

**Survey on Green Purchasing Activities in Asian Countries  
Republic of China**

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## **Preface**

The Asian Productivity Organization (APO) and Japanese Green Purchasing Network (GPN) have commissioned partners in three Asian countries: Republic of Korea, Republic of China (ROC) and Malaysia to conduct the survey of green purchasing activities in Asian countries. The survey started in January 2003 and is expect to be completed by March 2003.

The content of the survey is to include the followings:

- Activities of the public sector (national and local bodies): practice, system, development and barriers;
- Activities of the business sector: practice (purchase of products, parts and materials), system, development, barriers and case study;
- Product information in green purchasing: environmental labels, criteria, guidelines and database; and
- Promoting organizations.

The Taiwan Environmental Management Association (TEMA) has been commissioned by APO GPN to conduct the survey in ROC. With regard to the above terms, the report on the survey in ROC will introduce the government green procurement law which governs the green purchasing in public sector in ROC, report the green consumerism and green purchasing activities of the business sector in ROC, the Green Mark (eco-label) products, and finally the promoting organizations which include government, NGO and academics.

## **1. Government Green Procurement Law**

### **1.1 Background**

The Public Construction Commission and the Environmental Protection Administration (EPA) of ROC have jointly promulgated the Government Procurement Law in May 1999. Details of the law can be found at [www.pcc.gov.tw](http://www.pcc.gov.tw) which contains 15 articles (in English). Under the law, the ROC government has set measures for the priority procurement of environmentally preferable products by ROC government agencies. These measures are set as pursuant to Paragraph 3 of Article 96 of the Purchasing Law.

### **1.2 Requirements of the Law**

Under the law, ROC government agencies have the priority of buying three types of environmentally preferable products:

- ROC Type 1: products having awarded the Green Mark (ROC eco-label) or a foreign country's eco-label with reciprocal agreement with Green Mark program, that is the equivalent of eco-label products under ISO 14024 requirements;
- ROC Type 2: product material that can meet the requirements of “regenerated material, recyclable production and energy saving”, yet do not fit into the Green Mark category, however, the products or product materials have to be verified and awarded a certificate by a public third party; and
- ROC Type 3: products which reduce social cost and have been certified by one responsible agency such as the different government agencies or a public third party.

(Note: ROC Type 1 is the same as ISO Type 1 eco-label products, i.e. in the government procurement process, government agencies can purchase eco-label products to fulfill the requirement of the Law; example of ROC Type 2 is Energy Star, i.e. government agencies purchasing Energy Star products are complying with the requirement of the Law; under ROC Type 3 “increase social benefit or reduce social cost” means the characteristics of products or materials which, during the design, manufacturing or use stage, allow the reduced reliance on non-renewable resources, reduced resource consumption, use of new resource or other similar characteristics.)

Government agencies conducting procurement of environmentally preferable product with the above criteria can apply price preference. However, the price preference should not be higher than 10 percent. Under this condition, if the supplier of non-environmentally preferable product has the lowest price while the environmentally preferable product is although higher in price, but within the price preference percentage, the supplier of environmentally preferable product may be awarded the contract. The existing practice is that the supplier of an environmentally preferable product is given a chance to reduce the price if the quoted price is higher, but within 10% of the lowest price of the non-environmentally preferable product, and if agreed, the contract will be awarded to the supplier of the environmentally preferable product.

Article 16 of this law encourages the government agencies or persons who have significant contributions in the implementation of procurement of environmentally preferable products may receive an award from EPA. However, there is no penalty under the law for government agencies that cannot meet the target.

### **1.3 Monitoring Targets**

The law was enacted in 1999 and year 2000 was a year of promotion and awareness. More than 100 training had been conducted in different national, provincial, state and prefecture government agencies. Starting year 2001, all government agencies were required to achieve 30% (in monetary terms) product procurement on environmentally preferable products, but not including service and engineering contracts. In the year 2002, all government agencies were required to achieve 50% product procurement on environmentally preferable products.

The monitoring of government green procurement has just started and the first year (2001) reporting records could be used as practice and not assessment as many data were missing and incorrect. The second year (2002) reporting record is now under compilation and results showed many extremes. Government agencies such as EPA and Taipei City government can achieve 90% green procurement and many agencies only achieve less than 10%. It is expected that reporting in 2003 will be more complete and can

provide more details on how government agencies are progressing on green procurement. Based on the more accurate reported results, an award according to Article 16 of the Law may be granted.

ROC government does not require centralized government procurement system, but encourage government agencies to use the Central Trust which is implementing large amount of central procurement such as computers, office supplies, etc for all government agencies. Now EPA is promoting the Central Trust to practice as much as possible on green procurement so as to achieve more on the government green procurement target with less effort.

EPA, the implementing agency, not only provides the training and promotion to relevant government agencies, but also being the coordination agency to central, city and local governments. In 2002, EPA was providing training to government hospitals, schools and enterprises. With further training on green procurement and reporting, it is expected that government green procurement will improve with time and even expanded to cover service and engineering contracts.

EPA has developed the “Green of Office Program” (for both government and private) in 1999 and awards were given each year to outstanding implementation organizations. This program assists and accelerates the government green procurement, especially in office supplies. Also, the Ministry of Interior is promoting “Green Building” by seven criteria (such as energy saving, use less water, etc.) and this encourages the procurement of material and facilities contributing to the green building.

## **2. Green Consumerism**

Green consumerism in ROC is not strong because of the economy and culture. People still like to buy cheap products on the street and welcome imitation products. The Consumer Council is a weak NGO in ROC and is lacking funding support to promote green consumerism. Education on environmental protection, recycling, energy and water saving has begun in ROC for sometime, but education on resource optimization and use of environmentally preferable or environmental friendly products is at the beginning.

Government green procurement has to take the lead, followed by private enterprises and finally the consumers. There is still no “environmental or sustainable fund” in the ROC stock market to facilitate the investment of environmental products or invest on environmental friendly corporations. Women in society on environmental awareness and activities are not as strong as in Japan or Korea and only a few private corporations have just started to embark on social responsibility.

### **3. Green Purchasing in the Private Sector**

#### **3.1 The Incentive and Driving Force**

ROC started environmental protection in 1980 with end-of-pipe treatment, progressing to waste minimization in 1989, cleaner production in 1994, environmental management system in 1996 and now upgrading to green design and green procurement starting 2001. Although eco-labeling program started in 1993, government green procurement only started in 1999. Therefore, green purchasing is still a relatively new idea or practice in the private sectors of ROC.

The incentive and driving force in the private sector of ROC is still limited to the environmental benefits of the enterprise. Through greening of supply chain and green procurement, the enterprises can save material, save energy, save water, use less toxic and hazardous materials, generate less wastewater and waste, reduce packing materials, save on transportation cost and increase their public image. However, the benefit directly from consumers is limited.

#### **3.2 The Difficulty and Barriers**

The difficulty and barriers in green purchasing in the private sector of ROC come from different background and development including:

- Cultural and economic development, e.g. buying cheap products or imitation products on the street;
- Green procurement is only at the beginning in ROC, it takes time to build up awareness and allow promotion to get to all people and organizations;
- There is little pressure coming from buyers and export requirements, Japan and EU requirements still have 2-3 years to become mature;
- Support from top management in enterprises, government and consumers is weak and hopefully will build up with time in the next few years.

#### **3.3 Case Introduction**

*(a) Ford Lio Ho Motor Co. Ltd. (Automobile Industry)*

Ford Lio Ho (FLH) is the US Ford Motor Co. Ltd. investment in ROC with



manufacturing plant producing automobiles supplying ROC and some of the Asian markets. As FLH is also a big and leading enterprise in ROC, it has been practicing green design and greening of supply chain since a couple of years ago.

Ford has a global product development system under which there is a material management system which integrates green design and green procurement. So far, FLH has been promoting the following four areas in the greening of supply chain and green procurement:

- Requesting suppliers on plastic parts to mark all plastic materials to facilitate recycling and procurement department has implemented this through the bidding and delivery process;
- Implementing restricted substances management system (RSMS) to control toxic and hazardous materials such as heavy metals and listing the requirements in the procurement contracts;
- Training the suppliers on PU recycling to encourage the suppliers to recycle the PU from end-of-life vehicles and reuse the recycled PU in the new supplies; and
- Requesting first tier suppliers to obtain ISO 14001 certification and 85 suppliers have completed this already.

*(b) Epson Industrial (Taiwan) Corporation (Electronic Industry)*

Epson Industrial Taiwan (EIT) is the Seiko-Epson investment in Taiwan producing small and medium sized liquid crystal display (LCDs) for cellular phones, pagers, calculators, watches, etc for markets in Taiwan, Hong Kong, Japan, Singapore, Europe, Korea and USA. Seiko-Epson has a good reputation on green procurement in Japan and is also requesting all its global companies to follow. Under the influence of Seiko-Epson, EIT started to practice green procurement in the last two years in the following three areas:

- General supplies: by 2002, about 17% can achieve green procurement which focuses on Green Mark (eco-label) products in ROC, these include 19 types such as toilet tissue, printing paper, paper box, name card paper, toilet bowl, LCD monitor, tape, non-mercury battery, recycle-paper envelop, detergent, water pigment, refrigerator, washing machine, light bulbs, correcting fluid, and humidifier;
- Production supplies: by 2002, EIT can achieve 100% as EIT imports most of its production supplies from Japan and they use the same

suppliers of Seiko-Epson; and

- Equipment: by 2002, EIT can only achieve only achieve 8% as it is rather difficult to practice green procurement in this area due to difficulty in setting procurement criteria and shortage of suppliers.

*(c) Homemaker's Union and Foundation (NGO)*

Homemaker's Union and Foundation (HUF) is a women organization and NGO which is very active in environmental activities in ROC. They support a lot of environmental protection, ecology preservation, green consumerism, energy and water saving activities and campaigns. HUF supports the eco-label products in ROC by practicing green procurement which includes the purchase of Green Mark toilet paper and all office supplies.

*(d) Hitachi Taiwan (Electrical Industry)*

Hitachi Taiwan, following the Hitachi Japan's model, has been implementing green procurement system. However, so far, they have not been monitoring the exact amount of green purchasing they have achieved. Inside their green procurement system, they have set up guidelines for green procurement. Hitachi Taiwan also requests suppliers to obtain ISO 14001 certification and so far about 10% has achieved that. In addition, they request chemical suppliers to provide MSDS and by 2006, all their procurement shall not contain any hazardous material.

*(e) Others*

From the general survey and statistics conducted in ROC in the last two years on electronic and electrical industry, there may be about 10% of the private enterprises or business sector practicing some degree of green procurement. Most of the green procurement is restricted to office supplies. From the less than 30 environmental reports from the business sector in ROC, it can be deducted that only a few large private enterprises in ROC have set up green procurement system (including policy, guidelines, specifications, screening of suppliers based on environmental criteria). Japanese or European or US based large enterprises are starting to look into this and the head office's influence is often the driving office for implementing green procurement system.

## **4. Eco-Label Products in ROC**

### **4.1 Introduction**

In 1992, ROC EPA initiated the Green Mark (eco-label) Program and commissioned the Center for Pollution Control Technologies of the Industrial Technology Research Institute (ITRI) to implement the program. Upon the successful result of implementation, EPA and ITRI decided to form an independent non-government organization: the Environment and Development Foundation (EDF) to handle all eco-label affairs and participate in international activities.

At present, EDF provides certification and training on eco-label and green procurement to all interested parties, mainly producers applying for eco-labels, government and private sectors on green purchasing and purchasing eco-label products. The mission of Green mark Program is to promote the concept of recycling, pollution reduction and resource conservation. The objective of the program is to guide buyers and consumers in purchasing green products and producers to manufacture and provide environmental friendly products.

### **4.2 ISO Type 1 Eco-Label Products**

In 1993, established by EPA and implemented by EDF, the Green Mark Program or the ISO Type 1 eco-label products of the ISO 14024 was started. 1993-1996 was the promotion period and EDF was certified to ISO 9001 in 1997 to start receive applications under Green Mark. During the promotion period, Green Mark Review Committee of was set up, product criteria were developed, product testing and inspection methodology, procedure and laboratory were prepared and arranged.

At present, there are 77 product criteria developed, 1057 products and about 250 licenses (cumulated since 1997) have been granted Green Mark. From 1997-2001, there were about 200 application each year and because of the Government Procurement Law and pressure on government agencies to purchase green products, there were about 600 application in 2002. However, some did not renew the green mark license and that is why the total cumulated products is only 1057. More details of these product criteria, products, license and suppliers can be found on [www.edf.org.tw](http://www.edf.org.tw) and there is English

data on the web.

The ROC Green Mark Program is under mutual recognition agreement with the US Green Seal and Canada Environmental choice Program, i.e. product of the same product criteria which obtains eco-label in US or Canada can be recognized in ROC and vice versa. ROC government is providing 90% of the funding on product criteria development, promotion and training. Income is generated on eco-label product applications and this part is expected to be self sufficient in future.

#### **4.3 ISO Type 2 Eco-Label Products**

ISO Type 2 is self-declared eco-products according to ISO 14024 and there are a few of these products in ROC such as the non-ozone depleting products (e.g. products do not contain CFC), water saving, etc. However, EPA funding is provided only on ISO Type 1 eco-label products and there is no statistics and no central file or directory of these products.

#### **4.4 ISO Type 3 Eco-Label Products**

At present, there is no ISO Type 3 eco-label product in ROC.

#### **4.5 Other Eco-Label Products**

Not an ISO standard eco-label product, other eco-label is a single product or an individual industry such as paper, or a single criterion eco-product and there are a few of these products in ROC such as the energy saving (same as Energy Star in US), water saving, green building, etc. These eco-products are registered under different government agencies. However, EPA funding is provided only on ISO Type 1 eco-label products and there is no statistics and no central file or directory of these products.

## **5. Promoting Organizations**

### **5.1 Public Construction Commission**

The Public Construction Commission (PCC) is a government department under the Executive Yuan of ROC. PCC is in charge of the government procurement, including implementing the Government Purchasing Law and Government Procurement Law. The requirement of green procurement in government agencies is under the Government Procurement Law. The PCC web site [www.pcc.org.tw](http://www.pcc.org.tw) contains the government procurement information which includes local and international procurement items and amount. The cooperation of PCC and EPA on government green procurement is described in Section 1.

### **5.2 Environmental Protection Administration**

ROC EPA was established in 1987 and is a government department under the Executive Yuan of ROC to oversee all the environmental affairs. In addition to drafting all the environmental regulations, EPA also promotes waste minimization, cleaner production, ISO 14000 standards and sustainable development.

In May 1999, PCC drafted the Government Procurement Law requiring all government agencies to practice green purchasing. EPA is responsible for implementation and monitoring and they set the targets of 30% and 50% for 2001 and 2002. EPA designed and trained all the government agencies to fill in the achievements and at present, they are compiling the reports from different government agencies for overall assessment.

Furthermore, EPA is providing the funding support to EDF for establishing the Green Mark Program in ROC. At the same time, EPA is promoting the greening of office which also facilitates green purchasing in government and private organizations, especially on office supplies.

### **5.3 Environment and Development Foundation**

EDF is formerly part of ITRI and was spin-off from ITRI as an NGO in 1997 to implement the eco-product program in ROC with a 5 million New Taiwan dollars fund. At present, EDF provides environmental certification and consulting services to all interested parties, including government, business

and consumers in Taiwan and overseas. The types of services offered by EDF include:

- Certification of green products, i.e. operating of the Green Mark Program and USEPA-initiated Energy Star Program;
- Certification of ISO 14001 EMS;
- Promotion of green consumption and local initiatives such as green of office campaign, recycling and reuse of kitchen residue, community environmental service corps and recycling scheme for military agencies, etc; and
- International contact and liaison

EDF is taking the lead on promoting green purchasing in ROC, but mostly in government agencies and so far does not have sufficient resource to extend to the private sector. Each year, EDF is organizing local and international workshop, seminar and exhibition of eco-label products. EDF is an active and leading member in the Global Eco-labeling Network (GEN).

#### **5.4 Business Council on Sustainable Development**

ROC Business Council on Sustainable Development (BCSD) is part of the world BCSD to promote eco-efficiency in enterprises, especially large scale multi-conglomerates. In the last few years, BCSD and EDF have been publishing the Business and the Environment magazine in which they promote green procurement in the private enterprises. Last year, BCSD cooperated with Taiwan Electronic Testing Center (ETC) and Taiwan Environmental Management Association (TEMA) to organize an international conference on green procurement and green design, inviting international experts to come to ROC to speak on greening of supply chain and green purchasing.

#### **5.5 National Chung Kung University**

National Chung Kung University (NCKU) is the only academic organization in ROC which is conducting research in the greening of supply chain area. On 15 March 2003, NCKU is organizing a local conference on Sustainable Product and Enterprise Conference in which there will be a special section on Green Procurement and Greening of Supply Chain.

## **5.6 Ministry of Interior**

The Ministry of Interior (MOI) of ROC has been promoting the green building for a few years. MOI established the seven criteria for green buildings and encourage the architects to design green buildings, the suppliers to provide green materials, the researchers to develop relevant equipment, material and recycling systems for green buildings. Through such a process, the green of supply chain and green purchasing in the construction industry of ROC has just begun. Some engineering and construction associations, some contractors and suppliers are cooperating in forming the green supply chain in this area.

## **5.7 Industrial Development Bureau**

The Industrial Development Bureau (IDB) is under the Ministry of Economic Affairs (MOEA) of ROC promoting environmental protection and sustainable development in the manufacturing sector. After 20 years of work, the promotion started with end-of-pipe treatment, to waste minimization, cleaner production, environmental management system (EMS) and now focusing on green design and green purchasing.

IDB has been providing the funding to organizations such as TEMA to promote greening of supply chain and green purchasing in the manufacturing sector. In 2001, the funding support was on collection of information and in 2002, the funding was on international conference, local seminars and publication of promotion brochure. In future, the promotion will include publication of green procurement guidelines for the industry and directory of green product suppliers.

## **5.8 Taiwan Environmental Management Association**

TEMA is an NGO in ROC and involves in the promotion of EMS, green productivity (GP) and relevant tools such as environmental performance indicator (EPI), corporate environmental report (CER), environmental cost accounting (ECA), green design and green procurement to the industry. TEMA is getting funding support from IDB through projects to promote the above activities.

In 2001, TEMA collected information on greening of supply chain and

green procurement from Japan, US and Canada. TEMA is in close cooperation with EDF, BCSD, ITRI, NCKU and ETC in the area of green procurement. In 2002, TEMA organized seminars on green procurement, published promotion brochure and organized international conference. In 2003, TEMA is planning to speak at industrial associations on green purchasing and publish the green procurement guideline. In 2004, TEMA is planning to publish the directory of suppliers of green products and provide technical assistance to industry, helping them to establish green procurement policy, guidelines and specifications.

TEMA is still considering the establishing of Green Procurement Network in ROC following the Japanese model by cooperating with EDF and BCSD. As ROC is in different economic scale from Japan, the forming of GPN will be more difficult. Government support is not sufficient and the driving force and incentives are not explicit.



# **Survey of Selected Companies on Green Purchasing in Republic of China**

## **EPSON INDUSTRIAL CORPORATION**

### **Seiko Epson Group's Earth-Friendly Concept**

The Seiko Epson Group (SEG) investments in Taiwan include Epson Industrial (Taiwan) Corporation and Epson Taiwan Technology & Trading Ltd. The latter company, an Epson sales affiliate, has implemented green purchasing policies for stationery, business cards, and document paper. The former, Epson Industrial (Taiwan) Corporation (EIT) manufactures small and medium-sized liquid crystal displays (LCDs) for cellular phones, pagers, calculators, watches, and other devices for sale in Taiwan, Hong Kong, Japan, Singapore, and South Korea, as well as for markets in Europe and North America. The company has 550 employees as of July 2003. As an SEG member company, EIT is following the SEG green procurement system to establish its own green procurement policy and guidelines.

In 1998, to mark the tenth anniversary of SEG's CFC elimination program, SEG launched a series of new environmental policies and set ambitious environmental targets for all its business activities, from product development to end-of-life recycling. As part of this effort, SEG has implemented a thoroughgoing green purchasing program that focuses on production materials and supplies, enabling SEG to create and provide Earth-friendly products.

### **SEG Environmental Policy**

#### *Philosophy*

Epson will integrate environmental considerations into its corporate activities and actively strive to meet high conservation standards in fulfilling its responsibilities as a good corporate citizen.

SEG is engaged in the major activities listed below in order to implement the above environmental philosophy:

#### *Major Activities*

- Creating and providing Earth-friendly products
- Transforming processes to reduce their burden on the environment
- Recovering and recycling used products
- Sharing environmental information and contributing to regional and international conservation efforts
- Continually improving the environmental management system

With a policy for saving energy and resources and for eliminating hazardous substances, SEG strives to continually produce environmental products that impose less environmental burdens throughout their product life cycles.

### **SEG Green Procurement**

SEG established green procurement guidelines in 1999, to give priority to the purchase of environmentally-friendly parts. In the first stage, SEG reviews and evaluates suppliers based on their stances on environmental issues, to identify green vendors. In the second stage, SEG reviews and evaluates the level of environmental friendliness of parts targeted for purchasing, and registers them as green parts. In view of the globalization of production, SEG also recognizes the importance of fully implementing green procurement policies overseas. In 2000, SEG held meetings at 15 overseas production sites and commenced a review of green vendors and a survey of parts, including EIT. In Taiwan, EIT is using the SEG method to conduct its own vendor reviews and surveys. SEG has established green procurement standards for production supplies, general supplies, and equipment, and

EIT is implementing these same standards in stages.

### **SEG Green Procurement Standards for Production Materials**

EIT has applied the SEG green procurement standard to production materials in Taiwan to achieve the targets set by SEG. The standard applies to all parts and raw materials, collectively referred to as “production materials.”

SEG/EIT green procurement of production materials refers to preferential procurement of production materials from green vendors.

SEG/EIT green vendors must meet four conditions:

- Certification that products do not contain banned substances (mandatory)
- Certification that substances banned from manufacturing are not used (mandatory)
- Management of industrial waste (flexible)
- ISO 14001 certification and disclosure of environmental policy, activities, implementation plan, and organization

SEG/EIT green production materials must meet the following three conditions:

- Information provided on controlled chemical substances content in supplies (mandatory)
- Product procured from SEG/EIT green vendors
- Paper packaging materials used for supply deliveries must incorporate recycled paper and cannot incorporate PVC

SEG has established detailed procedures and forms for conducting the green vendor survey and green production materials survey. There are 34 chemical substances banned in products (Appendix 1), 32 chemical substances banned from manufacturing (Appendix 2), and 28 controlled chemical substances incorporated in products (Appendix 3).

### **EIT Green Procurement Achievements**

Under the influence of SEG, EIT has implemented green procurement in three areas -- general supplies, production supplies, and equipment.

#### **(1) General Supplies**

##### *Criteria*

For green procurement of general supplies, EIT focuses on Taiwan’s Green Mark (eco-label) products. There are 19 product types, including toilet tissue, printing paper, paper boxes, name card paper, toilet bowls, LCD monitors, tape, non-mercury batteries, recycled-paper envelopes, detergent, water pigment, refrigerators, washing machines, light bulbs, correcting fluid, and humidifiers.

##### *Mechanism*

When items (such as the items listed above) are needed, the people in charge of placing orders at the EIT Production Dept., Facilities Dept., or other departments use the EIT procurement system to ask the Procurement Dept. for the required items. Basically, the person in the Procurement Dept. in charge of procuring the needed materials (one person is assigned to each product category, such as chemicals, electronic parts, etc.) looks for products bearing the Green Mark environmental label, a third-party certification in Taiwan, and then orders the items that best satisfy the performance and characteristics requirements of the department placing the order.

If the green product already has an order history (performance), then the same product will be ordered. But if it is a product to be ordered for the first time, or to be ordered in large quantities, then an optimum product investigation is conducted to determine whether a certified eco-mark product is available.

In cases when the investigation shows that no Green Mark product is available, then the department

may use a Taiwan-made environmentally-friendly product that has not yet received the Green Mark certification. In Taiwan, registration of eco-mark products requires time, money, and the submission of various documents. There are many unregistered products that still utilize recycled paper, exclude toxic chemical substances, or reutilize resources. Such information may be available in product catalogs, etc., and the procurement officer can confirm the information by checking with the sales representative or the manufacturer.

There are special procurement items that are imported from Japan that cannot be classified as production materials. Such items are nevertheless passed on to the customer alongside the EIT products (such as the ink used on packing materials). In these cases, if no appropriate item is locally available in Taiwan, a green product from Japan may be used after due consideration of costs.

#### *Achievement*

2002 performance: 17%

2003 performance: 40% (to reach 60% between June 2003 and the end of the fiscal year )

2005 goal: 100%

	FY2000	FY2001	FY2002
Green procurement ratio for general items	10 items per year	15 items per year	20 items per year

Although EIT launched green procurement for general items in 1997, very few products bearing the Green Mark certification were available at that time. As a result, EIT was initially unable to show procurement ratios for either performance or targets, and instead used as the target value the actual number of items obtained each year. 2003 marks the first year that the company actually set a target value for the green product procurement ratio for general items. The target ratios are 60% for 2003, and 100% for 2005. One major impediment to meeting these high target values is the small number of products bearing the Green Mark. In this regard, EIT is considering the following policies:

- Constantly checking the Internet for the latest listings of Taiwan-made eco-products, and immediately utilizing any new items that are on the order demand list.
- For items that can only be obtained in Japan, finding an agency in Taiwan for temporary product procurement until lower-priced certified products can be found in Taiwan.

## **(2) Production Supplies**

### *Criteria*

EIT uses the SEG Green Procurement Standard, including registration of Green Vendors and a list of Green Production Materials.

### *Mechanism, Prospects*

Utilization of the Green Vendor system in Taiwan began in 1997 with a request for cooperation with the certification program that was sent out to all vendors. Procurement priorities by country is currently as follows: Taiwan, 55%; Japan, 20%; and other countries, 25%. For Taiwanese vendors, in particular, EIT sent people to each company to explain the program and also conduct a survey. Certification of all green vendors was completed in October 2002. The green vendors are registered in a database. In some cases, EIT also prefers to conduct on-site inspections to go alongside the survey responses.

For procurement in Japan, the SEG Display Department has prepared a joint database for all SEG companies. Depending on the country, some suppliers are reluctant to cooperate with the survey and certification process, indicating huge variations in environmental awareness between companies in different countries, including the United States. The vendor system will become even more rigorous in the future, with implementation of a stricter survey (starting December 2003). For information about substances used in products, the vendors will be required to submit constituent analysis forms and MSDS (material safety data sheets for chemical substances) for all product materials, and to submit declarations that no items on the Epson list of 31 banned substances are contained in materials or otherwise being used.

#### *Achievement*

	FY2000	FY2001	FY2002
Green Vendor ratio	99% (62 companies)	99% (62 companies)	100% (63 companies)

### **(3) Equipment**

#### *Criteria*

In liquid crystal display plants like that at EIT, there is a broad mix of equipment ranging from large-scale machines that utilize a lot of water to small manually operated machines. While there are no concrete guidelines for equipment, any order for equipment at EIT must include green product specification requests, such as energy-saving performance, etc. The suppliers are asked to provide information on the environmentally-friendly specifications of their equipment. For example, procurement of heat source parts from an energy-saving viewpoint can include utilization of heat insulating structures, installation of operation functions in energy-saving mode, and increased utilization of high-efficiency parts. In some cases, energy volumes can be specified in accordance with the scale (size) of the facilities.

#### *Achievement*

By 2002, EIT had achieved only 8% of the green procurement goal, since it is often difficult to implement green procurement in this area due to difficulties in setting procurement criteria and to a shortage of suppliers. Since demands on production equipment manufacturers usually focus on quality and cost-oriented specifications, there appears to be very little production equipment in Taiwan that takes energy use and recycling into account.

### **Consideration about higher costs**

Green Mark products are usually 10-20% more expensive than ordinary products (including old paper products). Moreover, additional personnel costs arising from extra management tasks require about the equivalent of an additional ¥130,000. Despite these costs, however, EIT is determined to press forward with green procurement to ensure compliance with the SEG environmental philosophy. The prices for general item Green Mark products have come down by about 20-25% in the last two years. Copy paper, for example, cost 97 NT\$ per unit when EIT first began purchasing Green Mark products, but has now dropped to 74 NT\$. It should be noted, however, that uncertified paper, which makes use of old paper, is even cheaper, at 67 NT\$.

### **EIT's Prospects**

In Taiwan, EIT has always taken a leadership role in environmental protection activities. Before 2000, EIT was cautious about disclosing information out of concerns that confidential information could leak out. Since that time, however, the policy has been reversed gradually, in consideration of the company's responsibilities to society. Since 2001, EIT has been selected as a Taiwanese environmental model corporation, and has joined with the Taiwanese government to perform the following activities.

#### *FY2001*

- Selected as an ECO index model plant for calculation of the environmental burden of manufacturing plants, disclosing all environmental burdens in the form of plant consumption and emissions. EIT's liquid crystal display plant in Taiwan was reported throughout the world as a model plant for environmental burden disclosure (the plant name was not publicized, however).

#### *FY2002*

- Received invitations from other companies to share experiences as a Green Productivity model corporation. Visitors also came to tour the EIT plant, and EIT played an important role of coordinating environmental protection activity efforts among the Taiwanese government,

environmental protection groups of other countries and other environmentally-friendly companies.

- Certified as an environmentally-friendly corporation promoting pollution prevention facilities, and acted at the request of the Taiwanese government to serve as a pollution prevention model corporation, presenting seminars and programs targeted at environment officers in other companies that showcased EIT's pollution prevention management and environmental management systems.

EIT is at a transition period to become a fully-localized company. Even if the corporate structure undergoes changes, however, the environmental philosophy and environmental activities policies will continue to ensure that the company retains its No.1 ranking as an environmentally-friendly corporation.

## **FORD LIO HO MOTOR COMPANY Ltd.**

### **Ford Conservation Environmental Grants and Environmental Commitment**

The global environmental policy of the US Ford Motor Co. Ltd. (abbreviated as Ford) originated from Ford-Ford Conservation and Environmental Grants which was established in England in 1983. During the last 19 years, this Grant has funded approximately 50 countries and 15,000 relevant projects. This Grant has been recognized and praised throughout Europe and is the biggest grant in the world.

Ford's commitment to the environment is to use wisely the materials. Ford's environmental pledge states that Ford is dedicated to providing ingenious environmental solutions that will position Ford as a leader in the automotive industry and care about preserving the environment for future generations.

Environmental activities include global company-wide recycling, cleaner operating vehicles, recyclable vehicle components, cleaner manufacturing, employee involvement in environmental cleanups, alternative fuel and low emission vehicles.

Major recent environmental developments include:

- Corporate Citizenship Strategy: love and appreciation for the world by working to maintain a balance between industry and the environment;
- SUV Fuel-Saver: involvement of Ford in electric vehicle, hybrid electric vehicle and fuel cell, and the first hybrid Sport Utility Vehicle (SUV) was announced;
- Zero Emissions: producing a zero tailpipe emission electric Ranger which has readily available fuel, reduces fuel costs and maintenance, and quite operation;
- Hybrid Electric: the hybrid electric vehicle program is an important of Ford's environmentally friendly vehicles; and
- ISO 14001 Certification: to meet ISO 14001 standards and certify all its plants in the world.

### **Ford Lio Ho Motor Company Ltd Environmental Activities**

Ford Lio Ho Motor Company Ltd. (abbreviated as Ford Lio Ho) is the Ford investment in Taiwan, the Republic of China (ROC) with manufacturing plant producing automobiles supplying ROC and some of the Asian markets. Ford Lio Ho has established its business in Taiwan automobile market for 30 years since 1972.

The major focus of Ford Lio Ho's environmental protection is on design for environment (DfE), pollution prevention (P2) and ecology preservation. Ford Lio Ho's environmental policy is:

- Actively striving to reduce the environmental impacts of the products in the life-cycle of the products from design, use to waste by using low pollution materials and cleaner technology;
- Provide suppliers with necessary information and work with them to enhance recycle, resource reuse and decrease the use of banned substances;
- Through sales to provide clients environmental information and promote DfE; and
- Establish corporate citizenship and share with stakeholders the environmental experience.

Ford Lio Ho has initiated many environmental enhancement programs and received many awards since its inception. Key programs that have been implemented included 5S (since 1972), Kaizen (since 1972), ISO 9000 (since 1996), QS 9000 (since 1998), ISO 14000 (since 1998) and Six Sigma (since 2000).

### **Ford's Product Development System**

Under Ford, there is a global Ford Product Development System (FPDS) which is already implemented in north and south America and Europe. In Asia, this is still under pilot test and Ford

Lio Ho is Ford's Asia design center to carry this pilot test.

Under FPDS, there is an Enterprise Material Management (EMM) which contains four main components:

- International material data system (IMDS): this will be a system on the web to be implemented through procurement department and suppliers have to comply with the material requirements;
- Material toxicology system (MATS): this will be a system performing LCA with reference to toxicology and hazardous substances, under this system there is a restricted substances management system (RSMS) providing an inventory and database of the restricted substances;
- Global material approval process (GMAP): this process involves environmental management system, safety, design and procurement for the approval of materials used in the manufacturing of automobile; and
- Global material integration and reporting (GMIR): this will involve design, procurement and suppliers so as to monitor how the suppliers are responding to the requirements.

It is under the above structure that Ford is generating all the green procurement requirements for its global suppliers. Ford Lio Ho is at the beginning of building this system and this year will be a pilot period and full implementation will be expected to start next year.

### **Vehicle End-of-Life Directive**

As Ford has joint venture in Europe on automotive manufacturing and also forming Vehicle Recycling Partnership in North America with the other two large automobile manufacturing companies, Ford is using the Europe vehicle end-of-life directive as it develops its future automotives. The directives include:

- Manufacturer's certification is required for cars, light trucks, minivans and replacement parts;
- Elimination of non heavy metals (hexavalent chromium, lead, cadmium and mercury) by July 2003;
- Reuse and recyclability of at least 85% average vehicle weight by 2005;
- 100% polymeric parts marking by 2003; and
- Cost free take back for vehicles put on the market after July 2002 and all vehicles after Jan 2007.

### **Ford Lio Ho's Achievement in Greening of Supply Chain**

It is under the FPDS and vehicle end-of-life directive that Ford Lio Ho is implementing greening of supply chain and green procurement to achieve the requirements and targets. So far, FLH has been promoting the following four areas in the greening of supply chain and green procurement:

- Requesting suppliers on plastic parts to mark all plastic materials to facilitate recycling and procurement department has implemented this through the bidding and delivery process;
- Implementing restricted substances management system (RSMS) to control toxic and hazardous materials such as heavy metals and listing the requirements in the procurement contracts;
- Training the suppliers on PU recycling to encourage the suppliers to recycle the PU from end-of-life vehicles and reuse the recycled PU in the new supplies; and
- Requesting first tier suppliers to obtain ISO 14001 certification and 85 suppliers have completed this already.

# **Green Purchasing Initiatives by AEON Co., Ltd.**

## **Introduction**

AEON Co., Ltd., has formulated the **AEON Environmental Philosophy and the AEON Environmental Policies**, which are in turn based on the AEON Corporate Commitment to create “a future of limitless promise — an AEON — by transforming daily life with our open, dynamic approach.” The AEON Environmental Philosophy was formulated in August of 2001, when the firm changed its company name from JUSCO Co., Ltd., to its present name, AEON Co., Ltd. The AEON Environmental Philosophy outlines the firm’s commitment to active initiatives for social contribution and environmental conservation in order to fulfil its social responsibilities as a corporate citizen. Furthermore, the AEON Environmental Philosophy recognizes that these activities have their roots in local communities and declares that the firm will pursue partnerships with local residents and work together with them to build a recycling-oriented society.

The AEON Environmental Policies declare that, as a retailer, the firm will actively carry out environmental conservation efforts through the provision of products and services of superior value at its stores in order to contribute to the establishment of a sustainable society. These policies include a commitment to carry out environmental conservation through AEON’s business activities and to review these activities on a regular basis, as well as to make efforts to achieve continuous improvement in environmental initiatives, of which green purchasing is just one aspect. Additional initiatives set forth by the AEON Environmental Policies include the provision of environmentally conscious products, energy and resource conservation, reduction of waste, implementation of reuse and recycling, and reduction of CO<sub>2</sub> emissions to prevent global warming.

## **1. Decision-making Process for Environmental Management**

In 1990, AEON established the JUSCO Earth-Friendly Committee, which was further developed into the Environment Committee in 1996. Environmental conservation activities are considered an important management agenda at AEON, and the firm has created a group-wide environmental management promotion system led by the president, resulting in an organization with unified policies under a single decision-making structure. Furthermore, following the company name change implemented in August of 2001, AEON changed its organizational structure to allow the directors of the AEON companies and affiliated companies to participate in the Environment Committee, which meets quarterly as AEON’s review board for environmental issues. By doing so, it became possible for the decisions made in the Committee to be implemented as uniform policies throughout the firm and its affiliates thus creating a system that ensures swift participation in environmental conservation activities extending to the store level.

The Environment Committee implements concrete proposals for environmental conservation, and is assisted by Environment Working Groups that carry out studies and draft proposals for the Committee. The six Working Groups concentrate on issues such as “Environmentally Conscious Product Development and Sales Promotion Activities,” “Promotion of Energy Conservation Activities,” “Resource Conservation/Waste Reduction and Green Purchasing,” “CO<sub>2</sub> Emission Reduction Activities,” “Regulatory Compliance Activities for Store Environment Furnishings,” and “Environmental Communication Activities.” Each working group is made up of 7 to 11 representatives representing up to five affiliated companies, with companies chosen according to their relevance to the working group theme.

AEON Co., Ltd., practices green purchasing as part of its environmental policies. Consequently, the



firm acquired company-wide multi-site ISO 14001 certification in June of 2000. With over 360 stores and about 60,000 employees, it had become necessary for AEON to establish an Environmental Management System, and the decision to acquire ISO certification on a company-wide basis was based on the determination that all staff members would be motivated to actively involve themselves in the Environmental Management System by ISO certification.

## **2. Green Purchasing Initiatives**

### **A. History of Green Purchasing Activities**

February 1996	Establishment of the Green Purchasing Network in cooperation with other entities AEON continues to participate in management of the Network as a managing member.
August 1997	A green purchasing product list is established for stationery, office supplies, and copy paper. Start of the green purchasing of office supplies and materials.
April 1998	Introduction of recyclable mannequins for use on garment sales floors
October 1999	Entire company switches to advertising flyers made from 100% recycled paper.
June 2000	Acquisition of company-wide multi-site ISO 14001 certification AEON adds the promotion of green purchasing to its Environmental Policies and specifies the relevant fields and environmental targets for each year, while moving forward with the “formulation of standards and step-by-step promotion of green purchasing.” Establishment of a project team for procurement of materials and supplies A project team is established to consolidate the procurement operations of all offices and stores into an electronic ordering system for materials and supplies. A review of green purchasing standards for stationery, office supplies, and paper and sales materials is also implemented.
November 2000	Commencement of operations of the green purchasing system for materials and supplies (unified management of green purchasing performance) Environmentally conscious products are recorded in the purchase order register for materials and supplies based on the green purchasing standards.
2001	Green purchasing standards established for sales materials and construction materials, in accordance with green purchasing guidelines.

New environmental initiatives by AEON include the adoption of green purchasing for the procurement of construction materials used in store construction. For the construction of the JUSCO Mikawa Store opened in September 2001, AEON made exclusive use of recycled flooring materials in the mall area and reduced the total volume of materials used, including a 75% reduction in construction adhesive usage. AEON also achieved a 35% reduction in the volume of flooring materials used in the mall area by utilizing a flooring material with a textile surface composition. Although textile surfaces tend to diffuse light and create a darker lighting environment, this issue was mitigated by the ample light offered by glass roof enclosures, which are frequently used in the retail mall corridors that connect major outlets such as AEON and Toys “R” Us stores in large-scale shopping centers. After using textile surface flooring materials on a trial basis, AEON concluded that there were no issues with this choice of flooring materials when combined with the pattern of heavy foot traffic coming in from the snow, a factor that reflected the JUSCO Mikawa Store’s location in Yamagata Prefecture. The firm also realized the added benefit of lower maintenance costs for cleaning the textile surface flooring

materials. By April of 2002, AEON had changed the design of its mall-type stores to specify textile surface flooring materials for all mall corridors. As a further extension of its green purchasing practices, AEON also presently conducts green purchasing for 14 categories of construction materials.

While AEON's green purchasing initiatives might appear to have proceeded smoothly, the staff at AEON who were responsible for the green purchasing project have indicated that there were difficulties with practical implementation. For example, differences between theory and practice led to disagreements between the firm's experienced construction material buyers and its environmental staff, who lacked specialized expertise in construction materials. AEON managers recognize that, despite top-down implementation of environmental conservation policies, actual policy implementation can vary from situation to situation, lacking a wholehearted acceptance of environmental conservation policies at all levels. According to the AEON staff mentioned above, patient discussion is required to prevent inconsistent implementation of environmental conservation policies.

## **B. Green Purchasing Policies and Guidelines**

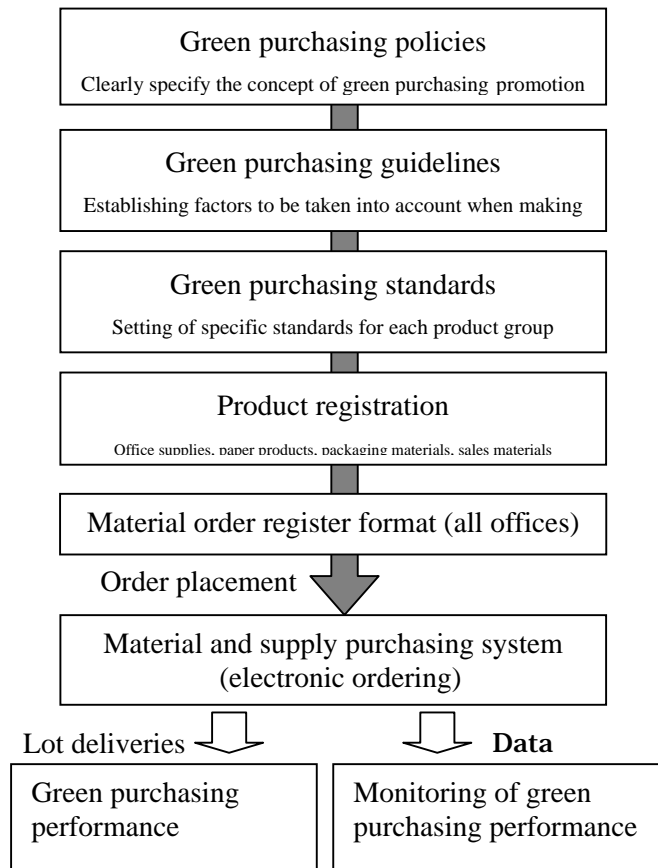
AEON's green purchasing policies are intended to reduce the impact on the environment resulting from the firm's daily business, by promoting increased purchasing of environmentally conscious products and services. By promoting green purchasing, AEON is attempting to expand the market for environmentally conscious products and to support efforts to reduce the environmental impact of product development and product supply by manufacturers and other sources. Furthermore, the firm hopes to accelerate the purchase of environmentally conscious products and services by its customers and at the municipal level, as one way of contributing to a sustainable society.

The green purchasing guidelines set forth by AEON are comprised of criteria for the selection of environmentally conscious products. Product and material purchase are reviewed to determine if they are first and foremost necessary, then selected with an emphasis on products and materials that have a low impact on the environment, rather than basing the selection solely on price and quality criteria. AEON's green purchasing guidelines are applied to the purchase of office products, marketing display materials for sales floors, and materials for sales such as packaging. During the 2001 fiscal year, AEON also established a separate set of criteria for the selection of construction materials.

