meant <sup>10)</sup>.

Exhibit 9-1. Spearman Ranking Correlationion  
Between Environmental Cost and Corporate size  
(non-consolidated date)

	Number of Companies	Correlation Coefficient	Z	P
Sales	91	0.60	5.69	0.0000
Total Assets	91	0.66	6.22	0.0000
Operating Profit	91	0.60	5.66	0.0000

Exhibit 9-2. Spearman Ranking Correlationion  
Between Environmental Cost and Corporate  
Size (consolidated date)

	Number of Companies	Correlation Coefficient	Z	P
Sales	16	0.90	3.50	0.0005
Total Assets	16	0.92	3.58	0.0003
Operating Profit	16	0.85	3.30	0.0010

Analysis was performed using the Spearman 's rank correlation coefficient analysis. As the results set out in Exhibit 9 show, the correlation coefficient was positive in the case of non-consolidated data (approximately 0.6) and strongly positive in the case of consolidated data (between 0.85 and 0.9 or above).

9 ) However, the extent consolidation of environmental accounting is not always same as of financial accounting.

10) The average environmental costs (for 106 companies surveyed) were 5 billion yen, which represents, on the average, 0.5% of sales, 17.0% of operating profits and 0.4% of total assets. The environmental costs here include " costs within business area cost ", " upstream/downstream cost " and " management activity cost. "

#### 4.4. Disclosure of Environmental Conservation Effects and Economic Effects

The MOE's guideline requires that environmental conservation effects be disclosed in terms of physical units. There were 80 companies which disclosed physical quantity figures for environmental conservation effects and 64 companies out of these conformed to the guideline. There are also attempts to provide monetary valuation of environmental conservation effects as expressed in physical units, while this is not provided by the guideline. Since the costs are indicated by a monetary units, this method, by expressing the corresponding effects by monetary units, makes it easier to analyse cost-effectiveness. This is put in the category "environmental conservation effects in monetary units" in Exhibit 8.

Among the economic effects accompanying environmental conservation activities, what the MOE's guideline requires companies to disclose are only "substantial effects," such as the sales of valuables through recycling activities and energy savings, where the calculation basis is assured. Disclosure Format C is suggested by the MOE as the most comprehensive environmental accounting format since it discloses not only environmental costs but also conservation effects and economic effects. 49 companies (26.6 per cent) employ to disclosure Format C in the guidelines.

Have the MOE's guideline influenced on these sorts of disclosure of effects? The chi-square independence test was conducted on companies which conformed to the MOE's guideline and those which did not, in order to find whether there was any difference between their disclosure patterns of the environmental conservation effects and economic effects (substantial effects). The results have been shown in Exhibit 10 and 11. Test results in both cases were significant at the 1 per cent level, and it was clear that according to whether or not companies conformed to the guideline there was also a difference in their method of disclosing effects. In other words, it may be understood that the guideline has a strong influence on the disclosure of such effects in environmental accounting.

Exhibit 10. Influence of the MOE's Guideline on the Disclosure of Environmental Conservation Effects :  
Chi Square Independence test

	Disclosure of Environmental Effects	Non-Disclose of Environmental Effects	Total
Based on MOE's guideline	62	16	78
Not Based on MoE's guideline	42	64	106
Total	104	80	184

a test of independence  $\chi^2 = 29.06$  degree of allowance = 1 P = 0.0000

Exhibit 11. Influence of the MOE's Guideline on the Disclosure of Substantive Economic Effects :  
Chi Square Independence test

	Disclosure of Economical Effects	Non-Disclosure of Economical Effects	Total
Based on MOE's guideline	59	19	78
Not Based on MoE's guideline	26	80	106
Total	85	99	184

$\chi^2 = 47.23$  d.f. = 1 P = 0.0000

Correlative analysis was also conducted for the relationship between environmental costs and economic effects (substantial effects). Environmental costs were limited to the three items previously mentioned and the companies surveyed were divided into two groups by the environmental cost calculation coverage : a non-consolidated group (including cases where it is not clear whether costs are non-consolidated or consolidated) and a consolidated group. Spearman's rank correlation coefficient analysis was then conducted and a positive correlation was shown in both cases, which is indicated in Exhibit 12.

Exhibit 12. Spearman Ranking Correlation Coefficient Between Environmental Cost and Substance Economical Effects

	number of companies	correlation coefficient	Z	P
Non-Consolidation	66	0.68	5.46	0.0000
Consolidation	14	0.91	3.29	0.0010

#### 4.5. Original Standards and Advanced Efforts in Environmental Accounting

There are also companies which adopt their own original environmental accounting standards. Companies such as Toyota and Takara Shuzo are among those which publish independent guidelines. Some of these companies had been making efforts to promote environmental accounting in-house, prior to the publication of the MOE's guideline. In general, the companies in this group have drawn up guidelines which are even more specific and advanced in content than those of the MOE.

On the other hand, among the corporations which employ Disclosure Format C and fully conform to the MOE's guideline, there are a fair number which have been making advanced attempts such as development of new environmental accounting index, segment environmental accounting and go on.

We can find the following two types of advanced environmental accounting trials. These companies are either ones which fully conform to the MOE's guideline or ones which have their own original environmental guidelines.

- Companies which evaluate environmental conservation effects in monetary units, and expressing cost-effectiveness by the unified indicator of " money " (Toshiba, Taiheiyo Cement, Kikkoman Shoyu, etc.).
- Companies which integrate environmental conservation effects by physical units and calculate eco-efficiency ratios. (Ricoh, Takara Shuzo, Asahi Breweries, etc.).

## 5. Conclusion

This paper has reviewed some governmental initiatives, including the MOE's projects and previous studies, and then examined environmental accounting practices of companies listed on

the First Section of the Tokyo Stock Exchange. As a conclusion, the following points were brought to light.

There is no significant difference in corporate size (sales, total assets, operating profits) between companies which disclose environmental accounting information in their environmental reports and those which do not. There is, however, a significant difference between companies which implement advanced environmental accounting based on some kind of standards and those which do not. There is also a significant difference according to industrial sector among companies which disclose environmental accounting information in their environmental reports.

The MOE's guideline has a strong influence on the methods of disclosing environmental costs. The guideline also influences the disclosure of environmental conservation effects and economic effects. Corporations which carry out advanced attempts at environmental accounting are either ones which fully conform to the MOE's guidelines or ones which have their own original environmental accounting guidelines.

Environmental costs have a significant positive correlation with companies' sales, total assets and operating profits. There is also a significant positive correlation between environmental costs and economic effects (substantial effects).

This study has demonstrated that while the MOE's guideline has a strong influence on environmental accounting practice in Japanese corporations, differences according to company size and industrial sector also emerged. The MOE's guideline is likely to become more widely used, but at the same time there are some companies which are trying to expand the contents of their environmental accounting beyond guideline. Environmental accounting in Japanese companies exhibits complicated features since standardization is progressing in the midst of much diversity.

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Environmental Accounting of Listed Companies in Japan

## 日本企業の環境会計

- 東証一部上場企業の実態調査 -

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## Purpose of Analysis

### 分析の目的

- To clarify the following points of environmental accounting information disclosure in Japanese corporations:
- 日本企業における環境会計情報の開示の実態について、次のことを明らかにする

An analysis of some financial characteristics of corporate environmental accounting disclosure companies

環境会計情報開示企業の財務的特徴の分析

An analysis of the influence of the Ministry for the Environment's guideline on environmental accounting practices

環境会計実務に対する環境省ガイドラインの影響の分析

An analysis of the relationship between environmental costs and sales, and effects

環境コストの額と売上高および効果等との関係の分析

## Environmental Accounting Initiatives in Japan 日本をめぐる環境会計の現状

### Major Governmental Initiatives

- 主要な政府機関のイニシャティブ  
“Environmental Accounting Guideline Draft”,  
Ministry for the Environment, March 1999
- 1999年3月：環境庁「環境会計ガイドライン中間取りまとめ」  
“Environmental Accounting Guideline 2000”, Ministry of  
Environment, May 2000
- 2000年5月：環境庁「環境会計ガイドライン2000年版」  
Study on the Development of Environmental Management  
Accounting Ministry of Economy, Trade and Industry 1999-  
2001
- 1999-2001年：経済産業省 環境管理会計手法の開発のための  
調査

### Previous Research on Japanese Corporate Environmental Accounting 日本企業の環境会計に関する先行研究

- Japan Accounting Association 2000
- 日本会計研究学会(2000)  
Subject for Study: First Section Market of Tokyo Stock Exchange and Osaka  
Securities Exchange
- 調査対象：東証・大証・名証一部上場  
Time of Study: June 2000
- 調査時点：2000年6月  
Number of Companies which disclosed environmental accounting information: 99
- 環境会計情報開示企業数：99社
- Matsuo (2001)
- 松尾(2001)
- Subject for Study: Companies for the Nikkei Environmental Management Study
- 調査対象：日経環境経営度調査対象企業  
Time of Study: Unknown
- 調査時点：不明  
Number of Companies who disclosed environmental accounting information: 98
- 環境会計情報開示企業数：98社

## Research Frame 本研究の分析フレーム

- Subject for Analysis: Companies listed on the First Section of the Tokyo Stock Exchange: 1430 Companies
- 分析対象：東証 1 部上場企業：1430社
- Time of Analysis: At the end December 2000, when investigating whether to publish environmental reports
- 分析時点：2000年12月末時点で環境報告書の発行の有無を調査
- Number of companies who published environmental reports  
257 Companies (18.0%)
- 環境報告書発行企業数：257社( 18.0% )
- Number of companies who disclosed environmental accounting information : 184 Companies (71.6%)
- 環境会計情報開示企業数：184社( 71.6% )

## Characteristics of Companies Disclosing Environmental Accounting Information 環境会計情報開示企業の特徴

- A test of the medium for environmental accounting disclosure and nondisclosure companies
- 環境会計情報開示企業と非開示企業の中位数の検定  
No significant differences in sales, total assets and ROA
- 売上高、総資産、営業利益、営業利益率に関して有意な相違なし
- A test of the medium for companies with and without environmental accounting compliance standards
- 環境会計の準拠基準がある企業と準拠基準のない企業の中位数の検定  
A significant difference of 1% sales, total assets in operating profit
- 売上高、総資産、営業利益について 1 %水準で有意な差あり

## Environmental Accounting Disclosures and Types of Industries

### 環境会計情報開示に関する業種間での開示

- An analysis of whether the number of environmental accounting disclosure and non-disclosure differs by the type of industry
- 環境会計情報の開示・非開示の頻度が業種ごとで異なるかどうかの分析  
Type classifications: construction, food products, textiles, paper pulp, chemical, transport equipment, electrical equipment, other manufacturing, commerce, other transport, electric power gas
- 業種区分：建設、食品、繊維・紙パルプ、化学他、輸送機器他、電気機器、その他製造、商業他、運輸他、電力ガス
- Chi-Square independence analysis
- カイ二乗分析による独立性の分析  
Rejection of the null hypothesis that there is no difference in the type of industry by 1%
- 1%水準で業種間に差異はないという帰無仮説は棄却

## Influences of the Ministry of Environment (MOE) Guideline 環境省ガイドラインの影響

- Companies conform to the MOE's Guideline: 106 companies (56.7%)
- 環境省ガイドライン準拠企業(環境コストの表示方法)：106社 (57.6%)
- Companies employ Disclosure Format C: 49 companies (26.6%)
- 公表用フォーマットC表準拠企業：49社 (26.6%)
- Disclosure ratios of environmental conservation effects/economical effects being significantly different between corporations which conform and do not conform to the MOE's Guideline (Chi-Square test, level of 1%)
- 環境会計ガイドライン準拠企業と非準拠企業の間で、環境保全効果・経済効果の開示比率は有意に相違(カイ二乗検定、1%水準)

## Relationship between Environmental Costs and Some Financial Indicators

### 環境コストと財務指標の関係

- Correlation analysis of environmental costs, sales, total assets, operating income correlation of 0.6 for non-consolidated information, a strong correlation of a minimum of 0.85 for consolidated information
- 環境コストと売上高、総資産、営業利益の相関分析 単体の場合は0.6程度の相関、連結の場合は0.85以上の強い相関  
Correlation analysis of the environmental costs and economical effects (substantial effects) 0.7 correlation for non-consolidated information, 0.9 correlation for consolidated information
- 環境コストと経済効果(実質的效果)の相関分析 単体で0.7、連結で0.9の相関

## Conclusion

### 結論

- Characteristics of corporations who disclose environmental information
- 環境情報を開示する企業特性について
- Influences of the MOE's Guideline
- 環境省ガイドラインの影響について
- The Relationship between environmental costs, financial indicators and economic effects
- 環境コストと財務指標および効果額との関係について

## ABSTRACT

Environmental accounting is now rapidly coming-of-age, and many leading companies in advanced countries have responded proactively to the challenge. Compared with these companies, however, most companies in developing countries are still far behind in understanding, developing, or implementing environmental accounting.

In Korea, because a wide range of stakeholders such as shareholders, financial institutions, governments, and local communities have been interested in corporate environmental performance and its disclosure, some leading Korean companies have, since the mid-1990s, started to introduce environmental accounting. Also, a substantial increase in environmental costs has forced Korean companies to begin to integrate such costs into management decisions at different levels. However, the practice of corporate environmental accounting and performance reporting is still at an early stage in Korea.

In this context, this paper reviews the overall status of environmental accounting in Korea and presents some case studies of outstanding Korean companies. These case studies are a part of the outcome from a special project carried out by the POSCO Research Institute in consultation with the Korea-World Bank Environmental Cooperation Committee (KWECC).

Through the case studies, this paper examines current issues in environmental accounting and discusses some of the problems that need to be solved in the development of environmental accounting in Korea. Further, it proposes policy options for the introduction and promotion of environmental accounting in Korea and other developing countries.

## 1. INTRODUCTION

Recently, people have been much concerned about environmental problems such as exhaustion of resources, global warming, ozone depletion, acid rain, desertification, species decimation, and marine pollution. To solve these problems, many countries have established or reinforced environmental laws, provisions and international agreements. These environmental measures are sometimes closely connected with international trade. Therefore the environment becomes one of important factors in international business. This context has an important effect

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upon corporate business activities. Accordingly, the relationship between the environment and business management is of great and growing importance.

In line with this trend, the rapid increase in environmental costs has now caused companies to begin to integrate environmental aspects into managerial decisions at all levels. However, measuring and reporting corporate environmental performance are still at an infant stage in spite of the development of a number of methodologies and practices. In this context, environmental accounting has recently been considered as one of the most significant tools in promoting successful environmental management. This reflects the view that conventional accounting, which ignores most environmental externalities, is not appropriate for encouraging companies to manage their activities in an environmentally benign way.

Consequently, environmental degradation is almost inevitable, given current accounting practice. Conversely, many companies have now come to recognize that environmental accounting can play an important role in the prevention and restriction of negative environmental responses and in the facilitation of positive and proactive responses.

Under these circumstances, environmental accounting has been introduced or implemented in many leading companies, especially in Europe, North America and Japan. Compared with these advanced companies, however, most companies in developing countries are still well behind in understanding, developing or implementing environmental accounting in their business practices.

## 2. OVERVIEW OF ENVIRONMENTAL ACCOUNTING IN KOREA

As a wide range of stakeholders such as shareholders, financial institutions, government, and local communities have been interested in corporate environmental performance and its disclosure, since the mid-1990s some Korean companies have begun to examine the introduction of environmental accounting.

Environmental investment and costs of pollution prevention have increased in Korea, as shown in Table 1. This is in line with the emergence of green-consumerism, non-governmental organizations (NGOs) ' environmental activities, and international trade barriers related to the environment. Some leading companies in Korea, such as POSCO, Samsung Electronics and LG Chemicals, have begun to consider environmental costs at in management decisions, because environmental costs have continually increased against total production costs.

Table 1. Corporate Pollution Abatement and Control Expense in Korea (million Won)

Field \ Year	1993	1994	1995	1996	1997	1998	1999
Air	700,789	797,651	916,888	957,276	1,284,333	46,034	1,140,798
Water & Soil	684,537	805,863	1,030,374	1,162,034	1,040,543	18,498	939,515
Waste	625,837	744,300	833,827	1,024,743	1,050,808	901,423	975,759
Noise & Vibration	68,502	92,583	74,599	79,849	62,830	50,054	69,785
Others	73,643	115,583	122,550	117,302	99,666	84,492	80,002
Byproduct sales in waste treatment (-)	7,801	9,363	11,659	12,164	16,297	17,152	20,793
Sum Annual	2,145,507	2,546,617	2,966,579	3,329,040	3,521,883	2,883,349*	3,185,066
Growth Rate (%)	( 12.8 )	( 18.7 )	( 16.5 )	( 12.2 )	( 5.8 )	( -18.1 )	( 10.5 )

Note: \* In 1998, the Korean economy went through an abrupt recession because of a monetary crisis in the region.

Source : Bank of Korea, Pollution Abatement and Control Expense in 1999, 2000

Furthermore, financial institutions such as banks and insurance companies have nowadays begun to be interested in appraising corporate environmental risk and performance when they lend or invest money. These changes pressured Korean companies into finding cost-effective ways to enhance their environmental performance.

As it continues, many companies are beginning to realize the importance of proactive environmental management strategy and environmental performance reporting. But, these changes are still at an early stage. The leading companies like POSCO, Samsung, LG and Hanhwa experience many difficulties with the introduction or implementation of environmental accounting. On the other hand, many other Korean companies do not recognize the concept of environmental accounting or understand how to implement it.

Meanwhile, in order to promote the environmental accounting practice in Korea and Asian developing countries, the Korean Ministry of Environment (KMOE) introduced a special project on " environmental accounting systems and environmental performance indicators " funded by the World Bank. In January 2000, the Korea-World Bank Environmental Cooperation Committee (KWECC) was organized to promote environmental management in Asia and launched three related projects including " environmental accounting and environmental performance indicators ".

Among these, the project on environmental accounting has been carried out by the POSCO Research Institute (POSRI) under the sponsorship and supervision of the KWECC from March 2000 to February 2001. This project aimed to develop a useful toolkit for assessing a company's environmental costs and performance more precisely and aimed to suggest a comprehensive methodological framework for the introduction of environmental accounting and performance evaluation schemes at the corporate level.

The project also considered a guideline for environmental accounting, which can be utilized in developing countries, and recommended some policy options that can facilitate the introduction

of these toolkits into business practice.

In line with the project, the Environmental Management Accounting Network - Asia Pacific (EMAN-AP) was initiated, in February 2001, during the World Bank Environmental Forum held in Korea. EMAN-AP plans to link the various efforts of organizations and individuals in the region towards developing and promoting environmental management accounting. EMAN-AP will be launched as a regional network for corporate environmental management accounting and independently operated in close relationship with EMAN-Europe and other regional networks.

The Network will be run with fourteen initial member countries including Korea, Japan, the Philippines, China, Indonesia, Taiwan, Thailand, Malaysia, Singapore, Hong Kong, Vietnam, India, Australia, and New Zealand.

At the same time, KMOE is developing a scheme for companies to include environmental accounting information in their environmental reports. Through this regulatory change, KMOE is trying to encourage Korean companies to implement environmental management in the whole range of their business processes.

In 2001, the Korea Accounting Institute (KAI) also published a report on an "Accounting Standard for Environmental Costs and Liabilities"; which covers a wide range of issues on environmental financial accounting. The report aimed to provide theoretical reviews and to propose relevant ways to introduce environmental financial accounting in Korea.

The report mainly covers definition and fields of environmental accounting, the conceptual framework for environmental financial accounting, practices of environmental accounting in Korea and a draft environmental accounting standard.

### 3. CASES ON ENVIRONMENTAL ACCOUNTING IN KOREA

As mentioned above, Korean companies have a growing interest in environmental accounting and a few companies actually have accumulated a little experience in environmental accounting. Three case studies are presented in this paper. These include the cases of POSCO, Samsung Electronics and LG Chemicals, which have had some practice with environmental accounting and have produced information on environmental costs.

#### 3.1. POSCO

##### 3.1.1. Profile of the Company

Founded in 1968 as a public corporation, Pohang Iron and Steel Corporation (POSCO) is one of the world's largest steel-makers with an annual production capacity of 28 million tons, and operates two steel works in Pohang and Kwangyang. The company produces hot rolled sheet, cold rolled sheet, wire rod, electrical steel, and stainless steel. In 1999, POSCO employed around 20,000 people and had a turnover of 10,696 billion won (US\$9.5 billion).

Since commencing its business, the company has recognized that environmental preservation is one of the most important aspects of doing business. Therefore, it enacted the ' POSCO Environmental Policy ' in 1995 and adopted an environmental management system based on ISO 14001 standards in 1996.

Furthermore, POSCO has recently switched its environmental policy from the conventional passive monitoring activities to a proactive effort aimed at preventing environmental accidents and constantly enhancing environmental performance in cooperation with the local community.

The company has invested nearly 10 percent of its total investment in environmental protection for this purpose, and is gradually planning to increase the scale of its investment. As a result of its proactive effort and investment, POSCO has achieved cleanliness ratings that are four to five times higher than a level stipulated by relevant laws.

### 3.1.2. Environmental Accounting Practices of the Company

POSCO has produced information on environmental costs since the 1990s, but the information did not satisfy company management. So, the company launched a special project to develop its new environmental accounting scheme in December 1999.

For the project, a research team was organized with the staff of the company's Environment & Energy Team and experts of the Environmental Management Center in the POSCO Research Institute (POSRI). Before beginning the research in earnest, the research team established the following four stages for the work.

- First stage: identifying environmental costs which are hidden in overhead costs
- Second stage: allocating environmental costs to each cost center which causes the costs
- Third stage: calculating and reporting environmental benefits and liabilities
- Fourth stage: integrating information on environmental accounting in management decision-making

However, POSCO recognized that it is difficult to calculate environmental benefits and liabilities because they are calculated in arbitrary ways, and the Institute decided to tackle the first and second stages among the four stages as this first trial. The company thinks, however, that environmental benefits and liabilities will have to be calculated in the near future.

Based on the scope of this project, the company defined environmental costs as follows:

- Environmental costs are direct or indirect costs related to the operation of environmental equipment used to remove or reduce air and water pollutants. Moreover, they also

include costs for disposing or recycling waste and for other environmental activities.

Under the definition, the company divided its environmental costs into costs for preserving air quality and water quality, costs for disposing and recycling wastes and other costs. The detailed cost items are shown in Table 2.

Table 2. Classification of Environmental Costs in POSCO

Level 1	Level 2	Level 3
Air Quality Management	Depreciation Costs	
	Electricity Costs	
	Material Costs	• Costs for chemicals
	Repair or Maintenance Costs	• Material costs • Costs for external service • Labour costs
	Labour Costs	• Labour factory costs • Labour office costs
	R&D Costs	
	Costs for Energy Substitution	
	Emission Charge on Air Pollution Others	• Test or measurement fees of equipment discharging air pollutants • Measurement costs of dust collectors • Test costs for Tele-metering System • General expenses
Water Quality Management	Depreciation Costs	
	Electricity Costs	
	Material Costs	• Costs for chemicals
	Repair or Maintenance Costs	• Material costs • Costs for external service • Labour costs
	Labour Costs	• Labour factory costs • Labour office costs
	R&D Costs	
	Emission Charge on Water Pollution	
	Others	• Test or measurement fees of equipment discharging water pollutants • Costs for preventing sea pollution • Costs for external service • General expenses
Waste Management	Transportation Costs	
	Incineration Costs	
	Reclamation Costs	
	Costs for By-Product Processing	
	Recycling Promotion Costs	
	Costs for Wastes Processing	
	Costs for Disposing Wastes on Commission	
	Labour Costs	• Labour factory costs • Labour office costs
	R & D Costs	
	Others	• General expenses
	Education Costs	
Others	Costs for Operating EMS	• Post-audit costs • Costs for publishing environmental report
	Costs for External Cooperation	
	Costs for Afforestation	• Labor office costs
	Labour Costs	

Because the above-mentioned environmental costs are mostly incurred through operating environmental protection equipment or facilities, it is necessary to define conceptual characteristics and scope of environmental assets before calculating environmental costs. It was, however, difficult to find any general definition or scope of the environmental assets. Therefore, POSCO defined environmental assets as follows:

- Environmental assets are all equipment and facilities operated for preventing environmental pollution.

Under this definition, when certain equipment or facilities are purchased mainly for the purpose of environmental protection, the company recognizes them as environmental assets. In general, however, much of the equipment or facilities is multi-purpose or multi-functional. In such cases, it is normally very difficult to decide whether certain equipment is an environmental asset. The same situation exists in POSCO.

To solve the issue, when certain equipment or facilities are used for environmental protection over 50 percent of the time, the company determined to recognize them as environmental assets. The judgment to determine a figure of 50 percent is made by the person working for environmental preservation in factories. This is a somewhat arbitrary figure, but it can be a useful method in practice.

After defining environmental assets, POSCO re-arranged the coding structure of all the company's assets to recognize environmental costs incurred from operating environmental assets in its computerized costing process. Even though it has some difficulties in adopting a new coding system, it is a different case in POSCO because the company is in process of re-arranging its assets coding structure prior to the launch of an 'enterprise resources planning' (ERP) system in mid-2001.

Further, POSCO plans to measure and allocate environmental costs more accurately through an Activity-Based Costing (ABC) method to be introduced in mid-2001.

## 3.2. Samsung Electronics

### 3.2.1. Profile of the Company

Founded in 1938, Samsung Electronics is the world-leading manufacturer of memory devices, and also leads the world semiconductor industry in development after designing a 256-megabit DRAM (dynamic random access memory), a one-gigabit DRAM, and the entire production process technology for 4-gigabit DRAM. The company accomplished net sales of US\$22.8 billion with 43,000 employees in 1999.

Samsung Electronics has recently positioned itself in four main business units: Digital Media, Semiconductors, Information & Communications, and Home Appliances, producing the world's most innovative digital components with the intention that everyone will recognize them as being the best in the world.

On the other hand, Samsung Electronics has tried to improve the quality of life by engaging in business activities that respect both people and nature. For the purpose, the company first announced its 'Environmental Policy' in June 1992, and declared the 'Samsung Green

Management Charter ' in May 1996. Now the company 's philosophy focuses on minimizing environmental impacts created by its business activities.

### 3.2.2. Environmental Accounting Practices in Onyang Plant

Onyang Plant of Samsung Electronics was established in 1990 as a Semiconductor Assembly & Testing Plant. In 1998, the plant was very interested in calculating environmental costs, but did not have a company-wide guideline for calculating environmental costs. In consequence, in 1998, the plant developed its own guideline and calculated its first specific environmental costs using this guideline.

In the company, environmental costs include the following:

- Costs related to environmental facilities including both pollution-prevention and damage rectification facilities;
- Costs related to waste disposal; and
- Costs for improving the efficiency of pollution prevention facilities.

