The content of the document is not clearly visible due to the quality of the image. It appears to be text, but the specific content cannot be accurately transcribed.
কথা দাঁড়ানোর বাংলা যুক্তি একটি বিশাল প্রসঙ্গের জন্য প্রয়োজন।

যেমনঃ কারণ অথবা ফলাফল বা কোনো প্রস্তাবের সম্পর্কে কোনো সংজ্ঞা দেওয়া নির্দিষ্ট করার জন্য।

বাংলা ভাষায় কথা দাঁড়ানোর জন্য সংজ্ঞা প্রয়োজন করে।

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- ল্যান্ড-
EMA in the Philippines: Education and Corporate Application

Maria Fatima Reyes, Chair, Environmental Accounting Committee, PICPA
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 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
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
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

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
<td>TOTAL</td>
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<td>Business &amp; Industry</td>
<td>115</td>
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<td>Consultant</td>
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<tr>
<td>Individual</td>
<td>15</td>
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<td>Association</td>
<td>3</td>
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<td>Government Inst.</td>
<td>8</td>
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<tr>
<td>University/Student</td>
<td>5</td>
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<tr>
<td>Laboratory</td>
<td>3</td>
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<tr>
<td>Research</td>
<td>2</td>
</tr>
</tbody>
</table>
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**

  - Integrate Approach (CP, EMS & LCA)
  - Blue Sky Program
- 1998: EMS and Voluntary Standards ISO 14000 Series
  - Bisnis Environmental Performance Rating
  - Environmental Auditing, Hazardous Waste Regulation
  - Adoption of Agenda 21, Soft Loan OECP-PAE
- 1996: CLEANER PRODUCTION (Prevention Approach)
- 1994: PROPER PROKASIH
- 1992: Water Pollution Control Regulation (PP 20/1990)
- 1990: Clean River Program (PROKASIH)
  - Clean City Program (ADIPURA)
- 1986: Act No. 4 of 1982, substituted by ACT No. 23 of 1997 on Environmental Management
  - Carrying Capacity Approach
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 excluded 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 partly 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 in decision 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

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

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.
5) Promote Love the Earth Citizens’ Campaign. (Environmental efforts by employees and their families)
Understanding Environmental Costs is a Requisite for Corporate Management.

External costs (handling of end-of-life products and packaging, etc.)

Total costs borne by a corporation

Conventional costs (pollution prevention, etc.)

Indirect costs (R&D, EMS establishment, training costs, etc.)

Criteria for planning and judgment as an environmentally corporation

As a long-term target, convert external costs to internal ones (minimize external costs).

Evolution of Environmental Consideration by Corporations

1) Establishment of environmental management systems (ISO14001 achievement)

2) Publication of environmental projects using environmental reports

3) Introduction and publication of environmental accounting

4) Environmental ratings, eco funds

5) Environmental performance evaluation
Obtainment of ISO14001 certificate
Identification of environmental performance (achievement of reduction target and objectives of environmental impact)

Environmental account
Environmental cost
Identification of investments and costs for the continuous improvement of environmental performance
Effects of savings
Identification of costs of savings by taking environmental countermeasures

Proper management decision (internal use)
Efficient and effective environmental conservation activities
Public announcement by environmental reports to indicate the company policy on the environment
**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**

<table>
<thead>
<tr>
<th>Costs</th>
<th>Effects</th>
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<tbody>
<tr>
<td>- Costs for environmental conservation</td>
<td>• Reduction of environmental impact</td>
</tr>
<tr>
<td></td>
<td>• Economic effects brought about by environmental measures</td>
</tr>
<tr>
<td>• Investment</td>
<td>• Operational profits</td>
</tr>
<tr>
<td>• Costs incurred</td>
<td>• Cost savings</td>
</tr>
<tr>
<td></td>
<td>• Avoided expenses</td>
</tr>
<tr>
<td></td>
<td>• Actual effects</td>
</tr>
<tr>
<td></td>
<td>• Estimated effects</td>
</tr>
</tbody>
</table>

**Examples of Environmental Costs and Calculation Rules**

<table>
<thead>
<tr>
<th>Item</th>
<th>Examples and calculation rules</th>
<th>Amount to be booked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy conservation at operating units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Investment exclusively for energy conservation</td>
<td>1) Introduction of new energy equipment</td>
<td>Full amount</td>
</tr>
<tr>
<td></td>
<td>2) Changeover to higher-efficiency equipment</td>
<td>Difference</td>
</tr>
<tr>
<td>(2) Investment with other objectives in addition to energy conservation</td>
<td>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.</td>
<td>Ratio</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>Difference</td>
</tr>
</tbody>
</table>
### Environmental Accounting Figures