### **Green Purchasing Guidelines** (criteria for the selection of products)

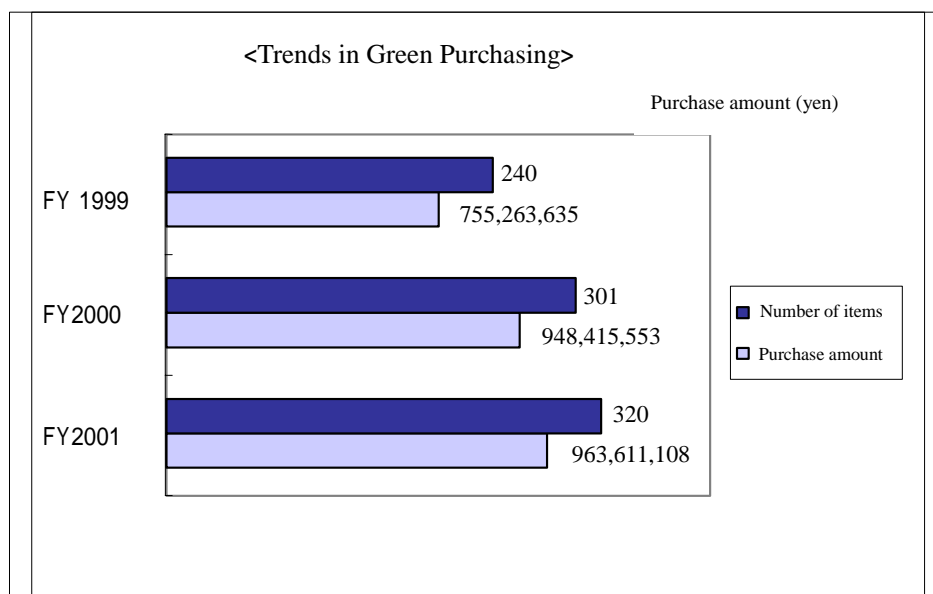
- Products with environmental labeling (Eco Mark, etc.)
- Products with environmental consideration for the manufacturing stage
  - Use of recycled, surplus, or waste materials
- Products with environmental consideration for use
  - Low consumption of resources or energy during use
  - Capable of repair, "parts" replacement or refilling
  - Reduced use of packaging or packing materials
- Products with environmental consideration for the disposal or recycling stage
  - Classifiable waste, recyclable
  - Durability enabling long-term use
- Products that do not generate hazardous substances in the use or disposal stages

### C. Mechanism for Promoting Green Purchasing



\*Enables monitoring of green purchasing amounts using a material and supply purchasing system for integrated management of the order placement process.

### D. Trends in Green Purchasing



### 3. Initiatives to Promote Green Purchasing by Consumers

AEON introduced the “Bring Your Own Shopping Bag” campaign in May of 1991, based on a commitment to eliminate single use items and waste items wherever possible. This campaign was followed by the introduction of the Shopping Bag Stamp Card in September 1991, in which customers receive a stamp each time they indicate that they do not need a plastic shopping bag at the check-out counter. When shoppers have 20 stamps, they may present the card in exchange for a product. Based on further input from its customers, AEON later introduced the “My Basket” campaign in May of 2000, as a way to further encourage customers to reduce the use of plastic shopping bags at supermarket check-out areas. Starting in May 2001, the “My Basket” campaign was extended to all sales areas including clothing and daily necessities sections. These initiatives have resulted in a decrease in the consumption of plastic shopping bags, as shown in the chart below.



The number of stamp cards exchanged by shoppers has also increased. Although shoppers initially had the option of exchanging their stamp card for either 100 yen in cash or a product that helps to conserve the environment, AEON instituted changes in September of 2002 so that shoppers could only exchange their stamp cards for environmentally conscious products developed in-house by AEON. This change was motivated by the firm’s desire to increase awareness of the benefits of environmentally conscious products among customers, and to serve as a springboard for green purchasing by customers. (AEON’s line of environmentally conscious products is described in more detail later in this document.)

AEON’s 60,000 employees are educated about environmental issues by means of an education system and procedures that are standardized under the ISO 14001 management system. The aim of this program is to ensure a uniform level of environmental awareness among all employees at all stores. Company bulletins also provide information on green purchasing in order to improve awareness of green purchasing among AEON employees. During the course of their daily work, AEON employees wear uniforms made from recycled PET bottles, work with recyclable mannequins, use advertising flyers made from 100% recycled paper, engage in paperless office communication, and utilize copy paper developed by AEON that is made from 100% recycled newspapers and still achieves 70% brightness. Other initiatives include the use of display shelves and point-of-purchase displays made from recycled milk cartons, and the use of “Turn Me Off” signs on light switches to encourage employees to turn off room lights whenever possible.

#### **4. Environmental Communication and Promotion of Green Purchasing by Customers**

AEON has established the TOPVALU private brand of environmentally conscious products, with three sub-brands named TOP VALU *Kyokan Sengen* (“declaration of environmental consciousness”), TOPVALU Green Eye, and SELF + SERVICE.

The TOPVALU *Kyokan Sengen* brand is reserved for environmentally conscious products developed according to AEON’s own standards. Products must show consideration for the environment and be of superior product quality, with products divided into three sub-categories so that customers may better understand how each product shows consideration for the environment. As of February 2002, AEON sold approximately 240 items under the “Recycle,” “Clean,” and “Natural” sub-categories of the TOPVALU *Kyokan Sengen* brand.

- **Recycle:** Products that effectively utilize recycled materials from in-store collection including aluminum cans, milk cartons, food trays, and PET bottles.
- **Clean:** Products that incorporate considerations for the conservation of air and water quality and do not pollute nature.
- **Natural:** Products that effectively utilize natural materials to replace those that have a heavy impact on the environment.

The TOPVALU Green Eye brand of products are grown or manufactured in consideration of health and the natural environment, based on the principle of providing customers with safe products and peace of mind. AEON applies the following five standards to TOPVALUE Green Eye products:

- (1) Food products that do not use artificial food coloring, preservatives, or sweeteners.
- (2) Minimal use of chemical substances such as fertilizers, pesticides, and antibiotics during production.
- (3) Emphasis on utilizing natural energy to obtain good flavor using suitable cultivation methods and fertilizers at proper locations and at appropriate times.
- (4) Support of agriculture that takes into consideration the conservation of the environment and ecosystems.
- (5) Comprehensive control from production to sales based on AEON’s own standards.

The TOPVALU Green Eye brand represents a new lifestyle and encompasses a wide array of products that are grown organically or grown with reduced use of agricultural chemicals, stock farm products that are safely bred, and processed foods that are made with the above two as ingredients. AEON has also introduced product labels using symbols to indicate various environmental considerations undertaken in the process from production to sales. The six symbols described below are applied to products according to AEON’s own standards.

##### **Utilization of natural energy available at the local area**

The symbol indicates contribution to curbing global warming by utilizing energy resources that are available at the local area, such as solar energy and heat from hot springs, for production activities.

##### **Utilization of returnable containers**

The symbol indicates the use of returnable, reusable containers for delivery from the producing centers in order to reduce the use of cardboard boxes.

##### **Utilization of composted soil from the local area**

The symbol indicates the use of environmentally conscious cultivation methods based on the material cycle of the local area.

##### **Utilization of materials that can be returned to the soil**

The symbol indicates the use of materials that can be returned to the soil to replace petroleum-based agricultural materials and containers.

#### **Considerations for the prevention of river and soil pollution**

The symbol indicates the recycling of agricultural materials and restraint on excessive use of fertilizers and agricultural chemicals.

#### **Eco-farmers certified by prefectural governors**

The symbol indicates that the produce is grown by “Eco-farmers” who have pledged to carry out production activities utilizing the natural elements of the local area and who have been certified by a prefectural governor.

In addition, representatives of AEON Co., Ltd., have visited agricultural producers in different parts of Japan to explain the firm’s intentions for TOPVALU farm produce and to seek the cooperation of the producers in cultivation. As a result, the firm has presently gained the support of approximately 3,000 agricultural producers who are currently working with AEON in production and sales.

The SELF + SERVICE brand offers products and store facilities that contribute to a sustainable society. The brand name conveys the message of “raising awareness of the environment within ourselves and putting this into action starting right at home.” Product development for the SELF + SERVICE brand is undertaken based on the five themes of “Recycling,” “Ecology,” “Natural,” “Organic,” and “Protection.” Efforts include the use of recycled cotton made of discarded cotton, the use of Tencel, which is made of wood pulp with little environmental impact, and the adoption of a manufacturing process employing dyes that create less water pollution. Furthermore, environmental considerations can be found throughout store facilities. Some examples include checkout counters using lumber from tree thinning, displays made of recycled acrylic, and racks made of recycled whisky barrels. AEON has also piloted the volume sale of additive-free shampoos at some stores.

Products offered under the SELF + SERVICE brand include pens made from recycled plastic, notebooks made from 100% recycled paper, recycled cotton shirts, Tencel innerwear, additive-free soap, and organic cotton towels.

Sales from AEON’s TOPVALU *Kyokan Sengen*, TOPVALU Green Eye, and SELF + SERVICE brands of environmentally conscious products totaled 9.2 billion yen in 2000. In 2001, sales from the three brands reached 23.7 billion yen, or 1.4% of total sales.

AEON is also involved in new and experimental efforts to conserve the environment, including efforts to establish a sustainable sales system in cooperation with Kyoto City, Kyoto University, the Citizens Environmental Foundation (NPO), AEON’s JUSCO Higashiyama Nijo Store and its customers. At the JUSCO Higashiyama Nijo Store, AEON is attempting to establish a sustainable sales model to encourage local consumption of locally produced agricultural products. Vegetables produced in the northern area of Kyoto City are displayed next to imported vegetables that come from around the world, in an effort to determine the price ceiling that shoppers are willing to accept to obtain locally produced products intended for local consumption. The collaborative approach of this effort is based on AEON’s recognition that governmental certification and the vocal support of NGOs are essential in creating a cost structure that will encourage local consumption of locally produced products, in spite of their higher cost to consumers. AEON’s efforts to create a sustainable system are based on the acknowledgement that such initiatives must be carried out in partnership with other sectors in the community, rather than working in isolation.

# Seiko Epson Corporation's Green Purchasing Initiatives

## Introduction

The Seiko Epson Group includes environmental conservation initiatives as an important part of its management philosophy, in order that the firm may contribute to achieving a sustainable society. The firm's management philosophy states, "Epson is a progressive company, trusted throughout the world because of our commitment to customer satisfaction, environmental conservation, individuality, and teamwork. We are confident of our collective skills and meet challenges with innovative and creative solutions." Based on this philosophy, in October 1994, Seiko Epson established its first Environmental Policy, which consists of an Environmental Philosophy and Major Activities (initiatives). The Seiko Epson Environmental Policy, most recently revised in June 1999, declares, "Epson will integrate environmental considerations into its corporate activities and actively strive to meet high conservation standards in fulfilling its responsibilities as a good corporate citizen." The Environmental Policy outlines five major initiatives to be pursued by the entire Seiko Epson Group.

- 1) Creating and providing earth-friendly products
- 2) Transforming all processes to reduce the burden on the environment
- 3) Recovering and recycling used products
- 4) Sharing environmental information and contributing to regional and international preservation efforts
- 5) Continually improving the environmental management system

## 1. History of Green Procurement

Seiko Epson's green procurement initiatives began in earnest in 1998, quickly followed by the initial implementation of green material reviews at its domestic operations in 1999. By 2001, the firm had expanded its green material reviews to plants operated by its group companies and affiliates in Japan, as well as to its overseas plants. Seiko Epson's green procurement initiatives continue to expand every year, resulting in an unprecedented level of involvement from both within the company and from the larger community.

1992 – Present	Switch to recycled copy paper and business cards
April 1998	Establishment of group-wide Green Purchasing Committee
July 1998	Start of green procurement of general purchases Formulation of green purchasing guidelines for general purchases
April 1999	Start of green procurement of production materials
September 1999	Formulation of green procurement guidelines for production materials
May 2000	Start of green material reviews at overseas plants and group companies and affiliates in Japan
December 2000	Completion of green vendor surveys implemented by Seiko Epson in Japan
June 2002	Revision of green purchasing guidelines for general purchases (following enactment of Japan's Green Purchasing Law)

January 2003	Establishment of Seiko Epson Group (SEG) Green Purchasing Standard for Production Material
March 2003	Official enactment of SEG Green Purchasing Standard for Production Material

Seiko Epson's Green Purchasing Committee is comprised of individuals drawn from the operations divisions and group companies of Seiko Epson, and includes the membership of environmental management divisions operating within the Seiko Epson Group. Administrative duties for the Committee are handled by the production management divisions of Seiko Epson Corporation. Although the committee is currently responsible for overseeing Seiko Epson's green procurement efforts, the firm eventually plans to fully integrate the work of the Green Purchasing Committee into Seiko Epson's day-to-day operations at the workplace level.

## **2. Green Procurement of Production Materials in Japan**

Seiko Epson is making every effort to reduce the environmental burden of every stage of its products' lifecycles, underpinned by a corporate commitment to energy-saving design, resource conservation, and the elimination of hazardous substances. These objectives are accomplished through a wide range of efforts in various fields including planning, design, materials procurement, manufacturing, sales, and distribution, as well as environmental initiatives regarding the use, recovery, and recycling of products. The firm's green procurement efforts are primarily focused on the elimination of hazardous substances and resource conservation through initiatives aimed at reducing the environmental burden of procurement in terms of both suppliers and production materials.

Seiko Epson formulated its own green procurement guidelines for production materials in 1999, and later established the SEG Green Purchasing Standard for Production Material in 2003. The SEG Green Purchasing Standard for Production Material describes the firm's fundamental approach to green procurement of production materials and contains concrete standards and procedures for its implementation. The document seeks to encourage the procurement of production materials that reduce environmental burden, as a means of fulfilling the firm's commitment to "Creating and providing earth-friendly products."

### **A. Green Vendor Certification**

At Seiko Epson, the process for green procurement of production materials occurs in two separate phases. In the first phase, Seiko Epson Corporation carries out surveys and certification of green vendors, and in the second phase the operations divisions of Seiko Epson carry out reviews and certification of green materials. However, materials are not reviewed unless suppliers are certified as green vendors, so that suppliers are encouraged to cooperate with Seiko Epson in order to achieve the firm's goal of a 100% green vendor certification rate among suppliers.

Seiko Epson is strongly committed to its suppliers' efforts to become green vendors, based on a recognition that earth-friendly products can only be realized by working in collaboration with its suppliers, as opposed to working in isolation. Seiko Epson is committed to working closely with its suppliers to implement environmental initiatives to enable its suppliers to achieve green vendor certification. Green vendors must satisfy the certification requirements shown below as a prerequisite for transactions with Seiko Epson.

#### *Requirements for Certification as Green Vendor of Production materials*

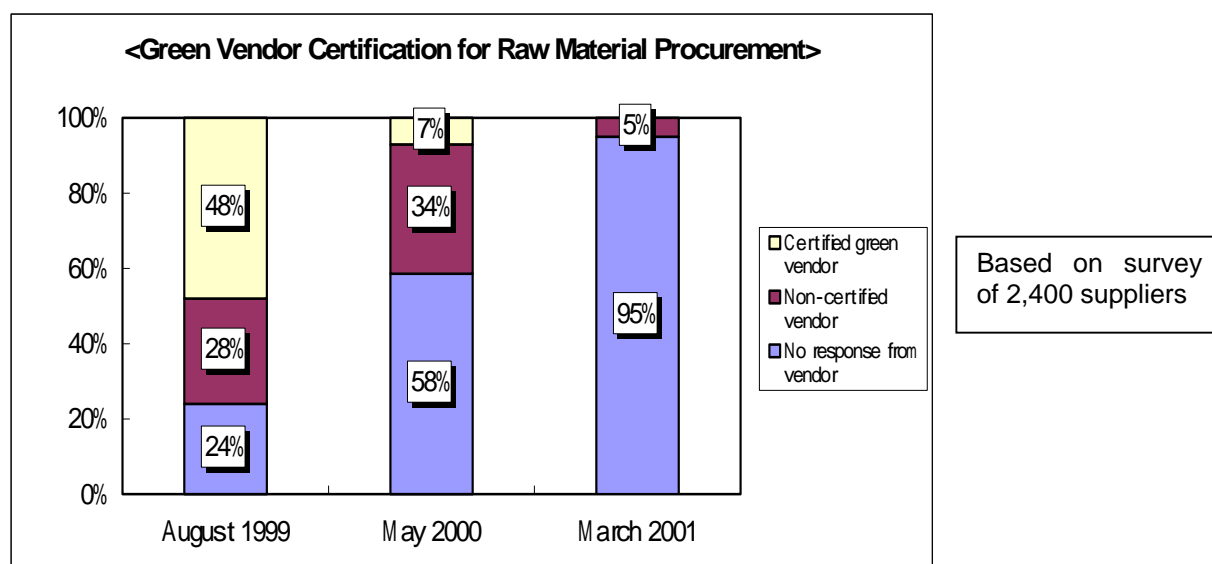
- (1) Certification that product does not contain banned substances (from March 2003)
- (2) Certification that substance banned from manufacturing are not used
- (3) Passed Seiko Epson Group waste control audit
- (4) Implementation of environmental initiatives (consisting of acquisition of ISO 14001 certification



or internal environmental system)

Seiko Epson implemented its first green vendor survey in May 1999, covering approximately 2,400 suppliers. At the time of the initial green vendor survey, Seiko Epson's suppliers showed a lack of awareness about green procurement, which led to a low number of survey responses returned by suppliers. Among those that responded, many of Seiko Epson's suppliers indicated that they either lacked the resources to implement environmental initiatives or were unsure how to proceed with such initiatives. Consequently, Seiko Epson sought to increase its suppliers' awareness of green procurement and to gain their cooperation through communication and guidance provided in the form of seminars, telephone and written requests for cooperation, and direct meetings with suppliers.

As a result of Seiko Epson's persistent efforts, the rate of green vendors among suppliers increased from 24% in August 1999 to 58% in May 2000. By March 2001, the percentage of green vendors increased to 95%, while the response rate for the green vendor survey reached 100%, as shown in Graph 1.



Graph 1

The data from the most recent green vendor survey conducted in December of 2002 indicates that 2,468 suppliers, or 94% of all suppliers were certified as green vendors, out of a total of 2,634 suppliers. Of the remaining 166 suppliers who were not certified as green vendors, 34% indicated they had concrete plans to implement initiatives to become green vendors, while another 15% indicated they would eventually do so. A further 15% indicated that they were trading companies and had not undertaken any environmental initiatives, while another 12% indicated that they lacked the manpower and financial resources to implement environmental initiatives. Overall, the figures from the latest green vendor survey indicate that nearly half of all uncertified suppliers plan to eventually undertake initiatives to become certified as green vendors, as Seiko Epson continues to strive for 100% green vendor certification among its suppliers.

## B. Green Materials Certification

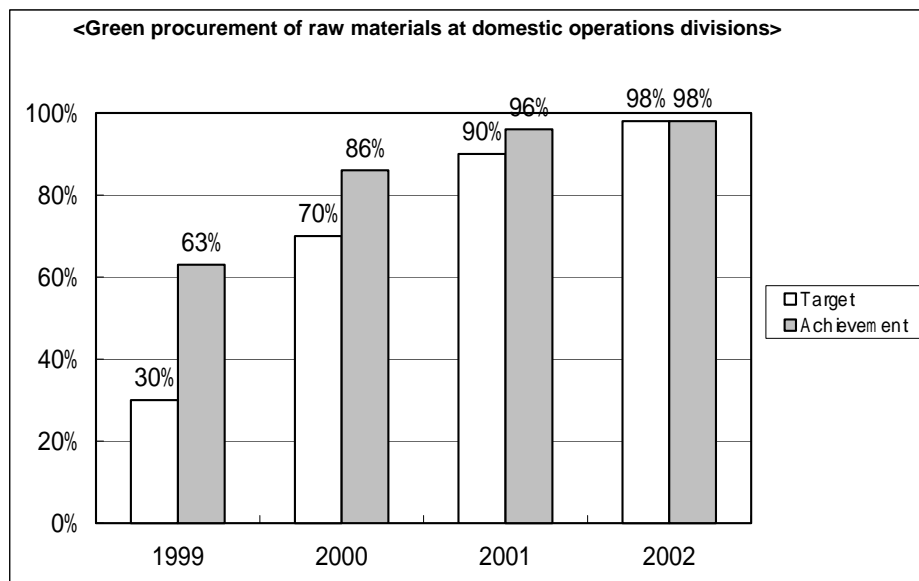
Seiko Epson conducts reviews of green materials for suppliers who are certified as green vendors. Green material reviews are conducted in accordance with the SEG green purchasing standard for production material, which outlines the requirements for certification of green materials as shown below.

### *Requirements for Certification of Green Materials*

- (1) Survey of information on controlled chemical substances content in products (from March of 2003)
- (2) Supplier is a green vendor
- (3) Use of more than 51% recycled paper (by weight) for production material/parts packaging or existence of voluntary recovery system

When Seiko Epson conducted its first green materials reviews in 1999, the green procurement rate for production materials was 63%. By 2002, the rate of green procurement for production materials had increased to 98%. As indicated in Graph 2, Seiko Epson has surpassed its annual targets for green procurement of production materials in every year since its initial implementation of green material reviews in 1999.

Graph 2



\*The rate of green procurement for production materials is calculated as a percentage of the overall procurement by value.

In 2002, 2% of production material procurements failed to meet the green material standard set by Seiko Epson. Of this group, 5% consisted of materials that either failed to use more than 51% recycled paper (by weight) for production material/parts packaging or used polyvinyl chloride (PVC) packaging. The remaining 95% of non-compliant materials were categorized as such due to a lack of supplier response to Seiko Epson's green material reviews.

Seiko Epson undertook several initiatives to address the two major factors for non-compliance identified by its green material reviews. To address semiconductor procurements that used PVC packaging, the firm introduced a system for recovery and reuse by recycling firms in order to eliminate the incineration of PVC packaging. This initiative alone resulted in a reduction of 12 tons of waste per year. Seiko Epson introduced collapsible plastic shipping containers that allowed for repeated reuse of the containers, in order to address material procurements that used less than 51% recycled paper for production material or parts packaging. As a result, Seiko Epson achieved a 70% reduction in cardboard box waste, and also realized savings of 80 yen per unit due to more efficient utilization of warehouse space resulting from the use of reusable containers.

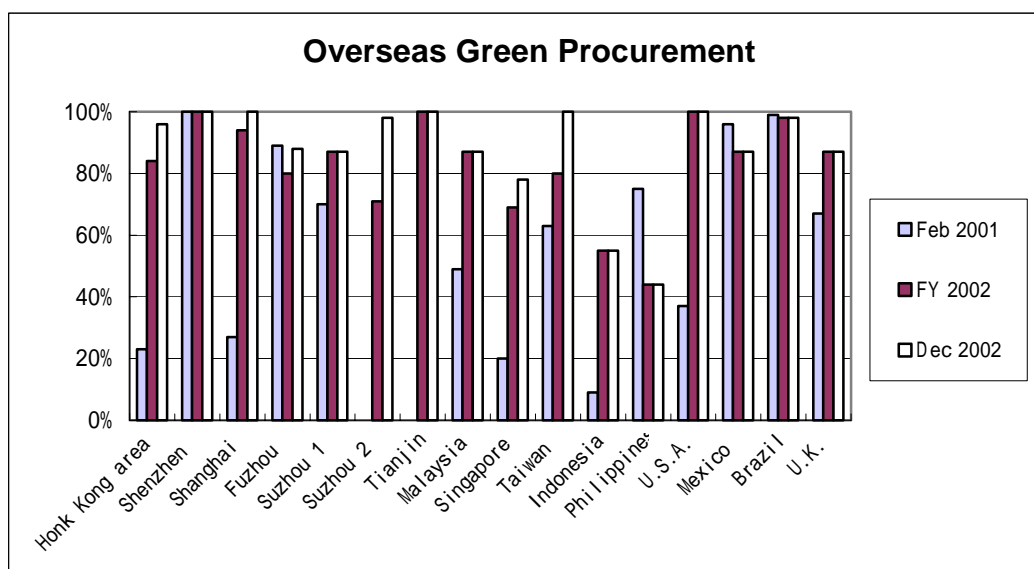
### 3. Green Procurement of Production materials at Overseas Plants

As the ratio of its offshore production continues to increase with every year, Seiko Epson is closely

monitoring green procurement at its overseas sites. In FY2000, the firm began implementing green procurement at 15 of its overseas plants. The firm dispatched personnel its overseas plants to communicate the fundamental approach toward green procurement and to stress the importance of green vendor surveys, and translated its survey materials into English and Chinese. These efforts paved the way for communication with local suppliers and implementation of green vendor surveys at its overseas plants. However, the staff at Seiko Epson who were responsible for implementing green procurement at overseas plants indicated that they frequently had trouble to cope with the different regulations and widely divergent attitudes towards environmental initiatives in each country.

Other hurdles faced by Seiko Epson included the absence of environmental policies and environmental plans at overseas plants, as well as the lack of organization structures for carrying out environmental initiatives. The situation was further hampered by the large number of suppliers not certified as green vendors and the scarcity of green materials from local suppliers. For instance, in China, there was a scarce supply of packaging that used more than 51% recycled paper. A further hurdle was the difference in attitudes towards environmental conservation displayed by suppliers, which tended to vary from country to country. In spite of these hurdles, Seiko Epson recognizes the need to work patiently to gain the cooperation of the local suppliers of its overseas plants, in order to implement a global strategy for green procurement.

Seiko Epson is also pursuing other initiatives to further its global strategy for green procurement. Since many of the suppliers of its overseas plants are overseas affiliates of Japanese companies, Seiko Epson is working with the Japanese headquarters of local suppliers of its overseas plants, in an effort to communicate the firm's fundamental approach towards green procurement and to gain the cooperation of local suppliers. Seiko Epson is also working to educate local suppliers of its overseas plants by holding seminars and meeting directly with its suppliers to discuss issues. The firm also works closely with its suppliers to suggest green materials as a replacement for non-compliant materials.



Graph 3

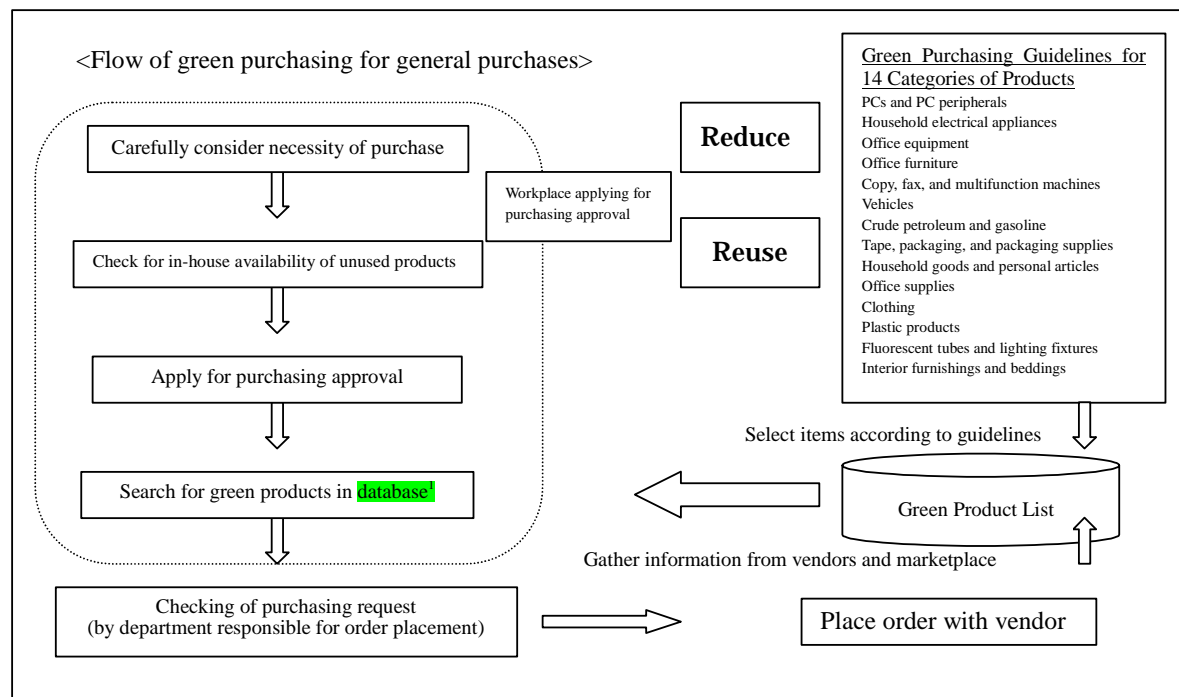
By December of 2002, the rate of green vendor certification among suppliers of Seiko Epson's overseas plants increased to 80%. At the same time, the green procurement rate from the 1,112 local suppliers of its overseas plants increased to 82%. Seiko Epson has also indicated that it is prepared to devote considerable time and resources to eventually implement green procurement at all of its overseas plants, based on a unified global standard for green procurement.

#### 4. Green Purchasing of General Purchases

Seiko Epson established green purchasing guidelines for general purchases in 1998, covering general purchases of items such as stationery, office supplies, office equipment, and furniture. Following the enactment of Japan's Green Purchasing Law in 2001, the firm revised the guidelines so that items are certified according to the standards set by the law. Any items not covered by the Green Purchasing Law are certified according to Seiko Epson's own green product standards. Seiko Epson's in-house guidelines stipulate that green products are to be preferred for all general purchases, and is augmented by individual guidelines covering fourteen product categories including: PCs and PC peripherals; office equipment; copy, fax, and multifunction machines; household electrical appliances; office furniture; vehicles; crude petroleum and gasoline; tape, packaging, and packaging supplies; household goods and personal articles; office supplies; clothing; plastic products; fluorescent tubes and lighting fixtures; and interior furnishings and beddings. The individual guidelines are routinely reviewed and expanded by Seiko Epson in order to maintain the pertinence of their content.

The flow of green purchasing for general purchases begins at the workplace, where employees are instructed to carefully consider the necessity of the purchase at the outset of any purchase. After checking for possible in-house availability of unused product, employees search for green products using Seiko Epson's own database of green products. Once an employee has applied for purchasing approval of green products, the order placement department checks the request before placing the order with the supplier.

Fig. 4



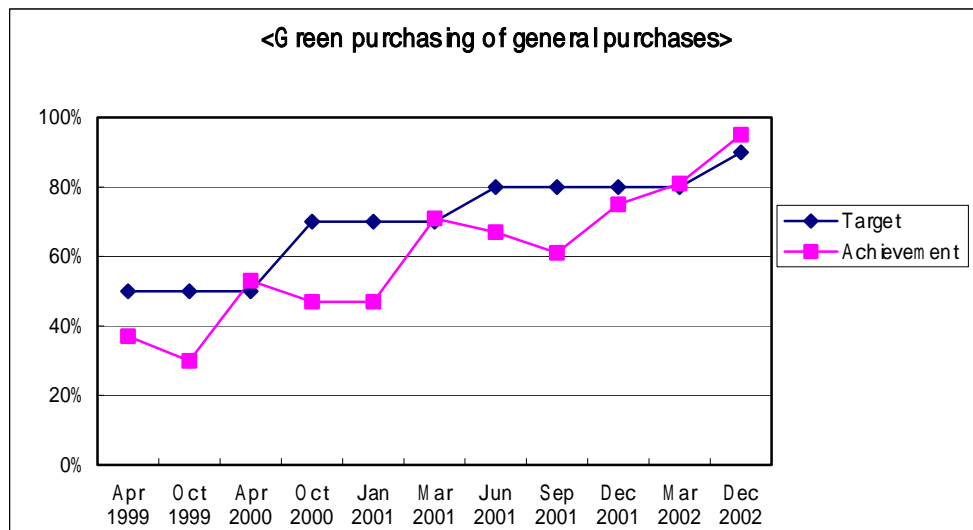
Seiko Epson implements bulk purchasing of general purchases using its own centralized order placement system. This system is also used to effectively promote green purchasing. When searching for green products in the master product database, the system automatically selects products for the user based on the established green purchasing guidelines and information from sources such as vendors and the Green Purchasing Network (GPN), an organization devoted to the promotion of green purchasing. Seiko Epson is committed to increasing the number of green products registered to its master product database, in order to ensure that its workplaces select green products in favor of

non-green products.

In addition to various systems that discourage purchases of non-green products in favor of green products, Seiko Epson has asked its purchasing personnel to educate employees about green products, in an attempt to further encourage the purchase of green products and speed up the transition to green purchasing.

By December of 2002, the green purchasing rate for general purchases increased to 95%, which exceeded Seiko Epson's original target of 90%. The graph below shows the purchasing rate for green products since 1999.

Graph 5



The green purchasing rate for general purchases is calculated as a percentage of the overall purchasing of general purchases by value.

Seiko Epson's commitment to green procurement of production materials is based on the firm's approach to choosing ecologically conscious production materials and supplementary materials used in the manufacture of its products. These choices are seen as a prerequisite to the supply of products that have a lower environmental impact throughout their lifecycles. The firm's commitment to increasing its green purchasing rate for general purchases is evident in its efforts to encourage employees to choose green products for general purchases such as office supplies, and in its deployment of an in-house system for bulk purchasing of general purchases.

Seiko Epson is dedicated to continuing its efforts to gather information about green products, expand the number of green products registered to its master product database, and create a corporate environment that encourages employees to select green products for purchases. Furthermore, Seiko Epson is committed to the cohesive implementation of green purchasing through the sharing of green product information and green purchasing guidelines with its overseas affiliates and group companies and affiliates in Japan. Seiko Epson also plans to further expand its green purchasing efforts in a number of ways, including attempts to better utilize its purchases by furthering encouraging the reuse of unused products within the company.

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## **Seiko Epson Guidelines for Green Purchasing of General Purchases June 2002)**

### **1. Purpose**

The guidelines contained in this document are based on Seiko Epson's green purchasing regulations, and define the basic approach and criteria when selecting products for general purchases. The purpose of this document is to encourage the purchase of products that have a lower environmental impact, to the greatest degree possible, and to increase the acceptance of green consumerism in order to expand the market for green products.

### **2. Scope**

The guidelines contained in this document apply to the product selection and purchasing processes for general purchases made by Seiko Epson.

### **3. Organizational Roles**

#### **A. Role of Headquarters Procurement Divisions**

- (1) To collaborate with procurement departments in order to formulate guidelines for product selection (see attachment) and green purchasing guidelines.
- (2) To oversee the approval of green purchasing guidelines.
- (3) General managers of headquarters procurement divisions shall be responsible for authorizing the green purchasing of products that conform with green purchasing guidelines.

#### **B. Role of Procurement Departments**

- (1) To collaborate with headquarters procurement divisions in order to formulate guidelines for product selection and green purchasing guidelines.
- (2) To implement product reviews based on the product category specific green purchasing guidelines, and to identify products as green products or non-green products.
- (3) To register approved green products to the indirect materials order placement system.

#### **C. Role of Purchasers**

- (1) To thoroughly and carefully consider the necessity of purchases when applying for purchase approval.
- (2) To give preference to the selection of green products registered to the indirect materials order placement system.
- (3) If no applicable green products are registered to the indirect materials order placement system, purchasers shall give preference to the purchase of products that conform to the green purchasing guidelines. Purchasers shall forward any information about products that conform to green purchasing guidelines to the purchasing departments.

### **4. Procedures for Preparation of Product Category Specific Green Purchasing Guidelines**

The following procedures shall be observed when preparing product specific green purchasing guidelines. The guidelines shall include criteria for green purchasing, in accordance with the Green Purchasing Law's intent to encourage green purchasing among the businesses and citizens of Japan.

- (1) Establish appropriate categories for the products purchased by Seiko Epson.
- (2) Determine the criteria to be covered by the product category specific green purchasing guideline, using the Seiko Epson Basic Guidelines for Product Selection and Japan's Green Purchasing Law as a reference.
- (3) Specify the criteria for green product certification as it applies to the product category specific green purchasing guideline.

## **5. Procedures and Sequence for Obtaining Purchase Approval**

- A. Give careful consideration to the necessity of the purchase.
    - (1) Thoroughly check for existing in-house stock of the product to be purchased. Reuse any in-house surplus stock if available.
    - (2) Do not purchase product in excessive volume.
  - B. If the purchase is deemed to be necessary, consider the reuse of product available in-house
    - (1) Check the immediate workplace for availability of any available product that can be reused.
    - (2) For fixed or semi-fixed assets, search for available product using the fixed asset management system and consider the reuse of product available in-house.
  - C. If no product is available in-house and the decision is made to issue a request for purchase approval, give preference to the purchase of green products registered to the indirect materials order placement system.
    - (1) Give preference to green products when applying for purchase approval.
    - (2) If there are no applicable green products registered to the indirect materials order placement system, employees may apply for the purchase of green products that conform to existing green purchasing guidelines. In this case, the employee shall notify the procurement department and request that the product in question be registered to the indirect materials order placement system.
  - D. If the request for purchase approval leads to a surplus of material or product resulting from the replacement of an existing product, the following actions should be taken:
    - (1) Determine whether the product can be reused by notifying others in the immediate workplace and at surrounding workplaces. Any unused product shall be registered to the fixed asset management system.
-

## Guidelines for Product Selection

### 1. Products for Purchase

- A. Possession of environmental labeling certified by a public body, such as Eco Mark labeling and Green Mark labeling.
  - Products certified according to the individual standards specified by organizations such as the Japan Environmental Association.
- B. Use of recycled materials, etc.
  - Products that contain recycled materials or reused components. Higher percentages of recycled/reused materials are preferable.
- C. Resource and energy conservation
  - Manufactured using less production materials and energy than conventional products.
  - Lower energy consumption during use of product due to features such as reduced-power standby mode.
  - Lower consumption of resources or energy during distribution.
- D. Capable of reuse
  - Container or durable supply material capable of refilling or replenishment.
  - Part or component made from durable supply material that is capable of repeated use in the same application and in its existing form.
- E. Capable of long-term use
  - After-sales service in the form of repair, parts replacement, etc.
  - Capable of long-term use through upgrading of product features.
- F. Designed to be easily recyclable
  - Use of production materials that can be easily recycled.
  - Constructed to be easily disassembled for ease of sorting and recycling.
- G. Products recycled after use
  - Products that are recovered or recycled by the manufacturer or a subcontractor after use.
- H. Reduced use of pollutants, etc.
  - Absence of substances which may have a harmful effect on the environment or the health of individuals.
  - Reduced use and release of hazardous substances throughout the product lifecycle.
- I. Product designed to be earth-friendly
  - Products designed to reduce environmental impact.
- J. Others
  - Products that do not fit the preceding criteria but clearly have a lower impact on individuals or the environment, when compared with conventional products.

### 2. Packaging of Purchased Products

- A. The packaging and packaging method shall be designed to conserve resources and conserve the amount of materials used in packaging.
  - Packaging that is solely designed for the packing of products shall utilize recyclable materials. Efforts shall also be made to conserve resources, such as conserving the amount of materials used in packaging, implementing recovery and reuse of packaging, and utilizing easily recycled materials.



# Green Procurement Activities at Canon & Standardization of Green Procurement Survey

## Introduction

Canon has been enhancing its environmental activities with the environment assurance philosophy “Maximization of resource efficiency”. In other words, Canon is aiming to achieve reduction of environmental burden and management at the same time by using resources efficiently. To market environmentally conscious products, reducing the environmental burden of the parts and materials would be the key. On the other hand, grasping the content of chemical substances used in products is also very important to comply with environmental regulations which are enacted all over the world. Canon has been conducting its green procurement activities to satisfy these 2 aspects. In addition to this, global standardization of green procurement survey is necessary to make the activities more efficient. And this standardization aims to allow each company compete its environmentally conscious products on the common basis.

## 1. Necessity of Green Procurement Survey

Why do companies conduct green procurement? There are two reasons. One is to make own brand products more environmentally conscious and the other is compliance with regulations.

The figure-1 below indicates the LCA (Life Cycle Analysis) of a digital copying machine. This LCA data shows the environmental burden of product life cycle in CO<sub>2</sub>. 95% of the copying machine’s whole environmental burden is occupied by customers’ use phase, which is approximately 60%, and material/procured parts, which is approximately 35%. The environmental burden which Canon causes at the production phase is 3 % and this would be trace per copying machine.

The significant importance of energy saving, waste reduction and chemical substance management at Canon does not change since environmental burden gathers at one place due to mass production at factories. However, what Canon has to concentrate more than before is reduction of environmental burden that products themselves generate, especially energy burden at use phase and the parts and materials.

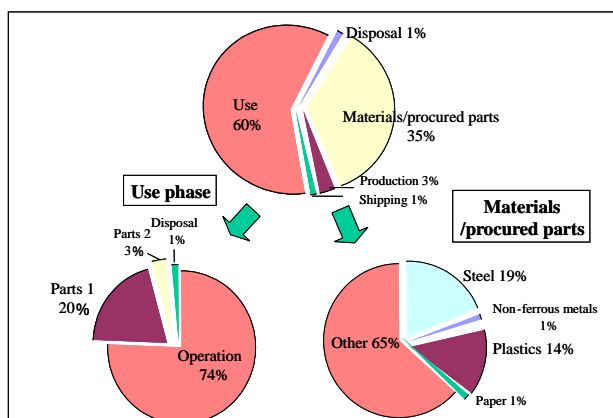


Fig1:LCA data of digital copying machine GP405

Energy burden at use phase can be reduced by promoting R&D at Canon, but parts and materials' environmental burden depends on efforts of manufacturers of parts and materials. Therefore green procurement, in other words, procuring parts and materials with least environmental burden becomes a big task.

Regarding the legal compliance, there are many regulations which restrict the use of chemical substances contained in products all over the world, as typified by RoHS directive (ban use of hazardous substances in products) which is under deliberation EU. In order to comply with such regulations, grasping what chemical substances are contained in all components including parts and materials correctly and taking appropriate measures when necessary would be important.

With these 2 aspects in the background, green procurement or green procurement survey, that is surveying parts and materials to be procured is getting more and more important.

## 2. Green Procurement Standards and Decision Making Mechanism

### (1) Overview

To conduct green procurement, Canon evaluates suppliers' both "Environment Activities" and "Products Themselves" and decides their "greenness" in total. Then Canon preferentially purchase products with high greenness.

Green Procurement Standards consist of the "Standards Related to Environment Activities" for suppliers' corporate environmental activities and the "Environmental Standards of Products" for the products themselves. The "Environmental Standards of Products" consist of "Parts and Materials" that compose Canon products and "Purchased Goods" for office use.

"Green Procurement Standards Book" is made and published to flesh out these green procurement standards.

**Green Products = Suppliers Environmental Activities + Products Themselves**

- Basic requirements
- Voluntariness

- Parts and materials
- Purchased goods

### (2) Standards and Activities against Suppliers

The "Standards Related to Environment Activities" for selecting suppliers consist of the "Requirements Related to Environmental Activities" for the environmental management system, compliance and risk management, and the "Evaluation of Voluntary and Innovative Activities Related to Environment".

The "Requirements Related to Environmental Activities" are requirements necessary for carrying out global environment conservation activities continuously. The "Evaluation of Other Voluntary and Progressive Activities Related to Environment" evaluates suppliers' voluntary and progressive activities. The points gained in this evaluation will be the extra points on top of the points gained by the evaluation of the "Requirements Related to Environmental Activities".

#### 1) The Requirements Related to Environmental Activities

The Requirements Related to Environmental Activities consist of environmental management system, compliance and risk management. Environmental management system requires both building up and

operation. “Building up” of system means appointment of administrators and establishment of procedures, and “Operation” means actual activities.

The elements of environmental management system are “Declaration by top management”, “Investigation of the current status”, “Establishment of goals and plans”, “Appointment of Administrators and informing employees of procedures” and “Self-evaluation”.

Compliance requires compliance of environment-related regulations. Environment- related regulations indicate laws and regulations, municipal bylaws and concords related surroundings in which an organization operates, including air pollution, wastewater, soil pollution and natural resources and their interrelation. Risk management requires chemical substance management and taking preventative measures against pollution of soil and groundwater.

## 2) Evaluation of Other Voluntary and Innovative Activities Related to the Environment

On the contrary to “Requirements related to environmental activities” which set minimum requirements, evaluation of other voluntary and innovative activities related to the environment gives additional points to suppliers who are achieving good results based on voluntary environmental criteria or conducting innovative activities.