Under this definition, its environmental costs are divided into 4 categories: air, water, waste and others. The costs are classified into direct costs and indirect costs. The former are directly traceable to each category while the latter cannot be directly traceable to a specific category and need to be allocated. Detailed environmental costs of the plant are classified as shown in Table 3.

Environmental costs that are calculated are not allocated to each cost center using a sophisticated allocation basis. However, the company recognizes that a sophisticated allocation basis is required to calculate environmental costs of products.

On the other hand, there is no specific evidence that the available information on environmental costs has been used for decision-making in the company, however the information is reported to the most senior executives.

## 3.3. LG Chemicals

### 3.3.1. Profile of the Company

Founded in 1947, LG Chemicals is the largest chemical company in Korea. Its major business fields are life science, information & electronic materials, petrochemicals, health care and household goods. Its sales were US\$3,969 million and its asset were US\$4,911 million with around 11,000 employees in 1999. Now, the company has eight manufacturing sites in Korea.

LG Chemicals considers environmental protection as its utmost importance in order to become an enterprise of practicing environment-focused management. To realize the

Table 3. Classification of Environmental Costs in Samsung Electronics

Category	Cost Items	
	Direct Cost	Indirect Costs
Air	Depreciation costs	<ul style="list-style-type: none"> <li>• Indirect supporting costs: Authority and permission, information collection, others</li> <li>• TMS: Depreciation costs, Labour costs, Repair costs</li> <li>• Laboratory: Labour costs, Chemical costs, Equipment depreciation costs, Repair costs, Costs for measuring pollution around plant, External test costs, U/T indirect labor costs</li> <li>• Operating &amp; Maintenance labor cost</li> </ul>
	Labour costs	
	Electricity costs	
	Repair costs	
	Material costs	
	Chemical costs	
Water	Depreciation costs	<ul style="list-style-type: none"> <li>• Indirect supporting costs: Authority and permission, information collection, others</li> <li>• Indirect labour costs</li> <li>• Lift depreciation costs</li> </ul>
	Labour costs	
	Electricity costs	
	Repair costs	
	Material costs	
	Chemical costs	
Waste	Costs for waste water treatment	<ul style="list-style-type: none"> <li>• Indirect supporting costs: Authority and permission, information collection, others</li> <li>• Indirect labour costs</li> <li>• Lift depreciation costs</li> </ul>
	Depreciation costs of weighing machine	
	Warehouse for waste: Depreciation costs, Labour costs, Repair costs	
	Attached facilities depreciation costs	
	Waste crusher: Depreciation costs, Repair costs	
	Waste acid: Depreciation costs of waste acid treatment site, Labour costs, External service costs, Repair costs, Energy costs	
	Costs for analysis of waste acid sludge	
Others	Education costs, Association fee, External relation costs, Costs for publication, Other labor costs, General expense, External service costs for night soil treatment	

consideration, the company declared ‘ Environmental Policy ’ in 1997 and set up ‘ Environmental Safety Committee ’. Especially, its eight plants have had practices on environmental accounting.

This study focuses on the case of its Cheongju plant which is a large facility for producing many kinds of chemical products such as cosmetics, household goods, flooring, and information & electronic materials. Even though it is one of the biggest chemical works in Korea, it doesn’t discharge a drop of wastewater.

### 3.3.2. Environmental Accounting Practices in Cheongju Plant

Environment and Safety Team in LG Chemicals initiated the environmental costing project to standardize measurement process of environmental costs in 1996. The project focused on classification of environmental costs, segregation of environmental costs from non-environmental costs, calculation and systematic management of environmental costs.

LG Chemicals classified its environmental costs into proactive environmental costs and ex-post environmental costs. The specific classification is shown in Table 4.

In Table 4, proactive environmental costs are incurred in pollution prevention activities, and consist of costs for pollution prevention at source, pollution treatment/ disposal costs and

stakeholder costs. Ex-post environmental costs are incurred to remedy or restore the environmental damage that have already occurred. The Ex-post costs include fines and penalties incurred from non-compliance with environmental regulations and compensation to third parties for loss or injury caused by environmental pollution and damage in the past.

After classifying the environmental costs, the company examined which cost accounts in the

Table 4. Classification of environmental Costs in LG Chemicals

Cost Items	Level 1	Level 2
Proactive Costs	Pollution Prevention Costs	R&D
		Facility Replacement Costs for Clean Process
		Utility Replacement Costs
	Pollution Treatment	EMS Costs
		Acquisition & Installation of Environmental Facilities
		Measurement Costs
		Maintenance & Operating Costs of Environmental Facilities
		Environmental Utility Costs
		Treatment or Disposal Costs
	Stakeholder Costs	Environmental Related to Operation & Administration Costs
		Law Compliance Costs
		Public Relation Costs
Ex-post Costs	Taxes & Charge	Advertising Costs
		Taxes
		Environmental Charges
	Fines & Penalties	Environmental Deposits
	Compensation to the Third Parties	
Opportunity Costs		

conventional accounting system match with items of environmental costs. However, the examination did not provide any objective criteria about the distinction between environmental and non-environmental costs. This situation makes the cost information collected unreliable. Therefore, information on environmental costs generated is now not sufficiently utilized in the company.

### 3.4. Implications

The three companies were concerned about, and introduced, environmental accounting for the following common reasons in the 1990s:

- To identify precisely environmental costs hidden in indirect cost;
- To establish and implement comprehensive environmental management system;
- To evaluate performance of their environmental management;
- To invest in environmental projects more efficiently; and
- To consider information on environmental costs in product price decisions.

Practices of environmental accounting in the three companies are now primarily focused on management accounting. They are only measuring environmental costs. Measurement of environmental benefits is in an early stage. Moreover, the three companies mainly manage environmental costs related to end-of-pipe environmental facilities and equipment and still do not include social or global environmental costs such as ozone depletion, or climate change.

The three companies do not disclose information about environmental costs in their annual environmental reports. However, they are trying to produce credible information on environmental costs and, after the trial, they are going to disclose environmental accounting information.

Three issues found through these case studies are summarized below:

- Need to develop a specific guideline for calculation and allocation of environmental costs.

Practices measuring and allocating environmental costs are now mainly based not on a theoretical framework or specific guideline but on the environmental department's intuition or experience. Moreover, two of the companies (the exception being POSCO) have no specific guidelines for the allocation of environmental costs to each cost center. This is a crucial problem because incorrect cost allocation can distort corporate decision-making.

Accordingly, first it is necessary to accomplish a specific field survey and then the three companies can build a better guideline for measuring and allocating environmental costs.

It may be appropriate for ABC to be adopted as in the process it could turn many manufacturing overhead costs related to the environment into direct costs. Hence, appropriate selection of environmental activities and cost drivers through ABC allows companies to trace many environmental overhead costs to cost objects and may give management of the company a better overview of environmental costs.

- More understanding about utilizing environmental accounting information.

To utilize information produced about environmental costs successfully, it is necessary for a company's management to have an understanding about its general and specific uses.

- Needs close cooperation with the accounting department.

It was found in all three cases that the information on environmental costs has only been produced by the environmental departments, and these have no professional knowledge about accounting practices. This is a common situation in Korean companies because accounting staff

are normally not familiar with environmental accounting and most accounting managers are conservative about changing their practices.

However, to measure effectively and allocate environmental costs, it is necessary for the environmental department to cooperate closely with the accounting department. Accordingly, companies have to encourage accounting staff to participate actively in environmental accounting projects.

#### 4. DISCUSSIONS ON POLICY OPTIONS

To promote introduction and implementation of environmental accounting in Korean companies, first of all, it is necessary for the government to provide an environmental accounting guideline, and then stimulate various stakeholders in their demands for information derived from corporate environmental accounting systems. To this end, government needs to develop appropriate policy options for corporate environmental accounting. In this context, it is recommended that a step-wise approach be adopted as follows:

- First stage: establish infrastructure by organizing a working group and benchmarking best practices on environmental accounting in advanced companies;
- Second stage: develop and provide an environmental accounting guideline and run pilot programs; and
- Third stage: activate environmental accounting through environmental reporting and auditing.

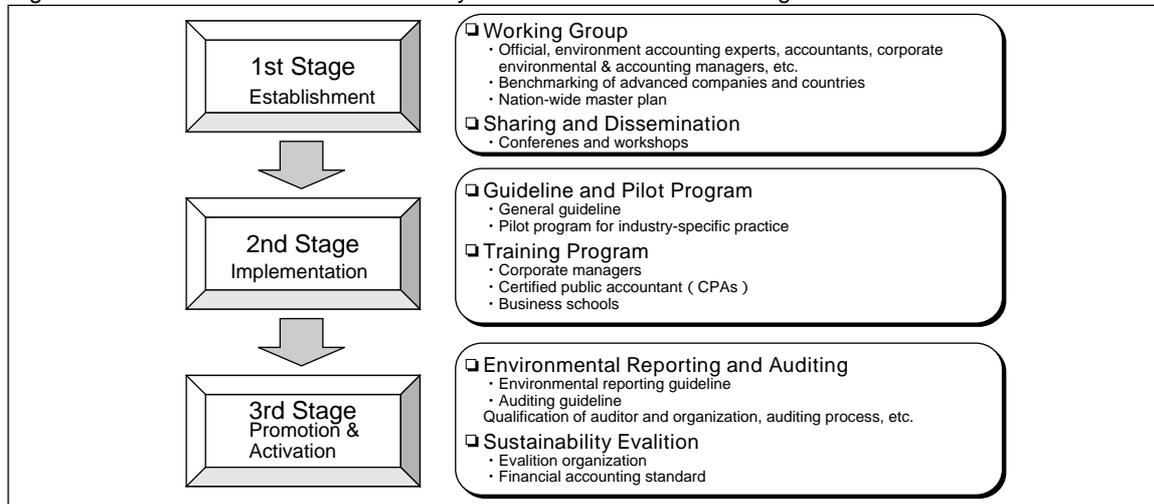
##### 4.1. Establishment of Infrastructure: 1st Stage

As an initial measure in the introduction of environmental accounting, it is necessary to organize a working group composed of government officers, environmental accounting experts, and corporate accounting and environmental managers. Cooperation and common understanding between these participants are crucial factors for establishing the infrastructure for promoting environmental accounting. Main roles of the working group are as follows:

- To survey international and domestic studies on environmental accounting;
- To analyze various guidelines and best practices;
- To build up a network with international expert groups such as EMAN-AP;
- To develop an environmental accounting guideline considered the country-specific business practices;
- To establish a nation-wide program to introduce and implement environmental accounting; and

- To assign roles and tasks to related government bodies such as Environment, Industry, Finance & Economy, Financial Supervisory Service, etc.

Figure 1. Framework of Government Policy for Environmental Accounting



Meanwhile, the working group holds seminars to disseminate international trends and the state of the art on environmental accounting, and to share its importance with corporate managers. Through these efforts, it may be possible to expand recognition of environmental accounting issues amongst managers and to gain acknowledgement of the importance of environmental accounting from top corporate management.

#### 4.2. Implementation: 2nd Stage

In addition to the first stage, it is necessary that the government plays an important role in implementing environmental accounting in corporate practice. This is the second stage. It has two components. One is to provide a country-specific guideline on environmental management accounting, which can be developed by the working group. The second is to run a pilot program for applying the guideline to several leading companies.

Based on the results of the pilot program, it is then necessary to review and revise the guidelines. In the process of setting the guidelines it is necessary to examine and reflect upon the substance of international guidelines. The guidelines may cover definition, scope and classification of environmental cost, and measuring methods. As these guidelines will show a general way of implementing environmental management accounting, it is necessary that more sophisticated guidance for each industry be developed.

In addition, the government can offer training opportunities to company staff in the practical application of environmental accounting. Certified public accountants (CPAs) also need to take

part in this training program in relation to their role in environmental accounting.

In the United States, accountants attend training programs managed by the BEAC (the Board of Environmental Auditor Certifications). After completing the training course, they are qualified to audit environmental reports. Likewise, the KICPA (the Korea Institute of CPA) can provide CPAs with training programs on environmental accounting. Finally, it is also recommended that business schools add environmental accounting to their curricula.

#### 4. 3. Promotion & Activation: 3rd Stage

At the third stage, the government needs to establish a regulatory framework for corporate environmental reporting and auditing. Environmental reporting is a useful tool for evaluating environmental performance which can be closely related to corporate value, and to deliver corporate environmental accounting information to stakeholders.

Government can raise a wide range of stakeholders' concerns about environmental accounting information and performance evaluation by promoting published environmental reports. To propose an international standard on environmental reporting, the Global Reporting Initiative (GRI) has developed the Sustainability Reporting Guidelines. With some adjustment, companies can utilize this guideline for publishing their environmental reports.

In addition, some issues on the qualification of auditors and auditing processes of environmental reports should be carefully examined. To audit environmental reports fairly and transparently, the government should prepare some measures regarding the qualification of auditing organizations and auditors, and auditing standards and processes.

On the other hand, many financial institutions are nowadays becoming more interested in corporate environmental performance. Therefore, the government can utilize the financial sector as a driving force to transform companies into being greener (see, for example, see efforts of the UNEP Finance Initiatives). To this end, it is necessary, for the government to support the finance sector to develop useful tools for environmental risk assessment.

When the finance sector actively assesses corporate environmental risks and performance, and also demands environmental accounting information, it becomes common practice for companies to introduce and implement environmental accounting. At this stage, the establishment of an organization that appraises corporate sustainability in a professional way can be considered. The roles of such an organization are:

- To rate corporate sustainability by assessing environmental, social, and economic performance and risk; and
- To provide the information to financial institutions.

## 5. CONCLUSION

Even though Korean companies are still at the early stage in environmental accounting they have a great potential for introducing and implementing environmental accounting. External pressures from the government, international standards, and NGOs also play an important role for companies to increase their interest in environmental accounting.

The policy options recommended in this paper can be one of the possible ways for applying environmental accounting to other countries as well as Korea. However, this paper does not cover the area of environmental financial accounting which is another equally important area. In the near future, therefore, it will be necessary to examine how to include environmental aspects in financial accounting standards.

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# Environmental Accounting in Korea

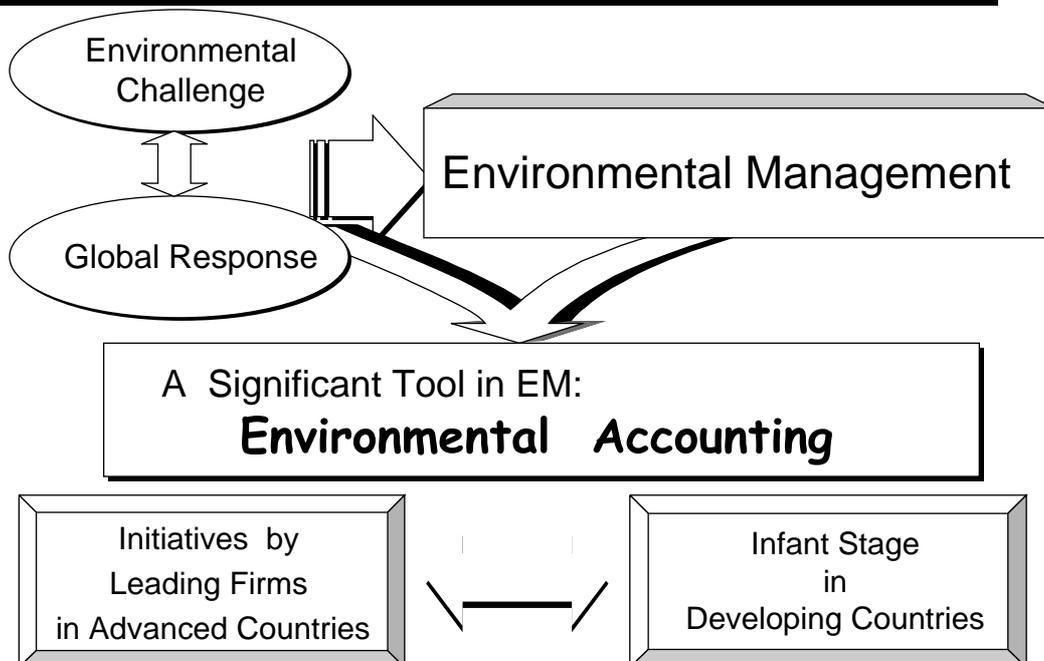
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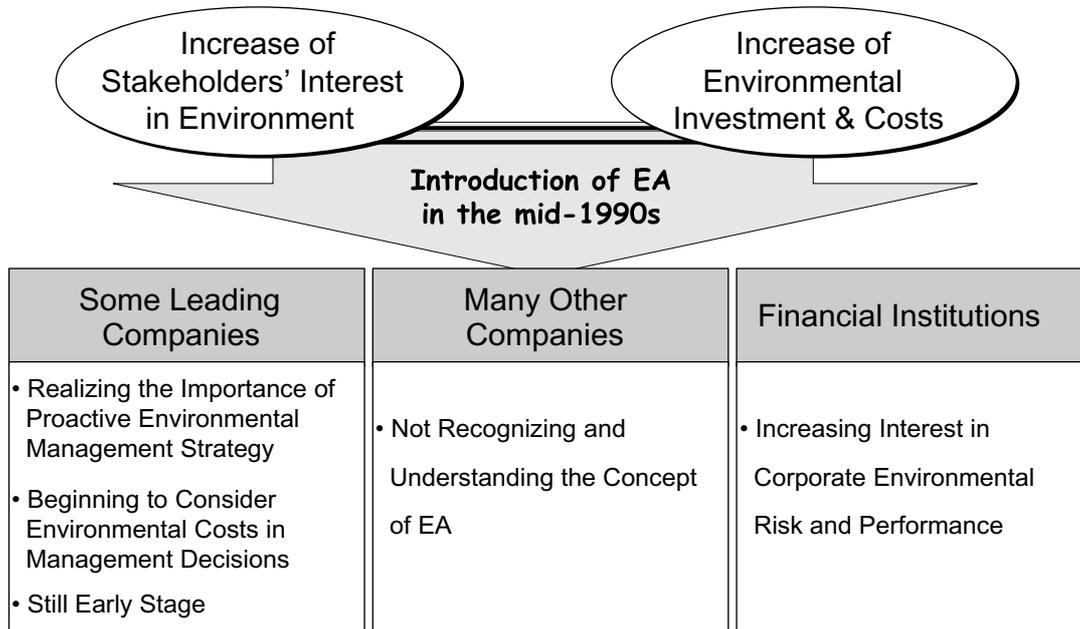
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## Introduction



## Overview of EA in Korea ( I )



## Overview of EA in Korea ( II )

### ■ To Promote EA:

- ♣ KMOE (Korean Ministry of Environment)
  - Organizing the Korea-World Bank Environmental Cooperation Committee(KWECC)
  - Launching Three Environmental Projects Funded by the World Bank
  - Holding World Bank Environmental Forum(2001.2)
    - Initiating Environmental Management Accounting Network-Asia Pacific (EMAN-AP)
- ♣ POSRI(POSCO Research Institute)
  - Carrying out one of the Three Projects Launched by KMOE/WB: 'Environmental Accounting Systems and Environmental Performance Indicators'(2000.3 ~ 2001.2)
  - Purpose of the Project
    - To Develop Useful Toolkits for Assessing a Company's Environmental Costs and Performance
    - To Suggest a Comprehensive Methodological Framework for Introduction of Environmental Accounting
- ♣ Korea Accounting Institute(KAI)
  - Publishing a Report of 'Accounting Standard for Environmental Costs and Liabilities'

## Case I - POSCO

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### PROFILE

- Founded in 1968
- World Largest Steel - Makers
- Production Capacity: 28 Million tons, Sales: \$9.5 Billion(1999)
- ISO 14001 Certification(1996)

#### ■ EA Practices:

- ♣ Start a Special Project to Develop New EA Scheme in 1999
    - Scope of the Project:
      - Identifying and Allocating Environmental Costs
      - Identifying Environmental Assets
  - ♣ Classification of Environmental Costs
    - Four Categories: Air, Water, Waste, and Others
  - ♣ Definition of Environmental Assets`
    - All Equipment and Facilities Operated to Prevent Environmental Pollution
    - Judgment by 50% Rule
  - ♣ Future Plan: Measuring Environmental Benefits
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## Case II – Samsung Electronics

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### PROFILE

- Founded in 1938
- World Leading Manufactures of Memory Devices
- Sales: \$22.8 Billion(1999)
- Environmental Policy(1992), 'Samsung Green Management Charter' (1996)

#### ■ EA Practices:

- ♣ Start a Project to Develop Guidelines on Environmental Cost in 1998
    - Scope of the Project:
      - Identifying Environmental Costs
      - Identifying Environmental Assets
  - ♣ Classification of Environmental Costs
    - 4 Categories: Air, Water, Waste, Others / 2 Categories: Direct and Indirect Costs
  - ♣ Definition of Environmental Assets
    - Environmental Facilities Including both Pollution - Prevention & Damage Rectification Facilities
  - ♣ Future Plan: Allocating Environmental Costs to Each Cost Center
-

## Case III –LG Chemicals

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### PROFILE

- Founded in 1962
- The Largest Chemical Company in Korea
- Sales: \$4.0 Billion(1999)
- Organizing the 'Environmental Safety Committee'(1997)

#### ■ EA Practices:

- ♣ Start a Special Project to Standardize Measuring Process of Environmental Costs in 1996
    - Scope of the Project:
      - Classifying Environmental Costs
      - Segregating Environmental Costs from Non-environmental Costs
  - ♣ Classification of Environmental Costs
    - Two Categories: Proactive Costs & Ex-Post Costs
    - Main Cost Items: Pollution Prevention Costs, Pollution Treatment, Stakeholder Costs, Taxes, Fines, Compensation to the Third Parties, Opportunity Costs
  - ♣ Future Plan: Integrating Environmental Costs Information in Management Decision-Making Process
- 

## Implication from Cases ( I )

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#### ■ Common Reasons to Introduce EA:

- ♣ To Precisely Identify Environmental Costs Hidden in Indirect Cost
- ♣ To Establish & Implement Comprehensive Environmental Management System
- ♣ To Evaluate Performance of Environmental Management
- ♣ To Invest in Environmental Projects More Efficiently
- ♣ To Consider Information on Environmental Costs in Product Price Decisions

#### ■ Common Aspects on EA Practices:

- ♣ Focusing on Management Accounting
  - ♣ Measuring only Environmental Costs
  - ♣ Managing mainly Environmental Costs related to End-of-pipe Environmental Equipment & Facilities
  - ♣ Not Disclosing the Information on Environmental Costs in Annual Environmental Reports
  - ♣ Producing the Information by only Environmental Department
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## **Implication from Cases ( II )**

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### **■ Remained Issues:**

- ♣ Need to Develop Specific Guidelines for Calculation and Allocation of Environmental Costs
    - Measurement of Environmental Costs Based not on a Theoretical Framework or Specific Guideline but on the Intuition or Experience of Environmental Department
      - Need to Accomplish Specific Field Studies
      - Need to Adopt ABC(Activity - Based Costing) to Turn Environmental Costs into Direct Costs
  
  - ♣ Need to Understand How to Utilize the Information on Environmental Accounting
  
  - ♣ Need Close Cooperation with the Accounting Department
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## **Policy Recommendations ( I )**

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### **■ First Stage: Establishment of Infrastructure on EA**

- ♣ To Organize Working Group Composed of Government Officers, EA Experts, Corporate Accounting and Environmental Managers
  
  - ♣ Main Roles of the Working Group
    - To Survey International and Domestic Studies on EA
    - To Analyze Various Guidelines and Best Practices
    - To Build up a Network with International Expert Groups such as EMAN-AP
    - To Develop an EA Guideline Considered the Country - specific Business Practices
    - To Establish a Nation - wide Program to Introduce and Implement EA
    - To Assign Roles and Tasks to Government Bodies such as Environment, Industry, Finance & Economy, Financial Supervisory Service, etc.
    - To Share and Disseminate Information on EA by Holding Seminars, Conference or Workshops
-

## **Policy Recommendations ( II )**

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### **■ Second Stage: Implementation of EA**

#### **♣ Role of Government**

- To Provide Companies with a Country - specific Guideline on Environmental Management Accounting
- To Run a Pilot Program for Applying the Guideline to Several Leading Companies
- To Offer Training Program : Especially, for Corporate Staff & Certified Public Accountants(CPAs)

#### **♣ Role of the Working Group**

- To Review & Revise the Guidelines based on the Results of the Pilot Program
- To Develop the More Sophisticated Guidance for Each Industry

#### **♣ Others**

- To Launch Environmental Accounting on the Curricula of Business Schools
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## **Policy Recommendations ( III )**

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### **■ Third Stage: Promotion & Activation of EA**

#### **♣ Role of Government**

- To Establish a Regulatory Framework for Corporate Environmental Reporting & Auditing
  - To Raise Stakeholders' Concerns on EA
  - To Prepare Some Measures Regarding the Qualification of Auditing Organizations & Auditors, and Auditing Process of Environmental Report
  - To Utilize the Financial Sector as a Driving Force to Transform Companies into being Greener
  - To Support the Financial Sector to Develop Useful Tools for Environmental Risk Assessment and Credit Evaluation
  - To Establish an Organization that Appraises Corporate Sustainability in a Professional Way
-

## **Remarks**

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- Increase of the External Pressure to Introduce EA
    - NGOs, International Standard, Governments, Financial Sector, Customers, etc.
  
  - Still Early Stage in Introducing EA
  
  - A Project for EMA Pilot Program: MOCIE (Oct. 2001~)
  
  - Need to Consider Environmental Aspects in Financial Accounting Scheme
-

## CONTEMPORARY ENVIRONMENTAL MANAGEMENT ACCOUNTING (EMA) DEVELOPMENTS IN AUSTRALIA.

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### Biodata:

Roger is Senior Lecturer at the School of Business and Information Management, The Australian National University, Canberra, Australia. He is the coauthor of a book entitled 'Contemporary Environmental Accounting' published by Greenleaf in the UK (with Professor Dr. Stefan Schaltegger), see the executive summary at <http://www.greenleaf-publishing.com/catalogue/cea.htm>, and international coordinator of the Asia Pacific Centre for Environmental Accountability (APCEA). APCEA is a networking organisation and has 14 branches at Universities throughout the Asia Pacific region and produces a quarterly News Journal. Details for subscriptions to the News Journal can be found at <http://www.accg.mq.edu.au/apcea/>.

### Summary of presentation:

This presentation has been developed in two parts. First, a framework, based on decision making and that will be of use to managers at different levels in organizations, is developed and tools of EMA which might be of interest are linked to the different management functions. Second, an examination of how contemporary developments in EMA in Australia map onto the framework is presented. The conclusion is that there are a number of gaps where no developments are taking place, but that Australia is focussed on many of the key issues in EMA development and promotion.