#### Environmental costs

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

#### Environmental Effects

<table>
<thead>
<tr>
<th>Item</th>
<th>Monetary value</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction of energy conservation costs at operating units</td>
<td>Reduction of energy conservation costs at operating units</td>
<td></td>
</tr>
<tr>
<td>Reduction of waste disposal costs</td>
<td>Reduction of waste disposal costs by reducing industrial waste</td>
<td></td>
</tr>
<tr>
<td>Reduction of water and sewerage costs</td>
<td>Annual reduction of water and sewerage charges by using desalinate and waste water</td>
<td></td>
</tr>
<tr>
<td>Reduction in packaging materials and distribution costs</td>
<td>Reduction in purchasing packaging materials and product transportation</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Global Environmental Accounting Figures

(fiscal 2000 results)

#### Environmental costs

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

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Monetary value</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of energy conservation costs at operating units</td>
<td>2,834</td>
<td>Reduction of energy conservation costs at operating units</td>
</tr>
<tr>
<td>Reduction of waste disposal costs</td>
<td>2,798</td>
<td>Reduction of waste disposal costs by reducing industrial waste</td>
</tr>
<tr>
<td>Reduction of water and sewerage costs</td>
<td>117</td>
<td>Annual reduction of water and sewerage charges by using rainwater and waste water</td>
</tr>
<tr>
<td>Reduction of packaging materials and distribution costs</td>
<td>1,845</td>
<td>Annual cost reduction in purchasing packaging materials and product transportation</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,594</strong></td>
<td></td>
</tr>
</tbody>
</table>

**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 Toted by Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Ratio to sales amount</th>
<th>Environmental costs</th>
<th>Environmental effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Capital investment</td>
<td>Costs</td>
</tr>
<tr>
<td>Head Office and research groups</td>
<td>31%</td>
<td>51</td>
<td>124</td>
</tr>
<tr>
<td>Consumer fields</td>
<td>41%</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>Industrial fields</td>
<td>28%</td>
<td>139</td>
<td>119</td>
</tr>
<tr>
<td>Component fields</td>
<td>45%</td>
<td>45</td>
<td>99</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>245</strong></td>
<td><strong>377</strong></td>
</tr>
</tbody>
</table>
### Environmental Accounting Totalled by Regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Ratio to production amount</th>
<th>Capital investment</th>
<th>Costs</th>
<th>Total (%)</th>
<th>Environmental effects (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 : Japan (137)</td>
<td>69%</td>
<td>33,528</td>
<td>22,299</td>
<td>55,827 (80%)</td>
<td>6,284 (83%)</td>
</tr>
<tr>
<td>2 : U.S. (26)</td>
<td>7%</td>
<td>619</td>
<td>1,278</td>
<td>1,897 (3%)</td>
<td>495 (6%)</td>
</tr>
<tr>
<td>3 : Europe and Africa (15)</td>
<td>6%</td>
<td>39</td>
<td>457</td>
<td>496 (1%)</td>
<td>38 (1%)</td>
</tr>
<tr>
<td>4 : Asia and Oceania (65)</td>
<td>14%</td>
<td>1,403</td>
<td>2,014</td>
<td>3,417 (5%)</td>
<td>541 (7%)</td>
</tr>
<tr>
<td>5 : China (35)</td>
<td>4%</td>
<td>224</td>
<td>351</td>
<td>575 (1%)</td>
<td>234 (3%)</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>35,813</td>
<td>26,399</td>
<td>62,212 (100%)</td>
<td>7,592 (100%)</td>
</tr>
</tbody>
</table>

### Comparisons of Environmental Costs among Major Regions

- **Japan (137)**
- **Southeast Asia (64)**
- **China (35)**

Environmental costs:
- Within business areas
- Upstream/downstream costs
- Administration activities
- R&D
- Social activities
- Environmental damage

(Number of applicable operating units: )
Comparisons of Environmental Costs in Southeast Asia (within business areas)

Singapore

Malaysia

Thailand

Philippines

Indonesia

Taiwan

( ): Number of group companies

Expansion of Environmental Accounting Concept

Society

Companies

Environmental Accounting

Economical evaluation of environmental conservation effects (currency unit)

Environmental costs

Economical evaluation of reducing CO₂ emissions during the use of products (currency unit)

Private benefits

Products

Economical evaluation of reducing CO₂ emissions during the use of products (currency unit)

Waste, CO₂, etc.

Social benefits
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.
□ □ □ □ □ □ □ □ □
The page contains a mixture of text and possibly some mathematical equations or symbols. The text appears to be a series of random characters or possible jumbled words. It is not clear what the content represents without proper context or understanding of the symbols used.

The page seems to be a page from a scientific or technical document, given the presence of symbols and mathematical notations. However, without proper context or understanding of the symbols used, it is difficult to extract meaningful information from the page.