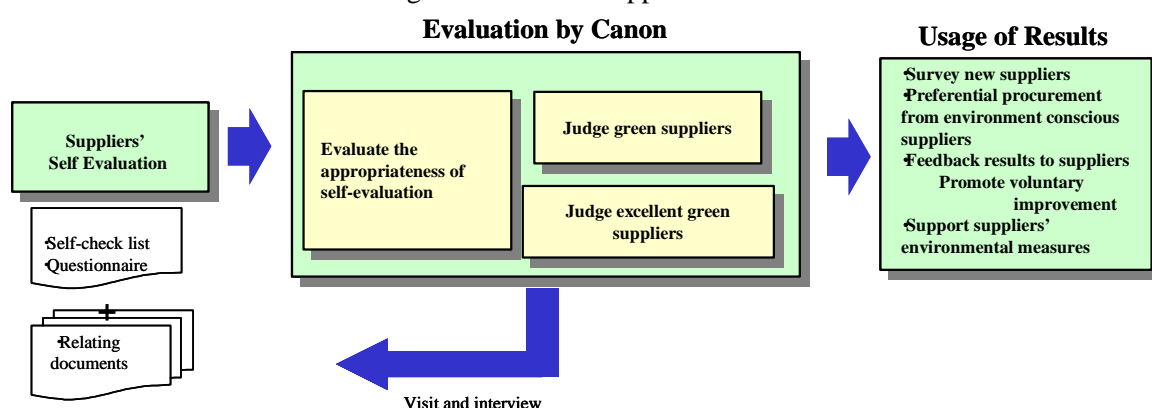
Examples of voluntary or innovative activities are as follows.

- Set goals stricter than laws and regulations and such goals attained
- Zero landfill waste disposal attained
- Award(s) from agencies such as public administration received
- ISO 14001 certification acquired
- Participating in environmental programs initiated by public administration
- Engaged in volunteer activities or community contribution activities
- Supervising or supporting environmental activities of suppliers’ related companies

As for suppliers’ activities related to environmental conservation, Canon asks them to self evaluate the status of their activities based on the green procurement standards and submit the results to Canon. Then Canon evaluates them based on the submitted materials. Canon asks suppliers to submit materials which were basis of self-evaluation and confirm by visiting or interviewing suppliers when needed. Canon would give feedback regarding the results of evaluation to suppliers and urge them to voluntary make improvement, and requires them to make improvement where necessary. When suppliers so desire, Canon technically assist them to achieve improvements, such as building up environmental management system and measures for reducing environmental burden.

After Canon evaluates, a supplier who satisfies the requirements related to environmental activities will be judged “A Green Supplier”. When a supplier not only satisfies the standards to be a green supplier but is also currently achieving good results by “voluntary and innovative environmental activities”, and Canon confirms such achievement by visiting and interviewing, the supplier is judged as “An Excellent Supplier”. However, for suppliers who have already acquired ISO 14001 certification, visits or interviews may be omitted.

Figure 2: Flow of Suppliers’ Evaluation



### (3) Standards and Activities for Parts and Materials

“Standards for Parts and Materials” that compose Canon products consist of “Chemical substances” contained in parts and materials to be procured, “Design for Environment(DfE)”, “Packaging materials”, and “Information disclosure”. As for chemical substances, 28 substance groups by Japan Green Procurement Survey Standardization (to be described later) are adopted as they are at Canon. Moreover the 28 substance groups are classified into:

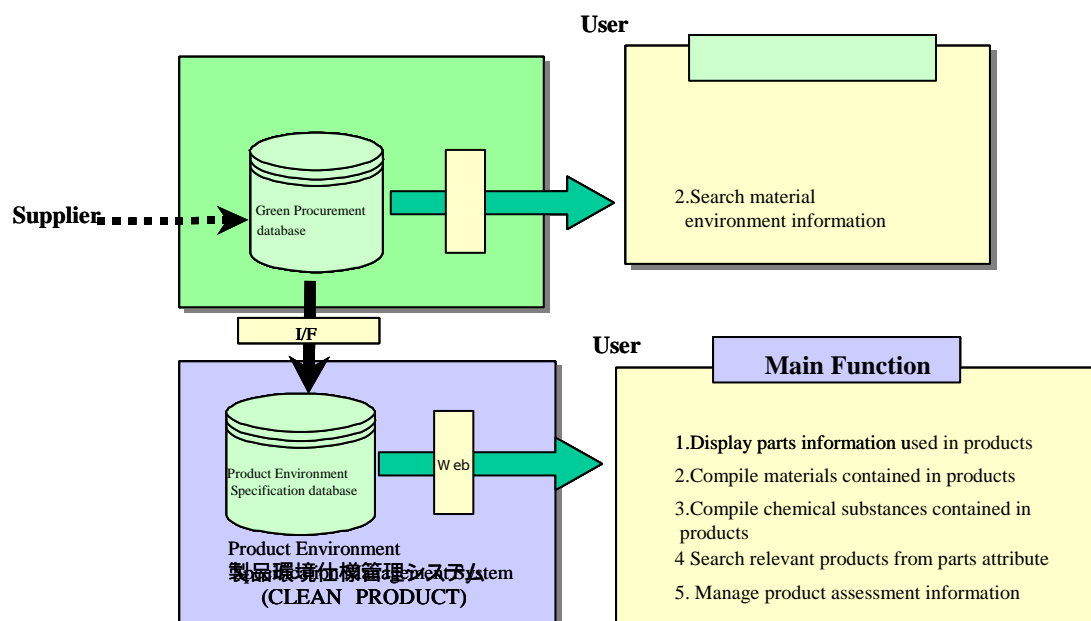
1. Prohibited substances
2. Substances for restricted use
3. Controlled substances.

The prohibited substances are banned to be contained in parts and materials now, substances for restricted use must be eliminated by the end of 2004, and controlled substances are those which their content has to be ascertained.

When adopting parts and materials, survey, mainly chemical substances contained in parts and materials is conducted and adopt parts and materials that conform to the standards. As for existing parts, the survey is conducted and the conformity is checked too. For parts and materials that do not satisfy the standards, substitution is carried out. The results of the survey are input to “Green Information Management System”(known as CLEAN MATERIAL) and provision of information is done globally via the WEB. Engineers in development and design section select parts and materials with small environmental burden by referring to this database. Also, the information on the Green Information Management System is copied to “Product Information Environment Specification Management System”(known as CLEAN PRODUCT) and chemical substance content of all parts that compose a product can be searched there.

In addition to this survey, technology development has been conducted with a goal of eliminating heavy metals such as lead, cadmium, hexavalent chromium from Canon products by the end of 2004. And adoption of substituted parts and materials such as lead-free lenses, solders and electric wires and steel plates free of hexavalent chromium has been started.

Fig 3: Green Information Management System



#### **(4) Standards and Activities of Purchased Goods**

The “Products Standards Goods”, the standards for office use, compose of common standards, optional standards and other points to consider.

The common standards apply to all goods and there are common 7 items regarding chemical substances and DfE. Environmentally conscious activities may differ by goods, other than these common standards. In such case Canon examines the goods individually.

Optional standards are set when the common standards are not sufficient to meet specific goods due to social trends etc, and examples are paper products and personal computers.

Even though packaging materials are auxiliary in logistics, they are they must be considered.

For purchased goods for office use, product evaluation is conducted based on “Standards of Purchased Goods”. Goods that satisfy the standards are registered as “Green-Certified Goods” and they are preferentially purchased. The green-certified goods are displayed on the internal purchase system preferentially and promote in-house green purchase. The list of green-certified goods now comprises approximately 4,600 items, including office supplies, printed materials, and envelope to personal computers, desks and chairs and even toilet paper. Adoption of Canon original green goods such as working wares made of PET bottle recycled threads, and printed materials using non-VOC ink has been carried out.

### **3. Discussions of the Japan Green Procurement Survey Standardization Initiative**

The green procurement activities mentioned above had been conducted within Japanese companies individually from around 1997. However in surveying parts and materials, problems of responses such as taking too long to obtain them and their accuracy became apparent.

The main reasons are that the green procurement survey standards set by each company lacked compatibility and the formats all differed. As a result, suppliers had to respond to the surveys one by one. The important point in surveying such goods is tracing the supply chain to the upstream. Different survey items and formats caused time loss and increase of workload due to information coming and going in the supply chain so many times.

Japan Green Procurement Survey Standardization Initiative (hereinafter referred to as JGPSSI) was launched in January 2001 with 8 companies having such problems regarding green procurement survey. After the launch, 10 more IT related manufacturers joined and the members of the initiative discussed items to standardize for approximately 1 year. The discussion of standardization took place while each company was conducting its own green procurement survey individually. Therefore even though heated debate was done, there was no objection on the standardization itself, and trial guidelines were published in April 2002.

With the issuance of trial guidelines, the secretariat of JGPSSI shifted to JEITA, Japan Electronics and Information Technology Industries Association, to enlarge the activities. Part and material manufacturers newly joined and the guidelines are under revision to make them better.

Moreover JGPSSI is aiming to make global standards and has been discussing globalization with electronic and electrical associations of U.S. and Europe.

#### **(1) Flow of Green Procurement Survey**

The basic flow of the survey is as follows. Each company possesses survey/response tool, which is a

freeware. Surveying companies send a list of parts using the survey tool to suppliers. Then the suppliers input data using the survey/response tool and change the data to CSV file and send it back to the surveying companies. The surveying companies with responses confirm the data using the data confirmation tool (also freeware). The survey can be conducted to primary and secondary suppliers with the same process. When the survey is done tracing the supply chain using this system, the responses with high accuracy can be obtained and this makes the provision of product composition information to end users possible too.

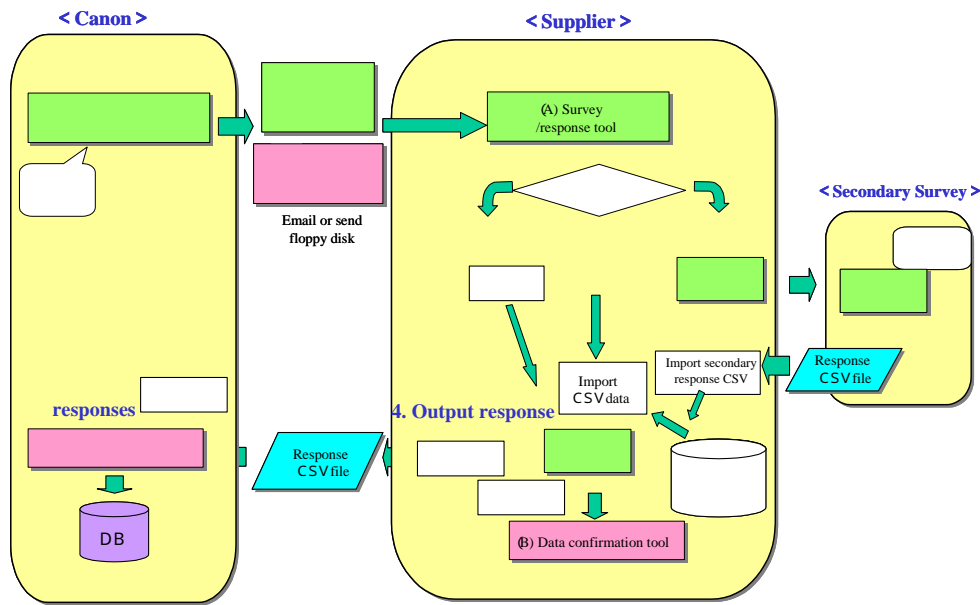


Fig 4: Flow of Green Procurement Survey

Major manufacturers who have developed original database already do not necessarily have to use the survey/response tool. As long as they conform to the CSV file format, they can make full use of the system. No company is forced to use the survey/response tool.

Once such system is ready, part and material manufacturers can prepare their own products information beforehand. In other words, provision of information from suppliers would be possible and information is available whenever needed, which is our ultimate goal. And information of parts and materials would be available at the development phase of products.

## (2) Future Tasks of JGPSSI

Canon has been conducting the trial operation of the standardized green procurement survey on a large scale since autumn 2002. Canon has confirmed that the responses from suppliers much improved compared to the past. Thanks to the understanding of part and material manufacturers, they are providing us precise information promptly. This fact seems to be the proof that the activities of JGPSSI have been widely recognized. However, problems of this standardization were discovered on the trial operation such as discrepancy of interpretation among the companies where the standardization was imperfect. We have to solve such problems first of all.

The next task is the globalization. Supply chains of Japanese manufacturers are extended to global scale with the overseas expansion of production sites. Therefore even if our efforts are realized within Japan only, much achievement cannot be expected. The standardization should be applicable to overseas use. Fortunately, IT manufacturers of U.S. and Europe share the same perception too. JGPSSI is ahead of the standardization among the 3 poles, so JGPSSI would like to bring the basis of

our trial guidelines to the global standards at an early stage.

There are still many tasks to solve but Cannon would like to put more effort on this standardization of green procurement survey, because Canon regard this is the construction of infrastructure to solve environmental problems.

# Green Procurement Initiatives by Toyota Motor Corporation

## 1. Toyota's Environmental Initiatives

Toyota Motor Corporation adopted its Guiding Principles in 1992, which describe the firm's commitment to "Dedicate ourselves to providing clean and safe products and to enhancing the quality of life everywhere through our activities." The firm's Guiding Principles serve as the basis for the "Toyota Earth Charter," which contains its basic policy for global environmental preservation, as well as its action guidelines and organizational framework for environmental preservation.

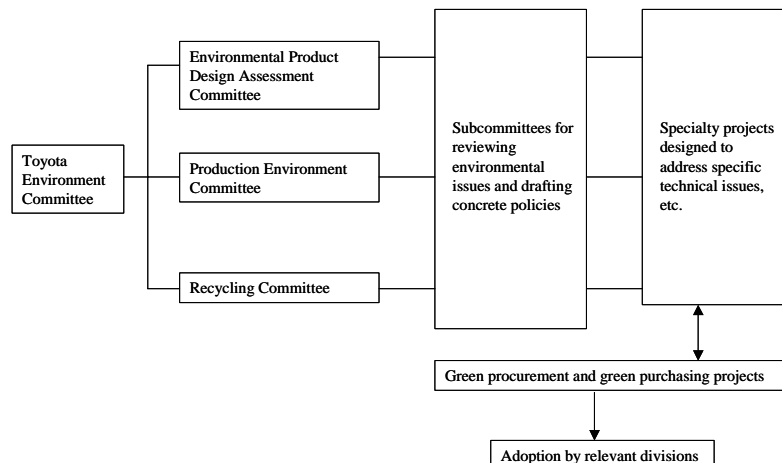
Toyota established its first "Toyota Environmental Action Plan" in 1993, as a means of implementing concrete initiatives that reflect the policy expressed in the Toyota Earth Charter. The Toyota Environmental Action Plan contains specific initiatives and targets in a variety of endeavors, and is currently in its third revision. Among other initiatives, the current Action Plan specifies that Toyota will endeavor to work more closely with suppliers and further promote green procurement and green purchasing on a global scale.

## 2. Organizational Framework for Environmental Initiatives

Toyota has established a Toyota Environment Committee with the aim of promoting the policies of the Toyota Earth Charter on a company-wide basis. The Committee is chaired by the President of Toyota Motor Corporation, and is assisted by separate committees related to product design, production and recycling, thereby covering the entire spectrum of activities ranging from the development of automobiles through to their disposal. The product design, production, and recycling committees are served by subcommittees that are responsible for reviewing environmental issues, drafting corresponding policies, and establishing a framework where the activities of relevant divisions can be coordinated in order to jointly promote environmental initiatives.

Toyota has also created an Environmental Affairs Div. that is involved in drafting company-wide environmental policies, and also carries out the administrative work of the firm's various environmental committees and subcommittees. The Environmental Affairs Div. also promotes green procurement and green purchasing projects within a company-wide framework, as prescribed by the Third Toyota Environmental Action Plan. It does so by coordinating the direction of Toyota's purchasing divisions in order to establish a company-wide framework for implementation. Once the relevant project content and framework have been established, the projects are incorporated into the work of the relevant divisions within Toyota.

### Organization Chart

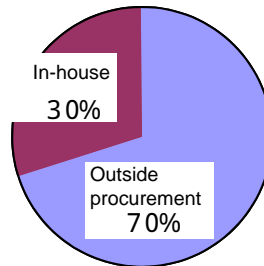




### 3. Basic Policies for Procurement

Toyota Motor Corporation works with many suppliers to procure vehicle parts and materials such as steel. The cost of procuring vehicle parts and materials accounts for 70% of the manufacturing cost of Toyota's automobiles. Consequently, Toyota is committed to working closely with its suppliers in order to effectively promote environmental initiatives throughout the lifecycle of its automobiles, with the aim of reducing environmental impact and implementing environmental risk avoidance.

#### Ratio of Outside Procurement in Toyota Vehicles

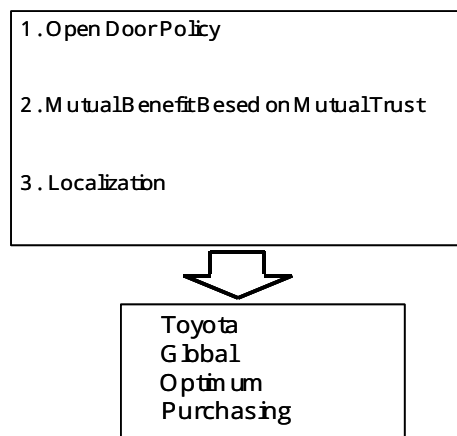


#### A. Principles for Procurement

Toyota considers its suppliers to be close partners in its quest to create attractive products, and has established three major principles that guide its procurement activities. The principles serve as the basis for Toyota's Global Optimum Purchasing System, which aims to procure products that are both competitive and environmentally conscious, apart from other considerations such as quality and cost.

- (1) Fair competition based on an open door policy  
Toyota is open to any and all suppliers, regardless of nationality, size, or whether they have done business with Toyota before.
- (2) Mutual benefit based on mutual trust  
Toyota believes in developing mutually beneficial, long-term relationships based on mutual trust.
- (3) Contribution to local economic vitality through localization: good corporate citizenship  
As it increases its production outside of Japan, Toyota works to make an economic and industrial contribution in each region by purchasing from local suppliers.

#### Principles for Procurement

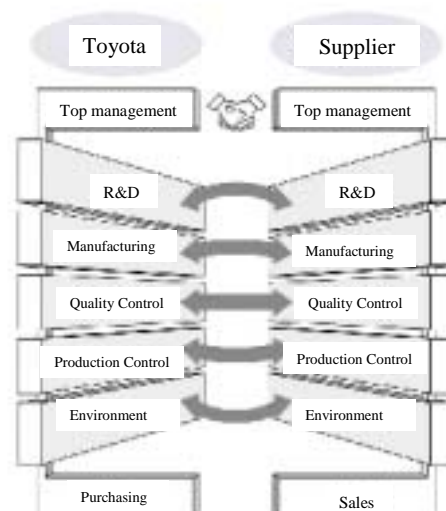


## B. Framework for Liaison with Suppliers

Toyota Motor Corporation emphasizes close interaction with its suppliers as being essential to making good on its commitment to mutual trust and mutual benefit in its supplier relationships. Toyota works hand in hand with suppliers, as if the two sides were a single company, and emphasizes good communication that involves working directly with suppliers at every level. At Toyota, this concept is referred to as “Surface contact,” which notably involves maintaining the following kinds of interface with suppliers:

- (1) Top management: Senior executives at suppliers and Toyota need to come to terms on common goals and policies.
- (2) All relevant divisions: Engineers and other specialists in development, product engineering, quality assurance, and other technical sectors at suppliers need to work directly with their counterparts at Toyota.
- (3) Suppliers’ sales divisions and Toyota’s purchasing divisions: The sales people at suppliers and the purchasing people at Toyota need to take responsibility for coordinating the relationships between different divisions in their companies and for leading activities to foster expanded business between the suppliers and Toyota.

### Surface Contact



## 4. Definition of Green Procurement Terms

Toyota uses the following terms and definitions as the basis for its green procurement and green purchasing initiatives:

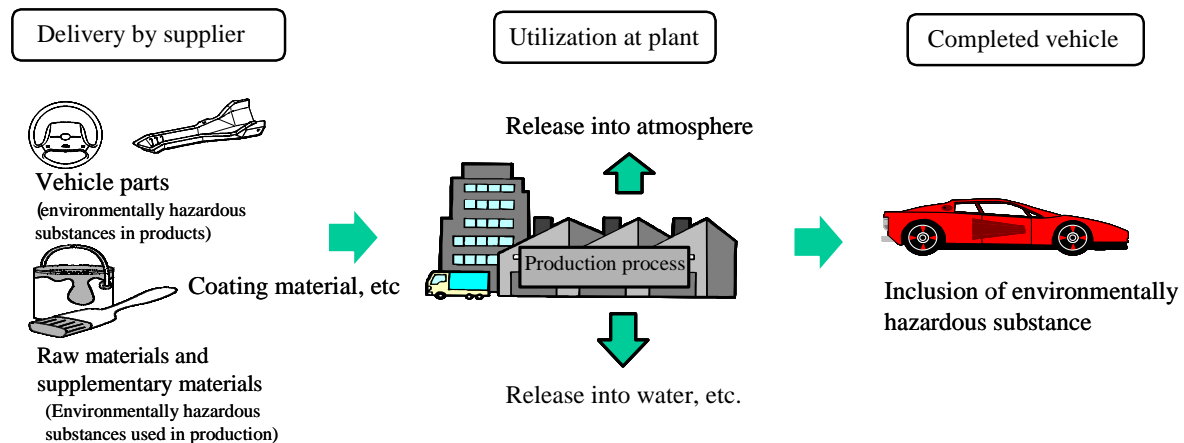
- (1) Green procurement: Buying of items related to production, including parts used in automobiles, materials such as steel, raw materials processed in plants, and supplementary materials such as cutting oil used in the processing of raw materials.
- (2) Green purchasing: Buying of office-related products and equipment

## 5. Green Procurement

At Toyota, environmentally hazardous substances are categorized into one of two categories, consisting of: (1) Chemical substances that have an environmental impact through release into the atmosphere or water during their use at plants, and (2) chemical substances that have an environmental impact when disposed of as part of an automobile. Toyota actively promotes green procurement by using products that have a low environmental impact, in order to reduce the environmental impact of vehicle parts as well as raw and supplementary materials used in the production of automobiles at its plants.

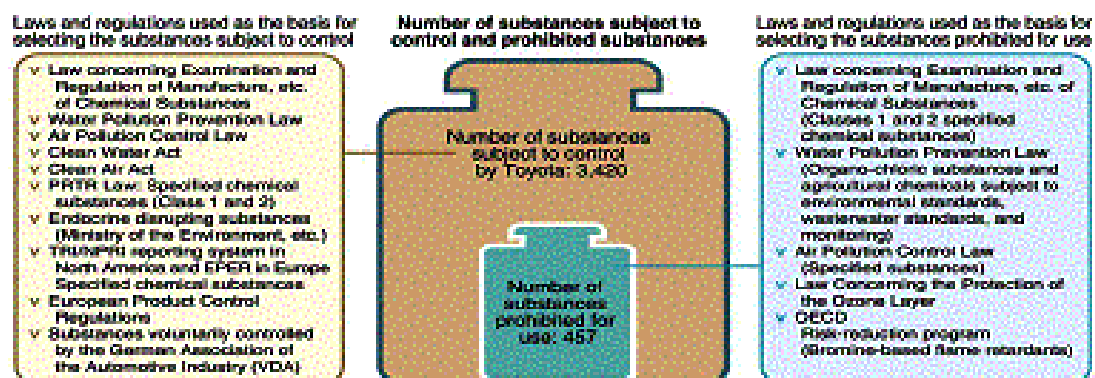
As part of its green procurement initiatives for both vehicle parts and raw and supplementary materials, Toyota practices entryway management of chemical substances by asking its suppliers to report the contents of substances of environmental concern in materials and not include prohibited-use substances.

### Flow of Environmentally Hazardous Substances in Parts, Raw Materials, and Supplementary Materials



Toyota's control of chemical substances was originally applied to approximately 2,200 chemical substances, which were selected based on toxicity assessments and regulatory guidelines in Japan and elsewhere. In 2000, Toyota expanded its chemical substance control system to include approximately 3,400 chemical substances, based on the need for a global system. The revised chemical substance control list also includes approximately 460 chemical substances that are now designated as prohibited-use substances.

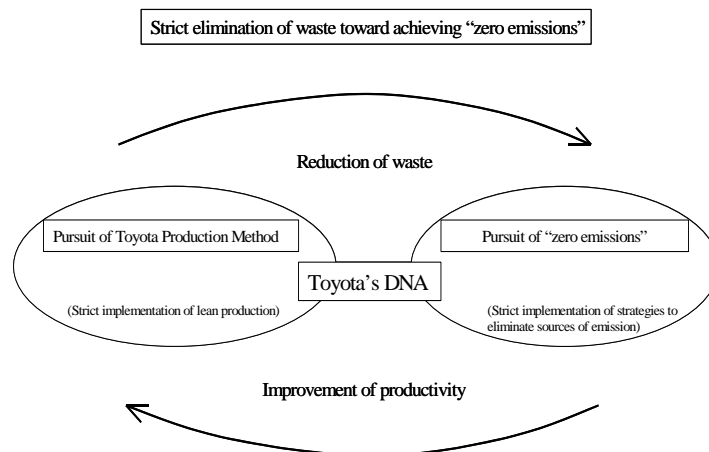
### Management of Environmentally Hazardous Substances



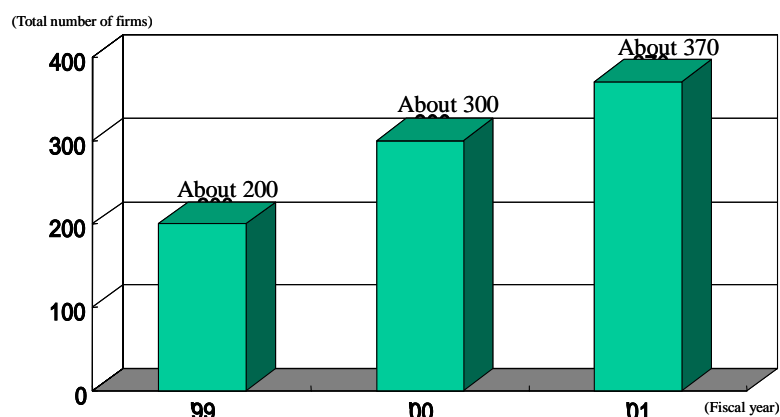
Toyota has created its own database to promote chemical substance control, which also led the firm to establish its Eco Research subsidiary in 2001. Eco Research was created in order to provide PRTR-related material composition data for firms seeking to comply with Japan's Pollutant Release and Transfer Register (PRTR) Law, and it is also intended to support Toyota's suppliers in the broader sense.

For Toyota's suppliers, the implementation of Environmental Management Systems (EMS) is essential to the task of obtaining reliable data. Furthermore, the process of creating, operating, and strictly adhering to Environmental Management Systems and the challenge of achieving "zero emissions" shares many elements in common with the "Toyota Production System," which emphasizes the strict elimination of waste and continuous improvement of productivity. Toyota recognizes that the adoption of Environmental Management Systems by its suppliers strengthens their management quality, and has requested that its designated suppliers acquire ISO 14001 certification by 2003.

### Toyota Production System and "Zero Emission" Challenge

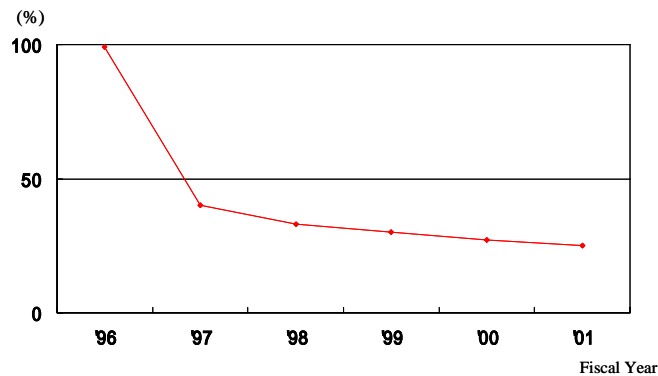


### Acquisition of ISO 14001 Certification by Suppliers



\*In March of 1999, Toyota requested that approximately 450 suppliers acquire ISO 14001 certification.

### Reduction in Lead Utilization (by Volume)



#### A. Green Procurement of Vehicle Parts

Toyota established the “Environmental Impact Reduction Project” in 1995, in order to serve as an organizational framework under the Recycling Committee. The Recycling Committee, which has since been renamed the SOC Task Force, originally identified approximately 300 substances to be managed for use in vehicles and vehicle parts, which formed the basis for Toyota to implement initiatives to reduce its use of such critical substances such as lead, mercury, and hexavalent chromium. As a result of its initiatives, Toyota successfully reduced its use of lead to 1/3 of the volume it used in 1996, and eliminated the use of mercury in fluorescent backlighting used in meter instrumentation.

Toyota reviewed its list of prohibited use substances in 2000, and decided to expand the list to include approximately 440 substances subject to management organized into 54 substance groups\* (the number of such substances has now been increased to 460 as stated in the section 5). However, the later enactment of the European Union’s “End of Life Vehicles Directive” (ELV Directive), which is set to take effect from July 2003, effectively mandates that automotive manufacturers must gradually phase out their use of lead, mercury, cadmium, and hexavalent chromium in automobiles. Consequently, Toyota has made a critical commitment to comply with the ELV Directive, and is working closely with its suppliers by holding seminars and requesting their compliance with the ELV Directive. Toyota has specifically requested that its suppliers do the following:

- (1) Submit written declarations for non-use of dangerous substances prescribed in the EU’s ELV Directive.
- (2) Submit documentation showing that the supplier has completed measures for dangerous substances, according to the schedule specified by Toyota.
- (3) Input data into the International Material Data System (IMDS)\*\* that describes the material composition of parts supplied to Toyota.

For Toyota’s suppliers, the enactment of the ELV Directive has resulted in different schedules for compliance from Toyota and its other customers, which Toyota recognizes as potentially having a significant affect on the production efficiency of its suppliers. Consequently, Toyota has been working closely with its suppliers in order to minimize the burden of compliance with the ELV Directive.

\* Substance group: Refers to a substance and its compounds. Example: Lead and lead compounds.

\*\* International Material Data System (IMDS): A database allowing for management of the material composition of vehicle parts. The IMDS is operated by the Europe-based Electronic Data Systems company.

Toyota recognizes that the production activities of its plants have a major impact on the environment, and therefore places greatest emphasis on the principle of strict prevention of environmental pollution. In 1984, Toyota established its “Prior Assessment System for Environmental Preservation” in order to improve its production activities and allow Toyota to assess the environmental impact during chemical substance management, and at the time of equipment deployment. By assessing various factors such as air quality, water quality and odors, Toyota is able to make necessary improvements to its production activities.

## Prior Assessment System for Environmental Preservation



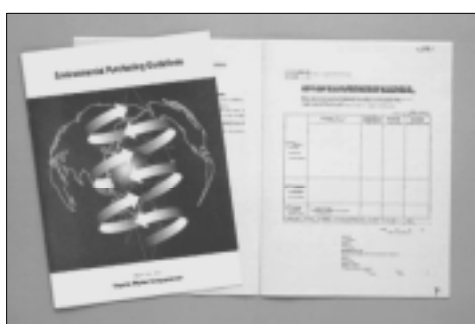
Among other requests, the Guidelines specify that Toyota's direct suppliers in Japan acquire ISO 14001 certification. This request generated numerous inquiries from Toyota's suppliers, which led Toyota to organize a seminar for its suppliers on the topic of acquiring ISO 14001 certification. The seminar was held in September 1999 and was attended by approximately 180 suppliers. The seminar included presentations from firms that had already acquired certification, which allowed Toyota's suppliers to gain a better understanding of the certification process.

The Guidelines have also been adopted by Toyota's consolidated subsidiaries that are responsible for manufacturing its vehicles in Japan, in a process that began in 2000 and was fully integrated by March 2003. In terms of overseas initiatives, Toyota's manufacturing-related consolidated subsidiaries have

established their own green procurement guidelines that contain Toyota's global requirements for suppliers, while also incorporating local initiatives that are unique to the country or region of operation. In August 2000, Toyota created its first green procurement guidelines for North America, which were later followed by separate guidelines for Europe. Toyota is also in the process of formulating green procurement guidelines for other countries and regions outside of Japan.

Toyota is currently revising its Guidelines in preparation for the upcoming 2003 deadline for designated suppliers to acquire ISO 14001 certification. The revised Guidelines are expected to include further requests for Toyota's suppliers, while expanding its scope to include from suppliers of parts, raw materials, and supplementary materials to suppliers of other items and materials. Toyota has also begun to implement green procurement initiatives in other areas of activity, such as its housing business.

### **Green Purchasing Guidelines**

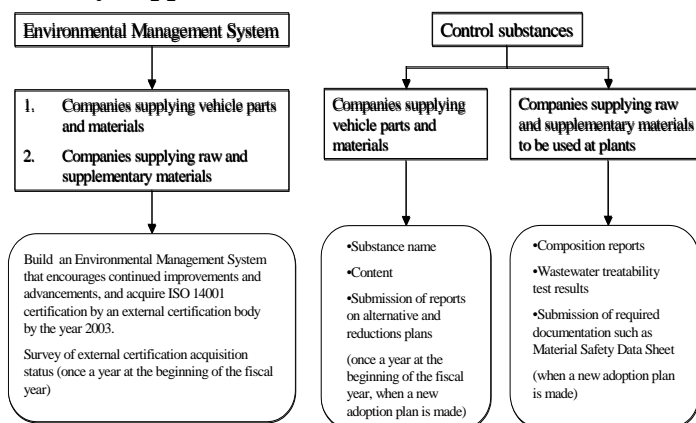


### **Adoption of Green Purchasing Guidelines**

Region	Time frame for adoption	Source	No. of suppliers
Japan	March 1999	Toyota	Approx. 450
	May 2000 – March 2002	Body manufacturers (7 consolidated subsidiaries)	Approx. 2,200
North America	August 2000	TMMNA	Approx. 320
Europe	April 2001	TMEM, TMME	Approx. 300
Other countries and region	FY 2002 (or FY 2003 in some regions and countries)	15 consolidated subsidiaries	Approx. 1,500

In terms of control substances in vehicle parts and materials, Toyota is gradually making the switch to suppliers that comply with the European Union's ELV Directive.

## Measures to be Taken by Suppliers



## 6. Green Purchasing

Toyota has adopted green purchasing initiatives for office supplies and office equipment in an effort to better utilize its resources, and to contribute to environmental preservation in the pursuit of a sustainable society as one with the community. In April 2000, Toyota began to implement green purchasing for approximately 2,000 office supply items and 300 types of office equipment used in its offices.

### < Designated Products for Green Purchasing >

- |                     |  |
|---------------------|--|
| • Office suppliers: | Stationery (including writing utensils and paper products), preprinted forms, paper (general office use paper, printing paper, paper used in office equipment), files, organizing and storage supplies, etc. |
| • Office equipment: | Personal computers, printers, copiers, and fax machines  |

Toyota's basic principle for green purchasing involves the purchase of products that have a low environmental impact throughout every phase of the product lifecycle, ranging from manufacturing and usage to disposal. Toyota first establishes purchasing standards for green products, then seeks to identify and prioritize green products that it should purchase.

### Basic Principles

Manufacturing	<ul style="list-style-type: none"> <li>• High recycled content</li> <li>• Absence of environmental pollutants</li> </ul>
Usage	<ul style="list-style-type: none"> <li>• Reusable</li> <li>• Low energy consumption</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>• Recyclable</li> <li>• Can be disassembled by material</li> </ul>

Toyota implements green purchasing based on three priority levels. Toyota places the highest priority on the purchase of products that contain environmental labeling approved by organizations based in Japan or elsewhere, including Japan's Eco Mark and Green Mark labels. The next level of priority is given to the purchase of products included in the "Environmental Data Books" published by the Green Purchasing Network (GPN), an organization devoted to promoting green purchasing. Finally, for products that do not satisfy either of the above requirements, Toyota has established its own in-house standards to identify products that either use recycled content or contain replaceable components, or can be recycled after usage.



Toyota made the conversion to green products by asking its suppliers to propose green products any time that a supplier revised the pricing of a non-green product. The green products proposed by its supplier were evaluated based on various factors such as the performance and cost of the product, in accordance with Toyota's policies for green purchasing. In particular, Toyota placed special emphasis on the following considerations:

(1) To retain the same features or performance while reducing the number of product categories, in order to decrease costs by increasing the purchasing volume per category, and minimizing the frequency of single purchases.

(2) To assess the energy consumption of office equipment during use and when idle, and to further assess the inclusion of any unnecessary features or unnecessary construction.

Consequently, Toyota was able to reduce the number of office supplies items used in its offices to approximately 1,300 categories, from a previous list of 2,000 items. In March 2002, Toyota achieved its goal of 100% green purchasing for approximately 1,300 office supply items and 300 types of office equipment.

Toyota has also improved its purchasing system by making it easier to ease. Users are now able to monitor the approval status for purchases and track deliveries at a glance.

The merging of office supply items has also helped Toyota to keep down its office supply costs. In addition, Toyota has been able to purchase suitable green office equipment at the same cost as before, due to the increasing availability of green office equipment spurred on by customer demand.

### Example of Conversion to Green Product



Toyota uses mouse pads made from the remnant materials of a product process

### Examples of Environmental Labeling

Eco Mark	
Green Mark	
R-mark (indicating use of recycled paper)	

Toyota is also switching to clean energy vehicles for its own use. Toyota currently utilizes 360 clean energy vehicles such as hybrid vehicles and compressed natural gas (CNG) vehicles, which account for 20% of its corporate fleet. In addition, Toyota has decided to adopt company uniforms that use materials made from recycled PET bottles beginning from April of 2003, and plans to expand its green purchasing initiatives to include new items such as lighting equipment and office furniture such as desks and chairs.

# **Green Purchasing Initiatives by Yamato Transport Co., Ltd.**

## **Introduction**

Yamato Transport Co., Ltd., places great emphasis on concern for the environment, and is committed to the principle that initiatives aimed at environmental conservation are essential to its continued existence as a corporation. Yamato Transport's principal focus on cargo transport operations requires that it possess a large fleet of delivery vehicles, and the firm has taken an industry-leading position in terms of implementing initiatives such as eliminating unnecessary engine idling in its delivery vehicles and phasing in low-emission vehicles within its fleet. In addition to its efforts to reduce exhaust gas emissions and preventing global warming, Yamato Transport is displaying a far-reaching commitment to other relevant environmental initiatives including green purchasing.

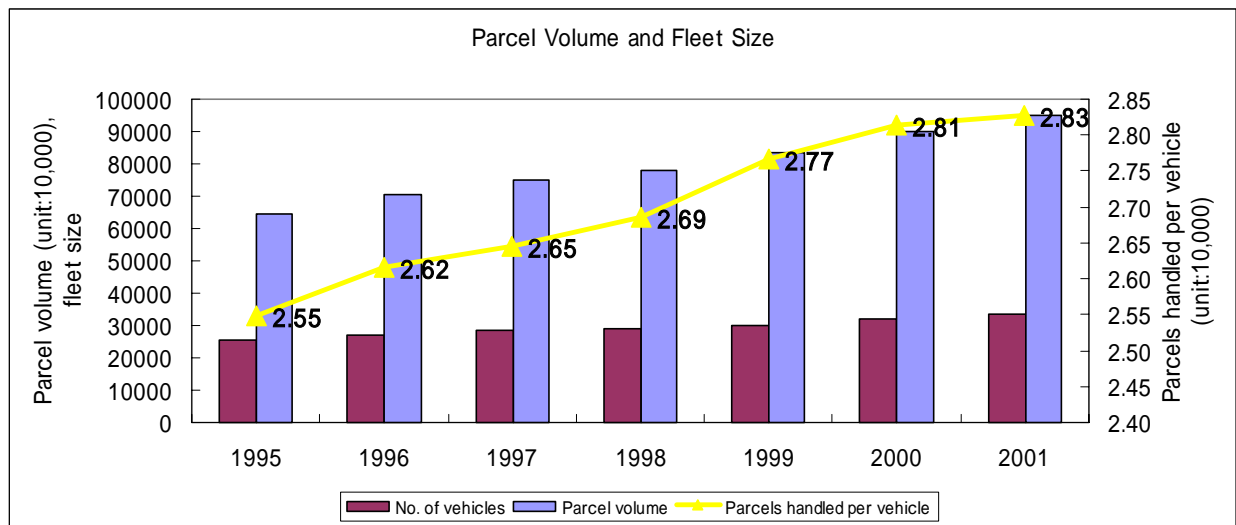
## **1. Green Purchasing in Transport Operations**

### **A. Environmental Initiatives for Delivery Vehicles**

Due to Yamato Transport's focus on transportation-related activities, a major portion of the firm's purchasing by value is devoted to the purchase of trucks and other delivery vehicles. Yamato Transport currently possesses a fleet of 33,511 delivery vehicles, which support the activities of approximately 3,000 offices located throughout Japan. Collection and delivery of parcels is largely accomplished using small freight vehicles, which account for 81% of its fleet (27,216 vehicles), while large and midsize freight vehicles account for 6% of its fleet (1,907 vehicles). The task of reducing the environmental impact of delivery vehicles represents a major issue for both the transportation industry and the community, due to the significant environmental impact of exhaust gas emissions and the contribution to global warming resulting from CO<sub>2</sub> emissions. Consequently, Yamato Transport has placed great emphasis on implementing initiatives designed to reduce the environmental impact of its delivery vehicle fleet.

#### ***Improving the Efficiency of Truck Deliveries***

Yamato Transport has experienced significant growth in the number of parcels it handles annually, and expects its parcel volumes to continue growing at a rate of 5% annually. For example, the firm processed 647 million parcels in 1995, and the number grew by nearly 50% to a volume of 948 million parcels in 2001. However, Yamato Transport's fleet grew by just 32% during the same 6-year period, from 25,375 vehicles in 1995 to 33,511 vehicles in 2001. The comparatively modest growth of the firm's fleet resulted from management efforts to improve the efficiency of truck deliveries, as opposed to allowing the fleet to grow in proportion to parcel volumes. The firm also was successful in achieving a 10% increase in the delivery efficiency of its fleet during the 6-year period from 1995 to 2001, from an average of 25,400 parcels handled per vehicle in 1995 to an average of 28,300 parcels per vehicle in 2001. The firm's initiatives to limit the growth of its fleet are typical of its commitment to "think first about the necessity," which is the foremost principle of Yamato Transport's green purchasing policy.



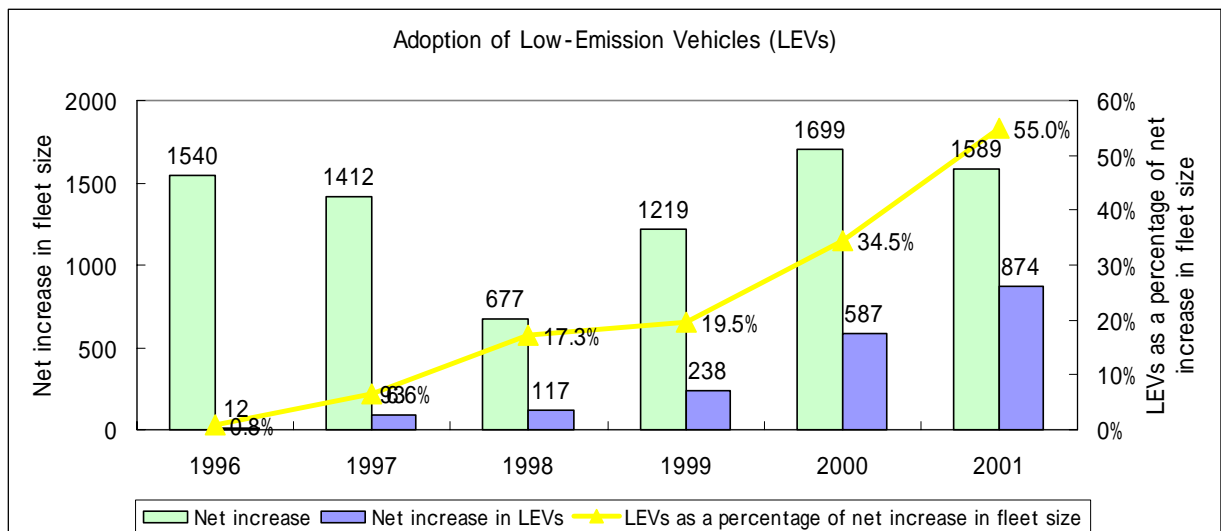
### *Satellite Centers*

Yamato Transport's strategy of using satellite centers for its activities has contributed to the firm's efforts to limit the growth of its fleet size despite increasing parcel volumes. The firm's satellite centers serve as small-scale collection and delivery centers, and are deployed in high-density residential locations and office districts. The satellite centers are generally staffed by seven employees, who use hand trolleys rather than delivery vehicles to collect and deliver parcels to customers. At the satellite centers, subcompact cars are only used occasionally to collect and deliver parcels, and the use of trucks is reserved for the delivery of parcels between the satellite center and larger sales offices. The deployment of satellite centers that use hand trolleys in place of delivery vehicles, as well as their significant deployment in urban areas, has had a major impact in terms of increasing Yamato Transport's delivery efficiency. As of March of 2002, Yamato Transport had deployed satellite centers in 338 locations throughout Japan, with plans to continue adding satellite centers in other locations. The firm has calculated that its current network of satellite centers has eliminated the need for an additional 1,690 vehicles, equating to savings of 54 tons of CO<sub>2</sub> emissions per day, based on an average requirement of five vehicles per sales office. Furthermore, Yamato Transport has also undertaken initiatives to utilize rail and ferry transport since 1987, in an effort to reduce the volume of vehicular traffic used in long distance transport.