## CONTEMPORARY ENVIRONMENTAL MANAGEMENT ACCOUNTING (EMA) IN AUSTRALIA.

### 1. A Framework for Analysis

Lack of a comprehensive framework to map existing EMA-tools hinders more widespread use and adoption of EMA-tools in business as no clear guidance is provided on which tools are pertinent for which business decision contexts. Therefore, the aim of this paper is, first, to develop a comprehensive framework to map all the different EMA-tools. Such a framework facilitates the appropriate application of EMA and shows which EMA tools meet the requirements of, and could be useful for, different business actors in different decision contexts.

Second, the framework is examined in the context of recent EMA developments in Australia.

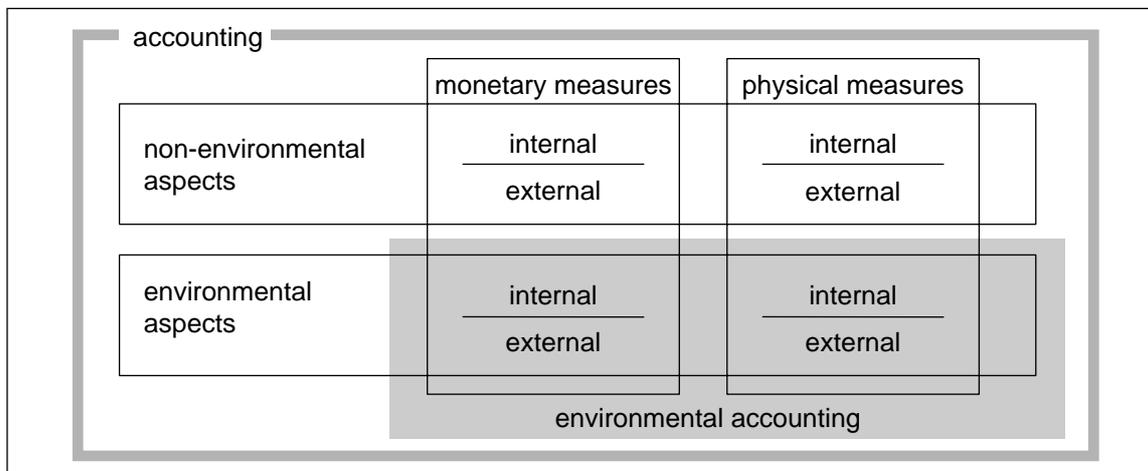


Figure 1. Scope and delineation of environmental accounting (Source: Burritt et al.2001).

Environmental Accounting, as seen in Figure 1, is taken to be the aspects of accounting, both internal and external, that examine environmental impacts of a business in monetary and physical terms.<sup>1)</sup> Environmental impacts, in accordance with ISO 14001, are defined as “ any change to the environment, whether adverse or beneficial, wholly or partially resulting from activities, products and services of the organization ”(para. 3).

Environmental Management Accounting (EMA) is seen as the internal aspect of environmental accounting, but it also provides an important foundation for external environmental accounting. ISO 14001 has a strict definition of an environmental aspect as being a component of an organization’s activities, products and services which are likely to interact with the environment (para.3). However, in this paper, internal aspects relate to information about environmental impacts and aspects that are used internally by management. In Figure 2, attention is drawn to two particular components of internal environmental accounting systems (see the grey shaded area) - monetary, represented as Monetary Environmental Management Accounting (MEMA), and physical, which is represented as Physical Environmental Management Accounting (PEMA).

1 ) The basic framework has been developed in Burritt, Hahn and Schaltegger (2001) forthcoming.

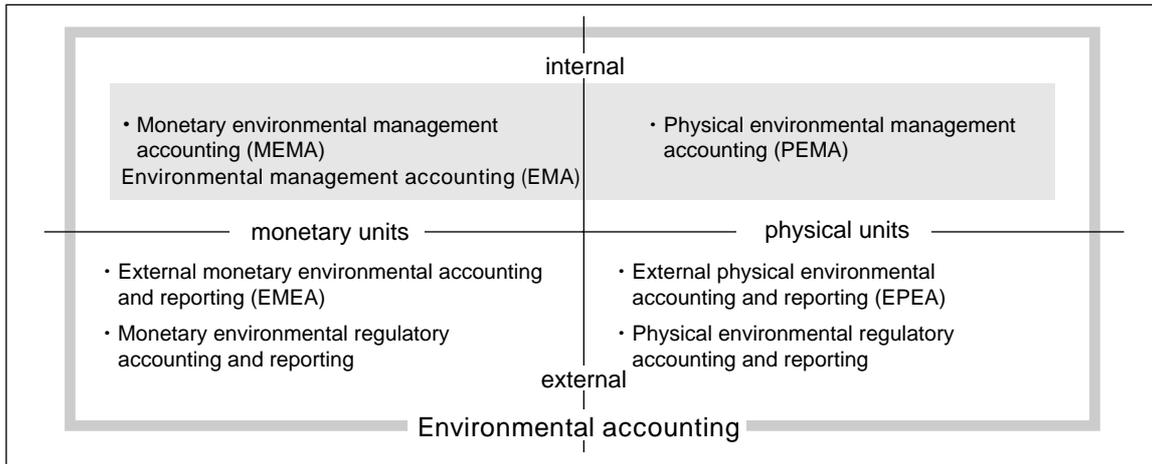


Figure 2. Environmental accounting systems (Source: Burritt et al. 2001 modified from Bartolomeo et al. 2000, 33)

Extending this framework further, the components of EMA can be divided into a number of bi-polar classes that represent particular needs of management, for example:

- The need for regular or ad hoc information;
- The need for information related to short term or long term situations; and
- The need for information about the past and present, or information about the future.

All three classes are needed to help with management planning, control, decision making, motivation, measurement of income and assets as a basis for external reporting, and cost justification or reimbursement (Horngren et al 2000, 498).

		Environmental Management Accounting (EMA)			
		Monetary Environmental Management Accounting (MEMA)		Physical Environmental Management Accounting (PEMA)	
		Short Term Focus	Long Term Focus	Short Term Focus	Long Term Focus
Past Oriented	Routinely generated information	1. Environmental cost accounting (e.g. variable costing, absorption costing, and activity based costing)	2. Environmentally induced capital expenditure and revenues	9. Material and energy flow accounting (short term impacts on the environment-product, site, division and company levels).  Ecological footprint analysis.	10. Environmental (or natural) capital impact accounting
	Ad hoc information	3. Ex post assessment of relevant environmental costing decisions	4. Environmental life cycle (and target) costing  Post investment assessment of individual projects	11. Ex post assessment of short term environmental impacts (e.g. of a site or product)	12. Life cycle inventories  Post investment assessment of physical environmental investment appraisal
Future Oriented	Routinely generated information	5. Monetary environmental operational budgeting (flows)  Monetary environmental capital budgeting (stocks)	6. Environmental long term financial planning	13. Physical environmental budgeting (flows and stocks) (e.g. material and energy flow activity based budgeting)	14. Long term physical environmental planning
	Ad hoc information	7. Relevant environmental costing (e.g. special orders, product mix with capacity constraint)	8. Monetary environmental project investment appraisal  Environmental life cycle budgeting and target pricing	15. Relevant environmental impacts (e.g. given short run constraints on activities)	16. Physical environmental investment appraisal  Life cycle analysis of specific project

Figure 3, provides a summary of these needs and draws attention to a set of EMA tools that can be used by managers to address each of these needs. Although this set of tools is still being extended as EMA develops, the tools do not provide the main focus of this presentation. Instead, developments in Australia are the main focus.

Figure 3, provides a summary of these needs and draws attention to a set of EMA tools that can be used by managers to address each of these needs. Although this set of tools is still being extended as EMA develops, the tools do not provide the main focus of this presentation. Instead, developments in Australia are the main focus.

One other element in the framework is required before examining contemporary EMA in Australia. It is necessary to break down the black box of management - what managers do and what types of information and EMA tools are of particular interest to them. A simple, but effective, way to address this issue is to base the classification upon the work of Porter (1985) because he recognizes all functions in the value chain. Figure 4 identifies the various functions. Each function has a manager in charge. Some managers have an overview of a number of

functions (eg top management), while others are responsible for their own specific function (eg production).

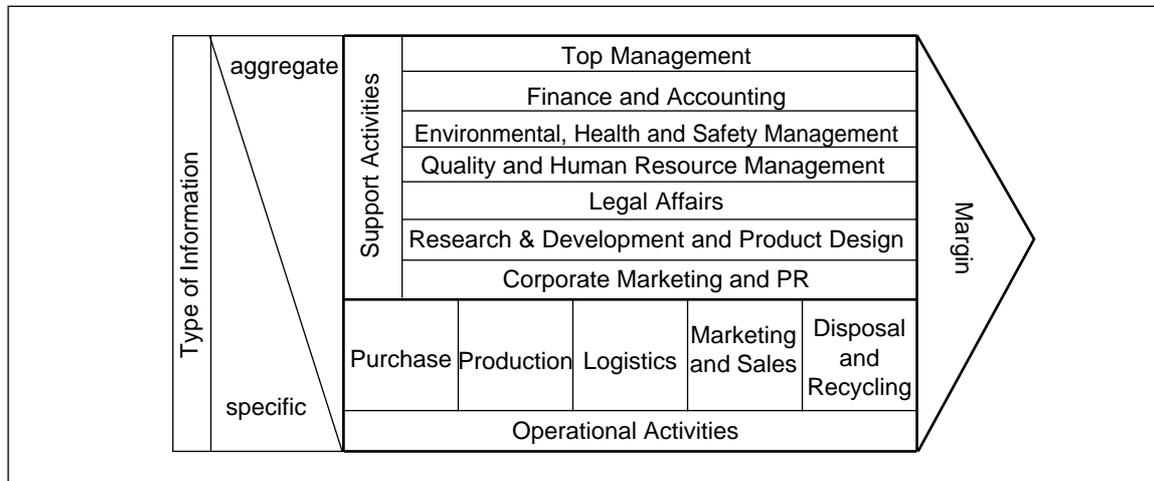


Figure 4. Value chain and internal corporate EMA users (based on Porter 1985, p. 37)

Given this overall framework, it is possible to locate the different types of manager in a matrix that is linked with their main information needs - short or long term, regular or ad hoc, etc.

## 2. Contemporary developments in EMA in Australia.

Using the framework introduced above it is possible to map recent developments in EMA in Australia based on public and industry initiatives (rather than consideration of conceptual issues). Some of these are captured and further discussed below.

Before examining these developments it is worth pointing out that there are a number of reasons why EMA in Australia is not as advanced as it is in the USA or Europe:

- public disclosure - the voluntary disclosure of environmental information is less developed than in North America and Europe, although Australia is moving forward;
- legislation - the enforcement of environmental legislation and the disclosure requirements for companies and superannuation trustees in relation to environmental issues is less onerous than North American and European systems, but recent changes to Company Law remain in place;
- market size - the supply of products and services that incorporate environmental principles is restricted by small market size, except where international markets are involved; and
- awareness - despite a high level of concern about environmental issues in the community, this has not been translated into a significant investment in "green" products or active

campaigning to promote sustainable corporate practices.

However, several initiatives are taking place, a selection of which follows. These are separated in to direct influences over EMA and indirect influences over EMA (see Schaltegger et al. 2000b).

- direct influences over EMA
  - a) Self Assessment for Corporations
  - b) EMA project
  
- indirect influences over EMA
  - c) Public Environmental Reporting
  - d) Financial Sector Projects Team
  - e) Mandatory Disclosure
  - f) National Pollutant Inventory
  - g) Greening Local Government
  - h) Carbon Accounting
  - i) AASB 1037
  - j) Petroleum Refining Capacity

Direct Influences:

- a) Total Environment Centre, Sydney - Environmental Sustainability Self-Assessment for Corporations.

The Total Environment Centre is a not-for-profit, non-government organisation funded mainly by public donations. The Centre campaigns for environmental improvement. It sought to produce a practical self-assessment tool, based on the Commonwealth's Public Environmental Reporting, to help encourage continual improvement in corporate environmental performance through partnerships with companies to develop a six step process: compliance with regulations; awareness of environmental sustainability; environmental reporting; community engagement; commitment to continual improvement in performance; and to move beyond compliance with legislation. The tool was published in May 2001.<sup>2)</sup>

Classification: This self-assessment tool developed by an NGO for internal use by top and environmental management emphasizes physical performance measures that can reflect past

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2) Available at <http://tec.nccnsw.org.au/member/tec/projects/upload/esarep.pdf>

		Environmental Management Accounting (EMA)			
		Monetary Environmental Management Accounting (MEMA)		Physical Environmental Management Accounting (PEMA)	
		Short Term Focus	Long Term Focus	Short Term Focus	Long Term Focus
Past Oriented	Routinely generated information	2. Accounting and Finance 4. Divisional Management 5. Human Resources 6. Legal 7. Product Manager 8. Purchasing	1. Top Management 2. Accounting and Finance 3. Corporate Marketing	9. Environment 10. Health and Safety 11. Quality 5. Human Resources 6. Legal 12. Production 7. Purchasing 13. Logistics 8. Product Manager 14. Disposal/Recycle	1. Top Management 9. Environment 10. Health and Safety 11. Quality 15. Corporate Marketing 13. Logistics 14. Disposal/Recycle
	Ad hoc information	2. Accounting and Finance 4. Divisional Management 5. Human Resources 6. Legal 7. Product Manager 8. Purchasing	1. Top Management 2. Accounting and Finance 3. Corporate Marketing	9. Environment 10. Health and Safety 11. Quality 5. Human Resources 6. Legal 12. Production 7. Purchasing 13. Logistics 8. Product Manager 14. Disposal/Recycle	1. Top management 9. Environment 10. Health and Safety 11. Quality 15. Corporate Marketing 13. Logistics 14. Disposal/Recycle
Future Oriented	Routinely generated information	2. Accounting and Finance 4. Divisional Management 5. Human Resources 6. Legal 7. Product Manager 8. Purchasing	1. Top Management 2. Accounting and Finance 3. Corporate Marketing	9. Environment 10. Health and Safety 11. Quality 5. Human Resources 6. Legal 12. Production 7. Purchasing 13. Logistics 8. Product manager 14. Disposal/Recycle	1. Top management 9. Environment 10. Health and Safety 11. Quality 15. Corporate Marketing 12. Logistics 14. Disposal/Recycle
	Ad hoc information	2. Accounting and Finance 4. Divisional Management 5. Human Resources 6. Legal 7. Product Manager 8. Purchasing	1. Top Management 2. Accounting and Finance 3. Corporate Marketing	9. Environment 10. Health and Safety 11. Quality 5. Human Resources 6. Legal 12. Production 7. Purchasing 13. Logistics 8. Product manager 14. Disposal/Recycle	1. Top management 9. Environment 10. Health and Safety 11. Quality 16. R & D, Design 15. Corporate Marketing 12. Logistics

Figure 5. Positioning managers in the EMA framework

long term performance and how this is changing over time. Hence, it looks for support from an EMA system that provides information about strategic measures of physical environmental performance that is routinely gathered for top management to use in tracking performance. It also involves the environment manager and production manager in the continual improvement process (refer to Figure 6).

b) EMA Case Studies.

Through its Triple Bottom Line Technical Specialist Group, The Institute of Chartered Accountants in Australia has sought tenders for their Environmental Management Accounting Project.<sup>3)</sup> The Institute is undertaking this project in partnership with EPA Victoria and

3) See the tender document at <http://www.icaa.org.au/tech/index.cfm?id=A103674954>

		Environmental Management Accounting (EMA)			
		Monetary Environmental Management Accounting (MEMA)		Physical Environmental Management Accounting (PEMA)	
		Short Term Focus	Long Term Focus	Short Term Focus	Long Term Focus
Past Oriented	Routinely generated information	b) EMA Project g) Greening Local Government i) AASB 1037	g) Greening Local Government	c) Public Environmental Reporting e) Mandatory Disclosure f) National Pollutant Inventory g) Greening Local Government i) AASB 1037	a) Environmental Sustainability Self Assessment for Corporations h) Carbon Accounting
	Ad hoc information	b) EMA Project			
Future Oriented	Routinely generated information	b) EMA Project	d) Financial Sector Projects Team		h) Carbon accounting
	Ad hoc information	b) EMA Project	d) Financial Sector Projects Team j) Petroleum refining capacity		j) Petroleum refining capacity

Figure 6. EMA Developments in Australia

Environment Australia, who together are providing \$150,000 to the Institute to fund a total of four to five case studies, including at least one SME study, with the objective of promoting environmental management accounting in the business sector. The goal for each case study is to demonstrate how reforming management accounting practices within a business can achieve positive financial and environmental outcomes. A key objective of the project is to produce materials that identify how changes to management accounting procedures can improve profitability by reducing costs and/or identifying revenue opportunities whilst achieving better environmental outcomes. The process is in its early stages with tenders closed on 10 August 2001 and final reports due by 31 March 2002.

Classification: The Request for tender document provides no specific indication of what constitutes Environmental Management Accounting. The following comment is made:

“ Firms can make sub-optimal business decisions because their internal accounting system does not properly account for environmental costs and benefits. For example, EPA Victoria has found that some companies choose waste disposal over waste reduction because their accounting system records disposal as a cheaper option. Disposal might appear cheaper because most environmental costs are placed in overhead accounts and therefore not properly allocated. Environmental management accounting assists companies to identify the full range of environmental costs and benefits within traditional accounting systems and may, in some cases, lead to improved decision making. ”

This indicates a focus on short term costs and revenues rather than the long term. It also seems to imply an interest in ad hoc information for decisions, as well as routinely generated information that is affected by cost allocations. Hence, there is a past and a future orientation to this project. Accounting and finance managers, divisional managers and other functional areas may find the information generated by the project to be of use (refer to Figure 6). There is a clear intention that accountants are to be targeted by this initiative.

Indirect Influences:

c) Australian Public Environmental Reports (PER)

Environment Australia, the Commonwealth government environment group, seeks to encourage the publication of public environmental reports thereby encouraging environmental management to set up EMA systems that produce this information. A framework was produced in March 2000.<sup>4)</sup> They define public environmental reporting as follows:

“ Public environmental reporting (PER) is the voluntary public presentation of information about an organisation’s environmental performance over a specified period, usually a financial year. An organisation’s PER may be published as a stand alone document, a website or as part of an annual report ”<sup>5)</sup>

By the end of 2000, around 80 Australian organisations across a variety of industry sectors had produced a PER.<sup>6)</sup> The number continues to increase. Environment Australia aims to create a comprehensive virtual library of Australian PERs to give companies and stakeholders insight into the range and quality of reporting to date. They provide no guarantee of quality, do not suggest that any of the reports represent best practice, and expect the publication to lead to continual improvement in reporting - although they do not say how this process of improvement will be brought about.

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4 ) <http://www.ea.gov.au/industry/sustainable/per/pubs/perframework.pdf>

5 ) <http://www.ea.gov.au/industry/sustainable/per/>

6 ) <http://www.ea.gov.au/industry/sustainable/per/ausper.html>

Example: MIM Holdings Ltd is a mining company. Its third annual environmental report examines (1) management's commitment to the environment; (2) environmental management policy; (3) its commitment to the Australian Minerals Industry Code for Environmental Management; (4) environmental management systems; (5) environmental audit and risk management; (6) National Pollutant Inventory data; (6) rehabilitation; and (7) Community Relations.<sup>7)</sup>

Classification: PER's have a focus on the short run time period, on routine provision of EMA information related to past performance. The main focus is on aggregate information about the organization. Environmental management is the group most heavily involved (refer to Figure 6).

#### d) Financial Sector Projects Team.

The Financial Sector Projects Team is part of the Sustainable Industries Branch of Environment Australia, whose mission is to provide national leadership in the protection and conservation of the environment. The Financial Sector Projects Team was created by Environment Australia to work cooperatively with Australia's financial services sector on the development of government and business policies that facilitate the integration of sustainability issues into their services, products and operations.

Their goal is to encourage financial institutions to incorporate sustainability information into their investment, lending and insurance decision making. They are trying to achieve this goal by improving understanding within the financial services sector about the commercial opportunities and risks presented by environmental issues, and by improving levels of consumer knowledge about the options for environmentally slanted financial products.<sup>8)</sup>

In some areas the finance sector is not as advanced as its international competitors:

- commitment and awareness - until recently, at an industry level, little interest had been shown in sustainable development. Unlike its European peers, only two financial institutions are signatories to the UNEP Financial Initiative. However, UNEP has now established a strong presence in this area and operates through the Victorian EPA.
- products and services - there is less demand for and supply of socially responsible investment products. However, products and services have been developed in response to the issues of climate change and community banking needs.
- greening of own operations - most financial institutions appear to have implemented environmental risk assessment procedures and undertaken energy efficiency and

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7) <http://www.mim.com.au/environment.html>

8) <http://www.ea.gov.au/industry/sustainable/finance/index.html>

recycling programmes. However few have implemented company-wide environmental management systems or published public environmental and/or triple bottom line reports.<sup>9)</sup>

Classification: Environmental Management Accounting information encouraged by this Project Team is future orientated because of the desire to influence short term decisions made by financial institutions eg decisions as to whether to grant credit after consideration of environmental risk. The focus is on monetary information for top management, credit analysts, and accounting and finance staff in financial institutions within a sustainable development frame of reference. Ad hoc and routine information will be encouraged (refer to Figure 6).

#### e) Mandatory disclosure

The only mandatory environmental disclosure requirement in Australia, is s299(1)(f) of the 1998 Company Law Review Act. Section 299(1)(f) reads as follows:

Annual Directors ' Report - General information (1) General information about operations and activities.

The Directors ' Report for a financial year must:

. . . (f) if the entity's operations are subject to any particular and significant environmental regulation under a law of the Commonwealth or of a State or Territory - details of the entity's performance in relation to environmental regulation

The importance of the disclosure requirement for management is largely at the top management level because Australia has the highest rate of share ownership in the world (appx. 52% either own shares directly or indirectly through superannuation funds) and ethical investment is a matter for top and environmental management to address.

Classification: This requirement for mandatory disclosure of non-monetary information is aimed at top management and environmental management who are concerned to ensure that they are in compliance with the requirements of corporate law. The information needs to be gathered on a regular basis by the EMA system, is routinely generated, short term in its orientation and related to past compliance (refer to Figure 6).

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9) <http://www.ea.gov.au/industry/sustainable/finance/pubs/role-fin-sector.pdf>

f) National Pollutant Inventory.

The National Pollutant Inventory (NPI) is Australia's national public database of pollutant emissions. It is an internet database designed to provide business, the community, and government with information on the types and amounts of certain substances being emitted to the environment. The NPI is important for EMA because it requires management to establish a system for gathering, recording and disclosing information about pollutant emissions in Australia. It operates in a similar way to the US Toxic Release Inventory. Australian industrial facilities using more than a specified amount of the substances listed on the NPI reporting list are required to estimate and report emissions of these substances annually. Currently industries are required to report their emissions to air, land and water of 36 of the 90 listed substances.<sup>10)</sup>

Classification: Physical data is gathered in the organization's EMA on a regular basis by environmental management with exception reports being provided to top management, to guard against any penalties that might be incurred. The data relates to the past activities of a company, and has a short term focus (refer to Figure 6).

g) Greening Local Government.

Development of a chart of accounts that includes environmental categories, in order to help local governments in Australia make better decisions, has been supported by the Australian Local Government Association (ALGA) for several years. This development is of particular interest because the projects that have been undertaken have been directed by the Australian Bureau of Statistics (ABS) using the Integrated System of Environmental and Economic Accounts (SEEA), as proposed by the United Nations for macro environmental accounting. The Victorian EPA has also explored the use of the SEEA system as the basis for recording past environmental impacts in corporate accounts, and it is also of interest to note that EUROSTAT (the European Commission Statistics Agency) has, in June 2001, provided definitions and guidelines for measurement and reporting of company environmental expenditure in line with SEEA categories.

Tegert (2001), who has introduced the SEEA classification and environmental reporting at Eurobodalla Shire Council (ESC) summarises the situation as follows:

Simply by tracking environmental costs against the SEEA/ABS classifications, the environment can be managed in much the same way as a local government's infrastructure assets - regular assessment of the asset's condition and serviceability, examination of design life;

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10) The list of substances can be found at

[http://www.environment.gov.au/epg/npi/about/background/list\\_of\\_subst.html](http://www.environment.gov.au/epg/npi/about/background/list_of_subst.html)

assessment of loads and pressures and calculation of costs to maintain, remediate or improve.

The draft Code of Accounting Practice is being prepared through the ABS and CPA. A Special Schedule, proposed to be appended to the AAS27 financial accounts, lists the:

- operating expenses and revenues against the SEEA classifications;
- the costs to maintain those environmental assets;
- the capitalised expenses to improve the environmental assets; and
- ultimately the loss of serviceability (defined as depreciation) of those environmental assets.

The draft Code of Accounting Practice references a range of different methods proposed for environmental valuation: damage evaluation; avoidance or prevention costing; restoration costs; and market evaluation.

At Eurobodalla Shire Council this draft method of environmental accounting is being introduced in the following way:

1. Recoding the Chart of Accounts to collect financial information in accord with the SEEA classifications.
2. Referencing environmental expenditures and revenues and capital expenditure in the 2000 SoER.
3. Introducing the philosophy of environmental accounting as a form of 'asset management' by causing the assessment of environmental risk as a financial consequence of taking or not taking a particular action.
4. Reporting to council on those environmental risks and quantifying them as financial costs or opportunities lost, such as costs of remediation, prevention or penalties.
5. Eventually assess projects comparing traditional engineering approaches versus environmental approaches. For example, life cycle costs may be compared between a formed storm water channel, including pollution/sediment traps, to an alternate natural grassed stormwater channel where the type and density of vegetation is determined to trap and divert sediment and rubbish from entering a waterway. The different levels of risk can be assessed by modelling the amount of sediment or rubbish entering the waterway.

#### Classification:

The SEEA classification of environmental protection expenditure incorporates both monetary and physical measures of corporate impacts on the environment. Furthermore, it is predominantly focussed on the systematic and regular recording of short term and regular long term, past information which may provide trend statistics as a basis for future decision making

by environment and top management (refer to Figure 6).

#### h) National Carbon Accounting System

The National Carbon Accounting System (NCAS) is a government system that provides a complete accounting capability for sources and sinks of greenhouse gas emissions from Australian land based systems. Development of the system is underway and is described as follows:

“ A capacity to undertake full carbon accounting with a degree of rigour would, with proper information management and accounting tools in place, enable capacities for all other types of reporting. The fully integrated suite of accounting and modelling tools required for such a system can only be a medium to long term aspiration. However, in the short term, this need may be served by identification of the existing or readily developed models, which can, acting in concert, be used to derive a full carbon budget. Operating in this somewhat ‘ cobbled together ’ fashion in the short-term will likely lead to considerable inefficiency in operation. Integration of model components is an important and ongoing activity that needs to be addressed jointly by the NCAS and Greenhouse Accounting CRC. ” (Australian Greenhouse Office 1999)<sup>11)</sup>

The system underpins reporting of Australia’s greenhouse gas emissions for the National Greenhouse Gas Inventory and Kyoto Protocol. It also supports emissions trading discussions and provides a basis for emissions projections to assess progress towards meeting international targets.