## ***Delivery Vehicles***

While improvements to Yamato Transport's delivery efficiency can be linked to a reduction in the amount of exhaust gas emissions and CO<sub>2</sub> emissions when calculated on a per vehicle basis, the actual increase in Yamato Transport's fleet size has the potential for greater environmental impact. The firm is attaching great priority to the implementation of environmental initiatives in its delivery vehicles, resulting in the adoption of low-emission vehicles (LEVs) and hybrid vehicles at a faster rate than was originally planned. For example, Yamato Transport originally planned to have 2,400 LEVs in service by 2010, but will achieve this goal in 2002, eight years ahead of schedule. As of March of 2002, the firm had 1,951 LEVs in service, which accounted for 5.8% of its overall fleet. In addition to low-emission vehicles, Yamato Transport has aggressively promoted the use of vehicles that run on liquefied petroleum gas (LPG), as a substitute for diesel vehicles. LPG vehicles have proven to be both a practical and acceptable alternative to petroleum cars, and were chosen by Yamato Transport based on an overall analysis that took into account the widespread availability of LPG fuel. Other environmental initiatives by the firm include plans to adopt hybrid vehicles and create its own infrastructure for the supply of fuel, as well as the planned use of "Eco Cool" vehicles that are capable of maintaining refrigerated cargo temperatures even while their engines are turned off.



## **B. Green Purchasing of Materials Used in Transport Operations**

Yamato Transport established its own environmental labeling program in 1994, in an effort to draw attention to the purchasing of ecologically conscious products and raise awareness about environmental issues among its customers. The firm has created its own standards for environmental labeling, which prescribe the criteria for selecting products for green purchasing.

### Standards for Environmental Labeling

- (1) Low environmental impact from product use
- (2) Significant positive impact on the environment from product use
- (3) Low environmental impact from disposal subsequent to product use
- (4) Other significant contribution to environmental conservation

Yamato Transport Environment Mark



The design for the Environment Mark was created by the firm's own employees, as part of a design contest that was implemented in order to draw attention to environmental protection issues and generate interest in the new environmental labeling program among employees. As of March 2002, Yamato Transport had approved its environment mark for use with 90 items, ranging from sales pamphlets to packaging materials available for purchase. The firm currently sells 23 packaging products to customers, 12 of which feature the Yamato Transport Environment Mark. In addition, Yamato Transport is making every effort to encourage its customers to purchase ecologically conscious products, and has also created Yamato Transport Environmental Labeling Guide. The guide was published in April of 2002 and has been distributed to each of Yamato Transport's offices in an effort to ensure that green purchasing policies are uniformly applied to the firm's suppliers. The guide contains guidelines based on various reference sources including the Eco mark certification criteria established by the Japan Environment Association (JEA) and guidelines from the Sanitation Department of the Tokyo Metropolitan Government concerning the use of recycled products by businesses.

#### *Reference 1*

##### Yamato Transport Environmental Labeling Guide: Requirements for Green Products

Product		Guidelines
Office paper	Copy paper	Min. 70% recycled fiber content, approx. 70% brightness
	Form paper	Min. 50% recycled fiber content
Paper for printing	Publications including reports	Min. 70% recycled fiber content, approx. 70% brightness
	Waybills, forms	Min. 50% recycled fiber content
	Pamphlets, catalogs, leaflets, posters, calendars, publications including corporate magazines	Color printing with photographs: Min. 40% recycled fiber content Color printing, no photographs: Min. 50% recycled fiber content Black & white printing, no photographs: Min. 70% recycled fiber content
General office supplies	Envelopes (white), business cards	Min. 70% recycled fiber content
	Envelopes (non-white), personal organizers, notebooks, letter paper/pads, files, data binders	Min. 50% recycled fiber content
Paper for sanitary use	Toilet paper, tissue paper	Min. 100% recycled fiber content
Materials	Cardboard boxes	Min. 50% recycled fiber content
	Shopping bags, wrapping paper	Min. 30% recycled fiber content
Other	Pens	Uses recycled plastic
	The following criteria shall apply for products not described above: 1. Product or system that conserves resources or is anticipated to reduce the environmental impact. 2. Product or system expected to draw attention to environmental conservation within the company and the community.	

### **C. Other Initiatives to Reduce Environmental Impact**

Initiatives aimed at reducing the environmental impact caused by the transport of goods and materials are critical to both the transportation industry and corporations in other sectors. Yamato Transport is involved in various environmental initiatives that, while not directly related to green purchasing, are nonetheless aimed at reducing the environmental impact of its transportation activities.

#### ***Elimination of Unnecessary Engine Idling***

In addition to the adoption of low-emission vehicles in its delivery fleet, Yamato Transport further recognizes that the reduction of exhaust gas emissions requires a shift in the attitudes and actions of its drivers. In September 1985, Yamato Transport implemented an industry-leading initiative requiring its drivers to be tethered to their ignition keys at all times, thus forcing drivers to turn off their engines when stopping their vehicles to handle parcels. The ignition key tether system has been adopted by both Yamato Transport and its group companies, and helps to conserve energy otherwise consumed by engine idling, while also reducing the risk of vehicle theft.

In July 2001, the firm conducted a 6-month trial period to investigate the effectiveness of the ignition key tether system. Engine hour meters were attached to each of Yamato Transport's primary delivery vehicles in order to monitor the extent to which drivers were shutting off their engines. The resulting data indicated that driver's were shutting off their engines for a total of 5.0 hours during an average 8-hour day of parcel collection and delivery, resulting in an average operating rate of just 38%. When the firm calculated in terms of CO<sub>2</sub> emissions based on this result, the fleet reduced a total of 86,870 tons of CO<sub>2</sub> emissions in FY2001. Yamato Transport is also actively involved in sharing information with its 1,000 partner companies in the transportation industry, in an effort to promote the adoption of ecologically conscious initiatives such as the elimination of unnecessary engine idling and deployment of low-emission vehicles.

#### ***Parcel Delivery Notification Service***

Yamato Transport began an e-mail based parcel delivery notification service in February 2002. In addition to its convenience for customers, the service helps to reduce the possibility of extra delivery trips that result when a customer is unavailable to receive a parcel shipment, thus helping to reduce the environmental impact of Yamato Transport's delivery vehicles.

## **2. Green Purchasing of Products Used for the Workplace**

Since 1999, Yamato Transport's annual Policies for Environmental Protection have prescribed green purchasing as a leading environmental initiative to be undertaken by the firm. In its Policies for Environmental Protection 2002, Yamato Transport makes a commitment to actively promoting green purchasing and aggressively educating its workforce in the importance of green purchasing, while promising to actively pursue a policy of reducing atmospheric pollution and global warming.

For FY2002, Yamato Transport has established a target of achieving a 60% green purchasing rate for all 101 products specified for green purchasing in the 2001 standards of Japan's Green Purchasing Law. Of the 14 product categories outlined in the Green Purchasing Law, the firm has already surpassed its target in the category of stationery and paper products as a direct result of previous initiatives to promote green purchasing. The firm is currently working to meet its green purchasing targets in all 101 products designated for green purchasing during FY2002.

### **A. Formulation of Purchasing Standards**

Green purchasing at Yamato Transport is implemented using the firm's own guidelines, which are designed to comply with Japan's Green Purchasing Law. The corporate guidelines for green purchasing are prescribed in the firm's Green Purchasing Guide, which was formulated in April of 2002 for the purpose of ensuring uniform implementation of green purchasing within Yamato Transport. The guide is available on the firm's corporate Intranet and can be accessed by any of its employees. The guide describes the concept of "thinking first about the necessity" as being the first principle of green purchasing, and also stresses that ecologically conscious purchasing should be implemented by each of the 100,000 employees employed by Yamato Transport and its subsidiaries. The guide contains separate sections focusing on the Green Purchasing Law as it relates to eight product categories, including: (1) stationery; (2) printed materials; (3) paper products; (4) furnishings and accessories; (5) office equipment; (6) electrical appliances; (7) lighting; and (8) construction equipment, construction work and services. The guide states that the firm's employees should evaluate the overall cost of purchasing beyond the basic cost of a product, by considering additional factors such as the operation cost, maintenance cost, and disposal cost. The guide further stresses that potential purchases should be reviewed to identify unnecessary features and describes how purchasing personnel can collaborate with other departments in order to negotiate pricing as a group.

For purchasing of printed materials, the guide states that employees should provide printing companies with a written request for green purchasing compliance, in order that suppliers can gain a better understanding of Yamato Transport's green purchasing practices. The guide also specifies that printing companies should be asked to provide the firm with MSDS sheets and a written report on the status of their green purchasing compliance. Yamato Transport clearly recognizes that the cooperation of suppliers is critical to the promotion of green purchasing initiatives, and understands the necessity of working collaboratively with its ever-diversifying group of suppliers.

#### Green Purchasing Performance

Category	Green purchasing	Non-green purchasing	Overall purchasing	Green purchasing rate
Office supplies by quantity	669	106	775	86.3%
Paper products by weight (kg)	3941	2458	6399	61.6%

### B. Management of Green Purchasing Performance

Yamato Transport and its group companies routinely monitor green purchasing performance for two categories of green purchasing products, consisting of: (1) products whose green purchasing performance can be tracked using existing systems and practices; and (2) products that account for a significant portion of purchase by value. The firm presently measures its green purchasing performance based on a green purchasing rate calculated not by value but by quantity of items procured, so as to eliminate the variable of pricing differences in products. Starting in April 2003, Yamato Transport adopted an office supplies purchasing system for deployment at its headquarters, business units, regional offices, sales offices, and subsidiaries. The system enables Yamato Transport to gather relevant green purchasing data and easily monitor its green purchasing performance, and to compare the green purchasing performance of its regional offices and sales offices. Furthermore, the firm expects that the new system will serve as an impetus for information sharing among the Implementation Committees and Subcommittees working under its Global Environmental Committee. The Group-wide deployment of the system will also decrease costs by allowing purchasing managers to pool their purchasing needs with other departments to better negotiate prices for bulk purchasing, rather than procuring supplies within departmental budgets.



### **3. Promotion of Green Purchasing through Merchandise Sales**

#### **A. Waybill Recycling and Development of Private Brand Products**

Yamato Transport has implemented a system for collecting waybills and other paper waste for recycling into toilet paper. Waybill and other paper waste is collected from its offices and group companies throughout Japan and brought to one of four paper-recycling plants for processing. The end product is a coreless toilet paper roll made from 100% recycled fibers, which is sold under the “Tokusen Shijo” (Special Market Selection) private brand developed by Yamato Transport. The toilet paper is sold nationwide and delivered door-to-door using Yamato Transport’s courier service, and qualifies as an ecologically conscious product under the purchasing guidelines established by the Green Purchasing Network (GPN), an organization that promotes green purchasing. During FY2001, Yamato Transport sold approximately 3.89 million cases of toilet paper, equivalent to 23.3 million rolls.

##### *Reference*

Green Purchasing Network Guidelines for Purchasing of Toilet Paper

-Made from 100% recycled fiber content

-Low brightness

-Other prerequisites: Coreless, single-ply

#### **B. Catalog Sales of Ecologically Conscious Office Products**

Yamato Transport is also involved in catalog sales of office products through its “Cat Work” sales venture. The Cat Work catalog sales service primarily focuses on customers located in outlying urban areas, and provides door-to-door delivery of a broad selection of office products from various manufacturers. Customers select the products from printed catalogs or from a partial online catalog. The Cat Work catalogs promote green purchasing among customers by using a “Cat Work Green Mark” label to identify products that comply with Japan’s Green Purchasing Law. The label gives customers a way to easily identify and choose ecologically conscious products for their purchases.

#### **C. Refurbishing and Remarketing of Unwanted Products from Moving**

Yamato Transport collects unwanted furniture and household appliances as part of its moving services, which are in turn refurbished by a subsidiary and then displayed for resale as affordable refurbished products. During FY2001, the firm achieved a 65.2% recycling rate, based on sales of 4,077 refurbished items.

In each of the environmental initiatives described above, Yamato Transport has successfully taken advantage of the frequent interactions with consumers that characterize its parcel delivery business. The firm has successfully developed new areas of business by aggressively incorporating ecologically conscious elements into its overall business model. Furthermore, Yamato Transport has made a significant impact through its efforts to promote green purchasing among consumers. From here on, the challenge for Yamato Transport’s environmental-related ventures will be to increase recognition among consumers and further expand the market for the goods and services they offer.

### **4. Recycling and Other Environmental Initiatives in Overall Operations**

Yamato Transport has several subcommittees that are devoted to reviewing environmental issues. One of these subcommittees is the Recycling Subcommittee, which is focused on ensuring that the Yamato Transport’s offices carry out 3R (Reduce, Reuse, Recycle) activities with the goal of reducing the volume of waste generated through the precise separation of waste streams.

### ***Recycling of Cardboard Waste and Utilization of Reusable Materials for Moving***

Yamato Transport is involved in an initiative to recycle cardboard waste used during the transport of goods. Waste cardboard is shredded using cutting machines and reused as cushioning material. Due to its aggressive efforts to recycle cardboard waste for use as cushioning material, the firm has decreased its reliance on conventional bubble wrap as indicated below. In addition, Yamato Transport is striving to further reduce waste by making every effort to switch to reusable materials as a replacement for sheet cardboard used to wrap objects during moving.



#### **Material Savings in FY2001**

- (1) Reduction in consumption of sheet cardboard for wrapping, due to use of reusable protective materials and reusable furniture padding: Approximately 326,000 rolls/year
- (2) Reduction in consumption of cardboard boxes, due to use of reusable plastic boxes: 24,500 boxes/year

### ***Recycling of Company Uniforms***

Company uniforms that are no longer used by employees are collected by Yamato Transport and shipped to the Takashima Plant of Kuraray Co., Ltd., for processing and conversion to a solid fuel source. The solid fuel is used as a supplementary fuel in place of coal, and serves as a heat source for special boilers used in power generation. Consequently, the heat energy for the processed uniforms is effectively reused to maintain the thermal cycle.

Since 1998, Yamato Transport has been tracking the quantity and volume of waste produced by its business activities. Each of the firm's regional offices and business headquarters are required to submit a monthly report on recycling and waste processing for tabulation of recycling and waste data. The resulting data showed that the firm's aggressive adoption of environmental initiatives allowed it to recycle 1,145 tons of waste in FY2001, out of a total volume of 37,668 tons of waste generated. Yamato Transport's recycling efforts appear to be making steady progress, as indicated by the increase in the firm's recycling rate from 28.7% in FY2000 to 30.5% in FY2001.

## **5. Organizational Commitment to Environmental Initiatives**

In May 1991, Yamato Transport established the Global Environmental Committee for the purpose of reviewing green purchasing and other environmental initiatives. The Committee is chaired by the Senior Managing Director of Yamato Transport, with the Chairman of the Labor Union's Central Administration Committee serving as the Vice Chairman. Additional members of the Committee include the 12 regional vice presidents and general managers of Yamato Transport, the 16 parent company general managers, and the 3 senior Labor Union officers. Administrative duties for the Committee are carried out by the Social Action Division of Yamato Transport. The Committee features a cross-organizational structure, and is mainly concerned with guiding the firm's policy on

environmental issues. The Committee meets on a quarterly basis to study and formulate initiatives in response to global environmental issues, with an emphasis on medium- and long-term solutions.

The Green Purchasing Subcommittee, formerly known as the Eco Mark Subcommittee, was established at the same time as the Global Environmental Committee. The Subcommittee is primarily concerned with certifying corporate publications and packaging materials sold by Yamato Transport that are to bear the Yamato Transport environment mark, and is also involved in promoting green purchasing of products used in the workplace. Administrative duties for the Subcommittee are carried out by the Operations and Systems Division of Yamato Transport. The Subcommittee has 9 members drawn from various departments within Yamato Transport and its subsidiaries. The members of the Subcommittees meet on a monthly basis to review practical issues relevant to the promotion of green purchasing. From an organizational perspective, the Green Purchasing Subcommittee is considered to be of equal importance with the Clean Energy Subcommittee, which is concerned with exhaust gas emissions and other air pollution issues that are traditionally of great concern to the transportation industry. The relative importance of the Green Purchasing Subcommittee in relation to Yamato Transport's other environmental Subcommittees is also considered an asset in terms of gaining recognition for the importance of green purchasing within the company.

## **6. Future Initiatives to Promote Green Purchasing**

Yamato Transport and its subsidiaries presently employ over 100,000 employees in 3,000 offices. Due to the large number of employees and offices it oversees, Yamato Transport is faced with the major task of ensuring that its employees and offices fully comprehend and comply with the corporate policies decided by the Global Environmental Committee and other organizations within the firm. In terms of exhaust gas emissions and noise pollution, the firm's employees tend to acknowledge their own responsibility for environmental issues. However, compared to a traditional manufacturer, Yamato Transport recognizes that it must make a stronger commitment in order to gain widespread acknowledgement and involvement in green purchasing among its employees, because the firm is in an industry where it has less need for purchasing of raw materials and components. The firm also recognizes the need for more education and further corporate initiatives to promote green purchasing, which are necessary to accommodate its plans to accelerate the transition to satellite centers by establishing an eventual network of 5,000 satellite centers.

Lastly, Yamato Transport is involved in the following initiatives as a prerequisite for expanding green purchasing within the firm.

(1) It is sharing information about the status and procedures for promoting green purchasing at the sales office level through the efforts of the Global Environment Subcommittees, which promote environmental initiatives at Yamato Transport's regional offices and business headquarters, and the Implementation Committees, which promote environmental initiatives at the major branch level.

Furthermore, the firm will attempt to instill its employees with a proactive attitude about environmental initiatives, by assigning its front-line employees to departments responsible for carrying out the administrative work of the Global Environment Subcommittees and Implementation Committees.

(2) The firm is working to further utilize its corporate Intranet as an information source for green purchasing, in order to further the acceptance of green purchasing at Yamato Transport's regional offices and sales offices.

(3) The firm is promoting the future development of a company-wide system for purchasing of office supplies.

# **Ricoh's Green Procurement Initiatives: A Growing Circle of Partners**

## **Overview of Green Procurement Initiatives**

The Ricoh Group has spent the last four years implementing green procurement of raw materials and parts by supporting its suppliers in their efforts to efficiently and effectively reduce their environmental impact. Ricoh's green procurement initiatives have included the creation of its own Environmental Management System (EMS), which served as the basis for its Ricoh Green Procurement Guidelines. Due to Ricoh's persistent efforts, all of its Japanese suppliers who were asked to establish Environmental Management Systems have successfully achieved this goal. Ricoh has also helped to improve the management performance of its suppliers with respect to their implementation of environmental initiatives and ability to improve their profits through environmental action. Ricoh is also working to expand its supplier initiatives to local suppliers in Europe, the Americas, China, and Taiwan.

In October 2002, Ricoh created a new purchasing system devoted exclusively to green purchasing of office use items, resulting from continuous improvements made to its purchasing system. Ricoh is also involved in green sales initiatives, beginning with the acquisition of ISO 14001 certification for all of its 49 sales subsidiaries and 410 sales offices. In addition, Ricoh's sales subsidiaries are involved in the "Live Office" project, a showcase project that demonstrates a fully functional, paperless office environment. Ricoh's environmental initiatives and past track record have also drawn significant interest from outside the company, giving Ricoh the opportunity to communicate its efforts to the public.

## **1. Green Partnership Concept**

In order for a firm such as Ricoh to reduce the environmental impact of its overall activities, it must carry out several important tasks including procuring raw materials that have a low environmental impact, reducing the environmental impact of its manufacturing processes, and selling products with a low environmental impact. To achieve this goal, the Ricoh Group subscribes to a "green partnership" concept under which it has green partners in all its environmental initiatives — from the suppliers from whom it procures raw materials, to the customers who use its products and the recycling firms it works closely with (Fig. 1). Consequently, Ricoh's green procurement initiatives are focused on reducing environmental impact in partnership with its green partners. By reassessing its business activities from an environmental perspective, the Ricoh Group has been able to reduce the environmental impact of its activities while also improving its workplaces, bringing down costs, and strengthening the management performance of its partner firms. The Ricoh Group is also working to expand its green partnership concept and initiatives to its overseas manufacturing facilities in Europe, the Americas, China, and Taiwan, as part of a critical component for improving the environmental management performance of its local suppliers.

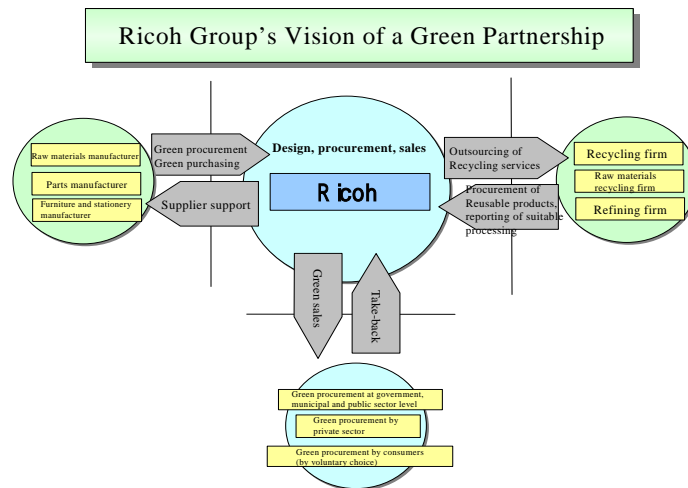


Fig. 1

## 2. Initiatives for Green Procurement

Ricoh defines green procurement as the “procurement of raw materials, parts and products with a low impact on the environment, which originate from a plant that implements sound environmental conservation practices.” Ricoh recognizes that, because it procures most of the parts and materials for its products from suppliers, its own initiatives for environmental conservation, taken alone, are insufficient to reduce environmental impact during the lifecycle of its products. For this reason, the firm has placed great emphasis on green procurement as a critical initiative in the context of Ricoh’s relationship with its suppliers (Fig. 2).

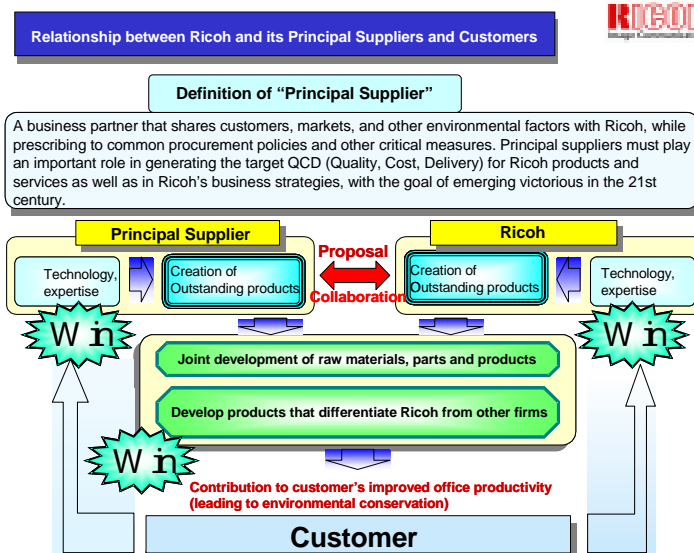


Fig. 2

Ricoh categorizes its green procurement into two separate forms of procurement. The first form of green procurement consists of the procurement of goods originating from plants that implement sound environmental practices. For this type of procurement, the firm promotes the creation of Environmental Management Systems by its suppliers (Section A of Fig. 3). The second form of green procurement consists of the procurement of raw materials, parts, and products with a low impact on the environment. For the latter form of procurement, Ricoh procures goods that have a low

concentration of environmentally hazardous substances or are manufactured using processes that have a low environmental impact (Section B of Fig. 3).

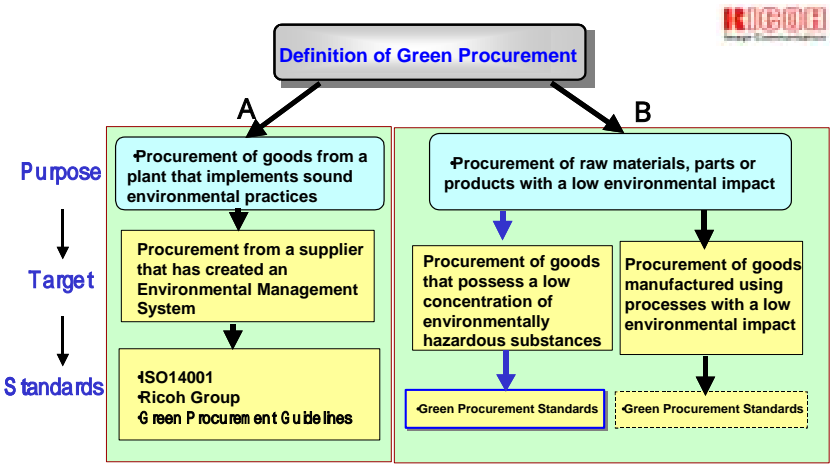


Fig. 3

Ricoh’s organization chart for green procurement is shown in Figure 4. The headquarters materials sections oversee the activities of materials sections belonging to Ricoh’s manufacturing operations in Japan and abroad. In addition to establishing policies for environmental conservation, the headquarters materials sections are also involved in educational initiatives such as providing necessary tools for green procurement and arranging regular meetings where materials sections as well as other sections can exchange information about their own initiatives and results. The collaborative relationship that exists between Ricoh’s headquarters and the materials sections of its manufacturing operations has played a major part in the success of the firm’s green procurement initiatives.

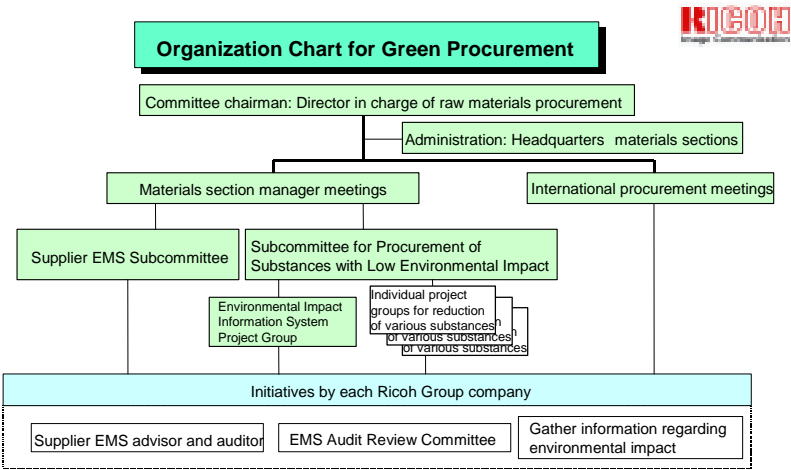


Fig. 4

### A. Procurement from Suppliers with Environmental Management Systems (EMS)

At the outset of its green procurement initiatives, Ricoh recognized that having its suppliers create Environmental Management Systems would provide the quickest route to green procurement, a goal that was eventually accomplished after four years of persistent effort by Ricoh and its suppliers.

Prior to its full-scale deployment of green procurement initiatives, Ricoh approached six of its small-to-medium-sized suppliers with a request to adopt environmental conservation initiatives within their firms. After six months, Ricoh gave each supplier a checklist to help assess the status of environmental initiatives at each firm. However, the checklists returned from its suppliers revealed that little had actually changed at the plant level. Apparently, Ricoh's suppliers felt that they did not need to create Environmental Management Systems, because of the perception that their environmental impact, as small-to-medium-sized suppliers, was limited, a perception that was further reinforced by their perceived primary role as manufacturers of goods based on specifications given to them by Ricoh. Due to the reluctance of the suppliers to establish Environmental Management Systems, Ricoh's senior management decided that they would establish a specific schedule for the firm's suppliers to create Environmental Management Systems, rather than simply requesting them to create Environmental Management Systems without a time frame. Ricoh's request to create Environmental Management Systems was communicated to its suppliers in May 1998. At the time, Ricoh also decided that the creation of an Environmental Management System would be a prerequisite for subsequent orders of parts and materials used in new products. Should a supplier fail to create an Environmental Management System according to Ricoh's schedule, it would receive no further orders of parts and materials for use in new products.

Although Ricoh's demands were stringent, they were based on Ricoh's belief that the establishment of Environmental Management Systems would improve the management performance of its suppliers. However, Ricoh did make an allowance for its small-to-medium-sized suppliers in Japan, by giving these suppliers until March 2002 to create their Environmental Management Systems. Suppliers which Ricoh's affiliates deal with were given until March 2003 to create their Environmental Management Systems.

At about the time that Ricoh asked its suppliers to create Environmental Management Systems in May 1998, many of its small-to-medium-sized suppliers were finding it difficult to obtain capital due to a lending squeeze by Japan's financial institutions, which had tightened their lending practices in an effort to comply with Bank for International Settlement (BIS) standards. In order to create the Environmental Management Systems demanded by Ricoh, small-to-medium-sized suppliers would have normally required as much as 1.5 million yen to undergo an audit for ISO 14001 certification or several million yen for the involvement of an independent ISO consultant. In response to the financial situation of its suppliers, Ricoh established its Ricoh Group EMS Guidelines. The Guidelines were formulated for the purpose of assisting Ricoh's primary small-to-medium-sized suppliers in creating Environmental Management Systems, and Ricoh conducted evaluations of suppliers' EMS systems free of charge.

#### (1) Initiatives to Support Suppliers through Green Procurement

Ricoh has implemented upstream quality assurance for its small-to-medium-sized suppliers since 1994, in an effort to improve the productivity of its suppliers through better workplace arrangement, and the creation of quality assurance systems. Ricoh's quality assurance initiatives have been successful in helping to reduce the environmental impact of its small-to-medium-sized suppliers, a goal which was further bolstered by its later support for green procurement initiatives starting from 1998.

By helping its suppliers to establish Environmental Management Systems, Ricoh is enabling them to achieve regulatory compliance, identify environmental aspects within their firms, and create a system for continuous improvement. Ricoh's goal is to provide support for its suppliers in a manner that takes advantage of the manufacturing strengths and management flexibility of its principal suppliers, without overwhelming them from over-management of environmental conservation initiatives.

#### (2) Implementation of Initiatives to Support Green Procurement

The Ricoh Green Procurement Guidelines prescribe the implementation of initiatives to support green

procurement, which occur in three phases consisting of the planning phase, system building phase, and audit/maintenance phase. Ricoh initially conducts fundamental environmental education for its supplier, which are followed by the supplier's implementation of initiatives to reduce waste and conserve energy. At the same time, Ricoh carries out initiatives to support the creation of an Environmental Management System by its supplier (Fig 5).

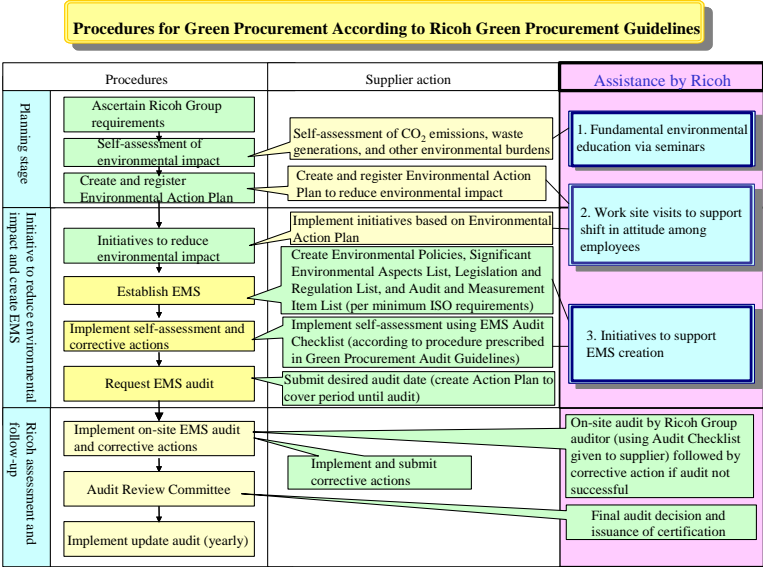


Fig. 5

In terms of the sequence of activities, it is important for a supplier to first conduct improvements that require a minimal investment from the supplier before setting out to create an Environmental Management System. This point is underscored by the example of one supplier, which found that an initiative to reduce waste oil from its cutting processes resulted in the added benefit of reduced oil consumption during cutting.

Suppliers must also ensure that they fully understand the requirements of ISO 14001 so that they do not create more regulations and documentation than are actually required, which can lead to over-management. Ricoh arrived at the solution of using teams of ten environmental internal auditors to assists its suppliers. The teams were given the task of visiting suppliers to observe the work site and assist with the practical implementation of environmental conservation initiatives. The teams were also responsible for ensuring that Ricoh's suppliers created the minimum level of Environmental Management System needed for efficient implementation of environmental conservation initiatives. Ricoh also made the decision to eliminate the need for its suppliers to prepare environmental manuals which are not utilized on a daily basis, while also instructing its suppliers to create the minimum amount of regulations and standards required. As a result of these changes, suppliers can create an Environmental Management System in 4 to 6 months using the Ricoh Green Procurement Guidelines (Fig. 6), compared with a minimum of 10 to 12 months to acquire ISO 14001 certification.



Fig. 6



ISO 14001 usually requires that a firm create anywhere from 20 to 30 documents related to regulations and standards. Under the Ricoh Green Procurement Guidelines, suppliers can operate an Environmental Management System by creating and utilizing just 15 types of documents for EMS management, including documents such as the Significant Environmental Aspects List and Legislation and Regulation List. The Guidelines also contain document examples with sample entries, which assist suppliers in creating their own documents. Ongoing revisions have been incorporated to the Guidelines based on Ricoh's work with suppliers, and the subsequent need to expand upon critical subjects requiring further guidance.

The supplier initiatives implemented in Japan are also being implemented at Ricoh's overseas operations. Local suppliers of its overseas operations are being invited to participate in green procurement briefing seminars and have been asked to create Environmental Management Systems. Local suppliers are also being informed about the benefits gained by Ricoh's suppliers in Japan as a result of their implementation of green procurement initiatives. Ricoh's subsidiaries also conduct on-site visits to support the initiatives being taken by local suppliers (Fig. 7).

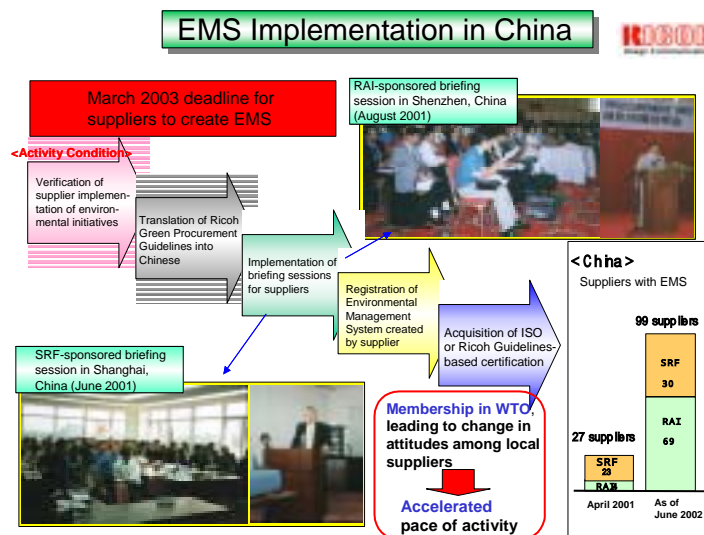


Fig. 7

### (3) Support for Suppliers in Conjunction with Creation of Environmental Management Systems

When Ricoh asked its suppliers to create Environmental Management Systems, it found that some of its small-to-medium-sized suppliers were unable to decide what concrete initiatives they should implement for environmental conservation. For these suppliers, Ricoh implemented various initiatives including direct observation of manufacturing sites and working to identify the principal areas of environment impact in an effort to determine the direction to be taken to reduce the supplier's environmental impact. When specialized technical expertise was required, Ricoh dispatched its engineers to work sites to assist suppliers.

In addition to its supplier-specific activities, Ricoh sponsored technical exchange meetings for all of its suppliers, as a means of sharing information about Ricoh's own initiatives and promoting exchanges between the engineering personnel of its suppliers (Fig. 8). Ricoh also created the quarterly "Green Procurement News" publication (Fig. 9) in a further effort to educate its suppliers. The publication features articles such as successful case studies implemented by Ricoh and its suppliers. Ricoh also plans to create a new Green Procurement Web site in August of 2003, which will contain various case studies featuring both Ricoh and its suppliers.



Observing energy conservation initiatives at Ricoh Unitechno Co., Ltd.

Fig. 8 Technical Exchange Meeting



Observing waste reduction initiatives (Zero-waste-to-Landfill) at Ricoh Numazu Plant



Fig. 9 Green Procurement News published by Ricoh for its suppliers

#### (4) Results of Initiatives to Create Environmental Management Systems at Suppliers

As of March 2002, every Ricoh supplier that was asked to create an Environmental Management System had achieved this goal. Starting from April 2002, Ricoh began placing orders for materials and parts used in new products exclusively with suppliers who had created Environmental Management Systems (Fig. 10). Presently, 94% of Ricoh's suppliers in Japan have created Environmental Management Systems, compared with a 77% rate among suppliers for Ricoh's overseas site suppliers. Ricoh is now working to ensure 100% compliance among all of its suppliers in Japan and overseas, with a target date of March of 2003 for compliance by its overseas suppliers. Due to its ongoing green procurement initiatives, Ricoh began seeing an increase in its procurement ratio from EMS suppliers starting from as early as FY2001 (Fig. 12).

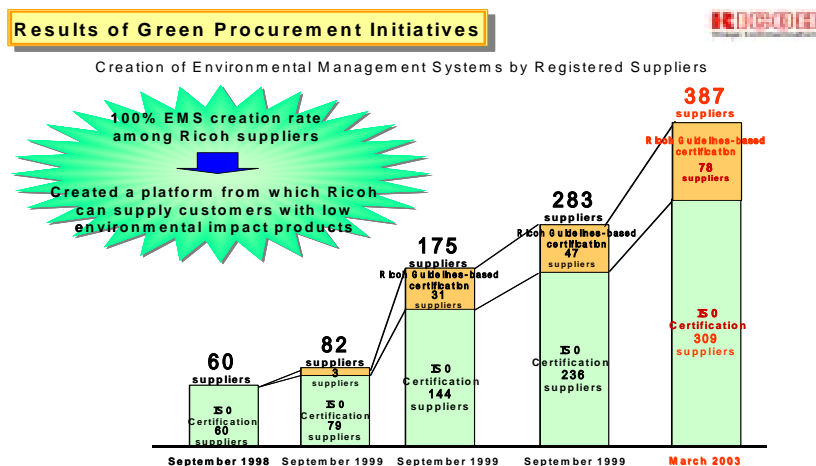


Fig. 10

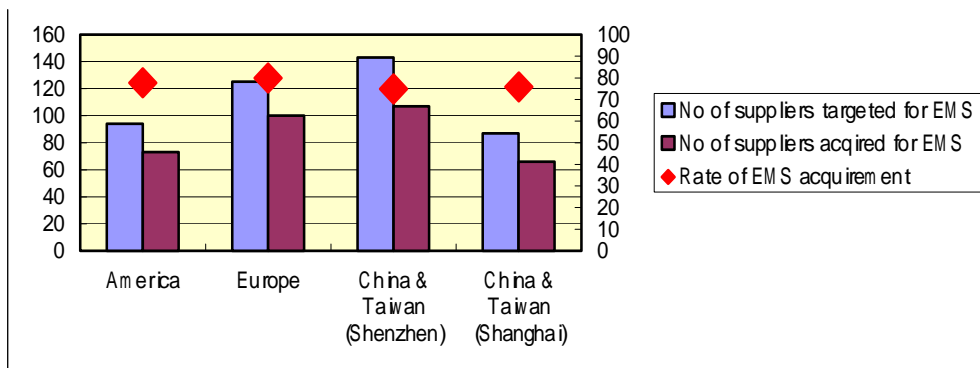


Fig.11 Environment Management System within Suppliers Overseas

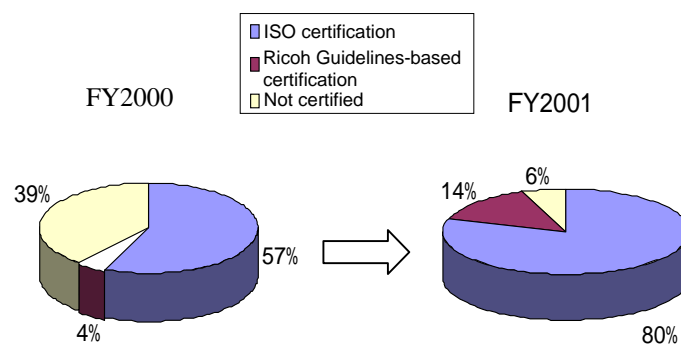


Fig. 12

#### (5) Successful Case Studies

Shizuko Sangyo K.K. is a 75-person firm involved in extruding and assembling plastics, and became Ricoh's first supplier to be certified in accordance with the Ricoh Green Procurement Guidelines. By establishing an Environmental Management System within the company, Shizuko Sangyo successfully transformed its plant into a Zero-Waste-to-Landfill plant.

Shizuko Sangyo's first step in its green procurement activities was to separate unneeded materials and implement better workplace arrangements at its plant. Later, the firm began implementing initiatives aimed at eliminating product defects, while also working to reduce waste. However, Shizuko Sangyo encountered several major obstacles once it had managed to eliminate a major portion of its waste. For example, the firm found it difficult to recycle its used fluorescent tubes, but ultimately was able to make use of Ricoh's own recycling collection route in order to have its fluorescent tubes recycled together with Ricoh's waste. Due to this and other initiatives, Shizuko Sangyo eventually became a Zero-Waste-to-Landfill plant in May 1999, having achieved a 33% decrease in waste compared with the previous year (Fig. 13).



Fig. 13

1. Case Study: Shizuko Sangyo Transition to a Zero-Waste-to-Landfill Plant
2. Business: Plastic extruding and assembly, Capitalization: 10 million yen, No. of employees: 75
3. Initiatives
4. Separation of unneeded materials, implementation of better workplace arrangement
5. Maintenance on machinery to prevent product defects
6. Development of route for waste processing
7. Partial utilization of Ricoh waste processing route
8. 1st designated supplier to create EMS and acquire Ricoh Guidelines-based certification
9. Classification
10. Volume of industrial waste produced (recycling rate)
11. FY1997: 16.6 tons (16% recycling)
12. FY1998: 6 tons (33% recycling)
13. From April 1999: 0 tons (100% recycling)
14. Principal initiatives by supplier
  - Reduced in-process defects during manufacturing
  - Conducted reappraisal of waste sorting methods and established a waste processing route
  - Switched from cardboard containers to plastic containers
15. Commencement of support initiatives
16. Cost savings
17. Annual waste processing costs, FY1997: 1.68 million yen, FY1998: 1.1 million yen Annual savings: 530,000 yen (-33%)

Shizuko Sangyo's desire to become the first Ricoh-certified supplier can be traced to a Ricoh-sponsored briefing session on green procurement policies that was attended by its president. In recalling the moment when he decided that his company would become involved in green procurement, Shizuko Sangyo's president says, "I had always regretted that the plastic waste produced at our plant became landfill waste. When I heard about Ricoh's program, I decided that we would make improvements to our plant and try to become the first supplier to gain certification from Ricoh."

Suzucoh Seisakusho is another supplier that has successfully incorporated green procurement initiatives. The firm has gained public recognition for its efforts and was awarded the 11th Japan Industrial Journal Award as part of the Global Environment Awards. After Ricoh first asked the firm to create an Environmental Management System in May 1998, it began working to acquire ISO 14001

certification starting from November of that year, and eventually acquired certification in August 1999. Through a variety of initiatives undertaken to acquire ISO certification, Suzucoh Seisakusho managed to improve its profit ratio from 1% in 1998 to 3% in 1999. Suzucoh Seisakusho's profit ratio eventually rose to 5% in 2002, despite having lost sales due to a shift to overseas production by one of its customer accounts (Fig. 14).



Fig. 14

1. Suzucoh Seisakusho: Management Reform Resulting from Implementation of Environmental Conservation Initiatives
2. Business: Press and assembly of components, Capitalization: 10 million yen, No. of employees: 75
3. Asked by Ricoh to create Environmental Management System (April 1998)
4. Profit ratio increased by a factor of five due to environmental protection initiatives, in spite of flat sales
5. Started initiatives to acquire ISO 14001 certification (November 1998)
6. Acquired ISO 14001 certification (August 1999)
7. Sales
8. Profit ratio
9. September 1997, September 1998, September 1999, September 2000, FY 2001
10. 11th Global Environment Awards (Company names are abbreviated)

Grand Prize	Matsushita Electric
Minister of Economy, Trade and Industry's Award	Honda
Minister of the Environment's Award	Asahi Beer
Minister of Education, Culture, Sports, Science and Technology's Award	Shiseido
Keidanren Chairman's Award	Sharp
Fuji Sankei Group Award	Kao
Japan Industrial Journal Award	Daikin Industries Suzucoh Seisakusho
Outstanding Corporate Citizen Award (elected by Global Environment Council)	TEPCO Cosmo Oil
Award for Outstanding Environmental Contribution by Local Government	Saitama Prefecture Okayama Prefecture Yokosuka City



Each of Suzucoh Seisakusho's employees played a role in the firm's environmental conservation activities, which allowed it to make the most of its engineering capabilities in an effort to reduce its environmental impact. Furthermore, Suzucoh Seisakusho successfully lowered its prices to Ricoh since 1999. The president of Suzucoh Seisakusho holds the firm belief that his firm should "aim to be a leading firm, regardless of its size," and is of the same mindset as Ricoh in terms of Ricoh's corporate goal of "emerging victorious in the 21st century." In concrete terms, Suzucoh Seisakusho has reduced its power costs by 35% compared with 1998 levels, and has successfully applied its engineering capabilities to shorten its machining processes and reduce their environmental impact. Green procurement initiatives also have an effect on secondary suppliers who supply materials and parts to Ricoh's suppliers, which is the case with Suzucoh Seisakusho. The firm has assisted its own sub-suppliers by evaluating their compliance and supporting their efforts to reduce environmental impact. The Global Environment Award received by Suzucoh Seisakusho was awarded not just for the firm's own initiatives, but for its overall contribution to environmental conservation.

Ricoh's overseas suppliers have also experienced similar benefits from incorporating green procurement initiatives. Wah Yip Pallet Mfg. Ltd., located in Dong Guan, Guangdong Province, has about 250 employees who manufacture wooden pallets, which are indispensable in transporting and storing Ricoh products. The partnership between Ricoh's subsidiary in China, Ricoh Asia Industry, Ltd. (RAI), and Wah Yip had begun before the start of Ricoh's green procurement initiatives. In April 2000, Wah Yip responding to RAI's request to reduce environmental impact and costs by proposing the development of pallets made of recycled plywood. Wah Yip has also developed a strong interest in environmental conservation, and in October 2001 established its own environmental policy, which details its commitment to five key areas including regulatory compliance, maintaining the health and safety of its employees, maximizing its recycling of waste, preventing environmental pollution, and continually improving its environmental performance. In addition to its efforts to reassess environmental aspects affecting the company, Wah Yip has actively become involved in other initiatives, which include the monitoring of waste water and exhaust gasses and the implementation of environmental education for its employees. Wah Yip has also worked to improve its plant working conditions and built a warehouse to store adhesives and other chemicals.

With the assistance of Ricoh Asia Industry, Wah Yip was able to acquire ISO 14001 certification in March 2002. The firm has also found that local demand for ISO 14001 certification has continued to increase in Shenzhen. At present, the total amount of pallets being produced that are made of recycled plywood or other materials has reached 10,000 units per month, accounting for 60% of Wah Yip's total production. Ricoh believes that Wah Yip's quick and positive participation in environmental conservation initiatives has led to concrete improvements in the firm's management performance (Fig.15).



Fig. 15

## B. Procurement of Materials and Parts with Low Content of Environmentally Hazardous Substances

In an effort to reduce the use of environmentally hazardous substances in its products, the Ricoh Group has worked with its suppliers to eliminate the use of lead in solders, PVC in wiring, and hexavalent chromium in steel.

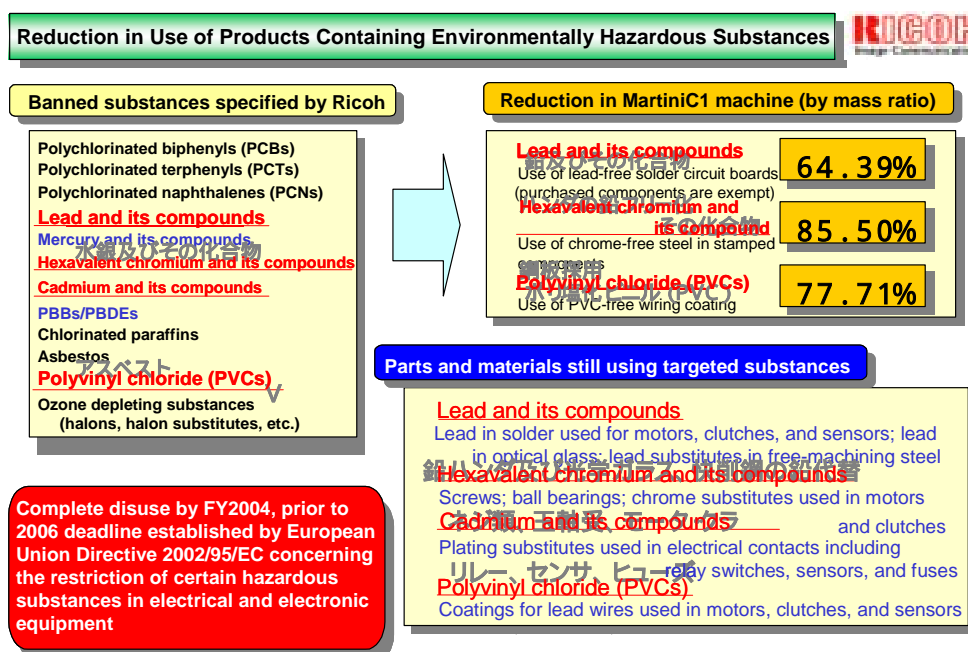


Fig. 16

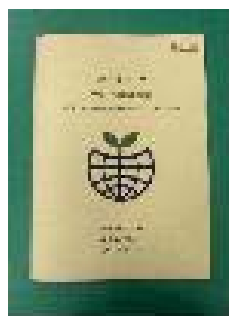
Although the use of environmentally hazardous substances does not affect the customer during use of the product, it does have an environmental impact during its extraction as a resource and when it is not suitably processed during disposal. Ricoh's initiatives to reduce the use of environmentally hazardous substances are an integral part of the firm's environmental management, because they help to decrease the environmental impact during the entire product lifecycle and reduce costs at the time of recycling. Until 2001, Ricoh's initiatives were focused on parts and components designed in-house (Fig. 17), but have since been expanded to include supplier-designed parts and components, starting in 2002, in an effort to fully eliminate the use of environmentally hazardous substances.

	Environmental Ranking in Green Purchasing Network Database		Use of chrome-free steel (in components designed in-house)
	Lead-free solder	Use of PVC in wiring coating	
imagio Neo 220/270(Aficio 1027)	A		more than 90%
imagio Neo 600/750	A		more than 85%
IPSiO NX730N/630N/630 (Aficio AP2610/2610N)	C		more than 90%
Aficio 1013/RICOH FAX3310L Series	—	—	100%

Note: Aficio 1013/RICOH FAX3310L Series is not sold in Japan and is not registered in the GPN database.

Fig. 17 Reduction in Use of Environmentally Hazardous Substances in Office Products  
(as of March 29, 2002)

Fig. 18 Ricoh Green Procurement Standards for environmentally hazardous substances



Suppliers that have successfully reduced their reliance on environmentally hazardous substances include Orion Electric Co., Ltd., which successfully switched to lead-free solder by modifying its existing equipment without the need for new equipment, and Hirakawa Hewtech Corp., which developed a halogen-free wire with the same workability as conventional PVC wire. Ricoh also worked closely with NKK Corporation, now known as JFE Steel Corp., in an effort to eliminate hexavalent chromium in its steel materials.

### **C. Procurement of Materials and Parts that Utilize Manufacturing Processes with a Low Environmental Impact**

In January 2002, Ricoh held its first “Green Procurement Meeting” as part of a further initiative to promote green procurement (Fig. 19). The meeting was held just prior to the March 2003 deadline for Ricoh’s suppliers to create Environmental Management Systems, and was designed to educate Ricoh’s suppliers by highlighting successful examples of joint initiatives between Ricoh and its suppliers. A further goal of the meeting was to ask for the continued cooperation of Ricoh’s suppliers in working to reduce the environmental impact throughout all the processes, from development and design to recycling.



Fig. 19 First Green Procurement Meeting

Ricoh’s procurement of plastic materials is just one area where groundbreaking initiatives were implemented through a green partnership, which in this case consisted of recycling firms, raw material suppliers, and plastic processing plants. The green partnership resulted in a sustainable system in which copiers are first collected by recycling centers and the plastic covers removed for separation according to plastic manufacturer. The covers are then washed in special machines using an ecologically sensitive technique. The washed covers are then crushed and shipped to plastic manufacturers, which convert the plastic into plastic pellets. The resulting recycled pellets are then used by plastic processing plants to produce new covers, using a 7:3 ratio of new plastic to recycled plastic.

Initiatives like this one are a result of a collaborative effort between firms, which helps to accelerate the process of finding engineering solutions and implementing initiatives. In the future, Ricoh hopes to work more closely with other copier manufacturers in an effort to further increase the recycling rate for copiers.

Kawaguchi Kasei K.K., a manufacturer of toner containers, is another example of a supplier working



in collaboration with Ricoh to reduce the impact on the environment. Toner containers are usually produced using a complicated blow molding process that is necessitated by their complex shape. Kawaguchi Kasei and Ricoh jointly designed and began to manufacture a new toner container that was thinner than conventional containers and nearly half the weight. The manufacturing process was also changed from a conventional blow molding process to a drawing blow molding process, using an injection molding machine and a newly created preform. Kawaguchi Kasei and Ricoh initially worked on a variety of prototype designs employing different shapes, before finally arriving at a new container design that was half the weight of a conventional container and 15% cheaper to produce, thus reducing the selling price to Ricoh. Based on the merits of the new container design, Kawaguchi Kasei became Ricoh's exclusive supplier of toner containers, where Ricoh had previously purchased them from several suppliers. By creating an Environmental Management System and making the most of its engineering expertise, Kawaguchi Kasei was able to realize benefits both for itself and Ricoh.

At the time of the first Green Procurement Meeting in January 2002, Kawaguchi Kasei was one of three suppliers to give presentations on the concrete benefits they had gained from Ricoh's green procurement initiatives. However, the examples given were sufficient for both Ricoh and its suppliers to come away from the event with a renewed understanding of the significant benefits that can be gained from initiatives carried out as part of a green partnership.

### 3. Green Purchasing Initiatives

Ricoh has created a “Ricoh Green Purchasing List” for its purchases of office use items such as office equipment, office furnishings, stationery, sales promotion materials, and gift items. It has also established an automated order placement system in an effort to effectively promote green purchasing of office use items. The order placement system has been deployed at eight non-manufacturing-related offices and seven manufacturing-related offices. Due to its green purchasing initiatives, green purchasing now accounts for approximately 80% of Ricoh's overall purchase of office use items by value.

Since it began practicing green purchasing in 1998, Ricoh has continued to make improvements to its order placement system, resulting in the creation of a new green purchasing system for office use items (Fig. 20). The new system began deployment in October 2002 and is designed to automatically select green products when purchasing office use items.

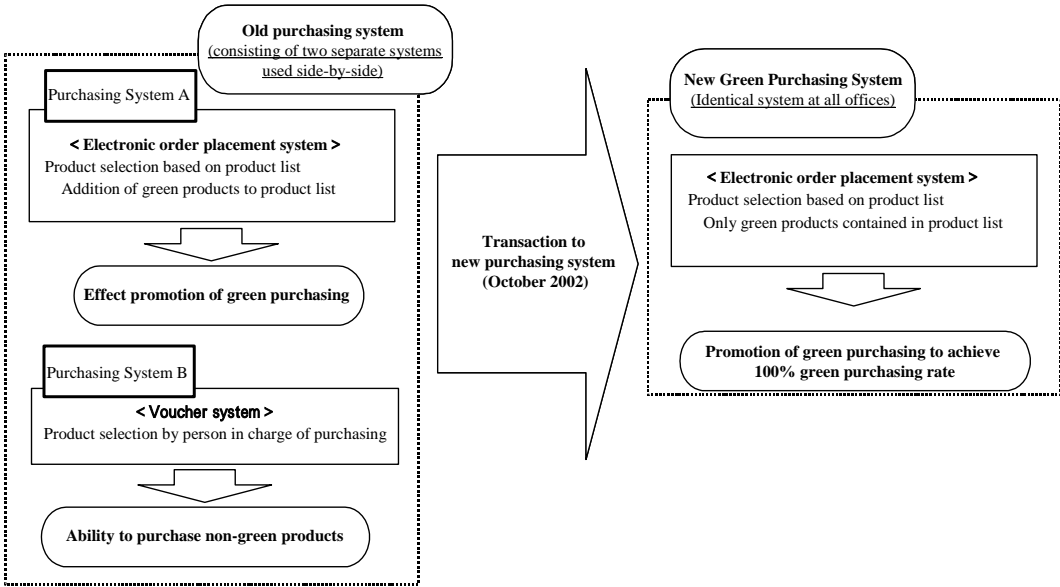


Fig. 20 Development of Purchasing System and Transition to New Green Purchasing System

Green purchasing is promoted at each of Ricoh Group offices in Japan through the appointment of a green purchasing promotion supervisor and staff in charge of green purchasing (Fig.21) Each designated individual reports to the headquarters and is responsible for managing the green purchasing targets of his or her office. Individual offices are also monitored for their green purchasing performance. At the headquarters level, environmental management promotion sections establish policies, guidelines, and targets for green purchasing, while regularly revising Ricoh's list of green purchasing products to reflect changes in Japan's Green Purchasing Law.

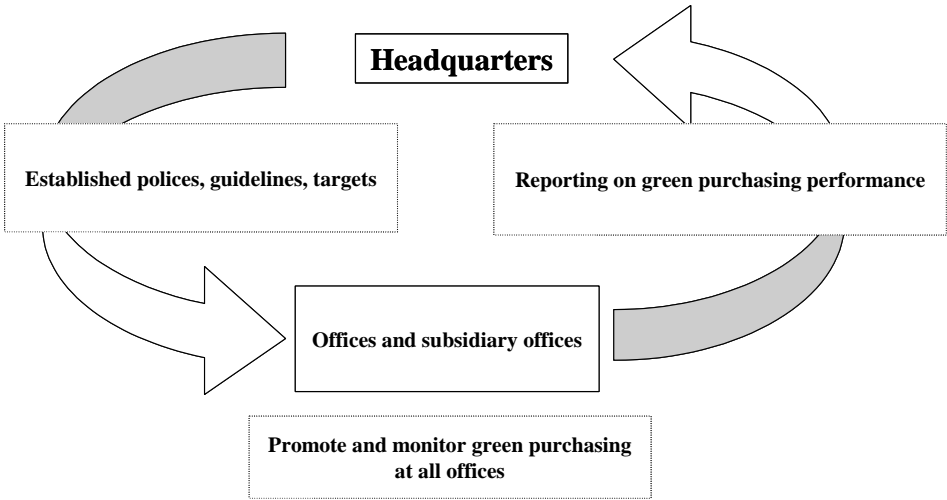


Fig. 21

Ricoh began tracking its green purchasing performance in 1998, starting with data collected from six offices located in the Tokyo area. Green purchasing was later made a Group-wide priority in 2001, which prompted Ricoh to begin tracking green purchasing on a Group-wide basis in Japan. For FY2002, Ricoh has established a target green purchasing rate of 90% for special items and a 100% compliance rate for all other applicable items. As of June 2002, Ricoh's green purchasing rate was 79.5% for special items and 78.9% for all other applicable items.

In addition to reaching its FY2002 targets for green purchasing, the firm plans to establish a 100% target green purchasing rate for FY2003, which it hopes to achieve through an even stronger commitment to green purchasing.

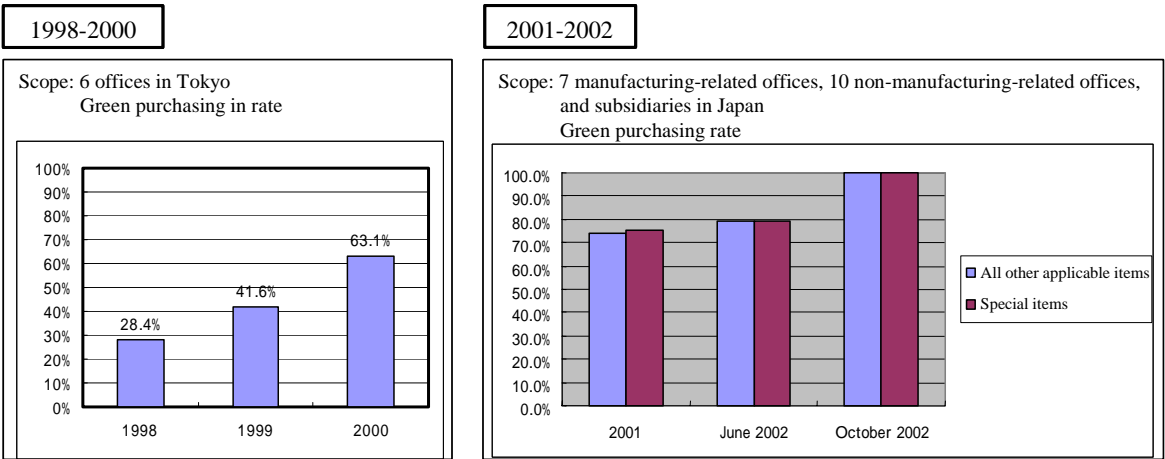


Fig. 22 Green Purchasing Performance

#### 4. Initiatives to Promote Green Sales

Green sales initiatives are implemented by the sales subsidiaries of the Ricoh Group, which have created Environmental Management Systems in an effort to implement ecologically conscious practices. As of December 2002, Ricoh had obtained ISO 14001 certification for all of its 49 sales subsidiaries and 410 sales offices, resulting in an environmentally aware sales force with approximately 18,000 employees. Ricoh had previously obtained ISO 14001 certification for its service subsidiaries in September 2000, which enables it to provide products and services with a low environmental impact. Ricoh is also actively involved in sharing its expertise regarding environment conservation initiatives, so that it may assist society as a whole in reducing its environmental impact.

Ricoh further recognizes the importance of providing customers with relevant information regarding its products, to enable them to choose products based on their environmental performance. To that end, Ricoh is working with the Green Purchasing Network (GPN), an organization that promotes green purchasing, to ensure that environmental information for its products can be accessed from the Green Purchasing Network's Web site (<http://eco.goo.ne.jp/gpn/index.html>). In addition, Ricoh is actively involved in acquiring environmental label certification for its products. For products categorized as Type I environmental label, Ricoh has acquired the Japanese Eco Mark label for its copiers and printers. For products categorized as Type II environmental label, the firm has established its proprietary recycling logo and put them on the products that comply with its in-house standards.

Ricoh's sales subsidiaries are also involved in a state-of-the-art initiative known as the "Live Office" project (Fig. 23), which is being implemented by its Mie Ricoh, Aichi Ricoh, Kanagawa Ricoh, and other sales subsidiaries. The Live Office concept is based on the implementation of fully paperless offices at Ricoh's sales subsidiaries, which is accomplished by reassessing the office workflow and making a wholesale conversion from paper to electronic technologies. The Live Office project also functions as a showroom to allow Ricoh's customers to observe a working paperless office. In addition, the project serves as a springboard for customers to consider environmental initiatives for their own offices and gives Ricoh's sales subsidiaries an opportunity to propose similar systems for their customers. The Live Office project not only helps to promote environmental conservation within Ricoh, but also helps to promote environmental conservation initiatives by its customers.



Fig. 23

1. Iwate Ricoh “Live Office” Showroom Project
2. The door to your future network office.
3. Live Office, 2nd Floor
4. Both a working office and showroom.
5. See how this office functions using the latest office equipment.
6. Live Office, 1st Floor
7. 100% paperless!
8. Only PCs are found on desks. All paperwork has been eliminated and converted to electronic format for storage on PCs.
9. Environmental management
10. Currently working towards achievement of an advanced Level 2 Zero-Waste-to-Landfill office
11. Seminar Room
12. Currently holding regular seminars and group education sessions. Corporate education sessions can also be arranged.

## 5. Public Initiatives to Promote Green Purchasing

The Ricoh Group believes that all of its stakeholders are green partners, including its customers, the local community, its employees, and the employees of its partner firms. Ricoh is committed to initiatives aimed at communicating its ideals to those outside the company and sharing its expertise regarding environment conservation initiatives, so that it may assist society as a whole in reducing its environmental impact.

### A. Mass Media as an Avenue for Communicating Ricoh’s Green Procurement Initiatives

Ricoh has made a concerted effort to communicate its green procurement initiatives by submitting articles to magazines and responding to media inquiries from magazines, television and other mass media outlets.

#### (1) Magazine Coverage of Ricoh’s Green Procurement Initiatives

*Nikkei Ecology*, April 1999 pre-inaugural edition

Title: “Environmentally-sensitive Firms Seek to do Business with Like-minded Suppliers”

Description: Discussion of Ricoh’s green procurement initiatives and efforts to change the environmental awareness of its suppliers, including its request to create Environmental Management Systems and its support initiatives for suppliers.

*Chikyu Kankyo* (Global Environment), August 1999 edition

Title: “Multi-part Series on Global Environment Awards: Creation of Environmental Management Systems as a Prerequisite for Supply Relationship”

Description: Discussion of Ricoh Group’s green procurement initiatives to develop 21st century partnerships.

*ISOS*, June 2000 edition

Title: “Multi-part Series on Green Procurement and ISO 14000”

Description: Discussion of Ricoh’s green procurement initiatives with a focus on audits and support provided through green partnerships. The Ricoh Green Procurement Guidelines and persons in charge of materials procurement are also discussed.

*ISO Management*, September 2001 edition

Description: Discussion of Ricoh’s request to its suppliers to obtain ISO 14001 certification or

certification according to the Ricoh Green Procurement Guidelines. The Green Procurement News and details of the Ricoh Green Procurement Guidelines are also discussed.

*Nikkei Business*, May 13, 2002 edition

Title: “Ricoh and NKK Tie Up to Develop a Chrome-free Steel”

Description: Case study regarding the partnership between NKK and Ricoh in jointly developing a hexavalent chromium-free steel.

*Business Research*, May 2002 edition

Title: “Ricoh Group’s Green Procurement Initiatives and Benefits: Creating a Win-Win-Win Relationship”

Description: Discussion of Ricoh’s history of green procurement, starting from its request to suppliers to create Environmental Management Systems in 1998. Ricoh’s approach to supporting its suppliers’ efforts to create Environmental Management Systems is also discussed.

*Chikyu Kankyo* (Global Environment), August 2002 edition

Title: “Focus on Environmental Factors and Choosing Suppliers”

Description: Discussion of Ricoh’s creation of an Environmental Management System starting from FY2002, and Ricoh’s fundamental approach to strengthen its initiatives to reduce environmental impact.

*Nikkei Ecology*, August 2002-February 2003 editions

Title: “Core Concepts of ISO” (7-part series)

Description: Discussion of Ricoh’s green procurement initiatives for both environmental conservation and greater profit, using case studies.

*Tool Engineer*, August 2002 edition

Title: “Supplier Change through Green Procurement”

Description: Discussion of various approaches to environmental countermeasures, environmental conservation, and environmental management.

## (2) Coverage on NHK Television Network

Network: NHK Public Television

Program: *Ohayo Nippon* (Good Morning Japan)

Broadcast date: July 30, 1998

Description: The program uses an analogy to describe a firm (Ricoh) that asks its supplier to acquire an “environmental passport” (EMS), which triggers its supplier to implement environmental improvements.

Network: NHK BS-1 satellite service

Program: *Kankyokakumei ga Kigyo wo Kaeru* (Environmental Upheavals Will Lead to Corporate Change)

Broadcast date: August 16, 1999

Description: A section of the program is devoted to firms that support their subcontractors, using the example of Ricoh and its suppliers.

## (3) Public Initiatives to Promote Green Procurement by Suppliers

As a result of Ricoh’s initiatives to create Environmental Management Systems, Ricoh’s suppliers have been asked by outside organizations to speak publicly about their experiences in acquiring ISO certification, which illustrates how the circle of green procurement continues to grow in scale.

K. K. Suzucoh Seisakusho

Date: June 2001

Sponsor: Kanagawa Small and Medium sized Enterprise

Event: Lecture on “Acquiring ISO Certification”

Date: November 2001

Sponsor: Environmental Forum 21

Event: Lecture entitled “Environmental ISO Eco Action 21”

Date: February 2002

Sponsor: Miyamae-ku Rotary Club

Event: Lecture on “Environmental Management Seminar”

Date: April 2002

Sponsor: Tajima-cho, Fukushima Prefecture

Event: Lecture on “Townpeople and the Environment”

Fujikura Kasei Co., Ltd.

Date: December 2002

Sponsor: Japan Paint Manufacturers Association

Event: Lecture on “Acquiring ISO Certification and Promotion of Coatings Care” (conducted as part of Coatings Care Seminar)

Shizuko Sangyo K.K.

Date: September 2002

Sponsor: Shizuoka Chamber of Commerce

Event: Lecture on “Creating an Environmentally-friendly Company”

## **6. Conclusion**

In 1998, Ricoh asked its suppliers to create Environmental Management Systems as a prerequisite for further transactions, at a time when there was limited awareness of environmental conservation initiatives within the private sector. Ricoh has supported its suppliers' efforts to create Environmental Management Systems with the realization that benefits will primarily be gained in the long term rather than the short term. Despite this obstacle, the firm has successfully implemented initiatives that create a win-win-win relationship among Ricoh, its customers and suppliers. The firm's green procurement initiatives during the last four years have been based on its belief that Ricoh can contribute to the rapid achievement of a sustainable society.

The initiatives implemented by the Ricoh Group's materials departments have extended their reach to involve Ricoh's suppliers both in Japan and abroad, resulting in an ever-widening circle in which its suppliers are now promoting green procurement beyond their firms, thus contributing to the goal of achieving a sustainable society.

# **Taisei Corporation's Green Purchasing Initiatives**

## **Introduction**

Taisei Corporation's management policy is to "create a lively environment for people," and this serves as the basis for its commitment to quality, safety, and environmental protection as the major prerequisites for company profits. The firm's response to environmental issues is of great concern to the management of Taisei Corporation. In October 1997, Taisei Corporation established its own standards for purchases of products such as consumables and office supplies, which marked the beginning of a company-wide green purchasing initiative that included switching exclusively to copy paper made from 100% recycled fiber content not exceeding 70% brightness. With the enactment of Japan's Green Purchasing Law in 2001, Taisei began in earnest to implement green procurement of construction materials and other initiatives aimed at reducing the overall environmental impact of activities ranging from the design to construction and operation of buildings.

## **1. Environmental Management and Green Purchasing**

Taisei Corporation's environmental initiatives began in earnest in 1992, when it established a company-wide Global Environmental Committee featuring a cross-organizational structure. The issue of reducing the overall environmental impact from construction activity has become a major challenge for the construction industry as a whole, with construction waste said to account for one-fifth of Japan's industrial waste and construction activity (including all stages from production and transportation of construction material to operation of the constructed buildings) responsible for one-third of all industrial CO<sub>2</sub> emissions. Taisei Corporation is engaged in various company-wide initiatives aimed at reducing the environmental impact of its activities, including the acquisition of ISO 14001 certification between 1997 and 1999, which resulted in ISO 14001 certification for two divisions and all of its branch offices. In addition, the firm also regularly revises and expands its Environmental Policy and the Taisei Agenda, which outlines its annual plans and targets for environmental protection.

The current Taisei Agenda 2002 specifies 14 targets covering 6 areas of activity, and further specifies midterm targets to be achieved by 2004. In the area of promoting environmental protection during the construction stage, the current Agenda establishes a target of increasing the number of items for green procurement and increasing the procurement ratio for Eco materials to 17% in FY2002. As a midterm target, the current Agenda specifies a target of further increasing the firm's procurement ratio for Eco materials to 25% by FY2004.

## **2. Green Procurement Initiatives**

### **A. Green Procurement Guidelines**

Taisei Corporation began its green procurement initiatives in 1997, when it first specified portland blast furnace cement and electric furnace steel as Eco materials in an effort to reduce the environmental impact of large volume materials. Prior to the expected enactment of Japan's Green Purchasing Law, Taisei Corporation established a working group to review green procurement issues in 2000, which called on the participation of its design, technology development, civil engineering, and building construction departments. Once established, the working group set out to study green procurement initiatives for company-wide deployment.

Following the enactment of the Green Purchasing Law in 2001, Taisei Corporation formulated its own Green Procurement Guidelines that same year. In its original form, the Guidelines specified 24 items designated for green procurement, including 11 items specified by the Japanese government and 13 items identified by Taisei Corporation. In 2002, the number of green procurement items was expanded to cover 40 categories of major construction materials. The expanded list of green procurement items includes additional items specified by the Japanese government as well as new categories for fixtures and equipment, which consume large amounts of energy during their operation. For the selection of green procurement items, Taisei Corporation relies on a variety of resources including product information published by the Japan Federation of Construction Contractors, the database of government-specified green procurement items and the online Green Purchasing Information Plaza site maintained by the Green Purchasing Network (GPN), an organization devoted to the promotion of green purchasing.

As a result of its green procurement initiatives, Taisei Corporation's procurement ratio for Eco materials increased from 9.5% in 1999 to 17.8% in 2001. Forms used in construction account for a significant portion of Taisei's green procurements by value, and the firm is promoting a transition to the use of alternative forms that do not utilize conventional tropical timber. Taisei Corporation successfully increased its green procurement ratio for construction forms from 27.3% in 2000 to 32% in 2001, in improvement of close to 5%. The major items used by Taisei Corporation consist of cement, concrete, aggregates, gypsum board, steel and forms, which together account for approximately 90% of the firm's overall procurements by value. Taisei Corporation recognizes that the green procurement ratio for these major items must be increased in order to achieve its future targets for green procurement.

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### ***Green Procurement Guidelines (FY2002)***

#### *Purpose*

Taisei Corporation is committed to fulfilling its obligation to the community and society to build a sustainable society, by promoting the use of construction materials and construction methods that reduce the impact on the environment during the design, construction, operation, and demolition of building structures. These environmental initiatives shall be implemented in accordance with the Taisei Environmental Policy, which includes a commitment to "protect and create a better environment." Taisei Corporation shall specifically focus on proposals to conserve energy and resources at the planning and design stage and to reducing the environmental impact at the construction stage, through initiatives designed to eliminate environmental pollution, reduce construction by-products, and promote recycling.

#### *Selection of Green Procurement Materials*

Taisei is committed to utilizing recycled materials, as well as making use of construction materials and construction methods with less environmental impact. Items for green procurement must satisfy the following criteria:

1. Does not contain hazardous substances exceeding permissible levels
2. Used in significant volume
3. Satisfies quality and durability requirements
4. Satisfies cost requirements

Materials for green procurement must comply with the following environmental selection criteria, with priority given to materials that satisfy the largest number of criteria.

#### *Selection Criteria*

Materials for green procurement must achieve a minimum score of 3 points, based on the following scoring system for comparison with conventional products.

1. Lifecycle CO<sub>2</sub> emission factor\* (Lower: 1, Same: 0, Higher: -1)



2. Conservation of resources or energy (Better: 1, Same: 0, Worse: -1)
3. Generation of construction by-products, measured by volume (Lower: 1, Same: 0, Higher: -1)
4. Use of recycled materials (Higher: 1, Lower: 0, None: -1)
5. Acquisition of ISO 14001 certification (Yes: 1, No: 0)
  - \* “Lifecycle CO<sub>2</sub> emission factor” refers to the amount of CO<sub>2</sub> emission during the lifecycle of a building from construction through to operation and demolition. The lifecycle CO<sub>2</sub> emission factor allows for a building to be evaluated according to its environmental impact, as defined by its contribution to global warming.

#### *Procedures*

Materials for green procurement are chosen on an annual basis based on discussions between relevant departments and the working group to review green procurement issues, which draws on the participation of the design, technology development, civil engineering, and building construction departments of Taisei Corporation. The Global Environmental Committee is responsible for approving the materials selected through this process, and shall subsequently notify the relevant departments of the decisions of the Committee.

1. Design departments meet with clients and hold discussions with construction material procurement departments and departments relevant to civil engineering. Based on these discussions, design departments propose the use of green procurement items by indicating the materials on design drawings.
  2. Purchasing and procurement departments procure Eco materials that satisfy the time frame and cost requirements.
  3. Construction departments hold discussions with construction material procurement departments and departments relevant to civil engineering. Based on these discussions, construction departments propose the adoption of green procurement items to either the client or designer(s) of a construction project, where the construction project was designed by a firm other than Taisei Corporation. Priority shall be given to separate guidelines, such as those described below, where they exist.
- Green procurement items outlined in specifications from a public agency
  - Construction based on green procurement guidelines produced by the client
  - Other guidelines similar to the guidelines stated above
- 

## **B. Promoting Green Procurement from Design Stage**

Initiatives designed to promote green procurement of construction materials must include efforts to actively incorporate Eco materials from the design stage. Taisei Corporation has adopted its “Eco Sheet” environmental design checklist, which plays a major role in Taisei’s efforts to promote green procurement. The Eco Sheet checklist covers 179 environmental factors organized under six categories, and describes issues such as consideration for the surrounding environment, resource conservation, resource circulation, and Eco materials. The Eco Sheet is used as a practical checklist to evaluate the environmental consciousness of a project during its design stage. The environmental factors contained in the Eco Sheet checklist are prescribed in such a way that project designers must check each design-related item prescribed in Taisei’s Green Procurement Guidelines, thus ensuring that green procurement is incorporated at the design stage. The Eco Sheet checklist includes recommended environmental planning indexes (see the table below) for specific building applications such as hospitals, hotels and apartment dwellings, using values based on past data collected by the firm. By using the Eco Sheet checklist to manage environmental planning ratios and implementation ratios in its designs, Taisei is able to successfully promote environmental consciousness at the subsequent construction stage.

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### *Eco Sheet Procedures (Excerpt)*

1. With the exception of the seven environmental factors listed under the category of “Determining Local and Lot Characteristics,” apply the following scoring method to all 172 environmental factors, in order to arrive at the Planning Score for each environmental factor and the Overall Planning Score (sum of each Planning Score).
    - Emphasized during planning stage: 2 points
    - Included at planning stage: 1 point
  2. Use the following scoring method to calculate the Implementation Score for each environmental factor and the Overall Implementation Score (sum of each Implementation Score):
    - Implemented as planned: Planning Score x 1.0
    - Only partially implemented: Planning Score x 0.5
    - Not implemented: Planning Score x 0
  3. Use the following equations to calculate the Planning Ratio, Implementation Ratio, and Achievement Index:
    - Planning Ratio =  $100 \times (\text{Overall Planning Score} / \text{Recommended Environmental Planning Index})$
    - Implementation Ratio =  $100 \times (\text{Overall Implementation Score} / \text{Overall Planning Score})$
    - Achievement Index =  $100 \times (\text{Planning Ratio} / \text{Implementation Ratio})$
- 

### *Recommended Environmental Planning Indexes for 2002*

	New construction, extension	Renovation/repair
Hospital, hotel	52	34
Office, condominium	48	31
School, factory, research lab	42	27
Restaurant or retail store	36	23
Shopping center, parking area	27	18
Other	42	27

The Taisei Agenda 2002 also sets quantitative targets for the firm according to ISO 14001. The current Agenda includes over 65 targets for environmentally conscious design to be achieved during 2002, and over 70 midterm targets to be achieved by 2004. Efforts to promote green procurement also help the firm to reach its quantitative targets according to ISO 14001. Furthermore, green procurement is promoted as part of the firm's Environmental Management System (EMS) under ISO 14001.

Efforts to promote green procurement must also include the involvement of suppliers and clients. Taisei Corporation is attempting to increase its ratio of environmentally conscious projects by using its Eco Sheet checklist to accurately gauge the environmental needs of its clients and actively propose the use of proprietary environmental technology at the sales stage. As a result of these initiatives, Taisei Corporation is able to assist building owners in the establishment of environmental management systems and to increase their understanding of green procurement efforts. The Eco Sheet checklist developed by Taisei as a result of its ISO 14001 certification can also be used by outside architectural firms to conduct detailed evaluations of environmental factors at the planning and design stage. By expanding the use of its Eco Sheet checklist in this manner, Taisei can effectively increase its green procurement ratio for projects designed by other companies, which currently account for 70% of Taisei's construction activity. These and other initiatives are designed to help Taisei Corporation expand its green procurement efforts. The firm exceeded its goal of achieving a green procurement ratio of more than 17% in 2001, reaching 17.8%. The firm is now working to achieve its midterm target of 25% green procurement by 2004.

### **C. Environmental Data Management System (E-DAM)**

Leading construction firms such as Taisei Corporation possess numerous project sites located throughout Japan, which can hinder efforts to promote green procurement and complicate attempts to measure overall green procurement performance. In order to address these issues, Taisei Corporation developed its Environmental Data Management System (E-DAM), which allows for management of green procurement performance so that Taisei's head office and branch offices can comprehensively manage the firm's environmental data and construction waste. At the project site, employees use the E-DAM system's forms to enter performance data covering project aspects such as treatment and processing results for construction waste, recycling results, and green procurement amounts. This environmental data is then centrally managed by the head office and branch offices of Taisei Corporation using the E-DAM system. In the two years since its adoption, the E-DAM system has given Taisei Corporation the ability to easily ascertain its green procurement ratio, and has dramatically improved the firm's ability to manage its initiatives for environmental conservation.

Taisei Corporation plans to further expand its green procurement initiatives at its branches and project sites by adopting a system that will allow branches and project sites to compare their green purchasing performance.

## **3. Green Purchasing Initiatives**

### **A. Green Purchasing Standards for the Workplace**

Taisei Corporation is also displaying a long-term commitment to green purchasing within the workplace, beginning with the formulation of its own standards for consumable and office supply purchases in 1997. From the outset of its green purchasing initiatives, the firm established relatively strict standards for office paper purchases, by specifying the purchase of office paper that is made from 100% recycled fiber content and does not exceed 70% brightness. Furthermore, Taisei set out to accomplish a company-wide, one-time conversion to using recycled office paper in all its operations, irrespective of the application or workplace. In order to ensure a successful transition, Taisei Corporation sought to gain the acceptance of its employees at the workplace level by using posters outlining the benefits and reasons for converting to recycled office paper. The effort to convert to recycled office paper was further aided by the support of key individuals in each of the departments within the firm. The success of Taisei's one-time conversion to recycled office paper also helped to raise the level of environmental awareness within the company and gain recognition for green procurement as an important environmental initiative.

In June of 2001, Taisei Corporation established its Green Purchasing Standards for the Workplace, which cover six product categories including paper products ranging from stationery and office supplies to copy paper and computer paper. The Standards specify that Taisei's employees give priority to the purchase of products listed in the Green Purchasing Network database, and to products with environmental labeling such as Eco marks, Green marks, and self-declared environmental labeling. The guidelines established by the Green Purchasing Network were used as a starting point in formulating Taisei's standards.

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#### ***Green Purchasing Standards for the Workplace (June 2001)***

In order to reduce the impact on the environment, the following products are recommended for purchases of products used in the workplace:

- a. Products containing the Wood-free Paper mark, Eco mark, Green mark or Recyclable Milk Carton mark.
- b. Products containing self-declared environmental labeling established by the manufacturer.
- c. Products listed in the GPN database published by the Green Purchasing Network.

1. Stationery and office supplies (including ball-point pens, post-its, paper cups, and envelopes for in-house use)
    - Contains a high proportion of recycled content
    - Capable of refilling/replenishment (for consumables)
    - Is designed and manufactured for ease of recycling and sorting of waste
    - Includes a content listing
    - Does not release hazardous substances during incineration or disposal
  2. Office paper (including copy paper, printer paper, and fax paper)
    - Contains 100% recycled fiber content
    - Does not exceed 70% brightness
  3. Continuous-form paper (including 10- and 11-inch continuous form paper and A4-size perforated continuous-form paper)
    - Contains no less than 70% recycled fiber content
    - Does not exceed 70% brightness
  4. Printed paper (including pamphlets, leaflets, and posters)
    - Contains a high proportion of recycled fibers
    - Uses a minimum of paper coating
    - Does not utilize plastic coating or other process that make recycling difficult
  5. Furnishings (including desks, chairs, and cabinets)
    - Utilizes a high proportion of recycled materials
    - Has a low rate of formaldehyde emission
    - Is designed for ease of disassembly after useful life, and for subsequent recycling of raw materials and parts/components
    - Includes after-sales service to enable long-term use
  6. Office equipment (including copiers, printers, fax machines, and scanners)
    - Contains international Energy Star labeling
    - Consumes less power during use
    - Has a higher energy consumption efficiency rating in accordance with Japan's Energy Conservation Law
    - Has a reduced power standby or shutoff mode triggered automatically after an idle period of non-use (not applicable to fax machines)
    - Is designed for ease of disassembly after useful life, and for subsequent recycling of raw materials and parts/components
    - Has a suitable program for recovery and recycling of used toner cartridges
- 

## **B. System for Green Purchasing Implementation and Management**

In 1997, Taisei Corporation created a system that would allow its purchasing personnel to easily implement green purchasing at its many project sites located throughout Japan. However, according to the staff responsible for deploying this system, the firm faced major obstacles during the initial operation of the system. In its earliest phases, the department responsible for developing the system prepared a product database with approximately 100 items for green procurement, and subsequently implemented the system at Taisei's head office, with plans to gradually expand the system to the firm's branch offices and project sites.

During this initial phase of development, the department in charge of the system undertook the task of manually evaluating over 10,000 purchases made by the head office of Taisei Corporation, in order to track the volume and amount of green purchases being made. The resulting data served as the basis for Taisei to objectively measure its green purchasing performance and to further identify obstacles and targets for improving its green purchasing initiatives. Presently, the firm is using an electronic purchasing system for office supplies used in the workplace, and is striving to expand its green product database as well as increase its efficiency in tracking green purchasing performance. From an outside perspective, it would appear that Taisei's initial experience in adopting green purchasing practices at the workplace level had a positive effect on increasing the level of awareness about green purchasing within the company.