The key components of the system are:

land clearing

- area, rate and method of clearing

land use/management

- effects of land use/management regimes subsequent to clearing

biomass

- growth rates, biomass accumulation and carbon content of cleared and standing vegetation, both above and below ground
- decay of cleared vegetation and litter
- usage and decay cycle of wood products

soil carbon

- effects of land use practices on soil carbon content and rates of decay.

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11 ) <http://www.greenhouse.gov.au/ncas/files/pdfs/tech10.pdf>

The Australian Greenhouse Office (AGO) is responsible for planning and implementing the NCAS. Sequestering carbon in carbon sinks provides industry with a lower cost option in the short term, to bring its net emissions within the bounds agreed in the Kyoto protocol. Industries that will benefit include energy, transport, forestry, agriculture, mining, insurance and manufacturing.<sup>12)</sup> The NCAS will be developed rapidly over the next few years- placing Australia at the leading edge of the science that underpins carbon accounting and land based emissions mitigation. It will provide support for carbon emissions trading at the corporate level.

**Classification:**

The emphasis is upon long term, routinely generated physical information for environment management support in future decision making (see Figure 6).

**i) AASB 1037 Self-Generating and Regenerating Assets**

The Australian Accounting Standards Board (AASB) produced, in 1998, an accounting standard that requires valuation of non-human living assets of companies (called SGARAs). These assets have to be valued at net market value - the amount that could be expected to be received from the disposal of SGARAs in an active and liquid market after deducting costs expected to be incurred in realising the proceeds of such a disposal. A collage of alternative measures can be used in the absence of an active and liquid market - net present value, historical cost, replacement cost, etc.

**Classification:**

Development of this external accounting standard influences EMA in an indirect way through financial reporting requirements. The focus is on short term monetary measures of performance related to the past and produced on a regular basis for use by accountants, production, product and environment managers.

**j) Petroleum refining capacity.**

At present, Australia has eight refineries of petroleum. Most of the refinery capacity was developed in the 1950 s and, if it is to survive, needs upgrading to allow for new environmental laws (the National Fuel Quality Standards Act 2000)<sup>13)</sup> relating improving fuel quality up to European Standards. Companies, such as Shell and Caltex, are in the process of assessing the physical impacts of new fuel quality standards. They also are assessing the monetary implications of this need for considerable additional investment if the refineries are to be kept open.

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12 ) <http://www.greenhouse.crc.org.au/industry.pdf>

13 ) <http://scaleplus.law.gov.au/html/pasteact/browse/TOCFU.htm>

#### Classification:

Petroleum refiners have to make ad hoc investment decisions about their existing refineries. First, they need to assess the long term physical impacts on their product and processes. Second, they have to assess the monetary implications of the new environmental legislation. Both aspects come together in an integrated assessment of whether to continue in business and EMA information is critical to the decision reached. The information is important for top managers, accountants and environmental managers.

#### Conclusion:

This brief examination of a number of EMA initiatives taking place in Australia indicates:

- Of the initiatives identified, some relate to promotion of EMA by certain bodies that have a direct influence on EMA (eg. a and b) while others try to have an indirect influence (eg. c, d, e, f, g, h, i and j).
- There is no shortage of indirect efforts to develop short run, routinely generated, past orientated EMA information expressed using physical measures. These measures are not, in general, integrated with monetary EMA.
- A number of empty boxes in the matrix, in Figure 6, reveal the lack of emphasis on:
  - o (i) future orientated aspects of physical EMA,
  - o (ii) the long term focus for ad hoc past orientated physical data, and
  - o (iii) past, ad hoc information.
- The main focus is on initiatives directed at MEMA - plus an emphasis on conversion of existing management accounting to EMA, and on routinely generated, past short term PEMA information.
- Two of the most potentially useful developments are b) the EMA project and g) Greening Local Government. These two developments focus on the EMA systems, how to implement the systems, discovery of any problems with implementation, and how to overcome these problems.

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# 1st Session Q&A

## 1st Session

### Q&A in response to report 1

Floor

Thank you very much for providing a wide range of information.

According to the rightmost column of exhibit 5 on page 18, companies which disclose environmental accounting information have less return on total assets than those that do not so. Companies with lower profitability try to disclose environmental information harder, while companies with higher profitability do not tend to disclose environmental information. I suspect that the results are significant.

Kokubu

As value P in exhibit 5 is 0.24, the results were not significant. All the results shown in exhibits 5 and 6 were not significant.

That is, in examination as to whether there was any difference between companies disclosing environmental accounting information and those which did not, all of the obtained results were not significant. Although there were significant differences between companies which conformed to the standards in terms of sales, total assets and operating profits, there was no significant difference in terms of return on total assets.

Floor

We have learned about various topics such as company characteristics, environmental information disclosure. I would like to know your total image of disclosure and behavior led by these aspects, if possible.

Kokubu

At present, we are busy at pursuing research mainly on problem recognition and current status analysis, so it seems difficult to refer to behavior. However, I note two points. Firstly, the MOE's guideline has a considerable influence on environmental accounting. Secondly, companies disclosing environmental accounting information in compliance with some standard are relatively large in size.

In latter case, as we only did a two-tailed test as to whether there is any significant difference, we did not test hypothesis that larger companies executed excellent environmental accounting in compliance with the standard. The results such as average value, however, suggest such tendency.

## Q&A in response to report 2

Floor

I am from the Philippines Institute of Certified Public Accountants. I would just like to clarify, if I understand it is right. I think, there is still no agreement as to what we are really addressing or what we would like to be reporting on, for example, one part of the report will take the shape of the concern and awareness of a company on the global issue of the environment. The other concern probably is the social cost of the report, and yet we are preparing it all for Environmental Accounting - and here comes the other confusion- where in accountancy we now have the disclosure for liabilities and possible disclosure of compliance and non-compliance of clients. I am just clarifying because I think that we will see the light at the end of the tunnel as to how we can classify this in the future. I think that is how I look at it - is it the way you look at it too?

Lee

At first, I couldn't catch your point. The first point is that do we include, how do we consider social costs in our scheme. Secondly, can you clearly point out the second point? The first one, I first explained...

Floor

The first one is that we would like the report to show the objective of the report....of awareness and concern.

Lee

As for the first question, we don't consider at the first stage the social aspects because it is very difficult to calculate social costs at the moment, so we are normally talking about the real amount which we paid. That is the basic starting point for this discussion. We discussed and categorized all the costs, like social costs, external costs, whatever, but it is still very difficult at the company levels. Secondly, the purpose of the environmental accounting, as in some cases, Korean companies realized that suddenly the international industry organization like the International Steel Organization or the International Semi-conductor Organization or whatever, they established their own guidelines for their own industry. I was one of the members of the International Steel Industry. We got an international working group for the members; we developed the environmental accounting guidelines for the steel industry. This means that the movement gives some impact to the leading companies everywhere in the world. So, POSCO was one of the members, one of the largest steel makers, they cannot resist that kind of movement, so they have some interest in that activities, and we developed our own ideas and gave some

input to the activities. That was the first stage, but eventually, they realized that environmental issues is very important from the CEO level to the working level, but still, it is quite difficult. The difficulty is words, how to integrate and implement the process in relation with computerized accounting systems. So at the moment, we are thinking about enterprise resource planning, ERP. So we tried to integrate environmental accounting process into the ERP system, but it was not ready at the moment from the advanced IT companies, even some bidding, the consulting firms, or ERP suppliers. So, that is one of the issues I think in this sector at the moment. Is that enough?

Floor

It sounds as though you are working on fairly similar lines to the Japanese guidelines that we were just hearing about. How far do you feel that adapting those would answer what you are looking for, or are you looking for something distinctly different?

Lee

I think that we cannot say any difference from Japan exactly, but the problem is the readiness of the industry. The Korean industry is not so well developed to introduce this kind of issue in the practice. But in the case of the Japanese, the globalization level or whatever, Japanese companies are larger than Korean companies. So in that aspect, it takes a couple of years more to introduce quite widely in Korea. On the other hand, the government's position is a little different. The Japanese government, the Ministry of the Environment or MITI or whatever, they tried to make it quite concrete policy, but in the Korean case, I think that it is still in the discussion stage with the government. I am leading a team to introduce these issues in government policy measures, but still it is under consideration at the moment, so it takes one or two years more. In terms of time gap, I think about 3 to 5 years difference between Japan and Korea, I think.

### Q&A in response to report 3

Floor

In figure 3, the terms "Future Oriented" and "Past Oriented" is described as "future data" and "past data" in Japanese version. I think these terms are probably based on a sense of direction of future orientation and past orientation. Considering managerial accounting, "Past Oriented" requires to be reported for accountability purposes, but accountability for the past has the feature of financial accounting rather than managerial accounting. So, in consideration of

managerial accounting, we need to provide information about the way to improve the present situation with this figure. It is unfortunate to give such a comment as to break the well-organized table, but in my opinion, the table would take a more complete form in terms of managerial accounting by adding “ Present Oriented ” or present focused data which spurs innovation for improvement of current operation. Please let us know your opinion.

Burrit

My comments would be that it is a useful comment to make, I actually do feel that the systems that we have in place are all important; that means to say that the past is important, contemporary information or current information is important, and using this information to perhaps predict the future is also important. So there are links between all three. My assumption in Figure 3 is that the past information includes contemporary information for decision making, in so far as I do not have real time information disclosed on this particular table, it would be too complicated to add that, but I entirely agree on your comment. Could I just say one other thing? Past information is very important for accountability purposes and that information can be used by external parties to make their decisions about how they will relate to the company, whereas for management purposes, past information is more useful for predicting the future, and for the decisions that they have to make.

Floor

My question might be inappropriate. I indeed agree that past and future information is important. The problem is that the table does not disclose real time information as another factor. For example using ERP, we have quantitative, physical data in a form of process management. I agree that past and future information is important, but, in my opinion, one more column “ Present Oriented ” would bring the figure to perfection. I never mean that past and future data is not important.

Burrit

Thank you, that is something which could take a while to discuss, but my own view would be past and current information are both used for predicting the future, so my preference would be to refer to past and contemporary, or past and current, information and just keep two boxes in the Figure. That would be my preference anyway. Perhaps we can talk more about this.

## 2nd Session

Environmental Accounting :  
Operations of Each Country

# ENVIRONMENTAL MANAGEMENT ACCOUNTING (EMA) IN THE PHILIPPINES: EDUCATION AND CORPORATE APPLICATION

The Environmental Management Accounting  
Network - Asia Pacific (EMAN-AP)  
Inaugural Conference  
Kobe, Japan  
September 27, 2001

**Abstract :** The presentation will describe the recent efforts done in the Philippines to develop and promote Environmental Management Accounting (EMA) through the following avenues: (1) Accounting Education, both professional and undergraduate, and (2) Application of EMA in business, particularly as a management assessment and rating tool for Corporate Environment, Safety and Health (ESH).

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Accounting is the language of business. Business decision makers rely on information provided by accounting to communicate and make sound decisions. Can accounting, the discipline that provides the language of earnings and capital, also give the environment a much needed voice in business decision-making?

## Introduction

Degradation of the global environment and the problems that accompany it have been widely documented. Many of these problems, such as pollution, deforestation, land degradation, and resource depletion are particularly acute in developing countries including the Philippines which is also struggling to solve poverty and other social inequities. The race for economic development has also brought about tremendous pressure for increased exploitation of the country's natural resources.

As disastrous floods, diseases and other fallout from environmental abuses and neglect are experienced by the nation like the Ormoc flood disaster of 1991 and the Marcopper Mining Accident of 1996, environmental protection has slowly but surely become one of the leading causes of many Filipinos. During the past decade, environmental issues have caught the attention of policy makers, community leaders, academics, media practitioners, business and environmentalists.

## Hidden Environmental Costs

Uncovering and recognizing environmental costs associated with industrial processes is one of the challenges facing businesses today. Among the growing list of internal environmental costs that companies pay for include costs incurred in connection with pollution reduction, waste management, monitoring, regulatory reporting, legal fees and insurance. In the midst of increasing environmental regulations affecting companies, the achievement of core business goals such as controlling costs and increasing revenues can hinge on the ability of companies to pay attention to current, future, and potential environmental costs. Business executives are beginning to realize that environmental cost data has become important for good management decisions.

Unfortunately, conventional cost accounting systems can conceal environmental costs because it attributes many of these costs to general overhead accounts. This practice hides environmental costs from product and production managers who are often unaware of the extent of environmental costs and their impacts to operations and profitability

## Environmental Management Accounting

Environmental Management Accounting (EMA) overcomes the limitations of conventional cost accounting in providing useful cost data for decision-making purposes. EMA can be defined as the process of identifying, collecting, estimating and analyzing environmental cost information to serve internal decision-making and reporting purposes. It also includes the collection and analysis of data on physical data flows related to inputs to production activities (eg. materials and energy).

By applying existing management accounting tools to the identification and estimation of environmental costs, EMA provides an excellent base for informing decisions made by managers in the following areas: cleaner production and pollution prevention, environmental management systems, green supply chain systems, corporate planning and assessment, and performance evaluation and benchmarking.

### Promoting EMA in the Philippine Through Accounting Education

EMA promotion in the Philippines is led by the country's organization of accountants, the Philippine Institute of Certified Public Accountants (PICPA). Through PICPA's EMA initiatives, the accounting profession in the Philippines has become a frontrunner in its desire to address the issue of how it can contribute towards development of a sustainable environment.

To meet the increasing challenge for accountants to provide business with environmental cost information, PICPA introduced in 1999 various activities in understanding, publicizing, and educating its members in the basic concepts of environmental accounting, and other modern environment-related approaches such as pollution prevention (P2) and Cleaner Production (CP). The dissemination of environmental management accounting concepts and tools is mainly through three new programs and initiatives:

#### 1. Continuing Professional Education (CPE)

Using funding from the US-Asia Environmental Partnership Program, PICPA has developed a new training course entitled "Environmental Cost Assessment (ECA): Profiting from Cleaner Production" as part of its continuing professional education program. The course was developed with participation from the following organizations: the Illinois Environmental Protection Agency, the Tellus Institute, and the Asian Institute of Management.

The course was designed for an audience of mixed professionals including accountants, engineers, and environmental specialists in recognition of the fact that successful environmental cost accounting and cleaner production require teamwork at the facility level. The two-day curriculum for this course was designed around a set of case studies based on Philippine businesses that have improved their financial and environmental performance through the adoption of cleaner production strategies. Topics on the course include the following:

- Introduction to Environmental Accounting
- How to estimate the true "cost of waste" at an industrial facility
- Basic concepts of cleaner production for reducing the cost of waste
- Environmental cost data collection and estimation issues and tools
- How to perform a comprehensive profitability assessment for environmental improvement

projects, particularly, investments for cleaner production

- Case studies of cleaner production profitability in Philippine companies
- How to use the environmental accounting software E2F Philippines
- Where to find more information and assistance about environmental management accounting

Ten experienced PICPA trainers, representing various regions in the Philippines, also underwent a 3-day train-the-trainers course in order to ensure the continued dissemination of the course in other parts of the country. The trainers have been conducting the course since January 2000 to different types of audiences coming from business, academe and government. Many more sessions of the course are currently in the planning stage in cooperation with industry associations representing large, medium, and small-scale companies and the Philippine Business for the Environment (PBE).

Company accountants, engineers, and managers who attended the course reported that it has helped them understand and initiate profitable environmentally-driven improvements in their companies. A good example of these companies is the Lopez Group of Companies, a diversified group representing more than 40 businesses in the Philippines. The conglomerate has integrated EMA in their Environment, Safety and Health (ESH) reporting and assessment system. EMA is expected to help improve the company's ESH performance and promote its full integration into the business organization.

Other courses exploring links between environmental issues and the accounting profession will be developed and offered in the future. One of these courses addresses issues in environmental auditing. This has already been included in the list of courses endorsed by the Professional Development Committee to the various PICPA chapters for the purpose of continuing professional education.

## 2. Integration of Environmental Accounting in the Undergraduate Accountancy Curriculum

To ensure that future practitioners will make environmental concerns an indispensable part of the practice of their professions, it is important for schools and universities to adjust their curricula to integrate an environmental perspective into the courses on offer. Environmental education at the school and university levels aims to deepen knowledge and develop the necessary skills for the management and improvement of environmental quality conducive to the well-being of society.

PICPA has responded to this challenge by working towards the integration of environmental accounting in the accounting curriculum for schools and universities. The PICPA Model

Curriculum integrates environmental accounting in the following subjects:

- Management Accounting. Environmental accounting topics include environmental cost analysis and capital budgeting for environment-related projects particularly cleaner production investments;
- Financial Accounting and Auditing. Discussions of applicable financial accounting standards relating to environmental issues in companies (e.g. contingencies, liabilities and disclosures).
- Professional Ethics. Topics for discussion include consciousness and care for the environment which is part of the social responsibility of an accountant. Also included is the integration of environmental and societal consideration in business decision making.

The Board of Accountancy in the Philippines has recently endorsed the 2001 Revised Accountancy Curriculum setting out the minimum requirements for an accounting degree in the country. The new curriculum also includes EMA topics in the following core accounting subjects:

- Management Accounting which lists environmental cost accounting as one of its topics; and
- Advanced Accounting where the impacts of environmental concerns on company costs will be examined.

### 3. Dissemination of Environmental Accounting Information and Tools Through Written Materials, Conferences, Networks, etc.

Other activities to promote environmental accounting have been undertaken by PICPA. Environmental accounting concepts and tools are being promoted via articles published in various PICPA newsletters and journals. To further spread the practice of environmental accounting to its membership, the Institute has also featured environment-related topics in conference and conventions. One prominent venue where environmental accounting was highlighted was the convention of the Confederation of Asia Pacific Accountants (CAPA) held in Manila in November 2000. To address the needs of the education sector, an EMA Coursebook is being planned for distribution to accounting professors to encourage the teaching of EMA in the classroom.

Various chapters of PICPA, situated across the entire country, have also initiated their own community-based environmental projects in the areas of solid waste management, recycling, and reforestation.

## The Future Work

The Accountancy profession in the Philippines is actively getting its members engaged in considering environmental issues in their decision making. Through the committed actions and unwavering interest of individuals and groups within the organization, PICPA has made great strides towards putting the environment on the agenda of the accountancy profession in the Philippines. However, much work still has to be done to sustain the various programs that are already in place, particularly in the area of educating professionals and students in the practice of environmental management accounting. The Institute looks forward to meeting these challenges in the future and will continue undertaking projects that will help promote sustainability in business and society through more innovative practices in accounting.

## CORPORATE APPLICATION

### The Lopez Group of Companies

Probably the most diverse of the family conglomerates operating in the Philippines, it has business interests in:

- Broadcast and Tele Communications
- Public Utilities
- Power Generation
- E-Commerce
- Infrastructure and Property Development
- Electrical and Electronics Manufacturing

ABS-CBN Broadcasting Corporation is the industry leader and has received various citations as the most admired network not only in the Philippines but also in the region.

When the Lopezes acquired Manila Electric Railroad and Light Company and from the American firm General Public Utilities in 1960, it was the biggest buy off in the region at that time. Now, Meralco is the largest electric distribution company in the country, covering Metro Manila and the adjacent provinces.

First Gas Holdings Corporation infuses 1500 MW into the projected countrywide grid. Santa Rita and San Lorenzo Power Plants operate as the first natural gas fired combined cycle power generation facilities in the country, and the biggest in the region.

In partnership with Sumitomo Corporation in the 300 hectare Industrial Park development and management and also with Sumitomo Electric Industries in First Sumiden Circuits, for the manufacture of flexible printed circuit and flat cables. In fact, it was Sumiden that the group of companies was first involved with the EMA project of PICPA way back in 1999.

Driven by its core corporate values of nationalism, entrepreneurship, loyalty and strong work ethic, the companies are involved in a number of Corporate Social Responsibility (CSR) programs. Some of these are:

The Foundations take up the corporate citizenship responsibility of uplifting the socio-economic security not only of the immediate communities where the operating companies are, but even to the impoverished districts and/or disadvantaged sectors of Metro Manila.

Quiet recently, First Philippine Conservation International was incorporated as the local agent of the global institution in pursuit of the preservation and protection of biodiversity.

The Group is actively involved with the Philippine Business for Social Progress and the Philippine Business for the Environment.

### The Environment, Safety and Health Management System

From its inception in 1998, focus was always given to establish a sustainable ESH Program that approached World-Class standards, with emphasis on an ISO-based Management System, progressing towards sectoral technical systems. To achieve such status, the methodology employed was the conduct of extensive in-house training and networking among the ESH officers of the Group companies.

The program entails a deliberate effort to move from the traditional ESH practices to systems approach. Not only will this create paradigm shift, but also more likely, one that will continuously evolve to address the inherent and intermittent ESH issues, concerns, hazards and risks.

Corporate Governance exudes the significance of ESH in relation to the other business objectives. ESH corrective, preventive and improvement opportunities become part of strategic planning exercises, alongside the various processes within the organizational hierarchy. ESH will then be infused with the operational measures of process integrity and efficiency; human capital capability and productivity; sustained growth and profitability.

The internally developed Management System follows sort of a stepladder, where companies graduate from basic organizational and hazard identification elements to somewhat advance technical subjects like the Environmental Impact Assessment adopted from ISO 14000, and the United Nations Environmental Risk Assessment model. We also adopted the United States Asia Environmental Partnership (USAEP) funded project on Environmental Cost Accounting, implemented in the Philippines through PICPA. As the companies develop confidence in the program, they then proceed to the expert level.

To close the loop, we measure the progress of the program by establishing the Management Assessment and Rating System (MARS), which the companies go through to determine their readiness to move on to the next level. Conducted semi-annually by independent systems auditors, the MARS rating is based on stretched targets. Awards will be given to companies with

outstanding (beyond the minimum compliance) performances.

In essence, the ESH MS seeks to synergize with other improvement initiatives like Total Quality Management (the world's learning from Japan's Deming and Juran experiences), Human Resource Systems (job profiling, competence development and performance management systems), and Information Management (Communications and Technologies).

We then report a successful rollout of a Lopez Group wide initiative amidst the political-economic uncertainties and the internal cultural challenges of migrating traditional operational practices to a more proactive management system in addressing ESH issues and concerns. In the end, we have accepted the responsibility of protecting lives and the environment as an integral part of our corporate values in promoting workers' welfare and in expanding our entrepreneurial public service.

### Cost Accounting

PICPA introduced the methodology for ESH practitioners to speak the language of the finance managers. Over the developing years of ESH in the Philippines, and probably in the region, practitioners have painstakingly lured the commitment and support of finance officers, oftentimes positioning ESH costs as investments.

After all, the ESH MS:

- Promotes a positive image of the company for investors and shareholders
- Saves the company exorbitant insurance premiums and emergency expenses
- Prevents from regulatory penalties and/or closures
- Protects against legal suits

Cost Accounting is for ESH, in the same manner that Cost of Poor Quality (COPQ) is for TQM. It is the economic justification for ESH budgets.

### The Benefits of ESH to Business

Rather than presenting the intended theoretical Benefits of the Program, here are some sort of feedback from the Heads of those companies who have successfully instituted the ESH Management System, if and how the program created positive impacts to their respective business processes:

“ as we got deeper into the commitment to be ESH-aware and conscious, we realized the value it added to the organization: THE DRIVE TO BE PREPARED AT ALL TIMES, eliminating risks where possible - this mentality took root. ”

President and CEO, First Gas Power Corporation

“ FPIP ’ s MARKETABILITY HAS BEEN ENHANCED given that we cater to Global companies which observe the same ESH programs. ”

President and GM, First Philippine Industrial Park

“ ESH allows First Balfour to bid in certain works, where it offers INTANGIBLE VALUE to Client. REAL COST SAVINGS in terms of reduced losses and lower insurance premiums/claims. FILIPINO COMPANY CAPABLE OF INTERNATIONAL PERFORMANCE ”

President and GM, First Philippine Balfour Beatty

“ For all BPPC employees, ESH does not mean following a policy instruction but adhering to A WAY OF LIFE. ”

EVP and COO, Bauang Private Power Corporation

#### The Perpetual Challenge

“ The Company that is rich and prosperous, while labor lives in misery has neither the right to exist nor the right to claim public support ”

Eugenio Lopez

Founder, Lopez Group of Companies

#### Conclusion

Environmental Management Accounting (EMA) can serve as a useful tool for both conventional and environmental decision-making within a firm. The experience in the Philippines shows that the Accountancy profession can serve as an effective catalyst in educating current and future professionals on EMA. Corporate Environment, Safety and Health (ESH) can particularly benefit from EMA because EMA translates ESH results and benefits using a language that business managers understand. This understanding gives way to increased appreciation for ESH and its full integration into the entire business organization.

## EMA in the Philippines: Education and Corporate Application

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Rene Mayol, Assistant Vice President, Lopez Group of  
Companies

Environmental Management Accounting Network for Asia Pacific  
(EMAN-AP) Inaugural Conference  
Kobe, Japan

## About PICPA

- The Philippine Institute of Certified Public Accountants (PICPA) is the national organization of accountants in the Philippines
- PICPA is a founding member of the ASEAN Federation of Accountants; it is also an active member of various regional and international accounting organizations
- It has more than 100,000 members
- PICPA is mainly responsible for the continuing professional education of Filipino accountants in the following sectors: commerce and industry, public practice, education, and government

## EMA in Education

- Continuing Professional Education
- Undergraduate Accountancy Education

## EMA in Continuing Professional Education (CPE)

- Multidisciplinary
- Training Courses
- Credited for Professional Development

EMA Courses in  
Continuing Professional Education  
(1)

- An Introduction to Environmental Accounting (two hour seminar)
- The Role of Management Accountants in EMS (halfday course)

EMA Courses in  
Continuing Professional Education  
(2)

- Environmental Cost Assessment:  
Profiting from Cleaner Production

Environmental Cost Assessment:  
Profiting from Cleaner Production

- To illustrate the true of costs of operating inefficiencies that create pollution and waste, and the importance of tracking those costs
- To increase awareness of the potential limitations of cost data from the accounting records, and to provide participants with some tools and approaches for environmental cost identification and estimation

Environmental Cost Assessment:  
Profiting from Cleaner Production

- To introduce participants to the basic concepts of Cleaner Production and its key role in enhancing both financial and environmental performance
- To familiarize participants with an approach to the comprehensive profitability assessment of Cleaner Production Projects

## EMA Software

E2F Philippines



## EMA in Undergraduate Accountancy Curriculum

- Board of Accountancy in the Philippines
- Task Force on Curriculum
- Philippine Institute of Certified Public Accountants
- 2001 Revised Policies and Standards for Accounting Education

## Core Accounting Subjects with EMA integration

- Management Accounting Accounting Part 2
  - This subject deals with the application of techniques and concepts focusing on segment reporting, profitability analysis, and decentralization, information for decision making purposes (short term and long-term), capital budgeting decisions and environmental cost accounting

## Core Accounting Subjects with EMA integration

- Advanced Accounting
  - Designed to cover accounting and reporting for not-for-profit organizations, government accounting, debt-restructuring, and accounting for financially distressed corporation.
  - This subject will also take the impact of environmental concerns on company costs.