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### ***Overview of Green Purchasing Initiatives for the Workplace in 2001***

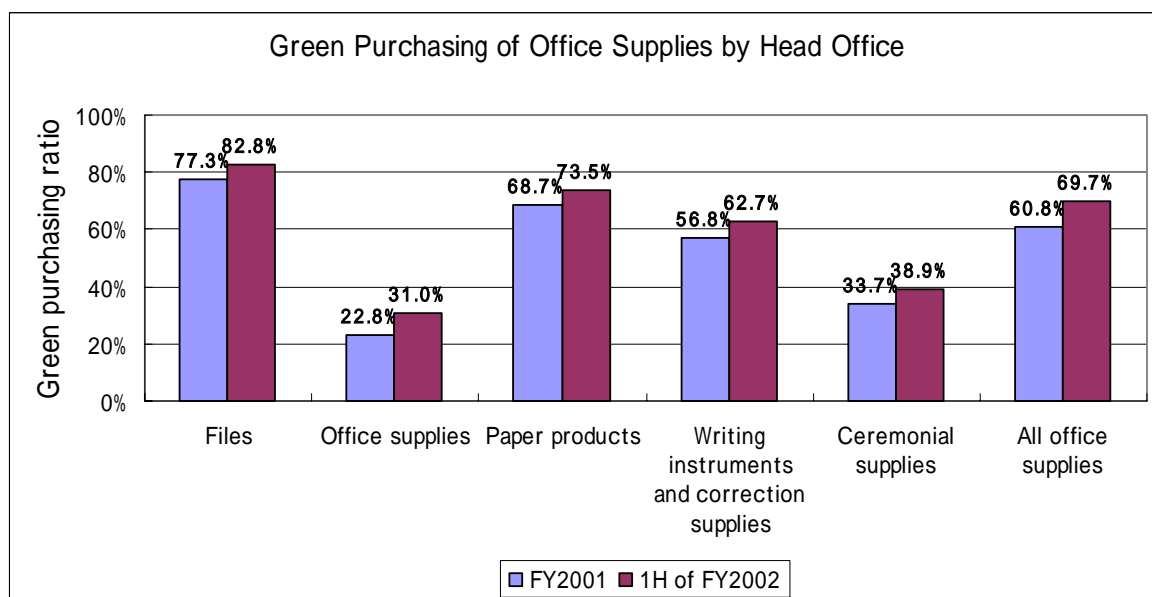
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Scope: Headquarters of Taisei Corporation  
 Management target: Green purchasing ratio  
 Persons in charge: To be selected by green purchasing coordinators within each department (or other manageable unit)

#### **Summary of Tasks:**

1. Implement purchasing according to the Green Purchasing Standards for the Workplace.
  2. If green purchasing is not possible, purchase products that can be easily sorted or easily disposed, wherever possible.
  3. The Environmental Management Dept. shall forward a quarterly "Green Purchasing Ratio Report" to the General Affairs Section of the General Affairs Dept.
- 

Taisei Corporation manages its green purchasing performance based on the firm's green purchasing ratio, which is calculated as a percentage of its overall purchases. In the major category of purchases for the workplace, green purchases accounted for nearly 70% of its head office purchases during the first and second quarters of FY2002, as shown in the graph below. The latest figure does not fully reflect the progress made by Taisei Corporation, as the adoption of a new purchasing system necessitated changes to the items and tabulation methods used to calculate the green procurement ratio. The most recent data therefore reflects the inclusion of new categories such as metal products like safes and other items.



The green purchasing system deployed by Taisei Corporation allows the firm to manage its green

purchasing ratio, which is summarized by department and published on its corporate Intranet on a quarterly basis. In addition, environmental system managers — department managers, and green purchasing coordinators in charge of actual product purchasing — hold meetings on a regular basis, in order to compare department performance and discuss ways of improving green purchasing performance. The meetings encourage participants to actively share information in an effort to further promote green purchasing. Presently, Taisei's green purchasing system has been expanded on a group-wide basis for use at branch offices and affiliates. Green purchasing coordinators are also being appointed at the branch office level in an effort to promote green purchasing. Some branch offices have utilized the educational materials and product selection guidelines provided by the Global Environment Department to create an "Eco Office Supplies Catalog" specific to their branch, listing products known to comply with Japan's Green Purchasing Law.

#### **4. Recycling and Other Initiatives to Reduce Environmental Impact**

According to trial calculations made by Taisei Corporation, the adoption of specific environmental initiatives can achieve as much as a 20% reduction in CO<sub>2</sub> emissions during a building's lifecycle from construction to operation and demolition, when directly compared with conventional designs. The initiatives identified by Taisei Corporation are: (1) conservation of resources and use of recycled materials at the design stage of a building; (2) sorting of waste, recycling, and reduction of packaging at the construction stage; and (3) the adoption of various energy conservation systems at the building operation stage.

##### **A. Zero Emission Initiatives**

Due to a dramatic decrease in the capacity of Japan's final disposal sites for industrial waste, Taisei Corporation is involved in long-term "zero emission" initiatives designed to minimize the final disposal of waste by the firm. These initiatives are aimed at achieving a final disposal ratio of no more than 10% in metropolitan areas and less than 20% in non-metropolitan areas. Furthermore, in an effort to reduce construction waste, Taisei has achieved a 92% recycling rate for construction waste by undertaking the following initiatives for the delivery of materials to project sites:

- (1) Use of pre-cut building materials, in order to reduce cutting waste and increase delivery efficiency
- (2) Use of reduced packaging for building materials and equipment/furnishings, in order to increase delivery efficiency
- (3) Sorting and recovery of cutting waste, for recycling by the manufacturer
- (4) Crushing of concrete from demolition, for recycling use in road base
- (5) Sorting and recovery of other construction waste, for recycling at plants, using intermediate treatment firms

##### **B. Case Study: Reuse of Excavated Soil Using Environmental Data Management System (E-DAM)**

Taisei Corporation supplied approximately 19,500 m<sup>3</sup> of surplus soil for the reclamation of two park areas, using soil excavated from four separate construction sites. The use of Taisei's E-DAM system allowed it to share information and identify nearby work sites where soil could be brought in over a shorter delivery distance than was originally planned, thus producing less CO<sub>2</sub> emissions. As a result, the delivery distance for each dump truck was shortened by an average of 40 km per trip over 3,250 trips (calculated based on the use of 10 ton dump trucks).

## **5. Employee Education**

In addition to promoting green purchasing practices, Taisei Corporation is involved in various educational initiatives to implement environmental education and share up-to-date environmental information with its employees, with the goal of increasing the level of environmental awareness among each employee. The major educational initiatives pursued by Taisei Corporation are outlined below, and are primarily supported by the efforts of the Global Environment Department.

- (1) Global Environment Award to recognize groups, project sites, or subcontractors that have undertaken initiatives to reduce the impact on the environment
- (2) Creation of an Environmental Management Dept. information site as part of the firm's corporate Intranet. The site serves as central source of environmental information within the company.
- (3) Inclusion of environmental articles in its "Taisei" corporate newsletter, covering a wide range of topics from environmental initiatives to environmental technology
- (4) Annual creation of a corporate environmental poster, to coincide with the designated Environment Month occurring every June to enhance environmental awareness among employees
- (5) Subsidies for acquisition of environmental qualifications and participation in environmental education by employees
- (6) Implementation of regular environmental education for its subcontractors

## **6. Future Initiatives to Promote Green Purchasing**

Taisei Corporation has made steady progress in its efforts to promote the green procurement of construction materials and green purchasing for the workplace, and is focusing on the following areas of environmental activity in order to expand its green purchasing initiatives:

- To gather accurate information regarding Eco materials that are difficult to select due to variations in cost and quality, and to increase the green procurement rate for these materials
- To further promote green purchasing within the product categories outlined in the purchasing guidelines of the Green Purchasing Network (including the guidelines for hotels/accommodation recently set)
- To further strengthen the commitment for green procurement at branch offices and project sites where green procurement is impeded as a result of past business customs or business relationships.
- To ascertain the status of environmental conservation initiatives undertaken by its subcontractors and suppliers

The construction industry as a whole continues to face a variety of issues related to the quality and cost of Eco materials used for construction, and the task of reducing the impact on the environment represents a major challenge for the industry as a whole. As part of the construction industry, Taisei Corporation is actively working to promote green procurement and green purchasing as part of its overall effort to reduce the impact on the environment, through initiatives aimed at reducing construction waste and CO<sub>2</sub> emissions.

# **Green Purchasing Initiatives by Obayashi Corporation**

## **1. Introduction**

The construction industry typically utilizes large amount of various construction materials, resulting in both direct and indirect environmental impact throughout the lifecycle of a building, starting from the manufacturing of construction materials, equipment and products and continuing through to building planning, design, construction, utilization, renovation, and demolition. The adoption of green purchasing initiatives within the construction industry requires an aggressive commitment to the creation of a sustainable society by purchasing suitable construction materials, equipment and products that cause the least environmental impact during the lifecycle of a building, in addition to standard cost, quality, performance, and safety considerations. Furthermore, the construction industry must strive to adopt environmentally friendly systems, structures and construction methods, and to provide services such as energy-saving diagnosis that are consistent with a commitment to green purchasing.

However, the construction industry is based on the project made to order in nature, which can serve as an obstacle to green purchasing, as construction firms must consider the cost and quality of materials, equipments and products while taking into account the policies and specifications of individual clients and building designers.

## **2. History of Green Purchasing**

### **A. History Outside of Obayashi Corporation**

In 1996, the Japan Federation of Construction Contractors (JFCC), Japan Civil Engineering Contractors' Association, Inc. (JCECA), and Building Contractors Society (BCS) jointly formulated the "Action Plan for Environmental Conservation by the Construction Industry." The Action Plan was established in order to promote measures to prevent global warming and create a sustainable society in construction industry. The JFCC later published its own "Introduction to Green Purchasing" in March 2000, with the aim of assisting the construction industry in its efforts to adopt green purchasing.

In August 2001, the JFCC, JCECA, and BCS jointly established a working group to establish guidelines for green purchasing, which included the staff of Obayashi Corporation as a member of the working group. The efforts of the working group eventually resulted in the formulation of the "Green Purchasing Guidelines for the Construction Industry" in July 2002.

Green Purchasing is also being promoted by the Japanese government, which established or revised six recycling-related laws in June 2000. Relevant laws include the "Basic Law for Establishing a Recycling-based Society" and the "Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities," also known as the Green Purchasing Law. The Green Purchasing Law took effect in April 2001, and describes the obligation of the Japanese government and independent administrative institutions and local governments to establish policies for green purchasing and to publish their purchasing performance data. Furthermore, the Green Purchasing Law urges the businesses and citizens of Japan to "choose eco-friendly goods, etc., as much as possible when buying or renting goods or receiving services," while also urging the businesses of Japan to "provide, in an appropriate manner, the necessary information to understand the environmental impact in relation to said goods."

Many of Obayashi Corporation's private-sector clients, particularly those involved in manufacturing,



have been relatively early adopters of green purchasing, and have formulated their own in-house guidelines or standards for green purchasing that apply to suppliers. The guidelines or standards established are typically designed to evaluate various facets such as the supplier's corporate commitment to environmental conservation, its initiatives for environmental conservation, and the environmental impact of raw materials, parts, products, and services provided by the supplier. Further consideration is given to the utilization, processing, and management of hazardous substances by suppliers before green purchasing occurs. In addition, Obayashi Corporation's clients are increasingly demanding environmentally friendly design and construction work, of which green purchasing is one aspect.

## **B. Green Purchasing Initiatives by Obayashi Corporation**

Obayashi Corporation established its own "Action Plan for Environmental Conservation " in December 1991, and began various activities at all branches starting from October 1992. The firm's major green purchasing-related activities are as follows:

- Increase the use of recycled paper
- Adopt ecologically friendly designs
- Develop environmental technologies
- Increase the Ratio of replacement of tropical timber plywood with form
- Reduce the volume of construction waste consigned to final disposal

In February 1996, Obayashi Corporation began to lay the groundwork for establishing an Environmental Management System (EMS) in order to eventually acquire ISO 14001 certification. The firm later established its "Obayashi Corporation Environmental Policy" in November 1997, and successfully acquired ISO 14001 certification for its Tokyo Head Office in September 1998 and its Main Office in December 1998. Obayashi Corporation eventually received ISO 14001 certification for all of its nine branches before March 1999.

Obayashi Corporation's organization chart for its Environmental Management System is shown in Figure 1.

In January 2001, the Tokyo Head Office of Obayashi Corporation added green purchasing initiatives to its separate Environmental Policy prior to other branches, in order to comply with the forthcoming enactment of Japan's Green Purchasing Law. The separate Policy for the Tokyo Head Office states, as its second Policy, that "all employee will take, in daily work, such measures as saving energy and resources, reduction of waste, encouragement of recycling and green purchasing."

In terms of guidelines for green purchasing, Obayashi Corporation established its "Green Purchasing Standards for Office Supplies, Equipment and Other Items" in April 2000. The firm later began research into green purchasing of construction materials, equipment and products in July 2000, and subsequently established a Technical Committee for Green Purchasing Standards in December of that year. The work of the Technical Committee led to the formulation of the firm's "Green Purchasing Guidelines" in March 2001, which was followed by the adoption of green purchasing initiatives at its Tokyo Head Office in the following April and by all of its branches in September 2001.

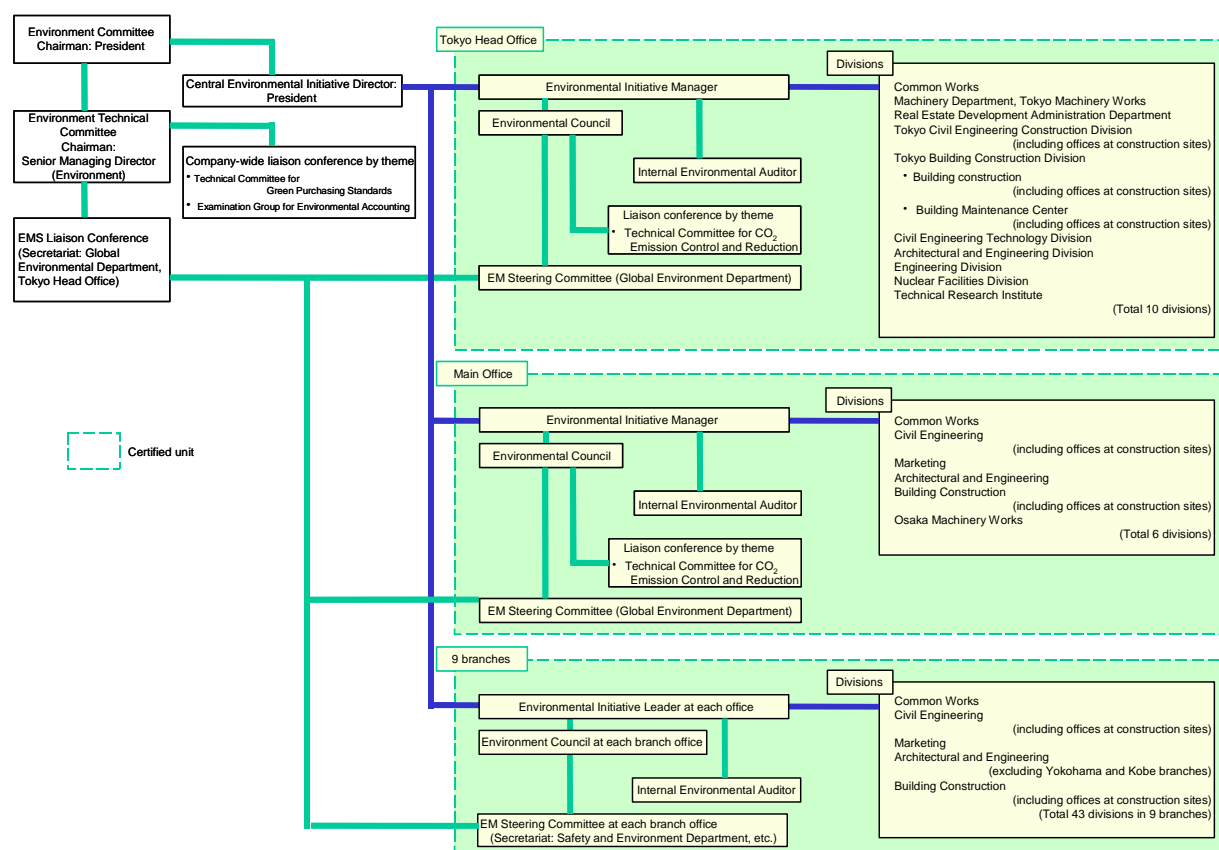
## **3. Organization and System for Green Purchasing**

### **A. Office Supplies and Equipment**

The General Administration Department of the Tokyo Head Office of Obayashi Corporation created the firm's "Green Purchasing Standards" in April 2000, which contains separate standards for evaluating both products and its supplier's commitment to green purchasing. The General Administration Dept. of each branch of Obayashi Corporation utilizes the Standards to conduct comprehensive product evaluations and carry out bulk purchasing of products that best comply with the guidelines set forth by the Standards. The Administrative Dept. is also responsible for bulk purchasing of office supplies and similar items required by other departments within each branch. In addition, the Tokyo Head Office service station has created a list of office supplies and similar items that includes environmentally friendly products and other environmental information.

Many of Japan's manufacturers of office supplies have already acquired ISO 14001 certification and are supplying Obayashi Corporation with products that possess various forms of environmental labeling. Specific examples include products that bear the Japan Environment Association's (JEA) Eco Mark label in accordance with its Certification Criteria and products that bear the Paper Recycling Promotion Center's Green Mark label for recycled paper products.

Figure 1. Obayashi Corporation Environment Management System Organization



## B. Construction Materials, Equipment and Products

Since establishing the firm's Green Purchasing Guidelines in March 2001, Obayashi Corporation's Technical Committee for Green Purchasing Standards has been conducting annual year-end reviews of the document. The review process involves adding new items for green purchasing and modifying the criteria for selecting materials.

Obayashi Corporation has also established the EM Steering Committee at each of its branches, which is responsible for promoting and overseeing the environmental activities in each branch. The EM Steering Committees also work together to coordinate company-wide initiatives for green purchasing.

Temporary-use materials and major construction materials used by Obayashi Corporation are purchased by purchasing departments at each branch. The firm's Architectural and Engineering Division also implements green purchasing at the design phase, and use the firm's "Environmentally-conscious Design Data Sheet" to track the green purchasing performance of designs.

#### 4. Selection Standards for Construction Materials and Decision-making

##### A. Specific Items and Criteria

Obayashi Corporation has identified specific items for which it aggressively pursues green purchasing in its public works and construction projects. The list of specific items for green purchasing began with 13 items in FY2001 and then grew to 47 items in FY2002, as shown in Table 1.

The specific items and criteria are based on various established policies and sources of information that include the Obayashi Corporation Environmental Policy, environmentally friendly evaluation factors and criteria, environmentally friendly design performance at the design phase, product categories and criteria prescribed by Japan's Green Purchasing Law, and certification criteria for Eco Mark product labeling. The firm's three major prerequisites for selecting specific items for green purchasing are as follows:

- Materials for which purchasing data at the construction phase is available
- Materials for which purchasing data is reliable and easily obtained
- Materials that are beneficial to the environment or contribute to creating a better environment.

**Table 1 FY2002 Specific Items for Green Purchasing: Construction Materials and Products**

Note: Green purchasing performance is based on 16 items (highlighted in green).

1	Reclaimed Excavation soil	17	Thinnings	33	Lighting control system
2	Super-plasticized soil	18	Ceramics tile	34	Environmentally-conscious road
3	Soil hardener	19	Carpet tile and roll carpet	35	EM electric wire and cable
4	Recycled asphalt concrete	20	Wall paper	36	Advanced phase capacitor (power factor improvement)
5	Recycled aggregates, etc.	21	Rock wool sound absorbing board	37	Water saving equipment (including automatic faucets, automatic flush units, and urinals equipped with
6	Blast-furnace slag aggregate	22	Interior and exterior finishing material made from recycled glass		
7	Ferronickel slag aggregate	23	Recycled gypsum board	38	Absorption water cooler/heater
8	Copper slag aggregate	24	Plywood with low formaldehyde emission	39	Total heat exchanger
9	Asphalt mixture with iron and steel slag	25	Particle board	40	Non-ozone layer-depleting fire extinguishers and fire extinguishing systems
10	Iron and steel slag mixed base course	26	Fiber board	41	Solar power generation system
11	Rainwater percolation permeable pavement (aggregated concrete, block, brick)	27	Wooden type cement board	42	Solar thermal utilization system
12	Portland blast-furnace cement	28	Sound absorber	43	Fuel cell
13	Blast-furnace readymixed concrete	29	Non-fleon type thermal insulation and heat insulation	44	Low exhaust gas emission construction machinery
14	Fly-ash cement	30	Thermal insulating sash and door	45	Low-noise construction machinery
15	Electric furnace steel materials	31	Environmentally-conscious coating (waterpaint; not including lead and chrome, etc.)	46	Bark compost
16	Replacement of tropical timber plywood with form	32	High frequency fluorescent lighting fixtures	47	Fertilizer made from sewage sludge compost

## B. Decision-making

Obayashi Corporation implements green purchasing of construction materials, equipment and products based on a comprehensive evaluation that takes into account the reduction of environmental impact, in addition to standard cost, quality, durability, and quantity considerations. The firm also evaluates the waste recovery and processing implemented by the manufacturer, supplier or recycling organization. If the price of two materials is the same, Obayashi Corporation gives preference to materials that contain Eco Mark labeling or satisfy the selection criteria under Japan's Green Purchasing Law.

At the present time, construction materials, equipment and products that conform to specific items and its selection criteria for green purchasing are relatively limited. Furthermore, they are often only available from limited suppliers.

## 5. Selection Criteria for Suppliers

Obayashi Corporation gives preference to suppliers that have acquired ISO 14001 certification, as an important component of its green purchasing initiatives. However, only a small number of manufacturers of construction materials have acquired ISO 14001 certification at the present time, and the firm's overall ratio of ISO 14001 suppliers is relatively low compared with other industries.

For suppliers that have not acquired ISO 14001 certification, Obayashi Corporation prefers to use suppliers that satisfy the following criteria: (1) suppliers that actively develop and market products that contribute to reduction of environmental impact when compared with conventional products and (2) suppliers that actively publish environmental information about the products.

Obayashi Corporation also procures construction materials from overseas sources, including wood products, metallic items, curtain wall, stone materials, and glass. However, wood products in particular must conform to the environmental criteria in Japan in order to be successfully purchased from overseas, even though they may be available at a lower cost.

## 6. Monitoring Green Purchasing and Obstacles to Green Purchasing

### A. Monitoring Green Purchasing

Obayashi Corporation began monitoring its green purchasing performance in FY2001, starting with an initial list of 13 designated items for green purchasing, which are tracked by volume or by purchasing cost. The firm began tracking its green purchasing data for the Tokyo Head Office starting from April 2001, and later began tracking its performance at all ten of its branches in October 2001. In FY2002, Obayashi Corporation increased the number of designated items used to track its green purchasing performance to 16 items. The firm's Global Environment Department is responsible for overseeing the green purchasing performance data in company-wide, while different departments within the firm are responsible for tracking purchasing of individual items, as described below.

#### *Safety and Environment Dept.*

Responsible for tracking data entered at construction site offices, with respect to the following items: Reclaimed excavation soil, Recycled aggregates, Recycled asphalt concrete, Portland blast-furnace cement, and Replacement of tropical timber plywood with form.

#### *Purchasing departments*

Responsible for tracking the purchasing cost from trading companies, interior finishing subcontractors and equipment subcontractors, with respect to the following items: Electric furnace steel materials, Carpet tile, Roll carpet, Wallpaper, Sound insulation panel made from rock wool, High frequency

fluorescent lighting fixtures, Water saving equipment, Fire extinguishers and fire extinguishing systems that use non-ozone layer-depleting gasses, and EM electric wire and cable.

*Global Environment Dept.*

Responsible for tracking the purchasing cost from suppliers with respect to Interior and exterior finishing materials made from recycled glass.

*Machinery Dept.*

Responsible for tracking the purchasing cost and leasing costs for Low exhaust gas emission construction machinery and Low-noise construction machinery

## B. Green Purchasing Performance

Obayashi Corporation's green purchasing initiatives and its performance data are described in the "Obayashi Environmental Report 2002," which is available on the firm's corporate Web site (<http://www.obayashi.co.jp/environment/report/pdf/eco2002.pdf>). The firm's green purchasing performance in FY2002 is shown in Table 2.

**Table 2 FY2001 Green Purchasing Performance**

No.	Designated items		Total
1	Reclaimed Excavation soil		202,000 m <sup>3</sup>
2	Recycled asphalt concrete		37,000 t
3	Recycled aggregate, etc.		214,000 t
4	Portland blast-furnace cement (Purchasing volume)		27,000 t
5	Electric furnace steel materials (Purchasing volume)	Steel frame	144,000 t
		Reinforcing bar	383,000 t
6	Replacement of tropical timber plywood with form	Alternative form (total size)	3,942,000 m <sup>2</sup>
		Form (total size)	9,177,000 m <sup>2</sup>
		Ratio of alternative form	43%
7	Carpet tile and roll carpet (Purchasing volume)		63,000 m <sup>2</sup>
8	Wall paper (Purchasing volume)		18,000 m <sup>2</sup>
9	Rock wool sound absorbing board (Purchasing volume)		164,000 m <sup>2</sup>
10	High frequency fluorescent lighting fixtures (Purchasing cost)		125 million yen
11	EM electric wire and cable (Purchasing cost)		33 million yen
12	Water saving equipment (Purchasing cost)		38 million yen
13	Non-ozone layer-depleting fire extinguishers and fire (Purchasing cost)		77 million yen

## 7. Obstacles to Green Purchasing and Future Initiatives

As part of its effort to promote green purchasing, Obayashi Corporation is involved in gathering related environmental information that is necessary to compare and to evaluate construction materials, equipment and products for green purchasing. Although a large number of database for green products (Table 3) is provided on the Website, some of the databases contain relatively few construction material entries and provide insufficient data for green purchasing. Consequently, the firm has taken the initiative to gather environmental data by directly contacting manufacturers to obtain brochures and Material Safety Data Sheets (MSDS) for their products.

Obayashi Corporation has also established the “Cone” online database for construction materials (<http://www.construction-portal.com/>), which contains products and environmental information covering all aspects of the construction industry. Obayashi Corporation is committed to further expanding the content of the Cone site and hopes that it will serve as a portal for the exchange of environmental information within the construction industry.

In FY2003, Obayashi Corporation plans to formulate a comprehensive set of guidelines for green purchasing that will incorporate its existing standards for office supplies and construction materials. The forthcoming guidelines will include new items for green purchasing in accordance with periodic addition to the designated green purchasing items prescribed by the Green Purchasing Law, as well as new product categories that the firm has developed and identified as having a significantly reduced environmental impact. The new guidelines will serve as a starting point for Obayashi Corporation to further promote green purchasing initiatives within the company.

On an industry-wide level, the JFCC, JCECA, and BCS recently published the 3rd edition of the “Action Plan for Sustainable Development by the Construction Industry” in February 2003. The latest Action Plan now includes a chapter that focuses on concrete strategies for promoting green procurement within the construction industry. The JFCC, JCECA, and BCS are planning to create brochures and manuals for green purchasing within the construction industry, and are planning to sponsor educational seminars on green purchasing.

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## **Excerpt from the 3rd Edition of the “Action Plan for Environmental Conservation by the Construction Industry”**

Published by the Japan Federation of Construction Contractors (JFCC), Japan Civil Engineering Contractor’s Association, Inc (JCECA) and Building Contractors Society (BCS):

### **Chapter 4: Promoting Green Purchasing**

#### **Background**

The enactment of Japan’s Green Purchasing Law has accelerated the adoption of green purchasing at the government level, and further obligates the use of specific green purchasing items with respect to construction materials and equipment, and construction methods used in public construction work performed on behalf of the Japanese government, etc.

The construction industry typically utilizes large amount of various construction materials, which it must recognize as having both a direct and indirect environmental impact throughout the lifecycle of a building. Use of these materials must be accompanied by a commitment to actively contribute to the creation of a sustainable society.

#### **Purpose**

To raise awareness of green purchasing within the construction industry\* and promote active green purchasing.

\* Green purchasing within the construction industry: Refers to the purchasing of environmentally friendly construction materials, equipment and products, in addition to standard factors such as quality, performance, cost, and safety considerations as they apply to buildings. Also refers to the adoption of environmentally friendly systems, structures and construction methods, and to the provision of services such as energy-saving diagnosis.

(The above definition originates from the “Green Procurement Guidelines for the Construction Industry” formulated by the JFCC, JCECA, and BCS)

#### **Implementation**

##### **1. Implementation Policies for JFCC, JCECA, and BCS Member Firms**

###### **A. Promoting Green Purchasing of Construction Materials, etc**

Firms shall strive for green purchasing of construction materials, etc by evaluating materials in terms of the reduction in environmental impact during the product lifecycle, and in terms of their contribution to creating a better environment. Firms shall also give preference to the purchasing of materials designated by the Green Purchasing Law and other guidelines, while making every effort to present clients and building designers with proposals to adopt environmentally friendly materials.

###### **B. Promoting Green Purchasing of Office Supplies**

Firms shall make every effort to adopt green purchasing of items used during their daily undertakings, including office supplies, office equipment, and vehicles.

### C. Promoting the Development and Improvement of Green Procurement-related Technology

Firms shall make every effort to collaborate with relevant industries in order to develop and improve upon technology, products, structures, construction methods, and systems that contribute to the promotion of green purchasing.

### 2. Implementation Policies for JFCC, JCECA, and BCS

#### A. Education for JFCC, JCECA, and BCS Member Firms

The JFCC, JCECA, and BCS shall actively take part in educational initiatives such as publishing brochures and sponsoring educational seminars, in an effort to increase awareness of green purchasing and promote green purchasing.

#### B. Information Exchange with Relevant Industries and Government

The JFCC, JCECA, and BCS shall actively exchange information with relevant industries and the government, with respect to designated green purchasing items prescribed by the Green Purchasing Law.

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Table 3 Databases Containing Information on Construction Materials, Equipment and Products for Green Purchasing

No.	Website	Administrator	URL
1	<b>General information service on green purchasing and products</b> <ul style="list-style-type: none"> <li>• GPN Database</li> <li>• Directory for procurement products designated by Law on Promoting Green Purchasing</li> </ul>	Green Purchasing Network (GPN)	<a href="http://www.gpndb.jp/">http://www.gpndb.jp/</a> <a href="http://www.gpndb.jp/gpn/view/gov_index.asp">http://www.gpndb.jp/gpn/view/gov_index.asp</a>
2	<b>Green Station</b>	Japan Environment Association	<a href="http://www.jeas.or.jp/ecomark/index.html">http://www.jeas.or.jp/ecomark/index.html</a>
3	<b>Eco Mark product database</b> <b>Eco Mark criteria</b>		<a href="http://www.jeas.or.jp/ecomark/nintei.html">http://www.jeas.or.jp/ecomark/nintei.html</a>
4	<b>Cone</b> (Comprehensive catalog for construction material, equipment and machinery)	Obayashi Corporation <ul style="list-style-type: none"> <li>• Public homepage</li> <li>• Information related to environment</li> <li>• MSDS registration</li> <li>• Promoted by JFCC, JCECA and BCS</li> </ul>	<a href="http://www.construction-portal.com/">http://www.construction-portal.com/</a>
5	<b>Construction database</b> (List of recycled construction material)	Construction Research Institute	<a href="http://www.kensetu-bukka-m.co.jp/yoran/index.html">http://www.kensetu-bukka-m.co.jp/yoran/index.html</a>
6	<b>Construction material database</b> (Recycled and/or ecological material)	Economic Research Association	<a href="http://211.15.45.93/kendb/prog/search1_f.asp">http://211.15.45.93/kendb/prog/search1_f.asp</a>
7	<b>Archimap</b> (Recycled construction material)	Information Center for Construction Material	<a href="http://www.archimap.ne.jp/">http://www.archimap.ne.jp/</a>
8	<b>AM Catalog Web 2001</b> (Homepage for construction material, equipment and machinery information)	Kajima Institute Publishing, Co., Ltd.	<a href="http://www.plus-alpha.co.jp/am/">http://www.plus-alpha.co.jp/am/</a>
9	<b>DNA21</b> (Homepage for construction material, equipment and machinery information)	Nikkei Architecture	<a href="http://kenplatz2.mediagalaxy.ne.jp/select_frame.phtml?category2_merge=10307">http://kenplatz2.mediagalaxy.ne.jp/select_frame.phtml?category2_merge=10307</a>
10	<b>dbNET</b> (Information network on construction material, equipment and machinery)	Watanabe Lab, Waseda University and Information Center for Construction Material, Equipment and Machinery	<a href="http://dbnet.watanabe.arch.waseda.ac.jp/opinion.html">http://dbnet.watanabe.arch.waseda.ac.jp/opinion.html</a>
11	<b>KISS</b> (Information service system for construction material)	Federation of Construction Material Industries, Japan	<a href="http://www.jkiss.or.jp">http://www.jkiss.or.jp</a>

Note: Some of the reference databases listed above primarily contain information on general products, and provide limited information on construction materials for green procurement.

# **Survey on Green Purchasing Activities in Korea**

**March 2003**

**Korea Environmental Labelling Association**

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# **Survey on Green Purchasing Activities in Korea**

## **1. Introduction**

A workshop was held at the Korea Chamber of Commerce and Industry in Korea on February 10, 2003, aiming to promote the manufacturing and consumption of environment-friendly products. The meeting attracted more people than expected and the participants sat through the sessions in their entirety, reflecting the heightened interest in environment-friendly products in Korea.

The current system of mass production, consumption, and disposal, has provided material abundance to many parts of the world. However, it has simultaneously brought on global environmental problems such as resources and energy depletion, air and water pollution, global warming, ozone layer destruction, and desertification.

Aiming to resolve these problems, the Korean government is pushing ahead with various environmental policies. Notably, environmental policies, which focus on developing and maintaining sustainable production and consumption systems, are designed to reduce environmental loads without restraining production and consumption activities. Past environmental policies that addressed production-related processes were unable to combat current environment problems, so some have advocated implementing a system that enables continued production and consumption.

Taking into consideration the entire product processing mechanism, ranging from raw material collection to production to consumption and eventual disposal, a product is labelled an environment-friendly product or a green product if it produces less loading to the environment than other products with the same usage. A green purchasing scheme, which embraces environment-friendly products has emerged as a positive solution in addressing environmental problems caused by mass production and consumption, enabling the structuring of a solid sustainable production and consumption system. The green purchasing scheme not only lowers environmental loading by incorporating environment-friendly products, but also encourages corporations to pursue environment-friendly management, thus greatly helping to structure a sustainable production and consumption system.

Given its significance, various sectors including the public and industrial sectors in Korea have recently been implementing numerous systems aimed at promoting green purchasing. This report aims to highlight some of those systems.

## **2. Green Purchasing in the Public Sector**

Given the nature of environmental problems, efforts made by the public sector as opposed to those made by other sectors will prove crucial for the success of green purchasing in the early stage. The role that the public sector plays is a vital one, and in that capacity Korea has implemented several systems to invigorate green purchasing in the public sector.

Such systems endorse the preferable purchase of accredited products with environmental labels and the purchase of recycled products.

Legislation for Environmental Technology Support and Development and Promotion of Resources Saving and Reutilization, provide for preferable purchase systems that encourage the purchase of recycled products and accredited products with environmental labels.<sup>1</sup> In accordance with these laws, the Minister of Environment requests the heads of public agencies to take necessary steps to promote such purchases, and those public agencies in turn should take steps to implement such laws.<sup>2</sup> The key public agencies include national and local governmental agencies, their-invested institutions, and special corporations that are mandated by law to undertake and assist national agencies' in their work. These agencies should purchase accredited products with environmental labels and recycled products, and submit performance reports to the Minister of Environment. The Minister of Environment is then required to publish the results of the agencies in governmental journals.

This principle holds true to the planning and carrying out of construction and civil engineering projects. Relevant public agencies are required to make reasonable efforts to use more environment-label accredited and recycled products in the design of relevant projects if this does not have a detrimental effect on the product.

With respect to the government's procurement of goods and services, Articles 23 and 26 of the Ordinances of Act relating to contracts to which the state is a party provide that agencies concerned are required to seek environment-label accredited products or recycled products through Selective tendering or limited tendering. This effort attempts to promote green purchasing in the public sector. Under the arrangements with the Public Procurement Service, supply goods sent to public agencies must have their suitability deliberated. Environment-friendly products are given more points so as to encourage green purchasing by public agencies.

In the same manner, the Public Procurement Service includes a technologically-superior factor in its criteria for designating Excellent Quality Products<sup>3</sup>, aiming to encourage their purchase.

Korea also maintains similar policies regarding energy-conservation products in addition to environmental-label products and recycled products.

Regulation for diffusion of energy-efficient goods (as notified by the Ministry of Commerce, Industry and Energy(MOCIE)) states that the Minister of Commerce, Industry and Energy can require the heads of public agencies to purchase energy-efficient goods when new or

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<sup>1</sup> The preferable purchase of accredited products with environmental label and recycled products has been limited to accredited products with type environmental label (hereinafter referred as environmental label). In the case of recycled products, the preferable purchase is limited to the recycled products the Minister of Environment publishes.

<sup>2</sup> The law relating to Environmental Technology Support and Development provides that the Environment Minister may request to heads of public agencies to take necessary steps for preferable green purchasing, and the head of a public agency so requested shall comply with the request without special reasons. This is seen not as an obligation but a recommendation unlike the law relating to Promotion of Resources Saving and Reutilization. However, the Environment Ministry is pushing to revise the law concerned to be upgraded to the level of the law relating to Resources Saving and Reutilization, thus paving the way to encourage the green purchasing.

<sup>3</sup> As the main purpose of the Excellent Quality Products System lies in supporting the sales for promising small- and medium-sized companies and venture companies, the following products are highly likely to be designated as Excellent Quality Products. -Advanced technology products (KT, NT, EM, IT, GR, GQ, new technologies related to electricity and construction) -Products under patent and practical new design manufactured by small- and medium-sized companies or venture companies.

replacement demand occur. The public agencies include national and local governmental agencies, their-invested institutions, their-reinvested institutions and national and public research institutions.

Similarly, the Energy Consumption Products Purchase Operation Criteria (as decreed by the Public Procurement Service) states that when a relevant agency requests the procurement of energy-efficient goods, electricity-saving office equipment or home appliances, the manager in charge of the purchase and contract must immediately confirm their accreditation as energy-efficient products with the Minister of Commerce, Industry and Energy (head of Korea Energy Management Corporation). The manager must then report confirmation of accreditation to the relevant agency, and if affirmative, encourage its usage. However, if an accredited product cannot be found competitive because only a single company manufactures it, the use of such a product may not be encouraged.

In addition to these green purchasing systems established by national laws and the central government, local administrations and public agencies are voluntarily making strides towards green purchasing.

For instance, the Seoul Metropolitan Government has decided to enact its own green purchasing criteria and implement it starting January 1, 2004. It aims to cut down on costs incurred by the consumption of resources from using environmentally harmful products as well as social costs from environmental pollution.

Public agencies are unable to consider the environmental factors in finalizing purchase contracts because existing national contract-related laws only provide for lowest price bidding systems and a set national standard for determining successful contracting parties. However, Seoul City's green purchasing criteria requires a supplier to prove the environmental benefits of the product concerned through objective data, thus reinforcing the importance of environmental factors.

As such, green purchasing is complicated and comprehensive. Seoul City officials must consider all product factors (ranging from manufacturing, distribution, consumption, to disposal), then establish environment-related criteria for each product, and ultimately reflect all this in contract terms and conditions. Seoul City has previously established environmental criteria for six items (roads, gas boilers, street lamp ballasts, tap water meters, tires, and laser printers), which are likely to bring about a greater effect of environmental improvement. The city will further continue to set such detailed criteria. The city will also request relevant agencies to revise standards and special construction specifications to promote the use of more environment-friendly materials in its ordered projects.

The city's green purchasing criteria is expected to bring about the effect of preventing the waste of resources and environmental pollutants generated by using environment-hostile products. Also, these efforts will expand demands for environment-friendly products, promote their production and development by businesses, and help disseminate the green purchasing culture to other local administrations and citizens.

### **3. Green Purchasing in Industrial Sectors**

As a growing number of people are starting to acknowledge the importance of a healthy environment, the Korean industrial sector is striving to enhance their corporate image by addressing the industrial environmental problem through the use of environment-friendly green purchasing from the early stage of gathering raw materials, as well as by realizing that environmental problems can be trade barriers thus shedding the past attitude of treating environmental problems passively only after the fact.

Corporations only observe existing relevant domestic and foreign regulations when they conduct green purchasing. As mentioned earlier, it can serve as a countermeasure to forthcoming environmental regulations to take environment into account from the stage of purchasing raw materials. This approach is all the more important for Korea because the country sees a higher share of its exports, notably electrical and electronic goods, becoming the focus of environmental regulations aimed at reducing wastes in advanced nations such as EU, the U.S.A., and Japan. In addition, green purchasing enables reductions in cost for treating wastes, improves overall environmental performance, and enhances the image of corporations that practice it.

Mindful of the significance of green purchasing and environment-friendly management by corporations, the Act relating to the Promotion of the Transfer to Environment-friendly Social Structure provides that policies and steps that aim to promote and disseminate environment-friendly management, support corporations that develop and utilize environment-friendly management techniques as well as corporations that manufacture and purchase environment-friendly products shall be implemented.

Given such necessity and the movement of the times, large businesses have bought into green purchasing, and have recently diversified efforts to disseminate this trend to small and medium sized businesses.

In March 2003, the Ministry of Commerce, Industry and Energy announced that it will push a business model using the Supply Chain Management tenet, aiming to nurture the ability to conduct clean production and environment-friendly management. Thus, if large businesses present a program on clean production and environment-friendly management together with its supplier companies, the government will support 50 to 75% of the costs involved. This project pursued by the ministry primarily focuses on helping small and medium businesses foster the ability to conduct clean production and environment-friendly management. It simultaneously enables large businesses to be supplied with quality environment-friendly parts. Also, the government can maximize its support by allowing large businesses to serve as intermediary managers against small and medium businesses, instead of providing direct support to the latter.

This report highlights Korea's large businesses such as Samsung Electronics Co. Ltd., LG electronics, the Hanwha group and Korea Water Resources Corporation among Korea's representative public enterprise, and introduces the condition of green purchasing respectively.

At first, Samsung Electronics Co. Ltd. is one of the top-ten electronics manufacturers in the world. Since its inception in 1969, Samsung has successfully transitioned from an analog driven product line to a cutting-edge and award-winning digital innovator that is currently the world's number one manufacturer of CDMA cell phones, LCD and CRT monitors, DRAM memory chips and microwave ovens. With worldwide electronic product sales of \$27 billion, over 64,000 employees in 89 facilities, and a global network in 47 countries, Samsung is truly a global giant and has been recognized as one of the world's Top 100 Brands by BusinessWeek magazine.

LG Electronics is a major global player in electronics & telecommunications, operating 72 subsidiaries around the world with over 55,000 employees worldwide, which was established in 1958. LG Electronics focuses on Digital TV, CD-RW, DVD, CD-ROM, DVD-ROM Drives, PCs, Monitors, Mobile Handsets, CRTs and PDPs.

Since its inception in 1952, the Hanwha Group focused on development in the petrochemical and machinery businesses. The Hanwha also considerably expanded its scope of business activities through engaging in the areas of trade, construction, foodstuffs and distribution.

And recently Hanwha has set its course to solidify its third industrial sector of finance, electronics, distribution, leisure and social welfare.

Finally, since its foundation in 1967, Korea Water Resources Corporation (KOWACO) is one of representative Korea's public enterprises, which provides sufficient water through a constant development of water resources nationwide and control water quality. Its revenue and capital are up to 1,280.2 billion won and 4,992 billion won in 2001 respectively.

### ***1) Samsung Electronics Co. Ltd.***

Samsung Electronics, mindful of entering the European market where strict environmental regulations are implemented, conducts green purchasing whereby it considers designs aimed at achieving environmental-friendly disposal when manufacturing parts using hazardous substances.

As demonstrated by Sony's green partnership program, a growing number of clients require environment-friendly products as they conduct the green purchasing system. Together with these requirements, ROHS directives, which will be implemented in July 2006, aims to ban the importing into EU of products that contain six hazardous substances including Cd, Pb, Hg, Cr6+, PBB, and PBDEs, and environmental regulations will surely emerge as a powerful trade barrier. Thus, Samsung Electronics conducted surveys of its suppliers in 2002 to find out whether products contained the hazardous substances. Twenty-two percent of its suppliers were found to have contained hazardous substances in their products which were supplied to Samsung.

Through these efforts, Samsung Electronics has pushed ahead with the green purchasing system whereby it purchases environment-friendly raw materials from its suppliers to respond to customers' desire for environment-friendly products.

In its first stage, the company will structure a green purchasing system by 2003. In its next stage, it will settle down green purchasing and ban hazardous substances by 2004. In the third stage, the company will structure a green supply network in 2005 aiming at bolstering its competitiveness.

Samsung Electronics conducted a benchmarking survey of advanced businesses in September 2002 to structure the first-stage green purchasing system, surveyed the status of hazardous substances contained in products in October 2002, and established green purchasing regulations in December 2002.

Starting January 2003, the company implemented the green purchasing system targeting raw and semi-raw materials, parts and all packaging materials. In February 2003, it organized a Green Purchasing Team and held sessions on the system.

To activate green purchasing, Samsung Electronics is pushing to survey supplied products in the first half of 2003, audit its suppliers in the second half, complete a green purchasing computerization system by September 2003, and structure database on environmental information of raw and semi-raw materials by December 2003.

To successfully push ahead with its green purchasing system, Samsung Electronics must first and foremost carry out an audit on its suppliers and their products. Starting January 1, 2005, the company plans to avert those suppliers that use hazardous substances beyond the permissible density level.

So, the company will classify its suppliers into eco-partners and non-eco-partners so as to apply different purchasing procedures to them. In the survey forms, the company will feature an

assurance statement related to information on hazardous substances, a list of hazardous substances showing their presence or absence and their contents, analysis results showing analytic agencies, techniques, contents, and analyzers, and a disposal plan until 2004. The company requires its eco-partners to complete and submit survey forms only one time and whenever components are changed. On the other hand, the company requires its regular partners to complete and submit survey forms at the initial supply time, when components are changed, and whenever they supply products. Also, the company allows firms that don't use hazardous substances in their products to submit only assurance statements at the initial supply time.

With respect to new purchases, the company conducts prior audits for green purchasing, and performs surveys on hazardous substances so as to ascertain whether the firm involved is an eco-partner or a regular partner. With respect to suppliers providing hazardous substance products, the company conducts on-the-scene audits, and conducts a written audit on those suppliers who do not reveal products with banned substances contained. Banned hazardous substances include the six chemicals as outlined in the RoHS directives, and substances banned in manufacturing include five k ozone-destroying substances (CFC, HCFC, Methyl bromide, 1,1,1-T.C.E., and Carbon tetrachloride). If a firm with its products containing hazardous substances intends to be designated as an eco-partner of Samsung Electronics, it must earn 130 points out of the total of 150 with the condition that it must have plans to completely dispose of its products with hazardous substances contained. However, if a firm with its products containing hazardous substances has no plan to completely dispose of its hazardous substance products, it cannot become an eco-partner of Samsung Electronics. If a firm does not contain hazardous substances in its supply products, it must obtain 45 points out of the total of 50 to become an eco-partner of Samsung Electronics.

Also, the company operates its eco-product web site to provide relevant information. This aims to supply environment-friendly products, create green markets, and publicize the campaign to customers and interested parties, thereby enhancing its business competitiveness. The site features EP strategies, development history, environmental reports, and quality test results.

In addition, the company is developing an environment-friendly products-related program called the Samsung Eco-Product System or SEPS, targeting all its domestic and overseas DS-overseen workplaces. SEPS consists of five modules including LCA, Eco-design, green purchasing, environmental accounting, and environment-related customer treatment. SEPS, when completed, will provide LCA data to the general public and experts. The system will likewise provide data for environmental label accreditation and a database on environment-friendly suitability of raw and semi-raw materials. It will further be used to provide information on work processes, environmental loadings of substance, environmental costs of products, environmental evaluation of suppliers, and accreditation of eco-partners.

## **2) *LG Electronics***

At the end of 2002, LG Electronics established an environment-friendly supply chain management system in response to European product-related environmental regulations, namely the EU WEE/RoHS directives, as well as the company's own initiatives to develop and purchase environment-friendly parts. This environment-friendly supply chain management system was initiated after the company conducted surveys on available data, benchmarked techniques of advanced businesses, and reviewed environmental regulations and laws. Through green purchasing, this system aims to control hazardous substances early on in the manufacturing process, starting from the use of environment-friendly parts that are then used to manufacture environment-friendly products.



The company initially applied the system to assess its TV products in order to set up relevant regulations for its parts suppliers to systematically monitor hazardous substances. First, the company investigated environment-regulated substances related to TV products and then reviewed relevant international agreements, laws regulating substances in other nations, and benchmarked techniques of advanced businesses. The company then established guidelines on the selection of hazardous substances. In accordance with these guidelines, the company initially identified 45 substances in its TV products that needed to be eliminated, with the intention to modify the number of substances based on later review. The company then performed on-site inspections of their TV products for hazardous substances. In addition, the company required its parts suppliers to submit information on parts components, their environmental management activities, and environmental policies. The data collected from the on-site inspection along with the information submitted by parts suppliers were then reviewed by a group of experts. Based on the review, the company determined what measures needed to be taken and then categorized them into projects that were to be handled internally, together with other businesses, or by parts suppliers. In addition, the company updated the list of hazardous substances to be eliminated from 45 to 27 substances after review.

In pinpointing these hazardous substances, LG Electronics referred to the U.S. Environmental Protection Agency's Cancer Risk Scores because it had yet to determine its own evaluation method. The company is now pushing to create an internal database with the 27 hazardous substances determined in its own studies, which includes six EU-banned hazardous substances.

The environment-friendly supply chain management system employed by LG Electronics also has the capacity to address other environmental regulations. For example, the system can be used to pinpoint mercury content in order to report mercury levels of products being sold in the states of Maine, New Hampshire, and Rhode Island in the U.S.A., as required by the U.S. Electronic Industries Alliance. Also, the company could use ESCM results in its efforts to draw up an agreement with the Swedish government on product-related environmental regulations.

LG Electronics has also applied its environment-friendly supply chain management system and environment risk assessment of parts suppliers to LG media products, in addition to its line of LG digital appliances.

### **3) *Hanwha Group***

Spearheading the purchasing of environment-friendly goods and services is the Hanwha Group which has embraced the tenets behind green purchasing so as to help uphold environmentalism in production and distribution systems across social sectors. Green purchasing will also be used as a means to continue the reinforcement of the organization's environmental management system.

Hanwha Group practices green purchasing focused on end-use consumption goods rather than on raw and semi-raw materials, thus intensively disseminating the campaign's ripple effect to the whole processes of relevant products' production and distribution. The business group even published and distributed Green Life magazine in 1996. The magazine featured articles on how to practice green purchasing in using paper in the workplace, equipment and parts, energy, product design, packaging paper, and raw materials. The group structured an e-purchasing system aimed at efficiently pursuing green purchasing across its affiliates. Through an integrated purchasing headquarters established in 2000, the group also endeavours to ensure economical mass production and efficient logistics aimed at establishing a green distribution system.

Hanwha Group focuses its green purchasing on efficient energy use, resources conservation, and energy-saving and recycled end-use products aimed at maximizing the ripple effect. Likewise, the group converted its buildings into energy-saving buildings in 1999, by mass-purchasing high energy-efficient lamps and ballasts as well as by replacing personal computers and monitors with energy-saving versions. As for recycled products, the group practices green purchasing by focusing on printers, and is considering green purchasing of printing and office paper items. It posted 9.9 billion won and 4.2 billion won in green purchasing of these energy-saving and recycled products in 2000 and 2001, respectively.

Furthermore, the Hanwha Group reflected green purchasing performance in evaluating its affiliates for 2002, and considered environmental factors in selecting its partners, thus practicing green purchasing.

Also, as part of the Environment-friendly Supply Chain Management (ESCM), the group supports its business partners in improving work processes. For instance, it helped Samyoung Ink improve its work processes by improving work environment measures by 50%, thus saving 220 million won. Likewise, Hanwha assisted Three Tech in improving its wallpaper process, thus coming up with a 30% wastes reduction measure and helping Three Tech save 390 million won annually.

To activate the use of green products, it is crucial to address distribution networks in Korea. Hanwha will thus cooperate with Hanwha Stores and the Eco-Procurement Association so as to operate exclusive booths focused on selling excellent environmental products. It is now selecting relevant products. Joining the Green Purchasing Network (GPN) in 2002, the group is also hoping to reinforce green purchasing. In addition, realizing that what is crucial for green purchasing includes scientific marketing methods that involve surveys on consumers purchasing trends and analysis, the group is planning for it accordingly.

#### **4) *Korea Water Resources Corporation (KOWACO)***

KOWACO once faced resistance from civic groups and environmental groups in connection with its dam projects. However, in order to perform its social obligations and meet the diverse desires of the people as a public corporation, KOWACO came up with an environmental management plan and held an advisory conference in March 2002. KOWACO, now upholds environmental management and green purchasing.

KOWACO practices green purchasing as one of its environmental management tasks, so as to disseminate sustainable a green purchasing-oriented consumption culture, and to encourage its business partners towards environment-friendly product manufacturing and use. Thus, KOWACO is amending relevant regulations and criteria so as to reflect both quality and environmentalism in purchasing products, and it will likewise purchase government accredited green accredited products.

The purchasing contract guideline will specify a requirement for purchasing of environment-friendly products and green products, and require justifications for purchasing regular products in connection with environmental products, thus hoping to reinforce the green purchasing system.

To stress the purchasing of environment-friendly products, each department is required to set a certain goal of green purchasing of environmental products, and towards this end, KOWACO will feature environment-friendly products through its homepage.

Also, KOWACO will structure an environmental information management system designed to manage its green purchasing performance and use it to evaluate its environmental performance and environmentalism. To effectively activate green purchasing, the public corporation will include plan vs. performance in environment-friendly purchasing and purchasing ratio of environment-friendly products in its in-house evaluation indexes.

The corporation will require the use of quality products of environment-friendly accredited products in connection with contracted works, and specify environmental criteria where no accredited products are available in connection with environment-friendly products. It will further require a specification of design unit prices by requiring the purchases of quality products out of environment-friendly products in connection with ordering of facilities design and services.

#### **4. Product-related Information Utilized in Green Purchasing**

In connection with activating green purchasing, various environmental labels are crucial for providing the most significant information on environmental products.

Environmental labels in Korea include Environmental labels, Good Recycled Mark, Energy Saving Mark, and the Environmental Declaration of Products (EDP) system.

In accordance with Article 20 of the Act on Environmental Technology Support and Development, Environmental labels aim to highlight products that create less pollution in the course of production and consumption compared to other products of the same use, and help save resources, to provide accurate information on products to consumers, and to encourage corporations to develop and manufacture products in response to consumers' preferences.

In Korea, the environmental label system has been in place since April 1992. Likewise, the Ministry of Environment oversees an overall environmental label system including the enactment and amendment of the system-related regulations and provides technical and administrative support. The Korea Environmental Labelling Association undertakes to select environmental label-target products, enact and amend accreditation criteria, accredit environmental labels and follow up on accredited products, as well as publicize environmental label system and accredited products.

In accordance with Act on Promotion of Resources Saving and Reutilization, through the Good Recycled Mark system, the government accredits the quality of recycled goods by improving the quality of consumers-averted recycled goods, diffusing consumers' lack of confidence in them, and expanding the demands. The Korean Agency for Technology and Standards under the Ministry of Commerce, Industry and Energy, accredits excellent recycled marks.

Starting in April 1999, the Energy Saving Mark was implemented to encourage energy saving in regards to electronic goods. This mark indicates that a product affixed with it is an energy saving product and a firm affixed with it is a firm that endeavours to conserve energy.

The Energy Saving Mark system was implemented to make the people aware of the significance of saving energy in overcoming national economic difficulties. This mark enables people to recognize a high energy-efficient product or a superior energy-saving workplace.

The Energy Saving Mark is provided on the basis of accreditation. The category includes accredited high-efficient energy equipment, first-rank energy consumption-efficient products, energy saving firms, energy use businesses and organizations in agreement with Green Energy Family Movement Headquarters, voluntary energy saving bodies, superior firms rated by five-year energy

saving plans, and occasions deemed necessary by the head of the corporation in connection with energy use rationalization.

Lastly, the EDP system quantifies environmental impacts from natural resources used in the whole product process involving raw materials collection, product manufacturing, and product consumption and disposal -- necessary for manufacturing products --, as well as from discharged pollutants. It is a Type III Environmental Label system that has been implemented since April 2002. The EDP system likewise provides objective and differentiated information on products to encourage consumers towards green purchasing.

The EDP system was implemented in accordance with Article 20 of the Act on Environmental Technology Support and Development. As for the EDP system, while its operation and accreditation work are undertaken by the Ministry of Environment and Environmental Management Corporation, respectively, the Korea Environmental Labelling Association operates the LCI information network, and the Korea Environmental Preservation Association offers education to examiners.

### <Certification Systems for Environmental-friendly Goods in Korea>

	Environmental Label System	GR Mark System	Energy Saving Mark	Environmental Declarations of Products system
Starting year	1992	1997	1998	2002
Regulatory Framework	Article 20 of Act Relating to Environmental Technology Support and Development	Article 31 of Act Relating to Promotion of Resources Saving and Reutilization	Act on Energy use rationalization	Article 21 of Act Relating to Environmental Technology Support and Development
Lead Government Agency	Ministry of Environment	Ministry of Environment	Ministry of Commerce, Industry and Energy	Ministry of Environment
Operating body	Korea Environmental Labelling Association	Korean Agency for Technology Standards	Korea Energy Management Corporation	Ministry of Environment
Targeted products	<b>84 items</b> Office items, construction materials, living goods, industrial goods, etc.	<b>224 items</b> waste paper, waste plastic products, waste fibers, waste rubber products, etc.	<b>48 items</b> Electricity-saving office and home appliances (15) High-efficient energy equipment and materials (23) Energy consumption efficiency mark-required products (11)	<b>11 items</b> Refrigerator, freezer, etc.
Certification costs	100,000 Korean won Use fee: 1 mil. to 5 mil. won annually	None (shouldered by the government)	480,000 Korean won	More than 7.8mil. Korean won
Government procurement policy	Selective tendering (For one supplier, limited tendering)	Limited tendering	Preferably purchased by Public Procurement Service	-
Measures of implementation	Preferable purchase by public agencies Mandatory use of tap water-related goods by public agencies Financial support warranty (pending)	Obligatory purchase by public agencies Price differentiating system (10%) Financial support: -Work to support technology development -Industrial base funds, industrial base technology development finances -Restructuring funds for medium businesses -Energy use rationalization funds -Funds for fostering recycling industries -Technology trust guarantee funds -Business incubation funds	Obligatory use by public agencies Obligatory use of high-efficient lighting equipment for construction Support funds for installation and manufacturing firms Taxes reduction for investing in energy saving facilities (10%) Support accreditation test fees for medium businesses (up to twice annually)	-
Logo				

Each accreditation agency provides detailed information for the various products with an environmental label. The Korea Resources Recovery and Reutilization Corporation (KORECO) provides information on recycled goods, and the Korea Environmental Labelling Association offers information on products with an environmental label. Also, the Environmental Management Corporation provides information on accredited products in connection with the EDP, while the Korea Energy Management Corporation offers information on accredited products in connection with the energy saving mark.

The Korea Environmental Labelling Association ([www.kela.or.kr](http://www.kela.or.kr)) provides information on environmental label-accredited products. The association also provides information on environmental label-accredited products to relevant agencies and organizations, and consumers through the internet and various publicity booklets. In addition, it encourages the eco-procurement or green purchasing with the government, local administrations, and public agencies, providing information on environmental product distribution and supporting the publicity.

In addition, by offering accredited products and relevant publicity materials at various environmental exhibits, the association is endeavouring to publicize environmental label products and broaden the knowledge base. KORECO operates a separate comprehensive information system on product recycling ([www.okrecycle.com](http://www.okrecycle.com)). This site provides information on the recycling movement, foreign recycling firms, and other reutilization information, as well as product sales/purchase information between recycled product firms and their clients, and information on samples and transactions like orders, thus helping public agencies purchase priority recycled products.

As discussed earlier, the Environmental Management Corporation is in charge of high-efficient energy equipment and material as accredited and first-rate energy consumption-efficient products. The corporation focuses on providing lists of accredited products rather than on providing detailed product information.

Also, the Environmental Management Corporation is in charge of providing information on EDP-accredited products. Aiming to disclose transparent environmental information on products, thus activating the accreditation system of EDP and disseminating green consumption, the corporation has structured and started to operate an exclusive EDP accreditation web site (<http://www.edp.or.kr>). The site discloses information on domestically produced home appliances such as refrigerators, PDP TVs, LCD monitors, CRT glass, and tissue rolls as well as other EDP-accredited products. The site features environmental information on 20-plus EDP-accredited products, an introduction to EDP system, accreditation criteria, accreditation consultations, and accreditation procedures and methods.

As such, Korea has no one single agency to provide environmental information on products, and each relevant agency instead provides information on accredited products. In the long term, Korea has yet to establish one single comprehensive information provider. Given that the government and public agencies purchase more through Public Procurement Service (PPS), the Ministry of Environment and Korea Environmental Labelling Association are endeavouring to use the PPS' Government e-Procurement System aimed at activating green purchasing.

The PPS Government e-Procurement System has yet to feature functions designed to classify and search environmental label-displayed products so as to help staff in charge of purchasing. Thus, the government is pushing to require the display of relevant marks on the contracted product mall in Government e-Procurement System to confirm whether a product is an environmental product. It is also pushing to feature a list of environmental label-displayed products only when a user wants so.

To boost the preferable purchasing of environmental label-displayed products, the Ministry of Environment is pushing to receive directly from PPS preferable purchasing performance data by relevant agency, which is currently received through governmental and public agencies.

These efforts will boost the purchasing of environmental products.

## **5. Introduction to Organizations' Green Purchasing Promotion**

The Green Purchasing Network (GPN) is crucial for facilitating green purchasing in Korea.

Established in 1999, GPN, consisting of 38 officers and 99 members from the private sector and NGOs, aims to encourage consumers to purchase environment-friendly products, thus promoting green purchasing and addressing environmental and economic concerns.

GPN's activities can be classified into three categories – research, publicity, publication.

In respect to GPN's research activity, they gathers information on consumers' needs and corporations' production trends, selects relevant products for writing guidelines on environment-friendly products, and formulates guidelines on environmental features and quality of priority products based on survey results. To activate consumption of green products, GPN surveys the status of green purchasing of consumers and the government and corporations, and pinpoints factors obstructing purchasing, thus pursuing purchase expansion. Recently, GPN has been making efforts to cover policy development for promoting green purchasing.

GPN publicizes the purposes of green purchasing, and encourages people to join in as they make tours across the nation. Also, GPN displays various environment-friendly products (environmental label-displayed products, high-efficient energy equipment and green Q products) in comparison with regular products, promoting them, and providing opportunities to select and purchase them. GPN likewise holds competitions aimed at promoting green purchasing and gives awards to model green purchasing cases that boost green purchasing at government, corporation and civic organizations, thus intensively building a consensus across the board in society and boosting participation in the campaign. GPN also offers information on environment-friendly goods and publicizes this through mass-media when necessary.

Also, environment-friendly goods catalogue for green purchasing and for purchasing of energy-saving goods are published by the GPN. At times, they also inform their activities by publishing news magazine.

In addition, other various agencies are making diverse efforts to activate green purchasing.

As mentioned earlier, Seoul City plans to formulate and implement Green Purchasing Criteria starting 2003. Local Agenda 21 Nationwide Consultative Council is pushing ahead with various projects aimed at disseminating Seoul City's green purchasing criteria to other local administrations by setting it as one of its 2003 projects.

Established to improve domestic environmental technology, foster environmental industries, and boost environmental investment efficiency, the National Environmental Technology Information Center, which is organized by the Ministry of Environment and Environmental Management Corporation, is endeavouring to promote the purchasing of environment-friendly products by drawing people into its cyber exhibit hall. The hall displays excellent recycled products, environment mark products, and water-saving facilities and equipment, among other things.

Established to uphold the spirit of helping one other and to enable consumers to voluntarily improve welfare, the Living Cooperatives have interest in green purchasing. They, in accordance with relevant law, may purchase environmental living goods (reutilized goods, recycled goods and environment-friendly goods), and supply or reprocess/supply them. Notably, Living Cooperatives in the Seoul metropolitan area are endeavouring to achieve efficient logistics that involves selection and production area management of living goods, joint production of living goods booklets and order sheets, joint carry-in and storage of living goods, and goods pick-up and delivery by cooperative. Thanks to these efforts, Living Cooperatives have recently been dealing with a growing quantity of environmental living goods instead of organic agricultural products at the initial stage.<sup>4</sup>

Other environmental label accreditation agencies are also endeavouring to promote their respective green purchasing.

## **6. Conclusion**

As specified above, relevant organizations make efforts to promote green purchasing at their own levels including the establishment of legal tools. But due to the lack of knowledge regarding environmental products and the necessary distribution networks, green purchasing has not fully taken off.

In order to solve these problems, all the parties involved including the government, manufacturers, consumers and NGO's need to make more strident efforts. They need to come up with a strategy for establishing roles and proper means of execution.

The enactment of integrated acts such as the Green Purchasing Act in Japan should be considered in the development of an effective strategy. With this in mind, the establishment of an organization can be taken into consideration in order to present necessary information in a systematic fashion including information as to accredited products and their environmental performance records.

It is important for manufacturers to employ an environment-friendly supply-chain management system. Such efforts will bring forth reductions of environmental risk, improvements in the environmental performance of suppliers, and development of environment-friendly products. This may take some time since the environment-friendly supply-chain management system has only just entered the initial stages of development in the large business sector.

In Korea, sufficient data is lacking in regards to hazardous substances which functions as the base for building an environment-friendly supply-chain management system. This problem is prevalent and affects many countries worldwide. For example, Agenda 21 of the Rio Declaration established in 1992, recommended management of hazardous chemical substances. But currently, only powerful international organization such as OECD, EU and highly-developed countries including the United States, Sweden, and Norway have made marked efforts to obtain data on the dangers of hazardous chemical substances.

Taking these factors into account, cooperation between businesses and between nations needs to be encouraged to build an effective environment-friendly supply-chain management system.

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<sup>4</sup> Living Cooperatives saw organic agricultural goods represent 63.4% of its living goods by the end of 2000. However, last year saw the share plummet to a whopping 49.4%. On the other hand, processed foods posted a 36.8% share, and industrial products including environmental living goods accounted for 13.6%, up 40% and 100%, respectively.



The experience of advanced businesses and their data on hazardous substances will be invaluable to other businesses.

# **Survey of Selected Companies on Green Purchasing in Korea**

## **LG ELECTRONICS INC.**

### **Introduction**

LG Electronics is a general electronics manufacturer. This report focuses on the company's Digital Network Display Division (DND), which is engaged in the manufacturing of home appliances, mobile handsets, information & communication systems, and DVDs, video players, projectors, and other devices associated with televisions, as well as LGE overall.

As one aspect of its vision and policy for a cleaner environment, LGE has selected the global environmental issue as an improvement task for management. The company is particularly focused on developing green products fitting to its stature as a global player. In 1994, LGE announced the "LG Declaration for a Cleaner Environment" and made it one of its cornerstones for business operation. The Declaration asserts that environmental and social factors are utilized as standards alongside economic factors in the decision-making process for business activities at LGE, and it is the foundation for LGE's environment-friendly business operations.

### **LG Declaration for a Cleaner Environment**

LG has consistently worked to minimize the environmental impact of its business activities and to promote safety in order to preserve the environment and to ensure the health of all executives and employees. However, the increasing importance of environment, safety, and health issues requires us to take on greater responsibilities, while at the same time provides us with new opportunities for creating value. Thus, in close cooperation with the local communities, LG aims to be a leading business group in environment, safety, and health affairs, striving to improve environmental quality, to enhance the level of occupational safety and health, and to ensure the sound and sustainable development of the global community through the use of LG's extensive knowledge and innovative technology.

The executives and employees of LG are of one mind in making LG one of the most environmentally conscious and responsible business groups in the world.

1. LG gives top priority to environment, safety and health issues in every step of its managerial activities and takes these as opportunities to create value for customers.
2. LG establishes and complies with its own strict environmental, safety, and health standards based on rules and regulation of the region in which it conducts business.
3. LG regularly audits and publicizes its performance of environmental, safety, and health policies.
4. The executives and employees of LG actively take part in conserving the local environment as part of its social responsibility to conserve the global environment.

### **Green Procurement**

#### **Objectives of Green Procurement**

Green Procurement has three objectives. These are, first, to procure products, components, and materials that have low environmental impact throughout their product life-cycles, second, to promote suppliers that manufacture environmentally conscious parts, and third, to comply with all laws, regulations and standards for environmental protection.

#### **Items for Green Procurement**

Areas where Green Procurement can be applied include manufacturing, office items, and components. At present, Green Procurement in the DND division is centered on components. Once some progress begins to appear in component procurement, the division intends to expand its effort to other areas. As

DND operations are mainly focused on television assembly, the division has tended to focus on components. Regarding office items, the division has no particular guidelines in place at present. The purchasing officer is free to make decisions at his or her own discretion. Some examples could be to select copy paper that is a little less white because it incorporates recycled paper, or to select personal computers, copiers, and other equipment that operate on less power.

## **LGE's Eco-SCM**

### **Overview of E-SCM**

The DND Division handles a larger number of different components than other units in the LGE Group, and is therefore further advanced in its Green Procurement policies. As early as 2001, for example, the division was already involved with Eco Supply Chain Management (E-SCM). In 2001, the activity was started to create E-SCM guidelines, followed by the launch of the E-SCM pilot project in 2002. A survey of hazardous substances used in the division's components was conducted, and an E-SCM standard format was drawn up. For 2003, the division plans to commence education of supplier companies. The division is also collecting detailed environmental information on components from suppliers to create a database. Other divisions in the LGE Group are expected to learn from the DND Division system to further them toward creating their own programs.

#### **Year 2001: E-SCM Infrastructure Setup**

- Establish E-SCM operation standards and guidelines
- Develop partner assessment index
- Establish company list of restricted hazardous substances

#### **Year 2002: - Pilot assessment and expansion of product analysis**

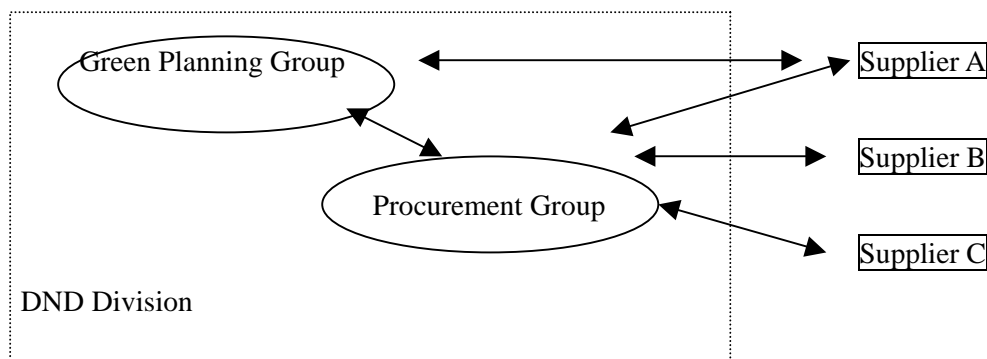
- E-SCM pilot project
- Survey of hazardous materials in components
- Determination of DND's E-SCM standard format

#### **Year 2003: - Expansion of E-SCM to all companies, and education offered by DND**

- Collect detailed environmental data from suppliers
- Develop a hazardous materials DB system
- Expand partner assessment
- Improve the assessment index

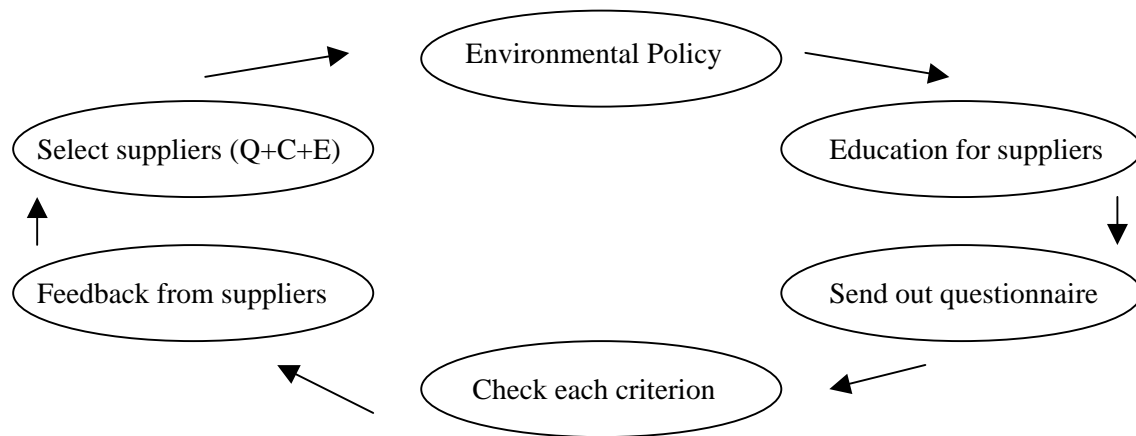
### **Activity Framework**

In the DND division, responsibility for E-SCM lies with the Green Planning Group and the Procurement Group, while responsibility for LGE as a whole lies with LGE's Quality Reliability Center. The Green Planning Group and the Procurement Group are part of the division's research organization in charge of products. The research organization includes a design section and a research section, and the Green Planning Group is embedded into these two sections, and is separate from the Procurement Group. The Procurement Group provides education and instructions to suppliers. Waste disposal policies are handled elsewhere. Activities are oriented toward ensuring adequate communication takes place at the division level.



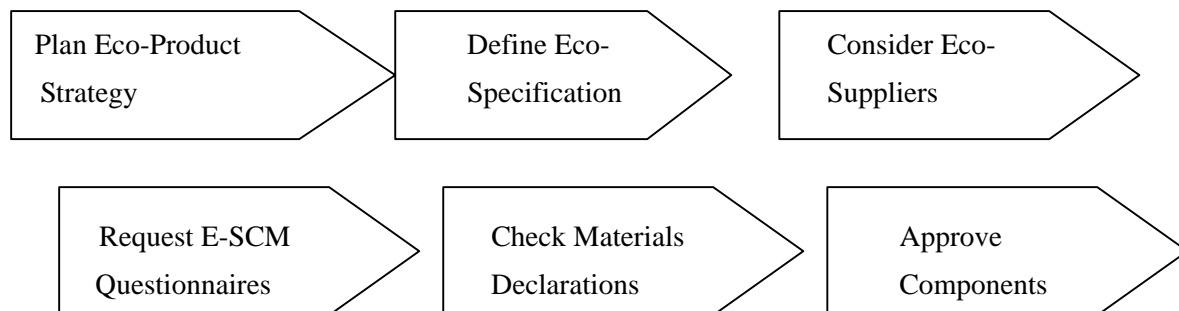
### E-SCM Mechanism In LGE

In the LGE Group, E-SCM begins by establishing an environmental policy. Then the company promotes education of the system among its suppliers, sends out questionnaires, checks the criteria set out in the returned questionnaires, receives feedback from the suppliers, and then selects the suppliers or implements the environmental policy. This sequence is called E-SCM.



### E-SCM Process in Product Development (Decision Making Mechanism)

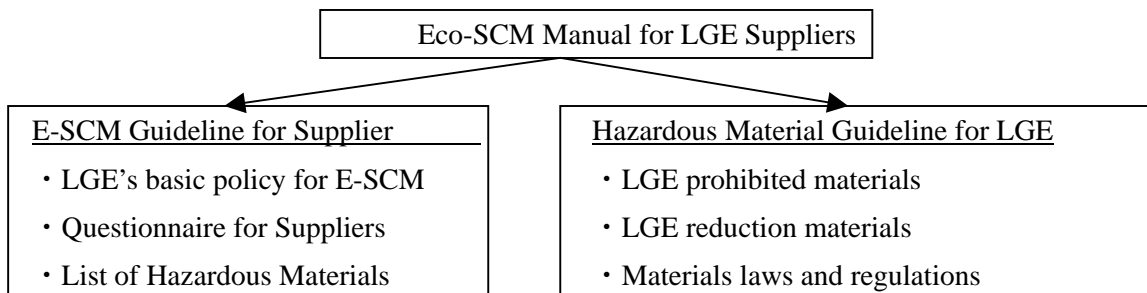
First, the company plans an environment-friendly product strategy based on the LG philosophy. Defining environment-friendly specifications involves study of a material's toxicity or reduction capabilities. At this point, however, no detailed figures are settled. If the supplier does not have any problems on the technical side, then a request for transactions is made. In reality, however, not all suppliers can meet LG's standards, and enforcement of such standards would cause a fall in productivity. In these cases, LG cautiously proceeds step-by-step until the standards can be met. Each material and component is tested, and if no particular problems are found, the material or component is put to use and approved as an environment-friendly product.



### Contents of LGE E-SCM

The LGE E-SCM utilizes three standards. First is the E-SCM Manual, second is the Questionnaire for Suppliers, and third is the List of Hazardous Materials. The Questionnaire for Suppliers includes the Environmental Management and Eco-Design & Materials questionnaires.

The E-SCM Manual is titled the "Eco-SCM Manual for LGE Suppliers." It is divided into two sections, an E-SCM Guideline for suppliers and a Hazardous Material Guideline for LGE. The first section explains LGE's basic policy for E-SCM, the Questionnaire for Suppliers and the List of Hazardous Materials. The latter section presents an explanation of the LGE prohibited materials, the LGE reduction materials, and the materials laws and regulations.



In the Questionnaire for Suppliers, Evaluations 1 and 2 include places for entering “yes” or “no” and a comment. Evaluation 1 asks about environmental management, while Evaluation 2 is about eco-design. It also asks about reduction capabilities toward recycling. Evaluation 3 asks about Product (Part) Information. Responses here are in the form of general information and specifications, with separate entries for product weight, amount of hazardous materials in products, etc.

#### Evaluation 1: Environmental Management System

General principles	Item of evaluation	Yes/No	Comment
1)-(1)	1. Has your company obtained an EMS certificate in accordance with ISO14001?		
1)-(1)	2. Does your company have plans to obtain an EMS certificate within 3 years?		
1)-(2)	3. Has your company set up a system for complying with environment-related regulations and laws?		

#### Evaluation 2: Eco-Design

General principles	Item of evaluation	Yes/No	Comment
2)-(1)	1. Does your company use materials prohibited by LG?		
2)-(2)	2. Do your products of 50g or more receive an ISO 11469 mark?		

#### Evaluation 3-1: General Product Information

Name of product		Name of manufacturer	
Weight (g)		Hazardous material	
P/No		Amount used	

#### Evaluation 3-2: Product Specifications

P/N	Name of part	Weight (g)	Material	Ratio of weight	Hazardous material	Amount (%)	Remarks

The List of Hazardous Materials includes LGE's own Criteria for Hazardous Materials. Documents available for reference include laws and regulations (EU RoHS, the Netherlands Cadmium Decree, California Proposition 65, etc.), eco-labels (Blue Angel, the EU Eco-label, etc.), and other standards of major companies and industrial organization. The Prohibited Materials section includes a list of 29 materials, while the Reduction Materials section includes 27 materials. Where Japan's home electric

appliance and electronics manufacturers collect information on three levels, hazardous materials, reduction materials, and controlled materials, LGE does not ask its suppliers for information about controlled materials.

## **About the Suppliers**

### **Supplier's Role**

LGE wants suppliers to fulfill five main roles with regard to their transactions with LGE. These include: Understanding LGE's environmental policy and E-SCM, identifying the contents of components, checking hazardous materials in components, procuring non-hazardous raw materials, and completing requests for data reporting.

### **Selection Criteria for Supplier**

There are three main criteria for selecting a supplier. These are Environmental Management (eight sub-criteria), Eco-design (seven sub-criteria), and Product Information (materials declaration). LG plans to select suppliers who have scored above a certain target level. At present, LG is focused on collecting environmental data from its suppliers. It is now collecting the data and hopes to finish by the end of this year.

### **Education of Suppliers**

In March 2003, LGE began educating of suppliers with a meeting entitled Explanatory Meeting on E-SCM. Where DND has more than 200 first-rank supply companies, the meeting attracted 130 people from a total of 80 different companies representing only DND-related suppliers. The company plans to eventually reach all suppliers throughout the LGE Group. Reactions to E-SCM at the explanatory meeting appeared to be concerns of suppliers about how they could meet the E-SCM and EMS regulations and expenses. For LG failure to manufacture goods that take the environment into consideration will result in loss of sales. In other words, with the suppliers in the same boat, the suppliers also need to work together with LG. Moreover, it appears that the suppliers are concerned about whether they will be approved as suppliers. While LG cannot force anyone to comply, the company plans to promote awareness through seminars and study meetings for the suppliers to help them improve their operations. In reality, LG is aware that we cannot force anyone to obtain EMS. Nevertheless, LG has taken initiative to develop an environmental philosophy and policy, thus creating an atmosphere where the suppliers themselves feel the urge to comply. This is where LG, as a major corporation, must take the lead with its environmental initiative.

While the actual number of suppliers that have obtained an ISO14000 is not known because no detailed survey of suppliers has been made, it appears that even some medium-class supplier companies have secured the ISO. LG wants to avoid compulsion regarding ISO14001. In South Korea, it's a normal practice to acquire ISO9000 first. From now on, acquiring ISO14000 by a company is likely to be a mainstay. LG itself acquired ISO9000 initially, and has later secured ISO14001. It is anticipated that even South Korea's small and medium-size enterprises will be able to obtain ISO14000 in future.

Among the 200 companies that attended the above educational meeting, some suppliers are from foreign countries including Vietnam, China, and elsewhere. The suppliers from China are increasing in number. Currently, the surveys include suppliers that have their own overseas sites.

LGE has an OEM network with companies in Japan and Europe. Since 2001, the company has started to receive inquiries from foreign corporations regarding the presence of toxic substances. LGE is preparing information at the in-house level in order to better respond to such questions in the future. But LGE needs detailed information from its suppliers before the company can provide detailed information of its own. For this reason, surveys of the LG suppliers are sure to continue.

## **Future Plans**

LG has created supplier guidelines and has been actively providing education to suppliers, but these efforts have not yet resulted in the achievement of specific figures and data. In October 2001, the company adopted the E-SCM Manual, the Questionnaire for Suppliers, and the List of Hazardous Materials. The database system backing up these three projects is called the Hazardous Substance Management System, which is being developed as of 2003. The LG-PRC center is in charge of development, including construction of a web-based access point. While the Hazardous Substance Management System is a unified system, it consists of three sections, the Hazardous Substance Database, the Improvement Guideline Database, and the Component Information Database. The Improvement Guideline Database will show, for example, that Supplier A has 100ppm of a certain substance while Supplier B has 200ppm, which is information that would be internalized and shared by both LG and other suppliers. And if, for example, the figure for certain substance is set at 50ppm, LG can inform suppliers in advance so that they can prepare beforehand. The above database is prepared for each component. The sections for Prohibited Materials and Reduction Materials were additionally created, and data is now being entered into the system which will be utilized later. The Eco-Design system has been in operation since 2001, and consists of three sections, the Eco-Design Checklist, the Design Guideline, and the Environmental Law & Regulation Information. This system deals with life cycle assessments.

The company has five plans for the future: Enhance the material database for components, continue education of suppliers, replace hazardous materials with non-hazardous materials, set up a strong E-SCM process, and join in and cooperate with industrial organizations.

# KOREA WATER RESOURCES CORPORATION (KOWACO)

## Introduction

The corporation was established in 1967 as the Korea Water Resources Development Corporation, changed its name in 1974 to the Industrial Sites and Water Resources Development Corporation, and then assumed its present identity, the Korea Water Resources Corporation (KOWACO), in 1988. Business operations include the management and construction of multi-purpose dams, multi-regional water supply systems, national industrial complexes and new towns, overseas projects and international cooperation, and research and development.

To ensure the efficient supply of high-quality water all across South Korea, the corporation is engaged in the development of water resources through the construction and management of multipurpose dams and water systems. The 13 multipurpose dams now in existence hold about 11 billion cubic meters of water and generate 1 million KW of hydroelectric power. The Korea Water Resources Corporation is a partially government-funded institution engaged in the development of infrastructure. For this reason, it has as its mission the social and corporate responsibility to “improve the quality of life” for all people. In March 2002, the corporation acted on the opportunity afforded by the “Environmental Management Declaration” to establish an environmental management system, and commenced a Green Procurement system in January 2003 as part of its environmental management campaign.

## Management Systems

The Korea Water Resources Corporation adopted the ISO14001 management system, and received certification. The corporation is continuously engaged in environmental issues, and believes that such a stance will boost its corporate value and contribute to its corporate philosophy, which is to “join water, nature, and people to build and realize a sustainable growth corporation that looks to the future.”

Greening Paradigm		
Entry of management systems	Environmental management system (ISO14001) certification	
Operation and management	Inspection and assessments	New environmental management
	Environmental performance evaluation (EPE)	Environmental accounting
	Environmental management assessment (EA)	Green procurement
	Life cycle assessment (LCA)	Green marketing

## Efforts at Green Procurement

The corporation has been engaged in green procurement of printing paper, toilet paper, tissue paper, toner cartridges, and other similar items since 2002 and even earlier. In FY2001, the corporation won an award among public institutions for its green procurement policies, being recognized as a superior institution in the government-investment institution category for its performance in the procurement of environmentally sound products. Below is a summary of Environment Ministry Declaration No.2002-82.



### Summary of Environment Ministry Declaration No.2002-82

Name of institution	KOWACO	Public Corporation A	Public Corporation B	Public Corporation C	Public Corporation D	Public Corporation E
Total procurement (A)	150.83	40.66	57	2.03	7,046.79	234.46
Green procurement (B)	135.23	40.66	5	1	688.7	42.46
Ratio (B/A)	89.66%	100%	8.77%	49.26%	9.77%	18.11%

Name of institution	Public Corporation F	Public Corporation G	Public Corporation H	Public Corporation I	Public Corporation J	Public Corporation K
Total procurement (A)	15.68	511.84	1,364.83	938.22	55.89	259.1
Green procurement (B)	15.68	53.39	609.03	599.05	55.89	24.7
Ratio (B/A)	100%	10.43%	44.62%	63.85%	100%	9.53%

### About Green Procurement

December 2002:	Plan for Implementation of Green Procurement System presented to all ministries and agencies
January 2003:	Project specification manuals for construction materials revised
February 2003:	Guidelines for Administration of Procurement Contracts revised and implemented
March 2003:	Details of Green Procurement System determined and implemented
Beginning in 2003:	Expansion of green procurement infrastructure

Alongside quality and price, KOWACO has now added environmental effects to its list of considerations for procurement of products. The corporation now also conducts comprehensive studies into a product's energy consumption and resource economization before deciding on product procurement. The standard for evaluation is a Type I Environment Mark affixed to products that are deemed to be environmentally friendly. The Environment Mark is currently available only on office supplies and on office equipment such as copiers, printers, and personal computers. In 2003, the corporation began acquisition of personal computers affixed with the Energy Star Mark. At present, about 90% of the corporation's office supplies are obtained through Green Procurement. Environmentally-friendly products include the Environment Mark products, which include Environment Display products (441 items in 45 categories) and Environment Performance Display products (six items), recycled products, which are represented by GR Mark products (225 items in 16 categories), and efficient products, which include power-saving office equipment and electric appliances (15 items) and efficiency-certified equipment and materials (23 items).

KOWACO first confirmed the existence of a market for environmentally-friendly products, and then set up an arrangement for prioritizing their procurement, calling it the Green Procurement Program Detailed Implementation Plan. The corporation's green procurement goal for FY2003 is 3.55 million won.

## Revised Guidelines for Administration of Procurement Contracts

Category	Before revision	After revision
Procurement standards	Quality studies (KS or higher standard)  Price studies (Lowest (optimum) price)	Priority procurement of green products → Reason for selection of ordinary product even though green product was available must be disclosed
Contract method	Contract obtained after study of procurement standards	Confirm existence of green product Then sign priority contract

The corporation has also divided environmentally-friendly products into lists of compulsory procurement and non-compulsory procurement items. Items on the list of compulsory procurement items must be procured unless extraordinary reasons for not doing so can be provided. Environmentally-friendly items on the list of non-compulsory procurement items are recommended for procurement as long as there are no extraordinary impediments to performance or quality, and the price is reasonable. The corporation plans to gradually promote Green Procurement in stages, to steadily and systematically expand the list of compulsory procurement items.

### Proposal for staged compulsory procurement of green products

Stage	Period	Objective	Designation of compulsory procurement items
Introduction	2003	Use designation of compulsory procurement item to establish introductory foundation	<ul style="list-style-type: none"> <li>Supplies Toilet paper, soap, fluorescent lights, dishwashing detergent Water-saving faucets, TVs, office paper Toner cartridges, PC monitors</li> <li>Internal assets High-efficiency pumps</li> </ul>
Expansion	2004	Expand compulsory procurement target	<ul style="list-style-type: none"> <li>Supplies Add copiers, gas boilers, vehicle tires (both passenger car and bus)</li> <li>Internal assets Add uninterruptible power source, magnetic stabilizers for electric lamps</li> </ul>
Fixture	2005 and later	Establish green procurement system	<ul style="list-style-type: none"> <li>Supplies and internal assets Expand targets that take construction conditions into consideration and establish a system</li> </ul>

### Procurement of environmentally-friendly products in 2001 and 2002

Unit: 1,000 won

Period	Total procurement (A)	Environmentally-friendly products (B)	Ratio (B/A)	Remarks
2001	150,829	135,231	89.66%	Printing paper, etc.
2002	248,862	230,262	92.53%	Printing paper, etc.