### EMA Coursebook for Accountancy Undergraduate Education

- Materials to be used by accounting professors to integrate EMA concepts and tools in core accounting subjects
- Modular in design to provide maximum flexibility for EMA instructors
- Lessons can be individually integrated into existing core accounting courses
- Can also be used as a stand-alone mini-course on EMA

### EMA Course Content

- Introduction to Environmental Accounting
- Environmental Cost Identification and Estimation
- EMA for Capital Budgeting and Project Profitability Analysis

### Additional EMA-related Modules

- EMA within government
- Environment and Financial Auditing
- Environment and Tax Accounting
- Environmental Issues in Financial Accounting and Reporting
- Environmental Issues in Other Types of External Reporting

### CORPORATE APPLICATION of EMA in the Philippines

- The Lopez Group of Companies
- Environment, Safety and Health Management System (ESH MS)
- Management Assessment and Rating Systems (MARS)
- Cost Accounting Module (MARS Specification)

## The LOPEZ GROUP of Companies

“through personal life and leadership, it is possible to render efficient services to the public and be profitable at the same time, that compassion for associates and employees is a vital part of doing business, and that environmental protection and conservation is a primary responsibility of business

## Lopez Group: DIVERSE CONGLOMERATE

- Communications (ABS-CBN, SkyCable)
- Power Generation (First Gas Power)
- Utilities (Meralco, Maynilad, MNTC)
- e-Commerce (BayanMap, BayanTrade, C3)
- Property Development (Rockwell, FPIP)
- Electrical & Electronics Manufacturing (FSCI)
- Infrastructure Development (FPBB)

## Corporate Social Responsibility Programs

- EL, ABS-CBN, Sky Foundations
- Conservation International
- Corporate Wellness Program
- Executive Education Program
- Industrial Environmental Mngt
- Occupational Safety & Health

## Environment, Safety & Health MANAGEMENT SYSTEM

- structured-measurable-sustainable
- evolving paradigm
- corporate governance
- ISO-ISRS-IERS based
- 5 year Development Plan
- 20 Modules

## Environment, Safety & Health STRATEGIC GOALS

- ensure Resource Efficiency
- strengthen Process Integrity
- enhance People's Capability
- institute Corporate Responsibility
- secure Profitability & Sustainability
- improve Shareholder Value

## MANAGEMENT ASSESSMENT and RATING SYSTEM

- objective review of the progress of MS development and implementation
- conducted semi annually
- third party / independent reviewers
- stretched targets
- Awards:  
President's, Chairman's, Founder's

## Business Integration: CORPORATE LINKAGES

- Total Quality Management
- Human Resource Systems
- Information Management
- Cost Accounting
- Due Diligence Reviews

## Module 9: COST ACCOUNTING

- budget for regulatory compliance
- program expenses
- historical costs of accidents and liabilities
- cost-benefit analysis and financial ratios
- economic justification for ESH projects
- ESH performance improvement
- production/operating cost efficiency

### Cost Accounting Application: INDUSTRIAL PARK

Cost Comparison in US\$

River Protection: 1200
Fines: 7300
Laboratory OH Program: 4000
Lost Manhours & Medical Expenses: 16000
Road Safety: 1400
Property Damage & Injuries: 36000

### Cost Accounting Application: POWER PLANT

Cost Comparison in US\$

Waste Segregation Project: 500
Disposal Expenses & Liabilities: 3900
Fire Brigade Competition: 1900
Fines, Property Damage & Injuries: 52900
Bacteriological Analysis: 100
Lost Manhours & Medical Expenses: 18200

### Cost Accounting Application: MANUFACTURING

Cost Comparison in US\$

Indoor Air Quality Project: 800
Lost Manhours & Medical Expenses: 7800
Drinking Water Quality: 1800
Lost Manhours & Medical Expenses: 11200
Waste Water Treatment Plant: 38500
Fines and Production Losses: 73000

### Don EUGENIO LOPEZ

“The Company that is rich and prosperous, while labor lives in misery has neither the right to exist nor the right to claim public support”

# INTRODUCING EMA TO THE INDONESIAN INDUSTRIES THROUGH EFFLUENT CHARGE



IKATAN PROFESIONAL LINGKUNGAN HIDUP INDONESIA  
INDONESIAN SOCIETY OF ENVIRONMENT PROFESSIONALS

## INTRODUCING EMA TO THE INDONESIAN INDUSTRIES THROUGH EFFLUENT CHARGE

LIANA BRATASIDA

Kobe, 26– 27 September 2001

## Outline of Presentation

- Introduction
- Environmental Management in Indonesia
- EMA Programs in Indonesia :
  - Evolution Laws and Regulation
  - Effluent Charge Development
  - Preliminary EMA Initiatives
  - Proposed EMA Program
- Conclusion

# Indonesia

- An archipelagic country as vast as Europe or as wide as the USA;
- Consists of 17,508 island on the equator;
- Has 210 million people living in 6,000 islands
- Islands of Java :
  - approximately 60% of Indonesia's population
  - approximately 7 % of Indonesia's area
  - approximately 70% of Indonesia's industry



Indonesia in Comparison to Germany and Europe

# IPLHI

IPLHI (Ikatan Professional Lingkungan Hidup Indonesia) or ISEP (Indonesian Society of Environmental Professional) is an independent, non-profit and non-political association of individuals and corporations, directly or indirectly involved in environmental management activities committed to environmental protection and principle of sustainable development

## IPLHI 'S MEMBER

TOTAL	180
Business & Industry	115
Consultant	29
Individual	15
Association	3
Government Inst.	8
University/Student	5
Laboratory	3
Research	2

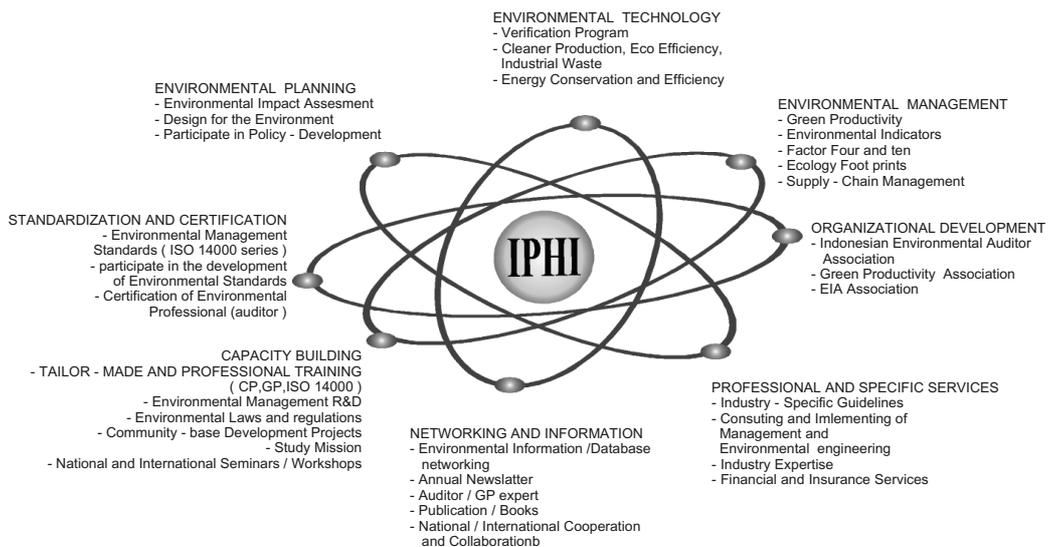
# VISION

Based on a partnership principle with all stakeholders, we promote the development of integrated principles in environmental management strategies in order to improve the efficiency, productivity, quality and environmental protection in sustainable national development

# MISSION

- Promote partnership with government, industries and other stakeholders, maximize the synergy between different environmental initiatives and programs
- Actively provide inputs to the Government for the development of environmental policies, regulations and programs, improve professional qualification of the members in environmental management capabilities. Disseminate environmental management tools, techniques and systems to support and enhance sustainable development in Indonesia
- Promote and enhance the implementation of eco-efficiency, cleaner production, green productivity strategies and environmental standardization

## SUMMARY OF ACTIVITIES IPLHI



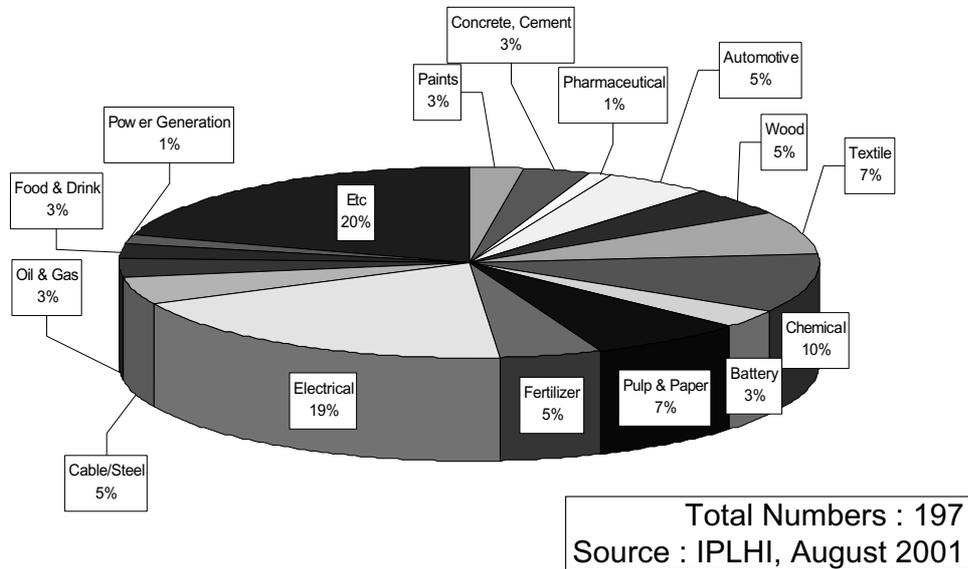
# International Cooperation

- Founding member of International Green Productivity Association (May 2000, Taipei)
- Establishing Green Productivity Association of Indonesia (GPAId), February 2001, Jakarta
- Signing UNEP– International Declaration on Cleaner Production, September 2000, Montreal
- Cooperation with APO, CDG, ASEP, IBCIG, JEMAI, EMAN - AP

## EVOLUTION OF ENVIRONMENTAL MANAGEMENT IN INDONESIA

2000	Green Productivity, PP 41/1999, 19/1999, 85/1999
1999	
1998	Integrate Approach (CP, EMS & LCA)
1997	Adoption of ISO 14000 Series, Act. No. 23/1997
1996	Blue Sky Program
1995	- EMS and Voluntary Standards ISO 14000 Series - Bisnis Environmental Performance Rating
1994	Environmental Auditing, Hazardous Waste Regulation (PP 19/1994, PP 21/1995, Act No. 5/1994 on Biodiversity, Act No. 6/1994 on Climate Change Adoption of Agenda 21, Soft Loan OECP-PAE
1993	- CLEANER PRODUCTION (Prevention Approach) - Ratification of Basel Convention (Kepres No. 61/1993) - PROPER PROKASIH
1992	- Ratification of Montreal Protocol (Keppres No. 23/1992)
1990	- Water Pollution Control Regulation (PP 20/1990)
1989	Clean River Program (PROKASIH)
1986	EIA (PP No. 29/1986 substituted by PP No. 51/1993 and by PP 27/1999) Clean City Program (ADIPURA)
1982	Act No. 4 of 1982, substituted by ACT No. 23 of 1997 on Environmental Management Carrying Capacity Approach

## REGISTERED ORGANIZATIONS FOR THE ISO 14001 IN INDONESIA (as Agustus 6, 2001)



## Laws related with Effluent Charge

- Act No. 23/1997 regarding Environmental Management
- Government Regulation No. 20/1990 regarding Water Pollution Control (under revision)
- Clean River Program (PROKASIH) started in 1989
- Environmental Performance Rating In Cleaning River Program (PROPER PROKASIH) started around 1993–1994

## Important Policy Issue for PROPER PROKASIH

Given the limitations of command and control approach, and the potential effectiveness of the non-legal factors, regulators are interested in new environmental initiatives that can effectively incorporate legal and non-legal factors in their compliance and enforcement programs PROPER PROKASIH is designed to address this issue

## Goal's of Proper Prokasih

- Increasing Compliance through Information Management and Public Participation
- To promote implementation Clean Technology, Cleaner Production, Recycle, Waste minimization by Pabrics
- To promote Self Monitoring by Pabrics
- Act No. 18/1997 regarding Regional Tax and Charge
- Act No. 34/2000 regarding Changes of Act No. 18/1997
- Government Regulation No. 20/1997 regarding Regional Charge (under revision)

## How to control the use of environment?

- Impose limits on how much pollution can be discharged by each firm
- Impose a price for each unit of pollution discharge

Pollution charge : a price that polluters must pay for every unit of pollution that they discharge to the environment

## Basic concept of Pollution Charge

- Each company pays a charge for each pollutant such that marginal damage caused by the pollutant equals the company's marginal cost of controlling that pollutant
- Marginal damage is specific to the location of the company
- Marginal cost of controlling pollution is specific to the company's production characteristics
- The optimal pollution charge varies from company to company, and from pollutants to pollutants

## Background of imposing effluent charge

- Natural resources and environment are considered as free goods
- There is no price associated with using the environment
- Result in no incentive to reduce the use of environment

## Effluent charge aims for :

- Reducing pollution level by imposing financial burden for polluter
- Increasing efficiency on the use of natural resources
- Providing incentives to reduce wastewater quantity below effluent standard
- Encouraging industry to participate as a partner in dealing with wastewater problems

## Effluent Charge

- Effluent charge is one of environmental cost that must be paid by an individual firm to the government
- Such cost is sometimes exclude from overall cost of production process → externality
- Top management (decision makers) → lack of information on detailed environmental costs must be borne by company
- Result in limitation on determination of options for improvement

## Effluent Charge

- To much intention on how to meet environmental standards by increase the use of wastewater treatment without considering other option which might be less costly → pollution prevention
- Top management need information on cost benefit of a certain option to improve environmental performance → requires data/information on environmental expenses
- → need tool to identify such information → environmental accounting

## Prospect of EMA Development in Indonesia

The increasing number of companies who have got ISO 14001 certification would enable easier acceptance of EMA implementation as compare to companies who have no earlier experience of environmental activities

It was believed to be partly due to the global trade, which is coming very soon and party to the customer pressure especially in the export market

In addition, the recent trend of protest coming directly from surrounding society to companies who polluted is taken more seriously by company top management rather than the command and control approach undertaken by the authorities. This situation has effected considerably by on company's environmental policy.

Therefore, the needs for utilizing EMA approach exist

## EMA Programs in Indonesia

The objectives are :

- Increase the awareness of government, industry, research institution, and the public on EMA
- Evaluate the economic, social and environmental benefits to be derived from its application
- Encourage, promote and assist the adoption and implementation of EMA by industry
- Assist in the collection, dissemination and transfer of information on EMA

## Environmental Management Accounting - EMA

- In Indonesia :
  - A new tool → need to be promoted
  - Lack of information
  - Increase awareness
  - Technical assistance
  - Financial support for promoting EMA
- Development and promotion program

## Environmental Management Accounting - EMA

- Improve skills and knowledge both environmental managers and finance managers in industry
- Increase awareness of top managers  
→ decisions making processes
- Association, Government & universities support in promoting EMA

## The EMA Program is Based on Four Primary Areas :

### TRAINING AND AWARENESS

Activities related to training and awareness include :

1. Conduct and/or coordinate training courses, TOT and workshop for :
  - industry and professional association
  - Research institution and universities
  - Public and non Government organization

## The EMA Program is Based on Four Primary Areas :

2. Facilitate in house training on EMA for companies
3. Conduct promotion and awareness seminars on EMA
4. Publish general information and awareness-raising materials such as EMA newsletter and booklets

## Technical Assistance (1)

All stakeholders require technical assistance to properly understand EMA concepts, methodologies and techniques.

The first priority has been given to industries, but other sectors such as mining and energy, agriculture and forestry also require assistance to understand and implement EMA

## Technical Assistance (2)

On-going and future activities among others :

- Develop technical guidelines on EMA for specific industries
- Assist industries companies to develop and voluntarily implement EMA and other ISO 14000 Standard Series to improve their environmental performance
- Initiate voluntary partnership program with industries on EMA and promote international partnership between industry, business and government
- Conduct EMA case studies in collaboration with industry, industrial associations and sectoral agencies

## Technical Assistance (3)

- Develop a Standard Operating Procedure for the application EMA in specific industry
- Facilitate industry's access to appropriate and experienced technical consultants (local and international)
- Establish EMA Working Groups for specific industry to facilitate information exchange and research on EMA methods and techniques

# Information System Development

- Dissemination on EMA information in Indonesia through newsletter, etc
- Access to world-wide information database on EMA through EMAN-AP
- Building a Data-base EMA (case studies)

## Challenges/Barriers in EMA Implementation (Typical Indonesian and ASEAN countries)

- EMA is relatively a new environmental tool, the introduction of the concept and the benefits still have to be widely promoted
- The political and economy situations in Indonesia are at present not quite favorable for most industries; except for some export oriented industries
- To perform EMA even in its simplest form needs quite an amount of data of good quality which are difficult to find in most existing industries
- In view of relatively complex nature in understanding and performing EMA, the availability of human resources locally for promoting EMA is still scarce

# Development of A Regional EMA Programs

These are several countries which have the same constraints concerning EMA development as Indonesia

Therefore, those countries need to :

- Have a similar platform for EMA development
- Set up a common strategy and programs for the promotion of EMA
- Develop cooperation and networking in the area of EMA
- Conduct synergy of efforts in EMA development

## Conclusion

Considering the various barriers Indonesia is facing in promoting EMA implementation, it would be better if we proceed as follows:

- Enhancing the capability and the capacity of human resources in promoting and conducting EMA program
- Promoting and implementing EMA program in companies who have got ISO 14001 certification, since apart from having better environmental awareness, considerable data are usually available in those companies, rendering easier data generation and collection

The success of the implementation could be used as an initiator for further dissemination of EMA concepts

# Case Study of Japanese Companies' Environmental Accounting in Asia

Shinichi Imai\*

## Outline

The Matsushita Electric Group introduced environmental accounting in fiscal 1998. The scope was limited to divisions in Japan but was expanded to its worldwide operation in fiscal 1999.

### 1) Scope

Worldwide manufacturing (R&D) divisions which obtained ISO14001 certification, Head Office and Corporate Regional Management Divisions (Japan: 137, Overseas: 141)

### 2) Accounting items

Environmental accounting items are categorized and their costs are calculated in conformity with the guidelines published by the Ministry of the Environment. Environmental effects are calculated limited to four items which allow for correct calculation of cost reduction. Estimated effects such as avoiding risks are not calculated.

Environmental accounting results for fiscal 2000 were, for environmental costs 62.2 billion yen (24.6 billion yen capital investment and 37.6 billion yen costs) environmental effects achieved were 7.6 billion yen.

In this report, I will compare the breakdown of environmental costs (major six categories) among divisions in Japan, Southeast Asia and China. For the divisions in Southeast Asia in particular, I will compare a breakdown of environmental costs within their business areas (four subcategories).

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\* Manager, Corporate Environmental Affairs Division  
Matsushita Electric Industrial Co., Ltd.  
Senior Visiting Researcher, Kansai Research Center  
Institute for Global Environmental Strategies

## Case Study of Japanese Companies' Environmental Accounting in Asia

September 27, 2001

Shinichi Imai

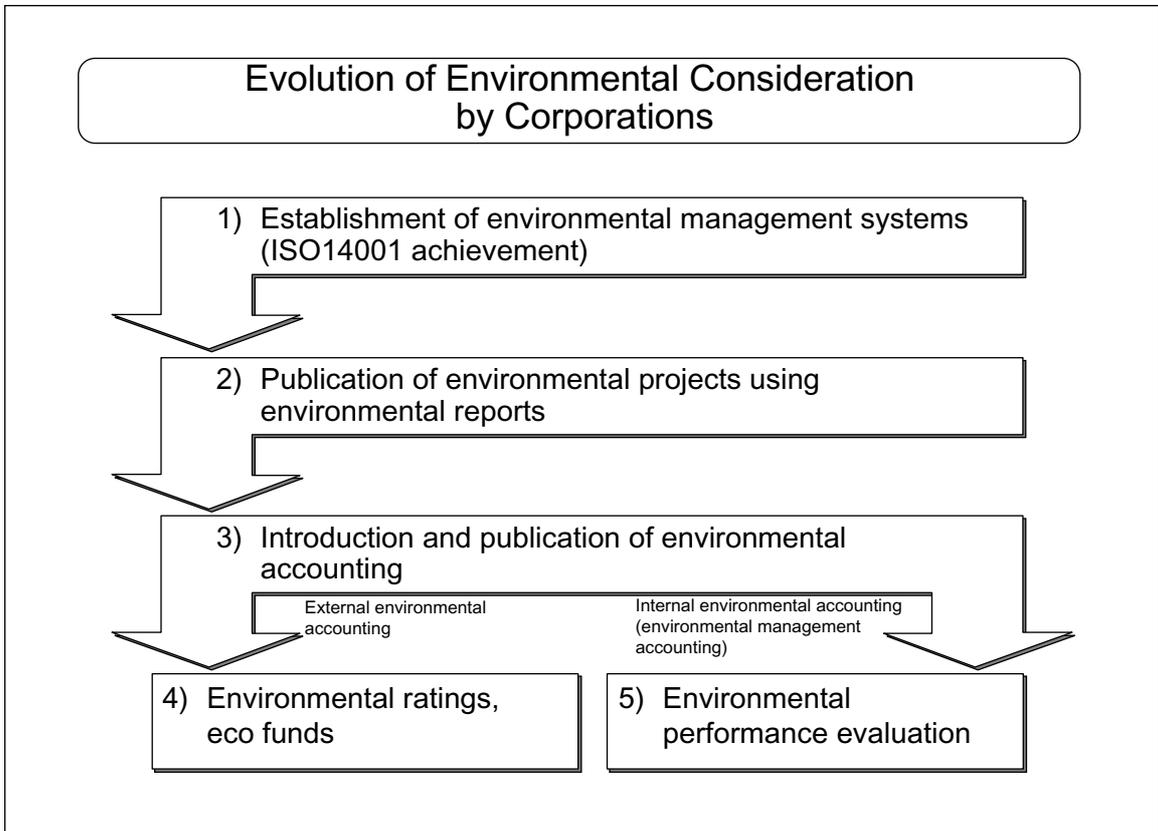
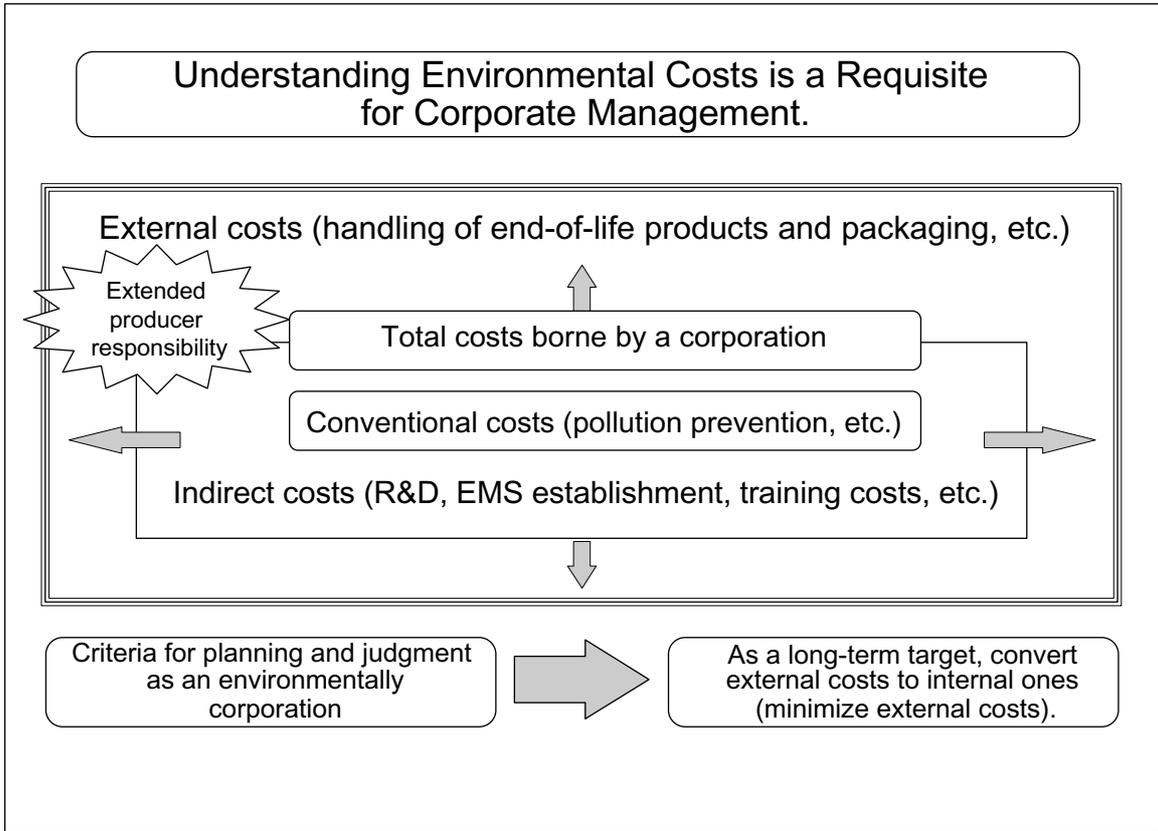
Corporate Environmental Affairs Division  
Matsushita Electric Industrial Co., Ltd.

(Researcher, IGES Kansai Research Center)

### Company Management and Environmental Affairs

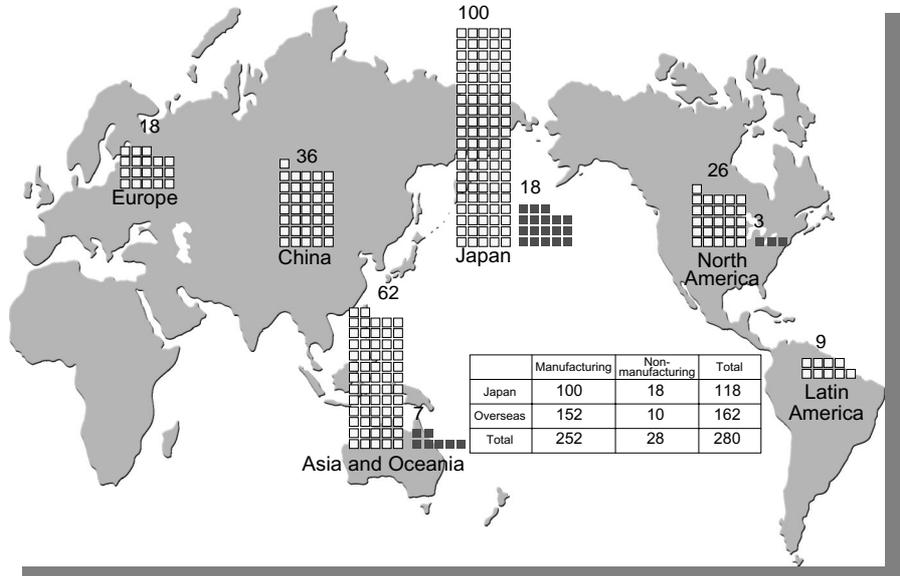
Matsushita Electric Group's key themes

- |                |   |
|----------------|---|
| Business phase | 1) Establish global environmental management systems (obtain ISO14001 certification).                 |
|                | 2) Develop Green Products (environmentally-friendly products).  |
|                | 3) Establish Clean Factories (plants which coexist with the environment).                             |
|                | 4) Recycle end-of-life products.  |
| Social phase   | 5) Promote Love the Earth Citizens' Campaign. (Environmental efforts by employees and their families) |

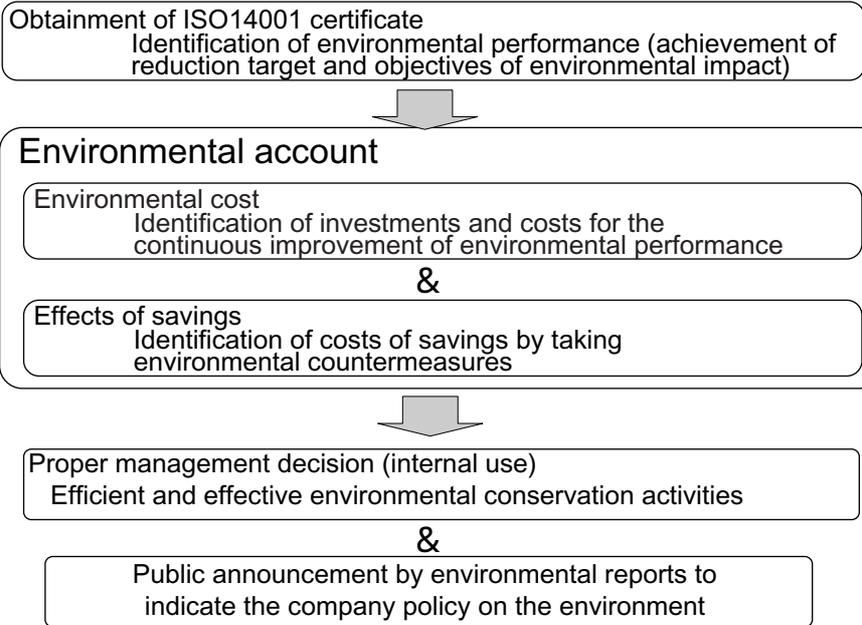


## Matsushita Electric Group's ISO 14001 Certification Obtainment

(End of March, 2001)



## Relationship with Environmental Performance



## Framework of Environmental Accounting The Environmental Agency in Japan

### Definition

System to quantitatively understand (in monetary values or volume of materials) and publish costs (investment and costs incurred during the term) for environmental conservation in the business activities of corporations.

### Image of environmental accounting

Costs	Effects
<ul style="list-style-type: none"> <li>u Costs for environmental conservation</li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <ul style="list-style-type: none"> <li>• Investment</li> <li>• Costs incurred</li> </ul> </div>	<ul style="list-style-type: none"> <li>u Reduction of environmental impact</li> <li>u Economic effects brought about by environmental measures</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px auto;"> <div style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li>• Operational profits</li> <li>• Cost savings</li> <li>• Avoided expenses</li> </ul> </div> <div style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li>• Actual effects</li> <li>• Estimated effects</li> </ul> </div> </div>

## Examples of Environmental Costs and Calculation Rules

Item	Examples and calculation rules	Amount to be booked
Energy conservation at operating units	(1) Investment exclusively for energy conservation 1) Introduction of new energy equipment	Full amount
	2) Changeover to higher-efficiency equipment	Difference
	(2) Investment with other objectives in addition to energy conservation 1) Introduction of equipment which will streamline production (Total investment) x (Monetary value of energy conservation effects) / (Monetary value of total environmental effects) Calculate costs multiplying monetary value of total environmental effects by the ratio of energy conservation effects.	Ratio
	2) Introduction of equipment with other objectives in addition to streamlining production (Total investment)—(Investment without the objective of energy conservation) Calculate the increase from the investment without the objective of energy conservation.	Difference

## Environmental Accounting Figures

### Environmental costs

	Items	Capital investment	Costs	Definitions
Costs within the business area	Pollution prevention			Investment and costs required for preventing pollution
	Energy conservation at operating units			Investment and costs required for energy conservation at operating units
	Other environmental conservation			Investment and costs required for ozone-layer preservation and use of rainwater and waste water
	Disposal, reduction and recycling of waste			Investment and costs required for proper treatment and reduction of waste
	Upstream and downstream costs			Investment and costs required for establishing recycling systems of end-of-life products
	Administration-related costs			Costs required for the obtainment and maintenance of ISO certification and those required for environmental training and efforts for improving awareness
	R&D costs			Investment and costs required for technology development whose principal aim is environmental consideration
	Social activities costs			Costs required for social activities such as donations, support and provision of information to environmental projects
	Restoration of environment			Costs required for surveys of and measures against pollution caused in the past
	Total			

### Environmental Effects

	Item	Monetary value	Definitions
Reduction effects	Reduction of energy conservation costs at operating units		Reduction of energy conservation costs at operating units
	Reduction of waste disposal costs		Reduction of waste disposal costs by reducing industrial waste
	Reduction of water and sewerage costs		Annual reduction of water and sewerage charges by using rainwater and waste water
	Reduction of packaging materials and distribution costs		Annual cost reduction in purchasing packaging materials and product transportation
	Total		

## Global Environmental Accounting Figures (fiscal 2000 results)

### Environmental costs

Unit: million yen

	Items	Capital investment	Costs	Total
Costs within the business area	Pollution prevention	5,515	5,203	10,718
	Energy conservation at operating units	9,985	2,416	12,401
	Other environmental conservation	742	179	921
	Disposal, reduction and recycling of waste	1,451	5,395	6,846
	Upstream and downstream costs	3,302	3,287	6,589
	Administration-related costs	5	6,439	6,444
	R&D costs	2,410	12,532	14,942
	Social activities costs	54	1,438	1,492
	Restoration of environment	1,121	739	1,860
	Total	24,585	37,628	62,213

**Notes:**

- Enter the total capital investment. Do not include depreciation expenses in the environmental costs.
- Personnel expenses: Calculate the monetary value according to the proportion that the staff have participated in the operations.
- R&D costs: Limit to investment and costs required for technology development whose principal aim is environmental consideration. Do not include costs of developing products which use developed technologies.

## Environmental Effects

Unit: million yen

Item		Monetary value	Definitions
Reduction effects	Reduction of energy conservation costs at operating units	2,834	Reduction of energy conservation costs at operating units
	Reduction of waste disposal costs	2,798	Reduction of waste disposal costs by reducing industrial waste
	Reduction of water and sewerage costs	117	Annual reduction of water and sewerage charges by using rainwater and waste water
	Reduction of packaging materials and distribution costs	1,845	Annual cost reduction in purchasing packaging materials and product transportation
Total		7,594	

Notes:

- Environmental effects:  
Book the total annual reduction for each equipment (or project) for which investment has been made.
- For capital investment made during the previous year, do not book its effects achieved this year.

## Environmental Accounting Totaled by Segments

Unit: 100 million yen

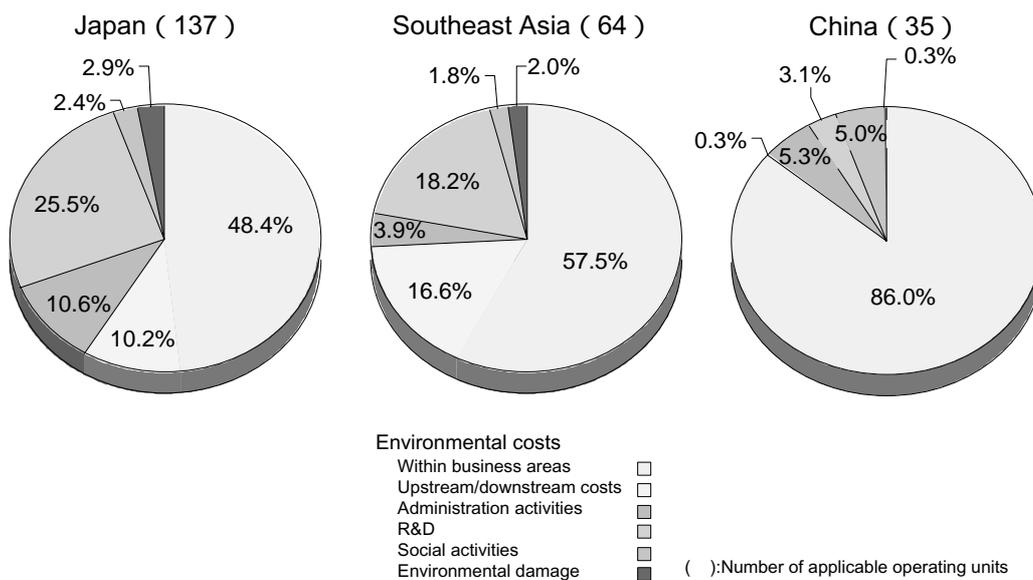
	Ratio to sales amount	Environmental costs			Environmental effects
		Capital investment	Costs	Total	
1 : Consumer fields	31%	51	124	175 (28%)	24 (31%)
2 : Industrial fields	41%	10	35	45 (7%)	6 (8%)
3 : Component fields	28%	139	119	258 (42%)	44 (58%)
4 : Head Office and research groups		45	99	144 (23%)	2 (3%)
Total	100%	245	377	622 (100%)	76 (100%)

## Environmental Accounting Totalled by Regions

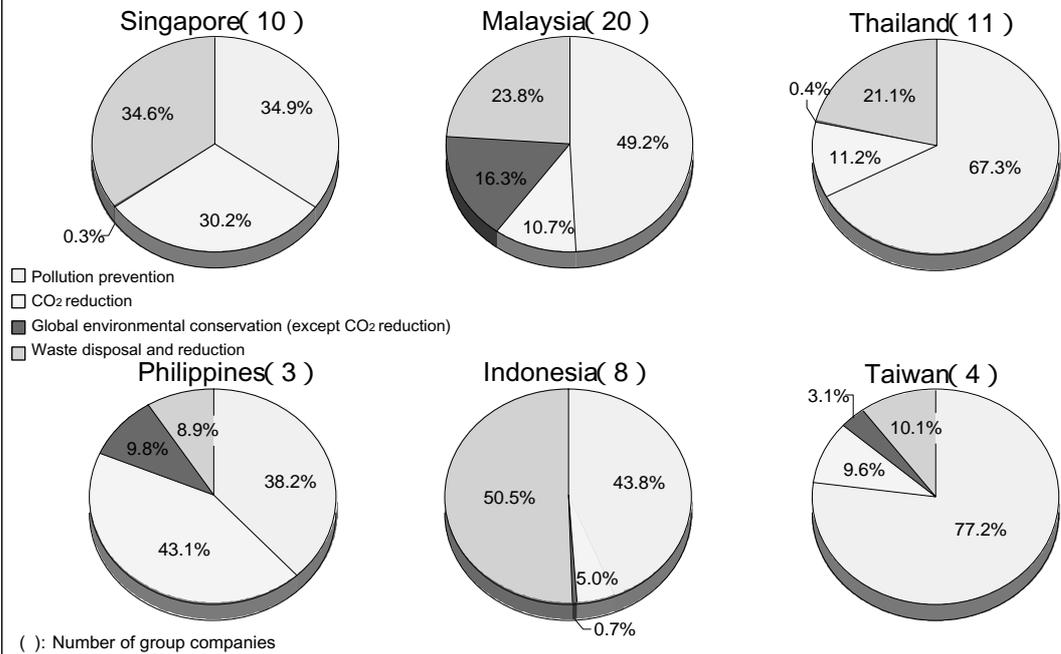
Unit: million yen

	Ratio to production amount	Environmental costs			Environmental effects
		Capital investment	Costs	Total	
1 : Japan ( 137 )	69%	33,528	22,299	55,827 (90%)	6,284 (83%)
2 : U.S. ( 26 )	7%	619	1,278	1,897 (3%)	495 (6%)
3 : Europe and Africa ( 15 )	6%	39	457	496 (1%)	38 (1%)
4 : Asia and Oceanina ( 65 )	14%	1,403	2,014	3,417 (5%)	541 (7%)
5 : China ( 35 )	4%	224	351	575 (1%)	234 (3%)
<b>Total</b>	<b>100%</b>	<b>35,813</b>	<b>26,399</b>	<b>62,212 (100%)</b>	<b>7,592 (100%)</b>

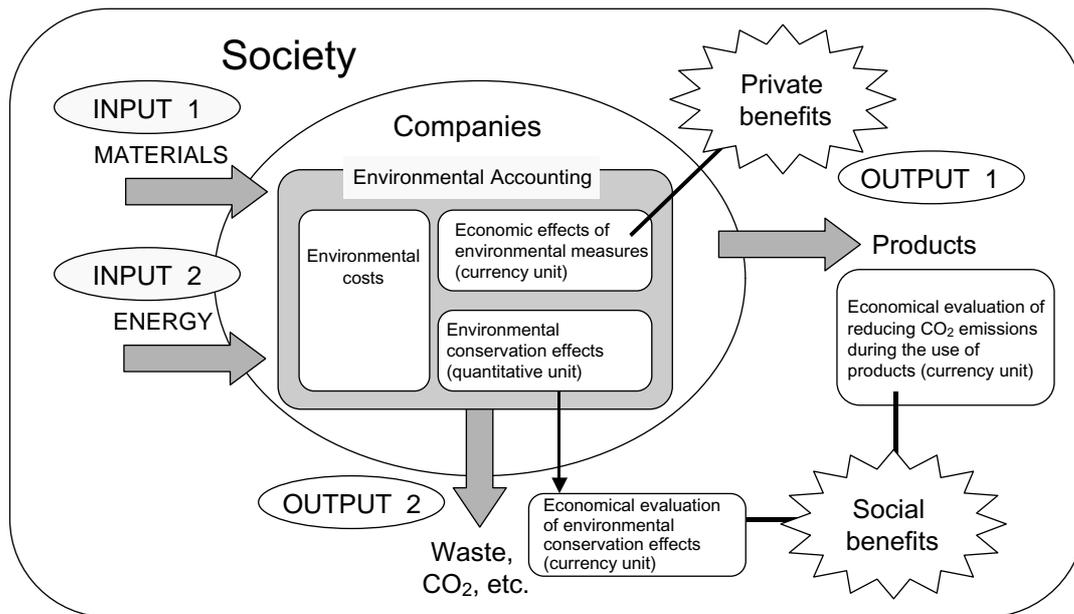
## Comparisons of Environmental Costs among Major Regions



## Comparisons of Environmental Costs in Southeast Asia (within business areas)



## Expansion of Environmental Accounting Concept



## Social Contribution in the 21st Century

Advent of a networking society

Coexistence with global environment

Regardless of great changes in society, the Matsushita Electric Group will continue to bring customers around the world peace of mind, security and satisfaction, as well as dreams and excitement.

## 2nd Session Q&A

## 2nd Session

### Q&A in response to report 4

Floor

I wonder if I could just ask in relation to your general experience. The examples that you've given seem to relate to win-win situations, so that you spend some money and you save more. Are there any circumstances where your companies would move beyond compliance with regulations to actually spend money on the environment when the monetary gains were not known or you couldn't calculate them, but you knew that spending money on the environment was the right thing to do?

Mayol

One very big project that we've launched about 2 or 3 years ago is on the Malampaya Project. As I have mentioned, we have a joint venture with British Gas, which would eventually would run on natural gas coming from Northwest Palawan, and produce about 1500 megawatts of electricity. At that point in time, there was not much pressure from the government; it was more of an unsolicited proposal from our company. So it is that we have to venture into what we call an environmentally-friendly sources of producing electricity. Other than that, we have another company, First Philippine Energy Corporation, where we venture into what we call as the renewable energy, solar, wind power, etc. It is of this field that is to say on the economic point of view there is not much economic returns actually, it is true. But because of the commitment of the group of companies, the Chairman and the rest of the stakeholders to go into, at least start something in the Philippines in the environmental front.

Floor

I'd be interested in hearing a bit more about the techniques, the details of the techniques that you used in coming up with the analysis that produced the sort of figures that you were reporting on. For example, how you actually determined the amounts of those savings that you compared with the costs and, for example, how far what you are doing in your application in environmental costing depended on similar techniques to the ones that we heard about the two papers this morning from Dr. Kokubu and Dr. Lee?

Mayol

Our experience of applying and adapting cost accounting in our program started as asking our environmental officers to just come up with a listing or a consolidated report on of all their

environment safety and health and expenditures. Before that, cost used to be scattered all over the organization; some of which may be embedded or hidden in production costs or they just may be hidden in government taxes or government licenses and so on. So, we started again simply as consolidation of all of those environmental and safety expenditures. From then on, with the help of Fatima here, we trained our environmental officers and our accounting managers to come up with a system. Again, based on simple things like, how much they spent for one particular project, and then based on historical data, how much they have spent paying fines, paying penalties or paying, should I say, ' end of the pipe solutions ' to these environmental problems. So, we projected the cost savings, it is based on historical data as well as projected data, meaning that if we will not invest in this environmental project today, maybe in the next year or the next five years we would be spending as much.

## Q&A in response to report 5

Floor

I would be curious to know what specific type of EMA tools you see as being most relevant for the companies that you are advising. Perhaps in the context of the sort of framework that Roger Burrit was explaining this morning, there can be a number of techniques involved. Which would you see as the most useful in your situation?

Bratasida

In introducing EMA to Indonesia? I think that the most technique that we have to start for introducing EMA in Indonesia is, that we have to touch the government-decision maker; because in the culture in Indonesian business, they will follow what the government says. Therefore, we would like to approach the government and approach the business at the same time. We would like to follow what the government would like to see. This is the business culture in Indonesia.

Floor

I wondered how closely you might be able to work with EMAN-AP for the dissemination of your newsletter, and possibly your database of case studies. It sounds that it would be very useful to work closely through the homepage and the internet site, if that is possible. I wasn't sure if you were going to provide information using a local language and English, Indonesian and English, or whether you will just be having your newsletter in Indonesian.

Bratasida

We have a language problem. Indonesian businesses like to have newsletters in the Indonesian language, so what we have to do is access information from your web site or whatever already exists and we have to translate it into the Indonesian language. That is what we have to plan in the newsletter, so if we always have workshops in English, there needs to be a translator and to translate the material into our own language. I think we will start from your existing information, because we don't have any information yet on activities in Indonesia. So I have to translate whatever exists now from your information database.

Floor

You experienced implementing effluent charges in the industries in Indonesia. Was it successful? Did the industries really think of ways in order to reduce effluent charge, or did it turn around in such that they continued paying effluent charges, because it is a lot cheaper than investing in those high-technology waste treatment facilities?

Bratasida

The effluent charge program was not successfully implemented in Indonesia. Why? Because, as I had mentioned before, the decision makers from the Ministry of Finance, Ministry of Environment, Ministry of Industrial and Trade are not coming into one solution about what they will do with this system. Our government collects money from the industries, then the government needs to provide them with a waste treatment facility not only to collect money but also to use the money for other purposes. But, this is not happening because there is no common understanding. So what happened with the effluent charges in Indonesia is that nearly every province issued their own system that is totally different each other. They thought that by giving a small price to let the industry pay for each cubic meter of water they are discharging to the environment, the investor will come to their province and then build the factory in their province. This is still their mindset. Therefore this is the right time for us to make the EMA program and to introduce what the environmental costs mean and what the market based instruments mean to all decision makers and to the industries. That was our failure in the effluent charge system in Indonesia.

Floor

A supplementary question. The example that you are using is in relation to effluent charges, which is an end of pipe treatment of environmental problems and you want to focus on training and awareness as a way of promoting a better approach to environmental issues. Have you thought as part of that, how are you going to go about trying to develop a proactive approach, a

preventative approach, to environmental issues, opposing with waste issues? Is that part of the strategy or is it not possible at the moment?

Bratasida

It is part of our strategy. As I mentioned that in 1993 we introduced our cleaner production program, and from thereon we implemented our mixed policy tools by combining command and control, voluntary activities and market instruments. Therefore, we emphasize industries to implement pollution prevention or cleaner production program instead of generating waste at the end. We reach our success story in our cleaner production program because there are already several industries that implement our cleaner production program or clean productive programs in Indonesia. So, end of pipe treatment is not our focus anymore. We already moved to implement our preventive approach.

Floor

Do these companies involved in cleaner production have environmental managing accounting systems that show them what the benefits are and what the costs will be?

Bratasida

Yes, I have already published three newsletters on cleaner production and they also put in information about the benefits in terms of money that they spent and they gained after a certain period of time. That is part of the environmental accounting process, but they don't know what is environmental accounting; they only count it as a benefit of what they are doing so far. Therefore, there is also a potential target group that we have to touch on in the EMA program in Indonesia.

Floor

It seems that you expect the Indonesian government will play a great role in promoting EMA in the future. Have you ever approached to the Indonesian government to talk about how to promote the EMA business initiative by the Indonesian government, and what was the result if you did?

Bratasida

I work in the government. I am one of the government officials from the environmental impact agency or EPA in the U.S. I just left the government last year, so I know all the programs and I just talked to the minister. We have a new minister since the new Cabinet last August, and after my visit here in Kobe, I would like to inform them of my presentation with the Minister and his staff of EMA activities. So I need his support in order that EMA will reach the target in Indonesia.

Floor

To introduce EMA the government themselves will have a good impact to the companies. Is that your idea? Do you think that the introduction of EMA by the government will provide a good impact to the introduction of EMA industries?

Bratasida

Yes, I told you that the government is the key player for EMA implementation in Indonesia, since I am also one of the ex-government officials; I have access to inform them about this activity. I hope that they will accept it and believe me about it.

## Q&A in response to report 6

Floor

Thank you for your presentation. This is a simple question. Environmental cost and effect, the numbers measured by the guidelines, I believe that your company's environmental report disclosed these numbers, right? I am wondering whether these numbers are also disclosed in conventional income statements and balance sheets.

Imai

This information is disclosed in the environmental report. The numbers disclosed therein are different from those appearing in financial reporting accounting. The numeric values in environmental accounting are disclosed in the environmental report. The numbers in environmental accounting do not correspond with those in the financial accounting. In fiscal 2000, amount of capital investment in Matsushita Electric Group was 504.4 billion yen. Amount of environment-related investment, which was published in the environmental report this time, makes up 4.9% of total amount of capital investment.

Floor

These figures are as a separate item in conventional income statements for the balance sheet?

Imai

At present, the figures are not incorporated as financial information. I think that environmental accounting information should be included in an annual report in future, but that's a little premature.

Floor

In the table of examples of environmental costs and calculation rules, at the bottom of the table, I think that you have to apply the differential and the proportional approach at the same time together to calculate the energy conservation at operating units, but you just only applied the differential approach method in calculating the costs when you introduced the equipment with other objectives in addition to streamlining production.

Imai

At operating units, investment exclusively for energy conservation is relatively small, while investment with other objectives in addition to energy conservation, such as introduction of equipment which will streamline production, is very large. When production rationalization of the multipurpose investment, for example shortening of production lines, has an effect on energy conservation and also leads to streamlining, environment costs are calculated by multiplying total investment by the ratio of monetary value of total environmental effects to monetary value of energy conservation effects.

Floor

You first applied the differential approach. So then you have to consider the proportion of environmentally driven and non-environmentally driven.

Imai

In the case of introduction of equipment with other objectives in addition to streamlining production, environment costs are calculated by subtracting investment without the objective of energy conservation from total investment. We have to select either method 1) or method 2). That does not mean carrying out method 2), in turn, method 1). Selection between the proportional calculation 1) and difference calculation 2) depends on the nature of equipment.

Floor

You mentioned early on looking at external costs. The first question is one of clarification. Is this restricted to looking along your own supply chain at your customers or suppliers, or do you look outside of potential societal costs as well? You did mention that later about putting monetary values on CO<sub>2</sub> emissions; are you looking at societal costs and if you are, are these actually calculated and reported internally and if so, have they effected any decisions that have been made within the company?

Imai

External costs our company is now trying to keep track of are only two; environmental effects or CO<sub>2</sub> effects at use of our products by consumers, and reduction in CO<sub>2</sub> occurring in production and hazardous waste.

Floor

The second part of the question was: are these costs actually calculated on a regular or on an occasional basis within Matsushita and reported, and if so, can you identify any situations when they have actually changed a decision that has been made within the company from what it might have otherwise have been?

Imai

We have explained about expansion of concepts of environmental accounting in Japan. However, Matsushita Electric is only keeping track of its internal environmental costs. What I want to tell is that new attempts to calculate social effects and social benefits have been made by some companies other than Matsushita. As environmental effects within entire Matsushita Electric Group have not calculated yet, they are still in the pre-publication stage.

Miyazaki

As you can see from this figure, Mr. Imai explained about that extension of concepts of environmental accounting and calculation of social cost-benefit in environmental accounting. I understand Mr. Bennet asked what kind of influence is made on decision-making by management. If the concepts of environmental accounting are extended in this way, what influence is made on decision-making by management? This is a key point of environmental management accounting in today's discussion. So, we will talk more about this later.

## 3rd Session

The Role of Environmental Management  
Accounting in the Asia-Pacific Region

## 3rd Session

### Chairman

From now, we will start the third discussion under the theme of “ Role of environmental management accounting in Asia Pacific countries ”.

In this session, Professor Katsuhiko Kokubu will act as a chairman.

Then, I leave it to Mr. Kokubu, please.

### Kokubu

Thank you very much for your introduction.

Today, six reports were presented, including my presentation. In this panel discussion, each of commentators gives comments in response to two presentations.

Martin Benett comments in response to the first presentations by Kokubu & Nashioka and Dr. Lee, Tomoko Kurasaka to the next presentations by Mr. Burrit and Reyes & Mayol, and Dr. Kim to the last presentations by Ms. Bratasida and Mr. Imai. Ms. Kurasaka and Dr. Kim attend the workshop from this panel discussion. As described in detail herein, Ms. Kurasaka is a leading expert in Japan on environmental accounting and environmental information disclosure as a certificated public accountant and a representative of NGO. Dr. Kim, an associate professor of business school of The Chungbuk National University, has specialized in the study of accounting and environmental accounting and engaged in various projects in Korea as a foremost expert on environmental accounting.

In today's discussion, Mr. Benett, Ms. Kuraska and Dr. Kim, in this order, give comments in response to two presentations, respectively. After that, presenters answer questions from these commentators and then we discuss various issues freely.

Because of casting, I have to answer questions while acting as a chairman. So, I asked Dr. Miyazaki hurriedly to act as a co-chairman. We together will proceed with this program. I would be grateful for everyone's supports.

Firstly, Mr. Benett, please make statement.

### Bennett

I am responding to the papers presented this morning by Professor Kokubu and Dr. Lee respectively, and would like to offer some comments and thoughts that they prompt. They reflect two projects into which a lot of work has clearly been input, and have encouraged me to do some hard thinking about what we mean by “ environmental accounting ”.

I have watched with interest and admiration just how comprehensively and quickly the guidelines in Japan on reporting and cost accounting have been developed, and I have been also

very impressed by the speed with which these have been widely taken up by Japanese companies. This is clearly the sort of direction in which Korea is now also looking to develop as well.

The papers both focus on an approach which involves the continuous measurement and reporting of environmental costs, and ways in which these can be identified, defined, captured and to some degree analysed. The Japanese situation as reported in Kokubu's paper is more well-developed than the Korean system which is reflected in the three cases reported in Lee's paper, but both share several characteristics. In both cases the core is some analysis of the total amounts of environmental costs incurred by a company, with a lead given by government to industry by providing guidelines to support and encourage companies in what they are doing. They both focus on internal costs, which is more realistic and pragmatic than attempting to include any measures of external costs.

Within this broadly similar framework, the two papers differ in their subject matter. Kokubu's paper reports on a survey of the adoption by Japanese companies of the present guidelines and the effect that these are having, whereas Dr. Lee's paper looks at three case studies in Korean companies that might offer some indications of how a standardised approach can be developed that could be promoted through government guidelines.

This is one direction in which an overall system of environmental management accounting (EMA) could be developed; or perhaps more correctly, in which a situation can be achieved in which EMA is a tool that companies will consider as one of their main techniques in their overall tool kits of environmental management methods. It can perhaps be characterised as an essentially supply-driven approach - to start with the accounting data, and then to consider how this may be processed in order to support environmental management - and in these papers this is explicated in considerable detail. However this is not the only position from which one could seek to develop a system of EMA. An alternative and complementary approach might be to start instead with the purposes for which the information is to be used: who the expected users are within the management of the companies which adopt EMA, and what judgements and decisions they have to face as part of their managerial responsibilities in which their responses might be improved if supported by EMA information.

This then raises further questions about how most appropriately to design detailed guidance on preparing the information. There are no authoritative definitions of what is and is not EMA, and it is apparent that the term may be used by different people in different ways. However the usual consensus is that EMA information is firstly accounting-type information, and secondly that it is information which is directed towards management within organizations in order to help support them in the various activities that are the responsibility of management. These management responsibilities can be loosely categorised under the two broad headings of

decision support and control. Decisions may be either long-term or short-term; control, in which I would include the prior process of monitoring an organisation in order to identify where control is needed, can itself then lead to subsequent decisions, for example on how individual managers are rewarded or penalised.

It also raises the question of what we should accept as accounting information. Is this purely information which is monetary form, or does it include also physical information? And if physical information is included, then is its primary purpose to support the monetary information by providing it with some underpinning in operational data, or other purposes too? Roger Burritt this morning described his approach in which both MEMA and PEMA are included, both being parts of a coherent whole. This view clearly enjoys a consensus of opinion in its favour here, but it does raise some questions. Firstly, why may accounting be helpful in this process in the first place? And secondly, following from this, what is the scope of what we choose to consider to be accounting, and what are the particular competences that accountants possess that can help to support this?

Monetary information has clearly always been in the ownership of accountants, and it is this which defines accountants' jobs and the accountancy profession. This is not necessarily the case for physical information, whether environmental or otherwise. There are several other disciplines and functions in business with their own histories of measurement and information generation that will also lay claim to physical performance measurement, so this raises questions particularly for those of us in the accounting profession about just what our profession is, what our distinctive competences are, and what it is that may give us a distinctive and competitive advantage.

The premises here are then firstly that environment matters, which we must take as a given here; and secondly that accounting can potentially help, both generally and in environmental management. The second premise needs to be supported in each case, since organisations differ in the extent to which they manage themselves by reference to accounting measures and financial methods; and if these were not present and used, this does not necessarily mean that the task of management will not be achieved since this might then instead be based on other approaches to management, perhaps people-based approaches rather than anything involving quantitative analysis. We might argue that this task might not be achieved so well in the absence of accounting measures and financial methods, but it is up to us to prove that what we can offer will in fact bring some added value.

My concern is not directly about these papers or the projects on which they report, but about how environmental management accounting is to develop. Firstly, what will the information be used for and by whom; what sort of decisions is it going to be relevant for; how will it help to improve these decisions or to support management control; and what value is added by having

the information in monetary form and the involvement of accountants and specific accounting competences. Following from that, perhaps rather more detailed guidance is needed on how to define and measure costs. I can anticipate that there could be several problems raised in practice in applying these guidelines over which heading to allocate some costs to, over how to decide whether a particular cost is in fact an environmental cost or not, and over what the significance is of the definition of a cost as “ an environmental cost ” in the first place. Does this imply, for example, that it will be managed differently than a non-environmental cost would be, or that it will have a different significance for particular stakeholders?

This then inevitably leads to the question of how the information which is generated is to be used, and what is the purpose of reporting a total amount of environmental cost. To put this most simply, at the extreme - is a high level of reported environmental costs an indication that a company is committed to the environment, on the grounds that high levels of spending are a symptom that they are prepared to invest in good environmental management, either to improve future business performance or as a direct indicator of their corporate responsibility generally? Or are environmental costs like any other costs, i.e. negative items in the income statement and therefore to be minimized? Clearly, the most basic requirement in calculating and reporting any quantitative information is to know whether an increase represents a positive or a negative indicator - unless there is clarity over this, the value of the information in the first place must be dubious.

So how can we build on the work that has been done to date, since we now have these tools and a lot of work has clearly gone into the supply side of setting up systems to generate the information? What would be helpful is some research into the potential users of this information, since in the end accounting is like any other activity - it is justified by the value of the activity to its own customers. Accounting produces an intangible product, the information generated by the accounting process, whose value is wholly defined by the extent to which it helps to inform decisions and judgements. An analogy can be made with the process of producing any tangible product, such as in automobile manufacturing. If a car manufacturer found that it was having little success in selling its cars, one reaction might be to look at the product and the manufacturing processes. However total quality management principles suggest that the first response should instead be to go back to the market and to ask customers what they want, and why they are not buying the manufacturer's vehicles. Are they instead buying another manufacturer's products, or perhaps even managing without automobiles altogether? This would mean going even deeper, to research into not only what customers are saying currently about their preferences but into what they might really need - what they might use the manufacturer's vehicles for, in what ways these could help to support their lifestyles and their working patterns, and indeed what their lifestyles and working patterns could otherwise become.

The analogy of this with EMA is that perhaps we should firstly aim to investigate how the people to whom we are directing this information towards are likely to be able to usefully use it, whether this is within the organization or by external stakeholders. Professor Kokubu was very explicit that external stakeholders are the immediate first audience for the information that the Japanese system produces, which prompts the question of which external stakeholders, and what decisions and judgements they need to make. Is it financial stakeholders and investors, to help them to make decisions on to whether or not to invest in the company? Is it the public generally? Or perhaps NGO groups, to help to form the attitudes that they may take towards the company? Unless there is some clear link between the information that is being produced and the consequent logical action, then it is not clear how the information can add any value to this process, so this needs to be made explicit. What are information-users doing at the moment, in the absence of this information? Are they, for example, making their decisions on the basis of some other form of approach? This is not intended as a criticism in any way of what has been done here but as an alternative orientation, and we need to approach this from both directions. We have here two very thorough and well-worked papers on the supply side, with systems of generating information, but I would suggest that these need also to be linked with a user focus.

Apart from this fundamental perspective, there are also several other aspects of interest in the papers that are worth pursuing. The complementary and mutually reinforcing external and internal focuses in the Japanese system were interesting, as was the creativity of allowing for different qualities of information - both information on a "credible basis", and "hypothetical calculations" as a short-term measure, as a way of encouraging measurement activity without having to postpone outputs until a full system can be developed, which could be over-perfectionist. The rate of implementation by companies in Japan with these guidelines in a very short time was impressive, and this would in itself justify further study into the relative balance of motivations on companies as between government pressure, peer group pressure from wanting to keep up with other companies, perhaps some concern for corporate reputation and public relations, and the actual experience in dealing with external stakeholders. Have any external stakeholders such as investors actually informed the companies or researchers that they have found the information to be useful? Similarly, the value for internal management within the companies - is this information actually informing decisions, meaning that those decisions when made are different than they might otherwise have been?

Three points in Dr. Lee's paper were of particular interest. The first was the link with activity-based costing as a way to integrate environmental accounting with other innovations in accounting that may be more established in companies. One concept which could help to define what is considered to be an "environmental cost" could be that these are the costs for environmental factors are the main cost driver, so that environmental expertise is therefore the

key competence in identifying those cost drivers and also in managing the costs in order to minimise them.

The second is the very important practical point that EMA should be linked to other developments in internal information and data collection systems, with the paper's mention of ERP. One notable feature of the presentations and discussions in both this workshop and the International Symposium yesterday has been that these have attracted only limited interest here, in contrast to the experience in EMAN-Europe where ERP (enterprise resource planning) systems and information systems have tended to attract substantial attention. This does not mean that either balance is more or less appropriate than the other, but there is clearly a difference as between the two EMAN regions which is itself of interest; and it is in any case important to consider information systems and how these can be designed and managed as cost effectively as possible.

The third point of interest from the paper and its reports on the three companies, though perhaps a rather discouraging one, was the responses that the companies made when questioned how the information that is already being produced is being used in practice by management. The finding of the paper is that the companies' managements were not in practice using this information. This then raises the question of whether this is just a matter of changing the details of the information set, or of doing something more fundamental. One factor here is that the

EMA information is being produced mainly by the companies' environmental departments rather than by their accountants, which again raises the question of how to make EMA more relevant to the mainstream of the company. In my own experience in the UK, management accountants to whom this question has been put have usually replied that their work is primarily determined by what senior management requires of them. and that this already fully occupies their time; however, if and when EMA information can be positioned as an essential factor to support the company and its senior management, they would then be able to fulfill that need. However the onus is on those of us who are working to develop EMA to make that case. Thank you.

Miyazaki

Thank you for your comment, Mr. Bennett.

Next, please give comments, Ms. Kurasaka.

Kurasaka

First, I would like to discuss the presentation given by Roger Burritt. As Martin Bennett mentioned, Roger presented a very interesting framework which categorizes Environmental Management Accounting into monetary and physical EMA on one axis ("MEMA" and "PEMA").

Differences between MEMA and PEMA scenarios may be readily apparent, but the distinguishing characteristics of Past-oriented and Future-oriented EMA are open to a number of interpretations as Mr. Nakajima pointed out this morning.

One possible way of clarifying these relationships is to focus upon purpose. Accordingly, Past-oriented EMA is used to analyze and develop understanding of the past, while Future-oriented EMA is to be applied when making decisions concerning the future. However, Roger explained that Past-oriented EMA[J1] could also be used for future decision-making. Thus, it seems necessary to focus on the kinds of information involved.

To reiterate, Future-oriented EMA incorporates a degree of predictive information of future projections, while Past-oriented EMA is not concerned with such information, being restricted to past information. Then the latter can be used for future decision-making by collecting and analyzing the past data.

In relation to past vs. future, “ present ”, as asked by Mr. Nakajima, seems to be included in the analysis of Past-oriented EMA, since in another moment, “ present ” will become “ past ”. That is, next moment it becomes concrete information with no uncertainty any more. Therefore, we may understand Past-oriented EMA would include concrete information with no uncertainty and Future-oriented EMA would analyze the other information that is predictive and uncertain to some extent.

Keeping this in mind, I would like to make a brief comparison between Japan and Australia, referring to Figure 6, which shows major EMA projects in Australia.

First, as shown in Figure 6, there are many examples of Past-oriented PEMA, especially in the cell of short-term-focus, and Japan also has numerous projects in the same cell. Though Roger little explained, Australia has PER (Public Environmental Reporting) program (c). This is placed at the top of this column since not monetary information but physical information alone should be disclosed in Australian PER. Japan has a corresponding reporting system that will appear in both PEMA and MEMA areas, as many Japanese companies disclose monetary EA (environmental accounting) information in their Corporate Environmental Reports as reported this morning. In this respect, Japan is relatively advanced in terms of the integration of MEMA and PEMA.

On the other hand, Japan has no equivalent to the Australian Mandatory Disclosure system (as e shown below c), which clearly specifies regulations concerning the disclosure of financial details with respect to environmental matters. This is located in PEMA area alone in Australia though in the US and some other countries this practice is placed in MEMA area as well because disclosure laws require that monetary information of cost for compliance with the regulations should be listed if it is important relating to a company’s financial condition and management performance. Japan, on the other hand, has no relevant financial disclosure regulations which

specify as environment related in either MEMA or PEMA category. So in Japan it is necessary to investigate this issue in the future.

“ AASB1037 ” located in both PEMA and MEMA areas as (i) at the bottom of this column is accounting standard which gives monetary evaluation on various species or biodiversity as explained by Roger. Australia is relatively advanced in this point as it has never been discussed in Japan.

As for Future-oriented EMA, Japan is engaged in only a few projects at present same as in Australia and has just started recognizing the necessity of timely development of Future-oriented EMA tools. For example, tools currently developed by Study Group of Environmental Accounting of METI (Ministry of Economy, Trade and Industry) include Future-oriented EMA tools and it is expected to promote further development in near future.

Now I would like to talk about the forth presentation on “ EMA in the Philippines ”. We learned from Ms. Rayes’s presentation that PICPA has 100,000 members against its population of 60 million around, whereas JICPA (Japanese Institute of Certified Public Accountants) has only around 15,000 members against Japan’s 120 million people. That is, as population of the Philippines is half of Japan, the number of members of the certified public accountants in the Philippines represents 6 to 7 times as in Japan. The work of PICPA members is not simply confined to financial auditing as JICPA members but extended into various industrial sectors, where their activities include a wide range of corporate accounting and financial operations. With this in mind, we can truly appreciate her efforts to educate PICPA members and others in matters of environmental accounting (EA).

Particularly admirable is her successful integration of EA into university accountancy curricula.

One of the reasons why EA has deeply permeated through accountants in the Philippines may be EA activities by PICPA members have an underlying focus on so-called “ win-win ” investment opportunities which is developed by the USEPA (United States Environmental Protection Agency), where economic as well as environmental merits can be reconciled by seeking to limit pollution.

There seem to be rooms to promote environmental activities to catch an opportunity of such “ win-win ” paradigm in Japan. On the other hand, as this paradigm is just a part of the whole environmental activities from which you can not expect any economic benefit in short term, companies should make efforts on environmental accounting considering other various conditions under the strong commitment of its leader. In order to make further progress, fresh tools and necessary education based on effective methodologies must be developed that will go beyond the “ win-win ” paradigm in Japan and in the Philippines as well .

Miyazaki

Thank you for your comment, Ms. Kurasaka.

Next, Dr. Kim, please make comments on the following two presentations, “ Introducing EMA to the Indonesian Industries through Effluent Charge ” by Ms. Bratasida and “ Case Study of Japanese Companies ’ Environmental Accounting in Asia ” by Mr. Imai.

Kim

First of all, I would like to thank all the ladies and gentlemen of IGES and Kansai Research Center for inviting me here to the beautiful city of Kobe and giving me an opportunity to give comments to the wonderful presentations by Ms. Bratasida and Mr. Imai.

Before I begin my comments, I would like to discuss and clarify a couple of terms to avoid confusion. They are internal vs external costs and internal vs external environmental accounting. I used to have no problem with understanding the meaning of the terms and their relationship with management vs financial accounting. But, I became a little confused after I realized that those terms were used a little differently in Japan than elsewhere. Thus, I have to address this issue to understand the terms exactly myself. As I understand, the management accounting is accounting for the internal use, and it reports to the managers for management decision-making regardless of the types of information.. The financial accounting is an accounting system to convey the information - whatever the information is - to the outside stakeholders.

So in that sense, I was a little confused when Prof. Kokubu and Mr. Imai mentioned external management environmental accounting. So, why don't we just use financial vs. management accounting, where financial accounting deals with providing information to the external information users, and management accounting deals with providing information to the internal users. It is an easier way to understand the management and the financial accounting. No matter what the information is, if you use it for internal purposes, you can call it the management accounting. And, if you try to convey information to outside (external) stakeholders, you can call it a financial accounting. That is how I understand the terms internal vs external and management vs financial accounting. So please correct me if I am wrong.

In the presentation by Mr. Imai, I understand that external costs are the social costs, which are not borne by the responsible private corporation (i.e., Matsushita). So, my question to Mr. Imai is, did you or didn't you incorporate the externalities in calculating the environmental costs of Matsushita? Please elaborate a little more on it later.

In conventional accounting area, as you know very well, management and financial accounting tend to be integrated. It is especially true when companies combine accounting systems to the integrated management information system, such as ERP. In the long run, as the environmental accounting system progresses, environmental information for management

decision-making purpose or external reporting purpose has to be produced by one integrated system.

Thus, when we prepare guidelines or some other types of environmental accounting tools and decision-making models, it is crucial to make environmental cost information produced for both purposes. In this context, I would like to raise a couple of issues for discussion. First one is regarding the depreciation expense. In the current Japanese guideline, depreciation expenses are not reported, if I understand it correctly. Instead, investments and operating costs are to be reported separately. My opinion is that depreciation expense serves as a link between investment and expenses. So the depreciation expense needs to be reported in the environmental cost report.

Secondly, what is the basis you use in segregating the environmental costs from non-environmental costs in Matsushita? In practice, it is not an easy task, and I understand that your industry does not have industry-specific guidelines for the purpose. Would you please share with us your experience on what kind of difficulties you faced in segregating the environmental costs.

Third, you did not provide us with the information of what portion of the total manufacturing costs environmental costs took. If we wanted the information for cost control purposes, we first have to know the figure and start from there. Thus, would you be willing to disclose the figure to us? In addition, environmental costs of 62 Billion yen in total are huge amount. I am wondering what implication and what message does the number give to the management of the Matsushita?

Another point is that in computing environmental costs, basically all efforts and costs are accounted for one period only, even though their effects continue to accrue in the years to come. So, how did you handle this problem of computing and grasping the costs and benefits? The economic benefits according to your report are around 7.6 Billion yen ? But, the costs are 62 Billion yen. Thus, total benefits reported are only 12% of total costs reported. What this may mean is that you dump as much as 62 Billion yen only to get the return of 7.6 Billion yen. How do you persuade the top management with this figure to keep on investing in environmental activities actively? We all understand that top management's commitment is essential in the success of an environmental management system, but what makes the top management to be committed to those environmental investment and other efforts?

It is very interesting that there seem to be two different approaches; in the first one, adopted by Japan and Korea, the government exerts a lot of efforts to articulate environmental accounting guidelines, so that the firms can follow it. It is very impressive, and even surprising, that so many Japanese companies already adopted the environmental accounting guidelines in such a short period of time. I'd like to interpret it as evidence that the guideline approach is working quite well. However, I would like to know if the adoption of the guideline is really voluntary in Japan, or if there is any kind of pressure from the government. Otherwise, are there any kinds of

incentives from the governments with regard to the adoption of the guidelines.

In the second approach, adopted by the rest of the countries, environmental accounting is basically internally driven and the type and extent of environmental accounting information required for internal decision making differs from company to company. Thus, accounting communities should help firms to develop their own ways of costing and decision making based on the environmental accounting information. In my opinion, each country can take its own approach depending on its social, political and cultural environments.

I believe that there are some key driving forces when corporations adopt and implement environmental management system. In the earlier stages of the development of EMS, the single and the most important issue is the compliance of the laws and regulations (Stage I). Later, corporations start to recognize there is room for cost saving as well as environmental performance improvement. At this stage, corporations take advantage of the opportunities to attain both goals, that is, environmental and financial performance improvement (Stage II). Once companies take advantage of the opportunities, there are no more rooms for cost savings without a break-through (i.e., technology innovation). After Stage II, markets or customers drive corporations to take environmental measures seriously, and make them to take opportunities of sales increase via enhancement of corporation image.

Most of Indonesian companies seem stay in the earliest stage striving to meet the legal requirements. Actually, many firms in Korea reveal the same behavior. Most of them are small and medium sized firms. Thus, in countries where governments take a strong initiative in the economic development the top down approach may work very well, like in Korea and Japan. In this regard, the IPLHI, the professional group in Indonesia, may well consider taking the same approach as Korea and Japan, although I don't know exactly about the social, economic, and cultural environment of Indonesia.

Finally, I would like to ask a brief question to some presenters. The first one goes to Dr. Kokubu. I guess the guidelines aren't mandatory in Japan as I mentioned before. Does the Japanese government provide any incentive to the firms that comply with the environmental accounting guidelines. It is very important to know how the Japanese government is promoting the guideline because the Korean government is in the same situation.

Professor Burritt, you provided us with a very insightful taxonomy of EMA and I would like to point out that the classification scheme is simply true not just for environmental accounting, but also for conventional accounting too. The physical environmental management accounting system can also be included in conventional accounting reports too. So, I would like to emphasize the importance of calculating of environmental costs and segregation of environmental costs from non-environmental ones before we go any further. Please give some comments on my remarks.

And the final question goes to Mr. Mayol. It is very interesting to know that your group, Lopez Group, has been installing and implementing environmental accounting systems. Normally the accounting people and the environment people, mostly engineers, do not get along very well. That is the case in Korea. When I engaged in the case study of a chemical company in Korea, the accounting people were not cooperative at all. They wouldn't give us the information about their accounting information system. Mr. Mayol said that they worked pretty well together in the Lopez case. How did you cope with the possible conflict between those two people? Thank you.

Miyazaki

As a question to Dr. Kokubu has just been presented, I ask presenters to respond.

Please make comment, Dr. Kokubu.

Kokubu

At the beginning, Mr. Bennett asked a very essential question. The most important thing is how environmental accounting information is used for decision-making. I would like to answer this question from following two points, one is what kinds of decision-making are made by using environmental accounting information under the present circumstances, and the other is what information for decision-making purpose is offered.

First of all, I explain about the kinds of decision-making using environmental accounting information under existing circumstances. For example, as Mr. Imai has reported, environmental accounting information according to the current Japanese guideline can give a clear correlation between environmental costs and improvements in environmental performance by the costs. So, by considering both elements, environmental information is used for internal decision-making in producing efficient environmental accounting. Also, by identifying environmental costs, previously unknown inefficiency relating to environmental issues can be found. One is an orientation of such internal use. Problem is how to use this information in disclosing publicly, and this is a very difficult problem. Only what I can tell is that "Analysis of environmental report by eco-fund" has a substantial influence on Japanese environmental accounting, and in the screening of target companies for investment, eco-fund analyzes environmental information disclosure of these companies. It is generally believed that the companies which disclose appropriate environmental information achieve excellent environmental performance and have well-organized internal environmental management accounting system. For that reason, analysis by eco-fund, I think, has an effect on environmental accounting.

However, I believe that a guideline for introducing environmental accounting system of Ministry of Environment (MOE) has more important social significance. As Dr. Kim previously

pointed out, for example, environmental accounting in Matsushita Electric shows 30 billion yen worth of red ink. 30 billion yen worth of red ink means an amount of balance based on expenses of 37 billion yen and kickback of 7 billion yen owing to energy saving and so on. The meaning of this amount has not been socially considered so much. Of course, the costs for conforming applicable laws should be excluded from total costs, however, if the costs occurred from voluntary activities by Matsushita Electric, Matsushita would bear the social costs voluntarily. That is, shareholders of Matsushita bear the costs. Despite the fact that government is supposed to use taxpayer money to pay the costs, Matsushita assumes the payment. This becomes controversial. Thus, it is important for companies to clearly indicate voluntary bearing of environmental costs in environmental accounting as well as performance.

In order to promote voluntary environmental conservation activities by companies, environmental taxes and various regulations are under consideration, and companies disclosing details of voluntary activities through environmental accounting have a chance of utilizing systems which provide incentives such as tax-reduction or subsidiary payment. Although I have recommended Japanese industries to adopt environmental accounting as means of social policy, it is not adequately penetrated yet. But, I think this matter will become important in future.

As a demonstrative example, when the Environmental Agency at the time introduced this guideline for environmental accounting, the agency proposed “ Tax benefits based on the amount of environmental costs ” to Ministry of Finance. However, Ministry of Finance rejected the proposal as arguing that calculating method of environmental costs is utterly unstructured and the present situation is not in the stage for discussion about tax calculation and so forth. I hear it was finally classified as a medium and long-term agenda. I think the proposal should be now reconsidered.

In this connection, as also asked by Dr. Kim, there is no incentive at present. Despite MOE’s efforts to give incentives companies to promote environmental accounting, there is no incentive as yet. So, why environmental accounting has become pervasive? The reason is external use such as eco-fund and advertising effects by newspaper article. That is, supposing that a certain company spent environment costs in its environmental accounting, if effects remain constant, irrespective of the judgment as to whether the spent money has actually a positive influence on environment or not, as the expenses rises up, the company is viewed as more environmentally sensitive firm. The amount of money can cause high impact, in other words, PR effect.

Further, as a point of detail, it is noted that the Japanese MOE’s guideline includes depreciation expenses.

Miyazaki

Thank you so much, Prof. Kokubu.

Next, please make comments, Dr. Lee.

Lee

Professor Kokubu explained many of the questions from Martin, so I just point out a few issues. I understand environmental management is to harmonize environmental sustainability and economic profitability, that is my understanding. In terms of those kinds of preparations, companies introduced environmental management systems based ISO14001, but at the first stages, environmental departments says something about that this is good for the organization and for economical results, but after a couple of years, they cannot say, they cannot show what the results are from the environmental management systems; is there any economic outcomes. In this sense, I think that we need some financial review after environmental management practice. So, the practitioners think about that. We need some indicators in terms of monetary figures. So the ISO14031, there is the environmental performance schemes. Under the schemes, we can find some financial indicators including the investment and expenses. I think that this is quite related to environmental management accounting, so eventually we should show the results of environmental management activity in monetary terms. In that sense, we need environmental management accounting at the base, but practically it is not so easy as we pointed out. At first we have difficulty to classify which is environmental costs and which is not, and how to collect that data, and is it correct or not, how to use it and what is the purpose, who will use it and that kind of questions are raised at the moment. Through my experience, I think that it is easier to find out what is the amount of cost; the problem is, what are the benefits? In that case, we just pointed out other experiences in Japan, the costs was 100 and the Philippines was just 10 or 12 or 15 or whatever, then it is not good news to management. They just expect the 100 expenses and 200 benefits. In that case, we should use the terms of social benefit or something like that. In this case, we will develop some practical concept of benefit, it is one of my issues in the case of Korea.

The second question about how to collect continuous data every year without any additional work by hand, so there is one issue of ERP. We actually tried to introduce ERP in my company, but it is not so easy there is no module for environmental accounting because we don't have exact clarifications on the methodology to adopt that kind of system concretely at the company level, so it is one issue to be taken by ourselves.

Finally, I think that at the moment we can find some useful cases to utilize our concept of EMA in the case of product development or lifecycle assessment, in this case, we can calculate separately project by project. For example, the design for environment, or lifecycle assessment for specific process of product, in that case, we can combine physical data and monetary data. In that case the result can be very helpful to decide their further development for the production at

a high level. It is not an integrated approach, but this is a case-by-case approach, and it can give some short-term results based on environmental management accounting. I would like to try that kind of accounting first, the concrete and integrated result will come later, I think. In the case of what I have just explained, we don't have enough cases and enough concrete framework, but we are building it one by one, so from now on we are focusing on environmental accounting based on this kind of discussions with the many differences and experiences from Japan. I don't have enough time, those are my comments about your presentations, thank you very much.

Miyazaki

Next, please make comments, Mr. Burritt.

Burritt

I'll just address briefly, as our time is very limited, about two or three of the issues that have been addressed to me. The first issue, addresses the role of accountants in environmental accounting and environmental management accounting. I personally think that environmental accountants do have certain strengths in this area, but I don't think that financial accountants necessarily have strength in this area. Let me explain. I think management accountants deal with monetary information and physical information every day of their lives. They are concerned with physical efficiency in the organization, they might use standard costing systems, for example, that compare efficiencies with targets and then they report this information, so they monitor it, report it and get feedback, and so on and so forth. They are also involved with monetary information and that goes without saying. Environmental accountants also need expertise in physical and monetary matters. So I actually believe that Prof. Kim's comment is very pertinent, as conventional management accountants and conventional management accounting can be adapted very well to the needs of environmental management accountants and accounting. However, financial accounting is much more focused on the monetary aspects and therefore, although financial accountants in parts of their work and their public reports on financial matters of accounting do deal with physical issues, this is not their strength. And so, I agree with your comment about integration. My focus is always on management accounting as the basis for all accounting information that is made public in due course, and is either disclosed externally or internally. Professor Bennett made some similar comments about the relative importance of accounting and accountants. Well I am not particularly interested in accountants ruling the world, I am more interested in developing a scheme which allows us to look at all of the different types of accounting tools and information that might be available. Whether it is environmental managers or environmental accountants that are the ones who promote these tools and take over the area, I am not too concerned about. I just think that we should have a set of tools, available to

us so that we can develop programs along all of the different dimensions that I have introduced. That is just one point.

The second point is in relation to the usefulness of the framework that I have spoken about, and I was very pleased to see an immediate application in the context of how Japan fares, relative to how Australia fares. To me that is a sign of a useful tool, because you can look at Korea, you can look at Germany, you can look at the US, you can look at Australia, and you could use the tool to develop your own ideas about where gaps exist in the matrix. Now I believe that this is the way we should go. I don't think that there is an area here that we should standardize for the whole of environment management accounting. I think that we can come up with some guidelines in each of these areas. Yes. And we should support developments in each of these areas in each element in the matrix, I think that we could do that. But, in some countries, some elements in the matrix will be more important than in other countries, and this means that we do have to allow for different cultural, political, social and economic settings in different countries. I believe that the matrix directs attention to these issues and could be quite useful as a basis for comparative work. Also, as an academic, I should say that this is very useful to me because it indicates the need for comparative work in this area. It is all well and good to sit and learn from each other's experience, but at the end of the day, we are trying to get some comparisons, so we can look to see if there are any common elements that we can use to develop guidelines. So that is my second point about the framework.

The third point is again related to a comment made by Professor Bennett, and this relates to spending money on improving the environment. Do we want to spend more money because this shows that we are committed to the prevention of pollution, or do we want to spend less money because it shows that we are trying to cut our environmental costs down? I think that the answer to that question is that we need to adopt total quality in environmental management, or TQEM. TQEM tries to draw our attention to that fact we need to cut down on environmental costs which represent "end-of-pipe" expenditures, and we need to increase the amount of money on preventing environmental costs occurring. I think that TQEM is a very good tool and will tell us that we do need to increase environmental costs in some areas, in those preventative areas, and that we do need to decrease them in the failure areas where we are dealing with "end-of-pipe" situations. I think that this is another point to bear in mind.

Finally, a personal problem with the way that this whole area of Environmental Management Accounting is developing especially at the UN DSD, which was raised to some extent by Professor Kim who mentioned that depreciation expense might not be reported in Japan, but investment and operating costs are reported. He said that depreciation is a link between investments and operating costs. One of the problems that I have always had with EMA is that we tend to focus on flows - environmental costs, and environmental benefits. From an accounting

point of view and from a management point of view, I think that we are interested in managing stocks as well as flows, and we should be looking for an environmental management accounting system that integrates or articulates those stocks and flows. Depreciation is a flow that articulates with a stock, an asset. It is something that tells you, you have an opening stock, you have a closing stock, and the difference between the two is the depreciation. This is a very important thing to know as all three should be managed. It is the same in the environmental sense. You have a physical environmental stock at the beginning, you might have degradation of that stock, or depreciation of that stock, and so your natural capital has run down, and then you have a closing stock. Given this information, you have the basis for managing stocks as well as the flows, and I think that we should start to think about those items instead of just focusing on the costs and the flows in EMA, so thank you.

Mayol

The questions raised regarding how we are able to bring along the environmental engineer and the accountants into one forum and work together, if you may allow before I answer that question, can I have a show of hands? How many in this group are engineers or environmental engineers and how many are accountants? How many amongst us are in the engineering field? Okay, just quite a few. How many of us are in the financial field? Okay, quite a few. How about the others?

How we brought along the engineers and work with the accountants was this way. First, our group of companies participated in the case studies on environmental management accounting upon the invitation of PICPA, the Philippine Institute of Certified Public Accountants. So it was sort of we in the environmental engineering field wanted to learn something that this in the forte or in the court of accountants or financial managers. From then on, the environmental engineers of our companies tried to develop an adaptation of PICPA and EMA.

Part of my presentation earlier, our very first step when we applied EMA in our companies was just a consolidation of environment safety and health expenses or costs. At this point there wasn't much help or any need to work together with the accountants. But as we moved towards the 2nd year of implementing EMA, there was a mandate to improve.

Recall that component of our program, which I also presented, the MARS - Management Assessment Rating System. During the first year of implementation of EMA, there were those companies who did good in their EMA, such that they received an award from the Chairman. This triggered a lot of enthusiasm, a sort of motivational factor to the rest of the organization. Those engineers and accountants who did not collaborate at the start, now they are motivated to do so. They probably realized that at the end of the year, their company would likely receive an award from the Chairman.

The next step, as mentioned earlier, is towards TQEM, Total Quality and Environmental Management. As part of our companies' goal, we would eventually want ESH to be a function or to be a support service where organizations can achieve higher levels of productivity and for that matter, cost efficiency. So all in all, I mean that is a good formula, not only for engineers and accountants, but even the other departments in the companies like human resource management, strategic planning and so on to be together in environmental management programs.

Miyazaki

Next, please make comments, Ms. Bratasida.

Bratasida

I would like to make a short comment about Professor Kim's suggestion that Indonesia should take the same approach as Japan and Korea. Yes, we will do that if they will make more detail comparison study because we have a different culture and also a different business environment, but for sure the result will be not as fast as Japan has already reached. Thank you.

Reyes

I would thank Ms. Tomoko Kurasaka from the Japanese Institute of CPA's for her comments. I would just like to make at least 2 points. The first one is that shown by our experience in the Philippines, the accounting profession can be effective catalysts for the development and promotion of environmental management accounting in business. So, I would suggest any country who would like to initiate programs in environmental management accounting to approach or try to involve the accountants' organization in your countries because they can definitely give a seal of approval for this practice of EMA. One more suggestion is that when you approach them, please clarify to them that you are not asking them to change the way that they report their income statement balance sheet. Emphasize that you are going to help them assist their companies to make better decisions by providing more information on environmental costs savings as well as returns. Another one, is that you also find the word accounting in environmental management accounting; it doesn't mean that accountants can dominate, because in our experience, we found out that EMA is really more disciplinary. In fact, in many of our courses, engineers do better than the accountants or those in finance. So everyone in the facility and organization can help. Accounts, managers, engineers and people in other expertise. The last point is that as EMA developments in Asia is very fast right now, but I would just like to hope that this development can be sustained in the future for the purpose of promoting sustainable development in the region. Thank you.

Imai

I'm grateful to Dr. Lee who has pointed out various points.

I would like to explain four issues as follows.

The first issue is what is environmental accounting; the second issue is whether environmental accounting can be used for decision-making by management; the third issue is the impression when we introduced environmental accounting into Southeast Asia; and the last issue is an idea of cost-effectiveness, which is the most troublesome concept.

Let me get this straight with you, the environmental accounting I presented today is the system used in Matsushita Electric Group, and environmental accounting of Matsushita Electric Group is not necessarily identical with that of other companies in Japan. For example, as previously mentioned, as to depreciation expenses, we do not include depreciation expenses in environmental costs at present. As Prof. Kokubu pointed out, Japanese MOE's guideline requires including capital investment and depreciation expenses in costs and therefore environmental accounting of Matsushita Electric deviates a little from the guideline.

I understand environmental accounting as follows. In Matsushita Electric group, top decision-making conference relating to environment is held twice a year, in April and October. The conference is referred to as environmental conference and CEO acts as chairman.

With respect to environmental accounting, the agenda "Introduction of Environmental Accounting to Matsushita Electric Group" was proposed in October 1998. But, before formal proposal, the agenda received a complaint by accounting department. The accounting department told us not to use the confusing term "environmental accounting" at the conference and mention the term without previous notice in the presence of CEO. As Matsushita Electric has already adopted financial accounting and management accounting for management, "Introduction of environmental cost" instead of the confusing "environmental accounting" was proposed as an agenda.

In summary, we have financial accounting for external report, management accounting for managerial decision-making, and environmental accounting. Environmental accounting consists of environmental accounting for external report and environmental accounting for internal use.

The difference between external environmental accounting and internal environmental accounting is whether environmental effects are released externally or they are not released externally but used internally. Environmental costs are the same. I understand like that.

The second issue is whether environmental accounting can be used for managerial decision-making. According to the yesterday's presentation by Mr. Benett, in view of environmental sustainability, balanced scorecard is a very effective tool. If company's value is estimated from a long-term view, not short-time view, environmental element is essential for assessment. In doing so, introduction of balanced scorecard becomes effective so much. I do agree to that. In order

to actually establish and utilize environmental accounting in companies, I think it best to use environmental accounting as one of the assessment of operating performance of each operating units, not environmental performance of corporation. I would like to bring internal environmental accounting of Matsushita Electric Group to this direction.

In the future, performance is evaluated on operating unit basis, such as air conditioning division, audiovisual division, component division, and Japanese and foreign operating units are evaluated on product basis, such as air-conditioner.

With respect to the third issue, the impression when we introduced environmental accounting to Southeast Asia, we spread out environmental accounting worldwide from last year. As Southeast Asia is the largest production base for Matsushita Electric Group, it is important to grasp correctly the environmental costs and the environmental effects in this area. We visited four countries and explained assessment criteria in conformance with Japanese MOE's guideline to a pair of staff from accounting and environment departments in each company. They listened to our explanation with absorbed interest. In every plant, environmental management department has conventionally engaged in sort of end-of-pipe typed operations, including pollution control in production plant, energy conservation etc. However, both of accounting and environment departments welcomed introduction of environmental accounting so much because of participation in management through monetary evaluation of these operations. At the beginning, we were worried that classification of environmental cost in Japan would not fit in Southeast Asia, but it was accepted without causing any trouble.

With respect to cost effectiveness as the fourth issue, when compared actual effects with environment costs, every company has a red ink. Supposing that environmental accounting intends to compare amount of money and physical value, there may be also an estimation that how efficiency including performance has been improved from the viewpoint of eco-efficiency rather than surplus or deficit. In order to take full advantage of environmental accounting in management, it is necessary to acknowledge deemed effects as well as actual effects, for example, environmental risk management (ERM) which is much talked in Japan nowadays, how recovery of ground pollution is considered as effect, and how research and development cost is considered as effect. As shown in my presentation, it is hard to identify research and development effects only in company, so we have to move outside and identify such effects from the viewpoint of social benefit. In connection with ground pollution, introduction of depreciation accounting is now under consideration in Japan. We are really eager to think about cost effectiveness and how to understand deficits at the present by combining depreciation accounting to environmental accounting properly, and so forth.

Miyazaki

All of the comments from commentators and the answers from presenters have finished. Please act as chairman, Prof. Kokubu.

Kokubu

Thank you very much.

We need to continue discussion about various topics, but this is an inaugural workshop for EMAN-AP and symposium will be held in future. Probably, there are many questions and comments from floor. I hope to receive as many opinions as possible from you without the time limits, and get presenter or commentator to answer, if possible. Furthermore, in response to these opinions, I would like to get others' argument or counterargument as many as possible.

From now on, including a question by Liu Yon Raymond from Taiwan, I will receive opinions from floor.

I look to you for cooperation.

Floor

I would like to share probably with the confusion. When we also introduce environmental accounting in the Philippines, this might be a play of words, but it might mean something. When you say, "environmental management accounting", it might mean environmental management, you manage the environment, and you report on it. The other one is, "environment management accounting" -management accounting for the environment. That is why that we made it very clear in the Philippines that one aspect of the CPA's job on the external reporting side is that they attest as to whether the company is towing the line on environmental issues, because it will effect the financials later on, and this is the obligation of the accountant as an external reporter, for up to the auditor level. Now the other phase that is, in 1999, our theme was CPA business advisor. The account now is a Dr. Jeckyl and Mr. Hyde personality; one is external and internal as pointed out by Professor Burritt. In fact, I am glad that Mr. Burritt also raised this point. The reason why we were successful in the Philippines was because we followed what precisely the principle of TQEM, as Professor Burritt said, and we looked into the prevention aspect and we told our accountants that you have to change, you don't have to focus on becoming an external reporter, you have to focus on the management accounting aspect. So, I think that should be very clear that one aspect is reporting on the social responsibilities side of the accountant, and the other aspect is precisely what you have mentioned here, that is a decision support environmental accounting system, and I was glad that that was even shown in the value chain presented by Professor Burritt. The world of the accountant is changing; we might not even have the word, "accountant" in the future because of information. The CIO,

the Chief Information Officer, and if we don't get out of our shell in accounting, we won't know about ERP and value chain, there would be a confusion. We are confused because the accountants now are actually metamorphosing into another kind of animal. But I think that it is very clear; one aspect is that the social responsibility reporting aspect, the other aspect is the decision support aspect of environmental accounting. Thank you.

Kokubu

I would like to receive comments from floor continuously. Next, please give your comments, Dr. Amano.

Amano

I am a member of IGES Kansai Research Center.

With respect to costs and effects in environmental accounting, it is said that costs of 62.2 billion yen and effect of 7.2 billion yen shows a substantial deficit. Although I am not an expert on accounting, I know a concept of compliance cost. It is the cost for complying with laws. In the material submitted from Mr. Imai, environmental costs in fiscal year 2000 comprise capital investment and costs. It is difficult to decide which of pollution prevention, energy conservation at operating units (there is energy conservation law in Japan), disposal reduction and recycling of waste correspond to the compliance cost, but, broadly speaking, all of them can be classified as the present and future compliance costs.

And, research and development cost, providing that it is the expense for the far and medium-term future, 70 to 80% of 62.2 billion yen of environmental costs in fiscal year 2000 may belong to compliance costs.

In my opinion, any remainder after subtracting the compliance costs and further reserve for larger compliance costs in future from total costs shows deficits, thereby generating accountability to shareholders. However, it may be incorrect to think that the all of the remainder, that is, 62.2 billion yen minus 7.6 billion yen are deficits.

Moreover, what interests me in Imai's figure is that social benefits are outside of the environmental accounting and Mr. Imai tries to change the concept. The social benefits correspond to external costs in economic terminology as mentioned by Dr. Kim. Nevertheless, there is a possibility that consumer electronics industry must bear some part of the external costs and Matsushita Electric must also bear a part. Therefore, companies, in the light of the external costs, have to spend a large amount of money for research and development. So, in my opinion, if these concepts are defined in environmental accounting, the misunderstanding of large deficits will be removed.

Kokubu

I would like to think over about the matter.

Next, please give us your comments, Mr. Liu from Taiwan, in the backward.

Floor

I work for the Taiwan Environmental Management Association. We have been promoting environmental management systems in Taiwan for five years and we have about 2,000 companies already ISO14001 certified. But, we have 13,000 SMEs, small and medium industries. I think that this is a very good beginning for environmental management accounting and environmental cost accounting. So this is the beginning. So now we are thinking how we are going to promote EMA in Taiwan. There is a very controversial fact of ISO 14000: environmental management system. Even after 5 years after promoting that, we have 2,000 companies that have ISO 14000 Certified. But, some of local experts are still saying that we should develop some simplified EMS for the SMEs, facing the 13,000 SMEs in Taiwan, instead of ISO 14000 just to the big or large corporations in Taiwan. And now, this is the beginning of EMA. So, what should we do? The question is, should we develop a simplified EMA for the SME, so that they can use it effectively? Or, should we just focus on the large public listed companies in Taiwan and promoting EMA? Or on the other hand, do we develop just for the environmental managers in each company or do we develop and promote through the accountants? So, this is the question that we would like to promote, we would like to ask the European experts and also the Japanese companies what would be the European experience or the Japanese experience? How are we going to promote this to SMEs in Asia? Thank you.

Floor

Earlier in this discussion, there were the statement about the necessity of financial indicator concerning to environmental costs and environmental effects. I also think that the ultimate theme in environmental management accounting is measurement of environmental costs and environmental effects.

So, I would like to refer to the material reported by Mr. Imai a little while ago. Notes “ For capital investment made during the previous year, do not book its effects achieved this year ” , which appears on p. 196 in the Japanese version, p. 205 in the English version of the handout, may be a controversial point.

The reason is as follows: the effect due to capital investment made during the previous year is not booked this year so as to measure only the effect due to investment made during the present year. But, if the situation continues, investment effects will be decreasing year after year. As a result, the effects become underestimated with the course of time. Accordingly, in the case that

environmental costs and environmental effects are compared for analysis in time series, cost-effectiveness analysis in time series cannot be achieved properly. In order to prevent such situation, I think that it is necessary to combine flows and stocks as Mr. Burritt stated earlier in this discussion.

The combination of flows and stocks means that in the measurement of environmental costs and environmental effects, flows are compared without ignoring stocks. For the correct measurement of effect of flow, stocks must be also included in computation, so we must manage to bring to completion.

Floor

I would like to ask three questions.

The first question is a matter of costs and benefits. In the case of Matsushita, large amount of deficits were accounted for honestly. Huge deficits were placed on the table, but when I visited at a company, the company has suffered huge deficits every year according to information of environmental accounting. Owing to the huge deficits, management decided to abandon environmental considerations and environmental accounting section lost its motivation. Someone told me that estimated figures of benefits were dressed up so as to exceed costs, so that both management and environment department can find significance in their duties. Unless doing so, environmental accounting cannot be continued in the company. Window dressing may be too exaggerated, but according to what I've been heard, unless a budget surplus is achieved by incorporating deemed effects in this way, environmental accounting is unlikely to become established.

The reason why Ministry of Environment is conscious about environmental benefits is that the estimation is left to the discretion of each company. As Prof. Kokubu pointed out, whether EMA becomes established, who uses EMA, and how EMA is used, these issues have been always discussed and it has been emphasized that EMA's establishment requires external pressure such as eco-fund. How should management adopt environmental accounting and exploit? The philosophy or social responsibility of management is now being asked. Unless external pressure is given, or unless a budget surplus is achieved, management cannot adopt environmental accounting, such companies are threatened the existence. I would like to hear the opinions of parties concerned in companies.

Next, I would like to ask Roger Burritt, who is a coauthor with Professor Schaltegger. A conceptual framework is shown in figure 6. In the case of Professor Schaltegger, environmental accounting is classified as environmental differences accounting and ecological accounting, each of the two being further divided into internal and external. In the figure of Mr. Burritt, I feel like that environmental differences accounting and internal of ecological accounting are extracted. I

would like to ask if there is any commonality between the framework of Prof. Schaltegger and that of Mr. Burritt, or these frameworks are different from each other.

I will ask the third question to Mr. Burritt and Mr. Benett. The question relates to users of environmental accounting. For management, how the improvements in environment are reflected upon costs and how much benefits are increased in monetary term, that is, cost-

benefit in monetary term is more important rather than how much the environment is improved. However, for our ordinary citizen, how much the environmental is improved or deteriorated in physical term is more important matter of concern.

As MOE's guideline provides carbon reduction and so on as problems plaguing the global environment, as a result of independent corporate efforts, how much environment in an area, all of Philippine, or the entire globe is improved or deteriorated in physical term, is a very big issue for our global citizen.

Therefore, although not in line with this workshop, I would like to ask to especially Mr. Burritt and Mr. Benett, who teach economics in university. I think only micro environmental accounting is inadequate to environmental accounting. In United Nations and the similar organization, macro environmental accounting has been also developed. Do you think about tie-up with it? And, do you take it as subject of research?

Floor

First of all, I would like to add to what Dr. Kim told about definition of term. I specialize in management accounting. When "management accounting" is referred to in Japan, it is generally limited to internal accounting. "Financial accounting" directs to external accounting, and "management accounting" directs to internal accounting. There is no confusion in these two terms, but see to figure of Mr. Imai "Expansion of Environmental Accounting Concept" on p. 207 in the English version of this handout. As producers have borne recycling costs of products conventionally, in this figure, products are shown outside of companies as output. Quite recently, during interview, many companies tell that they will sell services, not products for the future. If the trend continues, despite being output, products will be shown inside of companies and services will be moved outward.

In Japan, management accounting information includes, for example, running cost of refrigerator, so when we try to purchase a refrigerator, the price is not necessarily primary requirement.

Thus, as Mr. Benett pointed out, on one hand, we need to meet users' needs, but on the other hand, we need to get out users' needs or make users notice their needs. Viewed in this light, it is impossible to comprehend management accounting systematically and it is possible to take it as a signal or a management tool for providing information, instead.

Floor

Materials include “ For Understanding of Environmental Accounting ” issued by MOE, I want to avoid debate about whether environmental accounting is in red-ink or black-ink. As every person in charge agrees, such attitude of top management can cause uncomfortable situation. Environmental accounting is a tool, not an objective. Our objectives are to improve environmental performance indicator, make efforts to save energy, and contribute to reduction in air pollution, soil pollution and wastes, thereby enhancing environmental performance. Unless we proceed to a discussion with the aim of searching for the best solution, things are thrown into confusion.

To bring it all down to earth, when top executive introduce environmental accounting, environmental cost-consciousness of individual employee improves and the employees become to save power or water, resulting in that company profits increase. As a result, top management is highly motivated. I was a chief of a planning and coordination division of MOE. As mentioned above, what embarrasses person in charge most, is that management tends to discuss whether deficit balance or credit balance. It is not correct. How much money we have to spend in order to comply with environmental standards? How can we perform at lower cost? Alternatively, by protecting environment, various profits can cause instead of costs, leading to corporate profits? I want management to debate about these things.

Kokubu

We have little time to leave, but if anybody would very much like to answer, we will accept. Especially, I want Mr. Burritt to explain a bit more in response to the penetrating question about the difference from the theory of Prof. Schaltegger.

Burritt

Thank you. I will make three points. Just very briefly in relation to the questions directed to specifically at me. I can say that I work very closely with Professor, Dr. Stefan Schaltegger in Germany. He knows the developments that have been put in front of you. These ideas have in fact developed since the publication of our book. [Contemporary Environmental Accounting: Greenleaf Publishing: Sheffield, 2000]. The book was published at the end of 2000, but it was completely written by the end of 1999. We had to move on with our ideas slightly, as we have been involved with the United Nations Division of Sustainable Development, and some work that we have been doing there, and because of that, we have tried to develop terminology which people in all of the United Nations countries agree on. The terms used in my paper are really related to these more recent developments. I know we are planning a second edition of our book in due course, and we will make the adjustments to the terminology there. In particular,

ecological accounting will become PEMA and MEMA as particular forms of environmental accounting. PEMA is physical environmental management accounting, and MEMA is monetary environmental management accounting. So that is one point.

The second point is in relation to the fact that various people would like to have targets for environmental improvement. Various people would like to be able to say we are improving relative to those targets. Eco-efficiency might be one way to try to promote that, but eco-effectiveness is as important an idea. With eco-effectiveness, you set a target, you find out how close to the target you are, and you can report it internally or externally to any particular parties who are interested. Within the matrix and the framework that we have developed, if we look into the future, we might be predicting what our environmental impacts are going to be in a physical sense and how we can actually target in some of those desired objectives. Then, we can report after the event, in an ex-post sense, to see if we have achieved the goals. So, I think that these ideas are entirely consistent with the framework that is being put forward, but I am open to your suggestions about this. And a final point that has been mentioned in relation to the macro side of environmental accounting, are we just interested in what is happening at the company level, for example, are we interested that a whole area of macro environmental accounting exists? Well we are certainly interested in macro environmental accounting and we take note of the fact that there is quite an important system, the SEEA system, the integrated environmental and economic accounting system, which the United Nations promotes. It is interesting to note that in Europe, EUROSTAT, the statistical agency for Europe, is actually adopting the macro environmental accounting classifications for use by corporations within Europe. It is also interesting to note that in Australia, the Victorian Environmental Protection Agency is considering adopting the SEEA framework for classifications within some government activities and in particular, local government activities in Australia, and so there is this link with the macro environmental accounting side. I could expand on this, but it would probably be inappropriate at the moment.

Kokubu

We should proceed to a discussion, but this is an inaugural workshop for EMAN-AP and EMAN-AP is a continuous organization. We will take note of the contents of today's discussion, post them on website of EMAN-AP, and in consideration of the record, prepare for next workshop.

Registration with EMAN-AP requires no registration fee. If you want to register, please present your business card at secretariat on taking your leave so that we will send you registration documents later. I am grateful for your support.

Today, panelists and audiences, many thanks for your kind cooperation.

MC

Thank you for your attendance over the long time.

Today's workshop has finished. We will move to " Pearl Room " of 10th floor and hold a convivial party there. The party is estimated to wind up at 7 o'clock. Should you wish to exchange opinions further, please come to the party.

Finally, please give a big hand to Prof. Kokubu as chairman, Dr. Miyazaki, commentators, and presenters, once again.

I appreciate it very much.