The procurement ratio for environmentally-friendly products is the amount of environmentally-friendly products procured divided by the total procurement value.

The public institutions' environment display (Environment Mark) product procurement performance (2001) and procurement planning (2002) included the use of energy-saving and more efficient equipment to reduce the burden on the environment. The corporation is also promoting the GEF (Green Energy Family) campaign. One aspect of the GEF campaign is building lighting. By 2005, the

corporation will replace all building lighting with Green Lighting. In addition, power equipment is to be gradually switched over to high-efficiency devices as equipment reaches the end of its working life.

#### Building lighting situation

Category	Total	Through 2002	Through 2005
Building lighting	30,100	14,247 (47.3%)	15,853 (52.7%)

In the area of construction materials for multipurpose dams, the corporation has turned its attention to eco-materials, with this year marking the first systematic management and development of specific numbers. The corporation has also revised its specialist regional document related to construction materials. In the past, the construction materials standard focused on products featuring the KS mark, whose performance met or exceeded quality testing results set in the Korean Industrial Standards. Now, however, the corporation has announced its intention to use products bearing the Environment Mark, and is proceeding to implement the policy.

Going forward, the corporation plans to systematize the use of environmentally-friendly products from the design stage onward, utilizing design and cost calculations that presume the use of environmentally-friendly products. This policy is to be reflected in the corporation's "construction engineering control standards" and included in the operating instructions to be sent alongside orders placed with subcontractors.

### Relations with Other Enterprises

Regarding relations with other enterprises, the corporation plans to select corporate partners with environmental management systems in place. While South Korea already has laid the legal foundations for transactions with corporations holding ISO certification, very few corporations have in fact secured the 14001. In the future, the corporation wants to increase its relationships with enterprises having both environmental management systems and ISO14001 certification. While few corporations can meet these conditions at present, the corporation intends to give such companies priority during bidding processes.

### Organization Promotion System

Dam construction projects involve large numbers of people, with an ecology group and construction group organized under a general supervisory group. In dam construction, an engineering management group controls the project, determining whether the environment has been taken into due consideration from the design process all the way through execution of construction.

Elsewhere, general corporation-wide supervision includes Engineering Management, which supervises engineering issues, the Management Control Office, which supervises business management, and the Administrative Affairs Office. The Administrative Affairs Office reviews the availability of the KS mark, product quality, and lowest prices, and now it requests that procurement officers give clear, specific reasons on why they selected non-environmentally-friendly products when environmentally-friendly products were available. The office will ask for confirmation of whether environmentally-friendly products are available for a given procurement item, and promote their priority procurement.

### Future Plans

Regarding the balance between costs and the environment, the corporation in its position as a partially government-funded institution recognizes that costs will rise, and views them as indirect social costs. The corporation plans to have a sustained, continuing assessment management system in place by the end of 2003. This system incorporates such activities as Green Procurement performance management, environmental performance evaluations for each fiscal year, and environmental reports. In addition, the corporation plans to introduce an Eco-Partner system, and to establish an assessment system for small

and medium-size enterprises and procurement products.

The corporation is studying where problems or impediments arise in the practical promotion of Green Procurement, and is proposing solutions to these problems. While procurement costs are generally higher for environmentally-friendly products than for ordinary products, the corporation recognizes the need for awareness of such expenditures as being environmentally sound and for preservation of the environment. Of course, quality and reliability are the highest priority for public facilities such as dams and water works, and should even come ahead of environmental concerns. In many cases, no environmentally-friendly materials are available for construction materials, piping, etc. Moreover, in the area of materials supply, the corporation recognizes the need for development of sustainable technologies and for plant and equipment investment toward improvement of environmentally-friendly products in terms of quality and price. Also, as a partially government-funded institution, the corporation must place priority on procurement of products manufactured by small and medium-size enterprises, or enterprises that are headed by women or people with disabilities. The corporation's activities are somewhat constrained by prioritizing these concerns with environmental concerns.

While specific solutions to such problems are still to be found, the corporation plans to proceed with system reforms in terms of audits and policies, to reform corporate awareness through training and education programs, and to review product reliability in terms of both technology and costs.

**An Introductory Study on Green Purchasing Activities  
in Malaysia**

**March 2003**

**Green Purchasing Network Malaysia  
Kuala Lumpur**

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# **An Introductory Study on Green Purchasing Activities in Malaysia**

by  
**Green Purchasing Network Malaysia**

## **INTRODUCTION**

In so far as Green Purchasing or Green Procurement (GP) is concerned, it is a very new concept in Malaysia. The proposed strategy would encircle the involvement of an organization or company in the four fundamental principles as follows:

- a) to consider necessity before purchasing,
- b) to note the environmental impact of a product at all stages of its life cycle,
- c) to consider the corporations' and distributors' environmental performance, and
- d) to promote the gathering of environmental information when purchasing products.

### ***Environment Regulatory Framework in Malaysia***

Malaysia, like many developing countries, in the early days of abundant resources and minimal development pressures, little attention was paid to growing environment protection and conversation. However, since the enactment of the Environmental Quality Act in 1974, and the subsequent establishment of the Department of Environment, environmental management in Malaysia began to be more formalized and structured. Department of Environment Malaysia (DOE), under the Ministry of Science, Technology & Environment, Malaysia is formed to administer and enforce, amongst other environmental laws and regulations, the Environmental Quality Act, 1974 (Amendments 1985, 1996) and Section IV of the Economic Exclusive Zone Act, 1984.

### ***Environmental Policy Objectives***

The Environmental Policy Objectives are geared towards ensuring continued economic, social and cultural progress of Malaysia and the enhancement of the quality of life of its



people, through environmentally sound and sustainable development. The objectives seek to achieve:

- A clean, safe, healthy and productive environment for present and future generations.
- Conservation of the country's unique and diverse cultural and natural heritage with effective participation by all sectors of society.
- Sustainable lifestyles, patterns of production and consumption.

### ***Current Situation of Malaysian Industry***

As stated earlier, the concept of Green Purchasing (GP) and the establishment of a network is relatively new to the Malaysian industries. Even though other quality standards such as the ISO 9000, ISO 14000 series was launched as early as 1987, the Malaysian industries only realized the benefits when some of the firms were awarded "registered firm" in 1988. The ISO 9000 series or ISO 14000 series certification is carried out through the national accreditation body - SIRIM or the Standards and Industrial Research Institute of Malaysia and the National Productivity Corporation (NPC), Malaysia.

It is noticed that mainly the larger companies where the headquarters are from the USA, UK, Japan and other European countries have taken the challenge to promote 'green' practices. For the local manufacturing industries, especially the small- and medium-sized industries (SMIs), many if not all of them are still having the attitude of "wait and see".

Like most other countries, Malaysia has enacted a series of laws and regulations to stimulate pollution abatement based on end-of-pipe treatment. As discharge standards have become more stringent over the last two decades, the cost of end-of-the-pipe treatment has increased to the point of impacting the economic viability of companies in Malaysia. SMIs are particularly strongly impacted by rising costs due to their limited technical and financial resources. Equally important, the end-of-the-pipe approach does not eliminate pollutants, but merely transforms them from one medium to another. Therefore, it is crucial for Malaysia to look beyond the end-of-pipe methods to resolve pollution control problems. Although there is much public discussion on '5Rs' – reduce, reuse, recycle, recovery and refuse, at the moment the Malaysian government does not

have a formal policy on recycling activities. However, it is understood that a National Strategic Plan for the Management of Solid Wastes is in the final stages and it should be out towards the end of 2003. Meanwhile, government incentives are available which include:

- a) Capital rebate up to 50% for the purchase of recycling machineries, claimable from the Inland Revenue Board, Malaysia; and
- b) Exemption on the Import Duties and sales tax for such machines are applicable.

In Malaysia, statistics have indicated that a large portion of the country's environmental problems is associated with the activities of the small and medium-sized industries or SMIs. SMIs attribute their difficulties in compliance to their numerous constraints such as the lack of access to new technologies, lack of skills, low capital investment, low profit margins, small and variable scale of operation, and low productivity. However, with environmental standards and enforcement becoming more stringent, activities related to pollution prevention, control and waste minimization are steadily gaining momentum and attracting interest in Malaysia. Several programs that are relatively new in terms of concept and practice have been introduced and implemented on an ad hoc and piece meal basis. Some of the environmental programs or activities that have been launched in Malaysia are cleaner technology, cleaner production, pollution prevention, adoption of the Environmental Management System (EMS), and the ISO 14000 certification.

### ***Trends of Quality Management in Malaysia***

The main trends within quality management in Malaysia can be classified according to the following categories:

- Japanese affiliates, joint ventures with Japanese companies or those companies supplying products which apply Japanese system of quality management such as 5Ss.
- Multinational companies from Europe or the USA which apply TQC (total quality control) in accordance with their own standard manuals.
- Those companies aiming to realize quality system in line with ISO 9000, to meet the demands of export markets.

- Those companies recognizing the importance of quality management and which try to realize this but whose efforts are no more than line inspections.
- Those companies recognizing the importance of quality management but which are unable to realize objective results because of insufficient facilities.

Only a small number of Malaysian SMIs have reached a stage of development where they are able to apply quality management and effect an upgrading of their technical levels autonomously. The majority of these SMIs implement quality management in response to demands from their clients. (Hamzah & Ho 1994, pp.27-35)

### ***Awareness of the Importance and Role of Quality Management***

Many SMIs have no awareness of the necessity to implement quality management. Only some firms whose main markets are abroad or companies that produce parts and materials to be supplied to the manufacturers of products for export have the tendency to practice quality management. It is extremely rare among local SMIs to find companies which actually apply quality management systems, including quality control (QC) circle activities and other necessary practices, as an important element in upgrading in-house technical levels. The majority of local SMIs regard quality management as a response to buyers' requirements, and so they rarely undertake anything beyond product inspection. (Hamzah & Ho 1994, pp.27-35)

### **Education and Training for Quality Management**

At this juncture, only a limited number of SMIs make active use of the services of promotional bodies such as the NPC (the National Productivity Corporation) and SIRIM (the Standards and Industrial Research Institute of Malaysia). One of the plausible reason for the low level of awareness amongst the SMIs in this field is the fact that there are very few textbooks or reference works on quality management written in local language i.e. Bahasa Malaysia. This implies that local staff in charge of training would need to translate materials for use during training sessions. This slows down the promotion of quality management considerably. In addition, there is also an inability to comprehend the directions given by quality management staff due to educational level of

the trainees. Basic education on statistics is generally lacking, and this hampers the general application of statistical methods on quality management. (Hamzah & Ho 1994, pp.27-35)

### **Approaches to ISO 9000 Quality System**

Many local firms are interested in complying with demands from export markets to apply quality management systems based on the ISO 9000 Series. To meet this requirement, industrial associations are examining the possibility of instituting technical assistance, to be provided to member firms which intend to seek certification of quality systems based on ISO 9000. This assistance would include holding seminars organized with the help of SIRIM or employing qualified quality consultants by the associations. However, in general, because of the large amount of paperwork required by ISO 9000, it is difficult for the SMIs to tackle such tasks.

### **SIRIM's Quality Improvement Practice**

The Malaysian Government implemented its "Umbrella Project" in 1990, with the aim of upgrading technical levels and product quality among the SMIs, through SIRIM. This project aims to promote the gradual introduction of quality systems among SMIs based on ISO 9000 with the technical assistance of foreign affiliates and other advanced manufacturing companies. The aim was to encourage quality management by promoting the application of such systems under the Quality Improvement Scheme (QIP) and to tap those companies accredited under the QIP as suppliers to the main manufacturing companies co-operating under the aegis of the Umbrella Project.

### ***Malaysian Standards (MS)***

Generally, the Malaysian Standards are classified into three categories:

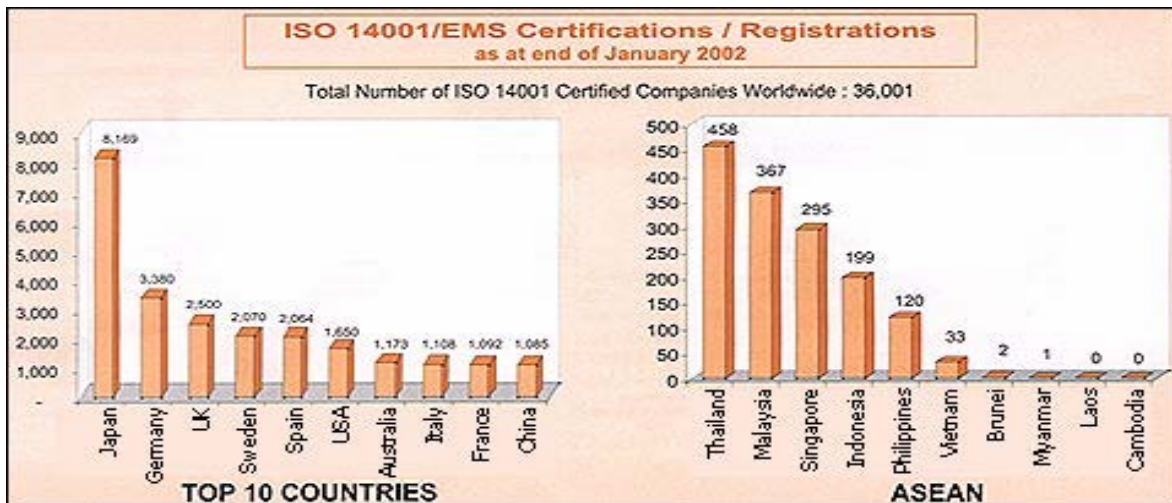
- a) Product standard: to specify the shapes, dimensions, quality and functions of products;
- b) Method standard: to specify methods of tests, analyses and inspection, and to establish procedures as well as codes of practice; and

- c) Basic standard: to specify such basic elements as glossaries of terms, marks, units and progressions.

The MS is used as a basis for product certification since it covers all industries including products related to electrical safety, automobiles and fire-fighting which are subjects of mandatory certification, as well as such principal export products such as rubber and palm oil (Hamzah & Ho 1994)

### ***Awareness on ISO 14000***

The ISO14001 Environmental Management System is an example of a standard developed by ISO/TC207 that has made significant impact on the global scene. After only 5 years since its introduction the number of companies that are certified to ISO14001 in the world has grown to more than 36,000, with Japan leading the rest of the world with more than 8,000 companies certified. Malaysia ranks 2nd within the ASEAN region and the number of ISO14001 certified companies in Malaysia have also seen exponential growth with an increase from 241 in December 2000 to 367 as end January 2002.



(Extracted from Transevent Sdn.Bhd. Corporate Website)

## **PRACTICES: GOVERNMENT INCENTIVES & POLICIES**

The Malaysian government provides several legal framework and incentive schemes for the manufacturing sector as described briefly as follows:

### ***Promotion Act 1986***

Through the Promotion Act 1986, Pioneer Status (PS) /Investment Tax Allowance (ITA) will be given out to any companies which carry out activities such as forest plantation project, proper storage, treatment and disposal of toxic and hazardous waste, waste recycling activities, the conservation of energy, utilizing biomass as a source of energy and also on specific manufacturing related activities

### **Pioneer Status (PS)**

A company that is granted PS will be granted tax exemption on 70% of the statutory income for 5 years. The balance 30% of that statutory income will be taxed at the prevailing company tax rate.

### **Investment Tax Allowance (ITA)**

The Investment Tax Allowance (ITA) is an alternative incentive that companies can opt for other than the Pioneer Status. ITA is designed to cater for projects which have large capital investments with long gestation period.

As in the case of PS, a company granted ITA will be granted an allowance of 60% in respect of qualifying capital expenditure (such as factory, plant, machinery or other equipment used for approved project) incurred within 5 years from the date the first capital expenditure is incurred. The allowance can be utilized to set off (exempt) up to 70% of the statutory income in the assessment year. The balance of that statutory income will be taxed at the prevailing company tax rate. Any unutilized allowance can be carried forward to subsequent years until the whole amount has been fully utilized.

### ***Other Incentives***

In addition, the Malaysia government through Ministry of International Trade & Industry (MITI) has offered grants for qualified Malaysia SMIs. The details are described briefly as follow:

### **Grant for Productivity and Quality Improvement and Certification (ITAF 3)**

The Scheme provides assistance to SMIs for productivity and quality improvement and to achieve international quality standards and certification. The Scheme provides grants to assist SMIs in:

- Productivity and Quality Improvement;
- Productivity and Quality Improvement based on customer's requirement;
- Documentation of Productivity and Quality Improvement;
- Productivity and Quality System Certification;
- Total Quality Management (TQM);
- Quality Development Systems [5S, Production and Planning Control (PPC), Quality Control Circles (QCC), Total Preventive Maintenance (TPM)];
- Occupational and Safety Measures;
- Quality Series: ISO 9000, ISO 14000, ISO 18000; and
- HACCP, Halal and other product quality certifications.

### **Form of Assistance**

The maximum grant allocated per company is RM250, 000.00. Assistance is given in the form of a matching grant where 50% of approved project cost is borne by the Government and the remainder by the applicant.

### **Eligible Expenses**

The grant covers the costs of:

- Cost of technical expertise;
- Cost of acquiring skills and technology through training and acquisition of technical information;
- Service cost for related schemes;
- Cost for testing and calibration;
- Cost of acquiring equipment for product testing, pollution prevention or safety; and
- Cost of material, used in designing and developing prototypes. Matching grant where 50% of approved

Project cost is borne by the Government and the remainder by the applicant.

## **BACKGROUND OF BUSINESS SECTORS**

In Malaysia, GP practice is new in corporate society. Only a number of Japanese companies which have subsidiaries or branches in Malaysia are found to practice GP activities. Even in these cases, it was learnt that the local companies or affiliates companies would have obtained certain management directives from the Headquarters based in Japan. Companies such as Fujitsu, Sharp, NSK and Brother Limited are a handful of private companies in Malaysia which have started green purchasing activities.

The followings are brief activities on Green Purchasing as practiced by the local Japanese branches:

### **a) Brother Industries (M) Sdn Bhd.**

Brother promotes green procurement activities featuring priority purchase of products that are friendlier to the environment. In particular, Brother Industries, Ltd. became affiliated with the Green Purchasing Network in 1997 and set procurement standards using the recommended products list, ranging from toilet paper to company vehicles. In 1997 and 1998 respectively, Brother Industries (Johor) Sdn. Bhd (Malaysia) and Brother Industries Technology ( Malaysia) Sdn. Bhd. managed to obtain ISO 14000 and started to implement GP in response to Brother's global GP campaign.

### **b) The Nitto Denko Group.**

The Nitto Denko Group started its green procurement in year 2000. In year 2001, through its subsidiary in Malaysia, Nitto Electronics Denko (Malaysia) Sdn. Bhd. has started its environmental accounting. In year 2002, the Nitto Denko Group, which aims for harmony and management, has application of green procurement guidelines and creating of survey information database for all the subsidiaries worldwide. According to Nitto Denko Group, due to the fact that laws and conditions differ from country to country, environmental activities must be pursued with attention on fine details. Centered on overseas expansion of environmental accounting, they are attempting to spread global environmental activities based on environmental impact cost reduction activities. Also, they are also synchronizing their conscious-sharing and activities by considering a global environmental management assessment system and holding international conferences on the environment.



**c) Others**

Apart from these companies, the following companies are also found to have knowledge on green purchasing practices. These include:

- i) Fujitsu Corporation via Fujitsu Component (Malaysia) Sdn. Bhd. (Malaysia), Fujitsu Microelectronics (Malaysia) Sdn. Bhd. (Malaysia) and Fujitsu Computer Systems (Malaysia) Sdn. Bhd. (Malaysia)
- ii) Casio (M) Sdn. Bhd.
- iii) SA6 Minolta (M) Sdn. Bhd.
- iv) Olympus (M) Sdn. Bhd.
- v) Shinko Electronics (M) Sdn. Bhd. Systems

***PLAUSIBLE OBSTACLES TO THE IMPLEMENTATION OF GREEN PURCHASING NETWORK***

The barriers and constraints in implementing GP activities in Malaysia can be perceived at two levels. One is at the Policy level and the other is at the enterprise level. However, if the organization of GPN Malaysia is well thought off, with the help and collaboration of GPN Japan, these obstacles can be overcome. Moreover, it is envisaged that at the early stage of implementation of GP Malaysia, slow steps and participatory involvements of some key industrial players would be important. Also, at the initial set up of GPN Malaysia, it is suggested that companies will not be charge a fees for being member. Nevertheless, some related issues are discussed as follows:

At the policy level, implementation of GP activities should be viewed on account of:

- **Incentives to encourage adoption of GP activities.**

At the national level, not many incentives are offered to companies or corporations to implement GP activities. Incentives such as Pioneer Status or Investment Tax Allowance, as well as ITAF 3 grant may not be significant to motivate companies, especially SMIs to adopt GP practice. However, as more companies are members of GPN, the 'self-motivation' concept may work and this may attract more companies to voluntarily come forward to have the products listed in the GP's directory.

- **Lack of awareness on the GP concept.**

In this regard, trained and qualified personnel in this area are of first priority. Industry would largely have to depend on manpower and resources outside the country for training, design and auditing the product or services so as to be listed into GPN directories.

At the enterprise level, the process of designing and implementing an effective GP practice may be constrained on account of:

- **Business Requirements**

Business to business environmental requirements has begun to influence corporate behavior in favor of environmental protection. Buyers abroad are increasingly demanding proof of environmental responsibility from all those who are in the supply chain. While product related environmental requirements like eco-labels have been a part of business stipulations for quite some time, now process related certifications are also gaining currency internationally. Such certification related to organic and sustainable farming, floriculture, forestry marine food etc. In the case of GP practice, most of the local or international buyers still do not regard it as mandatory. This may be true for some time. However, once GPN Malaysia starts as a legal and official organization to list the organization and display their products in the directory as done in the case of GPN Japan, the 'self-requirement' would propel the business requirement for the companies and their products to be within the listing of GPN Malaysia. This is especially so if GPN Malaysia can convince the government sector to be member of GPN Malaysia.

- **Customers' Awareness on Green Purchasing**

In this regard, there are two aspects i.e. the companies as consumers of intermediary products as well as individual consumers as end product users. The important aspect will be to raise the awareness of the companies' procurement department and their staff so that purchasing will go 'green'. This will influence the suppliers or the contractors of the company to be members of GPN Malaysia.

On the other hand, individual customer's awareness in green purchasing will be an added advantage to promote GPN Malaysia.

- **Unable to perceive the benefit of GPN Initially**

It would not be surprising that the initial reception of GPN Malaysia will be met with skepticisms especially when it is difficult to quantify the benefits, cost savings and customer rewards associated a green purchasing network. This is especially so in the absence of a legal framework to push for the so-called positive environmental action, and generally the businessman would not want the benefits accrue slowly but costs quickly in joining GPN Malaysia. The only way to this is to be patient to build up the network initially and once there is a critical mass of members with certain number of the products listed in the directory, the mis-conception will slowly but sure wane as in the case of GPN Japan.

### ***Potential Trade Impacts of GPN***

With the implementation of GPN Malaysia, the likely outstanding concern that its implementation may likely to pose a barrier to trade, particularly for small and medium enterprises and for companies in developing countries will have to be tackled. This has to be explained in the context of voluntarism for the promotion of environmental protection and the improvement of overall socio-economic development.

Some of the trade issues relevant to the implementation of GPN which might be raised are as follows:

- There is a concern that the GP practice will be adopted as a mandatory requirement by some quarters and therefore may pose a barrier to free trade. This should not be a concern as there is no effort to make joining the green purchasing network compulsory at any time
- It is possible that in future, government procurement practices will give preferential treatment to GP certified supplier. ( Nyati, 2001) This might be so as the society demands for better products and goods as well as cleaner environment.

## **INTRODUCTION OF ORGANIZATIONS PROMOTING GREEN PURCHASING**

### ***Green Productivity Association, Malaysia (GPAM)***

The Green Productivity Association is legally registered with the Register of Society Malaysia on 30th, July 2001. Amongst the objectives of GPAM are:

- a) To meet on a regular basis to promote technology, management experience, and training and sustain green productivity related activities among members
- b) To promote issues and encourage the implementation of Green Productivity through management methodologies such as the Environmental Management System (EMS) and in particular in relation to best business practices.
- c) To encourage active participation and share productivity related information among members.
- d) To share where possible relevant expertise and database on the area of productivity enhancement and environmental protection.
- e) To collaborate with local and foreign organizations involved in green productivity improvement activities including training programs, seminars, workshops, demonstration projects and publications.

The GPAM is still at its infancy stage and due to various factors including financial constraints; GPAM's activity has been limited to membership drive and organizing green productivity awareness meetings and workshops. The response towards the association's membership drive has been extremely encouraging thus far, with interested organizations and individuals applying for the membership. (Adapted from GP Country Paper-Malaysia)

### ***The Green Purchasing Network Malaysia (GPN)***

A group of like-minded individuals have gathered and submitted an application to the Register of Society Malaysia for the registration of a Green Purchasing Network of Malaysia in early January 2003. It is expected that the registration to form a legal entity will take several months. Once the formality of registration is completed, the Association

will than invite companies to attend the inaugural meeting in which case GPN Malaysia will be formally launched.

The stated objectives of GPN Malaysia are as follows:

- a) To promote, educate, disseminate, investigate and research on green purchasing issues and encourage the implementation of green purchasing through management methodologies and principles such as the establishment of guidelines for products and merchandise information in relation to best business practices.
- b) To encourage active participation and share productivity related information proliferating among Members; including the use of eco-mark, environment labels and data book.
- c) To share where possible relevant expertise and database in the area of green purchasing, procurement and related enhancement so as to achieve environmentally conscious products or services.
- d) To collaborate with local and foreign organizations involved in green purchasing improvement activities including training programs, seminars, workshops, demonstration projects, publications, disseminations and other related events.

## ***NATIONAL ACTIVITIES THAT ENHANCING GP ACTIVITIES***

### **Prime Minister's Hibiscus Award**

The Hibiscus Award was first launched in 1996 as the premier private sector environmental award in Malaysia. With the support of the Prime Minister, the Award was upgraded to be the Prime Minister's Hibiscus Award in 1998. The Award's objectives are to provide business and industry with the opportunity for an independent evaluation of their environmental commitment and sustainable development; Stimulate business and industry initiatives in assuming a proactive role in environmental protection and sustainable development; and recognize the achievements of exemplary participating organizations for other organizations to emulate.

## **Malaysia Environment Week**

The Commonwealth Heads of Government Meeting (CHOGM) held on 18-24 October 1989 strengthened the framework of environmental management with the adoption of the Langkawi Declaration on the Environment on 21 October 1989. To commemorate this date, the Government decided that Malaysia Environmental Day will be celebrated on 21 October each year to mark the adoption of the Langkawi Declaration. Henceforth, 21-27 October each year will be Malaysia Environment Week (MASM). Many activities were planned for the celebration at National and State level during one week event

## ***LOCAL AUTHORITY'S EFFORT IN PROMOTING GP***

Malaysia is running out of space to dispose of the urban waste generated daily by wasteful consumption. There simply aren't enough landfills. According to Housing and Local Government Minister Datuk Seri Ong Ka Ting, 80% of the country's landfills will be full in two years. In fact, landfills themselves cause many serious environmental problems both for us and for future generations.

## **Breakdown of solid waste created by Malaysians**

<b>27 %</b>	<b>Paper</b>
<b>36.5%</b>	<b>Household waste</b>
<b>3.9%</b>	<b>Steel</b>
<b>3.7%</b>	<b>Glass</b>
<b>16.4%</b>	<b>Plastic</b>
<b>12.5%</b>	<b>Others</b>

Experts believe a landfill can last 10 years longer if Malaysians recycled 50% of their garbage. According to an estimate, in the 1990s, the average solid waste disposal by a Malaysia was 0.7 kg per day and today the solid waste disposal by the same Malaysia has risen to about 2.2 kg per day. The residents of Johor Bahru generate 1300 tons of waste every day. It will take only 3 days to fill the entire length of the Johor Causeway with this amount of garbage.

## **Local Agenda 21**

To start on all this - saving water, recycling, composting, Local Agenda 21, or LA 21, is a means of linking local authorities with the people towards a common goal of sustainable development. Launched by the United Nations at the seminal Rio Earth Summit in 1992, it is aimed at empowering local communities in the 21st century - hence "Local Agenda 21".

LA 21 in Malaysia is jointly implemented by the United Nations Development Programme, the Housing and Local Government Ministry and various local authorities. LA 21 will provide affirmation and encouragement to local authorities, and will at the same time provide growing opportunities for community participation in planning and development. It also increases social integration and promotes a self-help attitude among the people of a particular community. [Adapted from Kitarsemula Website]

## **Petaling Jaya Community Centre (PJCC)**

The PJCC is a program based on a smart partnership of government, non-governmental and private organizations and communities. It was conceptualized in September 1996 and the smart partnership program started in 1997. The PJCC has the objective of setting up continuous and self-reliant programs at community level utilizing the resources of older persons, with participation from the young, for the benefit of all groups in society. Emphasis is given to activities and services which are economic, educational, health, social, environment, cultural, sports and recreational, and related to information and communication technology. [Adapted from PJCC Community Website]

One of their activities is collecting recyclable items. All items brought in must be clean, dry and in the conditions specified or they will be rejected. Besides items in the list below, also accepted are toys, clothes, bags, furniture (beds, cupboards), appliances (fans, fridges), dinnerware (cutlery, cookware) etc.

<b>Items/ Material</b>	<b>Price per kg*</b>	<b>Conditions</b>	<b>Some examples</b>
Aluminium Cans	RM1.00	Crushed	Soft drink cans
Tin Cans	2 cents	No rusty tins	Food, biscuit and milk tins

Paper	5 cents	No food wrappers	Newspapers, magazines, telephone books and cardboard boxes
Glass bottles/jars	5 cents	Clear or colored. No ceramics, window panes or light bulbs	Vitamin, jam and drink bottles
Plastic	10 cents	-	Drink bottles/straws, tupperwares, plastic bags and wrappings
Useable clothing	15 cents	No torn clothes or rags	Adult's or children's clothes

\* Prices indicated are based on rates set by the respective recycling companies and may vary accordingly.

## ***ENVIRONMENTAL FRIENDLY ORGANIZATIONS & EFFORTS***

### **Eco Labeling - NTCC**

The establishment of the National Timber Certification Council (NTCC) is an important development towards sustainable forest management in Malaysia. Incorporated as a company limited by guarantee in October 1998, the council had started its operations since January 1999. The NTCC is a non-profit company established to plan and operate the timber certification scheme in Malaysia, as part of Malaysia's overall efforts to ensure sustainable forest management as well as to facilitate international trade of timber.

### **Incentives for Energy Efficiency & Conservation (EEC)**

EEC programs will focus on the industrial and commercial sectors being the major consumers of energy. Measures to promote the efficient utilization of energy include the enforcement of the Energy Efficiency Regulation, extension of financial and fiscal incentives and demonstration projects. In this respect, the establishment of new integrated complexes and townships that are managed on an energy-efficient manner will be encouraged. The implementation of demand-side management will be intensified during the Eight Malaysia Plan (2001-2005) period, which includes energy auditing,



retrofitting and district cooling programs, changing the energy usage pattern and appliance labeling.

One of the most promising programs is energy auditing that aims to encourage industries and building owners to audit their energy use towards reducing energy cost and increasing productivity. Under this program, about 40 units of buildings and industries have been audited between 1993-1995 through the bilateral and multilateral cooperation. This is the first energy audit program carried out under the Malaysia Development Plan 1991-1995. The Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP) is one of the biggest projects that is currently being carried out by Malaysia Energy Centre (PTM) targeting the industrial sector while Energy Audit in Government Buildings (EAGB) is targeting the building sector.

### **Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP)**

The implementation of this RM 80-million 4-year project is guided by the utilization objective of the National Energy Policy. This project is jointly funded by the Government of Malaysia, the private sectors, the Global Environment Facility (GEF) and the United Nations Development Programmed (UNDP). The project is developed to remove the barriers to energy efficiency and conservation in the country's industrial sector, i.e., Global Environment Facility (GEF) Operational Program No. 5. The objective is not to constrain the consumption of energy but to promote efficient use of energy resources. In addition, the MIEEIP is expected to make accelerated inroads as a practical and economic "green" energy option to reduce the negative environmental impacts on energy consumption on the local, regional and global environment.

The MIEEIP aims to reduce the barriers and encourage implementation of energy efficiency improvements in the eight energy intensive manufacturing sectors namely; cement, ceramic, iron and steel, food, glass, wood, pulp and paper and rubber. The project will develop benchmarks for energy use in the eight industrial sectors, enhance their capacity to identify and evaluate energy saving measures, provide training and education and demonstrate the viability of new energy saving technologies through pilot project.

On top of that, the government has provided fiscal incentives through Malaysia 2001 Budget for energy efficiency companies via Pioneer Status and Tax Allowances  
[Adapted from ASEAN Energy Corporate Website]

### ***Private Sector in promoting to GP***

As part of a continuous improvement process, Malaysian manufacturers, especially in chemical related producers constantly work towards meeting existing and new "green" guidelines imposed by key export markets like the European Union and Japan. In line with meeting eco-labeling requirements, Malaysian manufacturers are working towards phasing out chemical substances such as *cadmium*, *lithium* and polyvinyl *chloride* (PVC) from electrical and electronic equipment. Malaysian producers are also working towards fulfilling Japan's new green product guidelines covering the designated labeling of *nickel cadmium* batteries, *lead acid* batteries, and PVC in building materials such as pipes, floor coverings and wallpaper.

As a mark of their commitment towards environmental conservation, many Malaysian chemical companies have eradicated the use of *CFCs* in aerosol products, which was identified as a major contributor to greenhouse gases and global warming.

In the area of R&D, many Malaysian companies and brands are constantly investing in new product development for items like adhesives, paints and petrochemicals. Significantly, Malaysia produced a world first with the Silverfil mercury-free dental amalgam, a major contribution to global dental health.

In order to completely globally, ISO 9000 series and 14000 series, and other standards such as GMP are being adopted. As for 2003, 50 Malaysian-based companies have managed their operations according to the 10 guiding principles and 6 codes of management practices of the Responsible Care Program. These codes include *Distribution, Community Awareness and Emergency Response, Pollution Prevention, Process Safety, Employee Health and Safety and Product Stewardship Code*. [Adapted from MATRADE Corporate Website]

## **CONCLUSION**

At present, the practice of GP amongst the manufacturing industries including the SMIs in Malaysia is virtually non-existent. This is because the concept is still new to many. The implementation of environmental techniques by Malaysian SMIs is based very much on ad-hoc practices and many of them do not actually subscribe to any particular environmental concept. Most of the firms in Malaysia are still in the 'wait and watch' stage to actively participate in any environmental protection related programs because many organizations in Malaysia do not recognize the need to link the business to the environment for greater benefits.

Several issues related to the implementation of green purchasing in Malaysia have been discussed and with the commitments from individuals, companies and collaborations from GPN Japan, many of these issues can be overcome slowly but surely. For more effective implementation and promotion of GP practice, efforts should be taken to include government departments and agencies, the academic institutions and NGOs to be part of the GP family. In this context, the role of supporting agencies like the Green Productivity Association Malaysia, the NGO's and related government bodies could play a significant role in promoting awareness of existing environmental practices that may generate better environmental performances. Various approaches such as technical demonstration, public awareness and training programs, information services and offering financial incentives could be held simultaneously in creating the awareness of GPN practice.

With the support from government and enforcement to instill awareness among the local and international traders and business communities, there is no reason why Green Purchasing Network could not be well received among Malaysia companies. What is expected for the future in terms of environmental management is the wide acceptance and practice of GP in industries and related organizations.

## **CASE STUDIES**

For this introductory study on green purchasing or green procurement (GP) in Malaysia, an effort was made to categorize the manufacturing industries into two big groups namely, the big Multinational Corporations where the local organizations are branches, affiliates, subsidiaries or regional set-up of the parent companies based abroad including Japan. An example of such a company will be NSK Sdn. Bhd. The other group comprise of the local SMIs which may be the small or the medium set-up.

Surveys were carried out for the purpose of this study on the following companies:

- a) NSK Sdn. Bhd., Selangor
- b) REM Corporation Sdn Bhd, Selangor
- c) LEP Precision Components Sdn Bhd, Selangor
- d) Progress Plastic Sdn Bhd, Melaka

The case studies for each of the above companies are attached as in Appendix I-IV.

## ***APPENDIX I: CASE STUDY ON NSK (M) SDN. BHD.***

### **Company Background**

NSK (M) Sdn. Bhd. located at Taman Taming Jaya Industrial Park, 43300-Balakong in the state of Selangor is a subsidiary company of NSK Co. Japan. The principal products are: bearings, precision machine parts and automotive parts. Most NSK bearings are made of steel that is recycled from scraps. Machinery, which use bearings and no longer have any useful life, are recycled and the recycled steel products are re-used as raw materials.

### **Environmental Practices**

The companies have a varied environmental policies and practices. NSK Japan established the Global Environmental Protection Committee in 1993 and since then NSK has engaged in the development of environmentally friendly products as well as the reduction of energy consumption, waste management and the reduction of hazardous substances at each manufacturing site, including in Malaysia. NSK also practiced some form of environmental policies with their headquarters in Japan insisting on an environmental policy e.g. Green Purchasing policies for their products which are being supplied to various multi-nationals like Sony. They possess ISO 14001 certification though they do not have any kind of eco-labeling as yet (UPM. 1999).

NSK Group of Companies have taken note of the growing environmental concerns and a comprehensive mid-term goal was outlined in the year 2000. Under these voluntary action plans, the companies enact and strive to achieve environmental protection activities throughout the entire company. The companies have also introduced LCA activities and successfully reduce negative impact on the environment including the waste management goals.

In terms of green purchasing and green procurement, the midterm goals were two-folds:

- a) to adopt green procurement standards; and
- b) to adopt guidelines for green purchasing.

In these efforts, the companies had compiled standards and adopted them for 93% (in terms of total volume of purchase made) of vendor companies. In green purchasing, guidelines for papers, office equipment, stationary and vehicles were established. On the other hand, they have minimum related information utilizing green purchasing such as eco-labeling criteria or guidelines, products database and other parameters.

### **Barriers**

It was noted that the suppliers to NSK do not have ISO 14000 certification and do not have a policy of environmental conservation policies. Their purchasing of final products, parts and materials do not take into account of life cycle assessment. It was told that there are at present no legal requirements for these green practices in Malaysia. (Department of Environment, 1974).

### **The Companies' Awareness**

The company is aware of the organization promoting green purchasing i.e. the GPN Japan. It is, however, not sure of the movements involved. They have minimum business approaches as shown in comparison to other MNC's (Harvard Business School, 2002)

## ***APPENDIX II: CASE STUDY ON REM CORPORATION SDN BHD***

### **Introduction**

**REM Corporation Sdn. Bhd.** was established in 1983 as a Resource Environmental Management Company. It is a SME with total staff of twelve person. Its early business activities consisted of earthwork, road, drainage, sewerage, construction, waste paper recycling, precious metal recovery, hazardous wastes and environmental pollution consultancy. Other associated businesses in the past included plant tissue culture, cosmetic and pharmaceutical and starfruit farming.

During the later part of 1980s, the company diversified into fruit wine and brandy production thus, became the first and only company to be awarded a manufacturing license by the Custom and Excise Department of the Ministry of Finance to produce wine using the local starfruit as its raw material. The company produced perhaps the first Starfruit Wine (**Rambola**) and Starfruit Brandy (**Stargnac**) in the world. In the later part of 1999, it was granted the Good Manufacturing Practice (**GMP**) license by the Ministry of Health to produce traditional herbal medicine.

During a glut of starfruits (*Averrhoa carambola L.*) in Malaysia, many farmers discarded them in order to reduce their losses. Confronted with the fluctuation of the growing seasons, the supply and demand of the markets, Rem Corporation decided to make history by converting the good quality off grade fruits into fruit wine and fruit brandy. This is how the history of fruit wine and fruit brandy industry began in Malaysia. REM's customers are wholesalers, retailers, night spots in Malaysia, Singapore and Japan. REM also sells its product directly online at <http://www.rem.com.my>. It also does contract beverage manufacturing for other companies.

### **REM and the environment**

REM does not have written environmental nor green purchasing policy. In fact, when approach, REM admitted to not having knowledge of green purchasing network. However, it has the business philosophy of keeping their production clean with

minimum wastage, and the staff can work in a safe and comfortable environment. REM is sensitive to the environmental aspect of its business due to the background of its founder. The founder of REM is a veteran environmental scientist with a doctorate in environmental health. The early business activities are in the environmental protection realm such as consultancy in environmental pollution and resource recovery.

### **REM as a purchaser of environmentally less damaging good and services**

The most critical issues affecting REM's purchasing decisions are quality, consistency and reasonable price structure. Currently, environment aspect of the product does not critically affect its purchasing decision; REM only asks for the standard product specification. REM will be compelled to ask for environmental-related information when the quality is below acceptable standards. REM do not consider genetically-modified organism as a critical issue in the winery industry. However, REM would consider these products as priority if it were to incorporate green purchasing; concentrates, fruit quality, herb quality (basically the raw material for production).

### **REM as a supplier of environmentally less damaging good and services**

The most critical aspects of the beverage industry are chemical residues and microbial contamination. REM has taken action to minimize environmental impacts of your operation by reducing wastage and reusing by-products and rejects (for example odd-sized fruits). The actions taken are due to legal requirements, customer demand and it is cost effective to do so. REM do not disclose the environmental measures, for example on the labels, it has taken on its products because it is not required at the moment.

REM does not often encounter environmental-related queries from its customers. Customer demands necessitate stringent quality control to ensure its products are safe and healthy. GMO is not a critical issue and organic wine would not be part of REM in the near future because of high cost.

### **Conclusion**

REM's environmental actions are motivated by its experience in the environmental consultancy business. REM practices elements of cleaner production such as waste minimization and was able to capture the cost savings through such measures. As a



**purchaser, REM's emphasis is on products that maintain and enhance the quality of its beverages. As a supplier, the market place more emphasis on the taste rather than the environmental aspects of REM's products.**

### ***APPENDIX III: CASE STUDY ON LEP PRECISION COMPONENTS SDN. BHD.***

#### **Introduction**

In general the electroplating sector is dominated by small and medium enterprises (SMEs) working on a wide range of job orders. These SMEs provide electroplating services catering to automotive, motor-cycles, electronics, wire products, fasteners and appliances in one end to smaller components and fittings for recreational products on the other end of the continuum. At the same time, this industry has always been noted as one of the major contributor to pollution.

The electroplating process involves the deposition of heavy metals such as copper, nickel, chromium, zinc, etc. electronically on metal surface or components. As a result of electroplating, the stipulated heavy metal get deposited thereby the surface is resistant to corrosion or rust which in turn increases its durability. In addition, electroplating also increases the aesthetic appearance of the component and enhances the special surface properties.

This brief write-up provides some basic information in a SME which involves in the die-casting and electroplating industry. The company, LEP Precision Components Sdn Bhd. (LPC), located in Shah Alam produces completed consumer and industrial products as well as intermediate parts to other companies. Some of the company's products include furniture fittings, food service equipment components, architecture handles and fishing reel components. The products are electroplated with copper, nickel or zinc. Does the company face problems in its waste treatment and pollution control such as the treatment of its polluted wastewater? If it does, it can result in the destruction of environmental balances and pose health hazard to both human and animals dependent on these water bodies.

#### **Company Profile**

The LEP Precision Components (LPC) Company is a partnership company between 2 enterprising businessmen. It has an authorized capital of RM100, 000 (approximately

equivalent to USD26, 000). In term of sales, in 2001, the company's volume of sales was estimated to be RM1.5 million (USD400, 000). The products are mainly marketed locally but a certain volume of its products are also exported to the neighboring country in Singapore as well as contracted work for a Japanese company.

Some other information regarding this company is summarized in Table 1.

**Table 1 - Company Profile**

Name & Address of Company	LEP Precision Components Sdn. Bhd. 26 & 28 Jalan 5, Off Jalan Rimau Bukit Kemuning Shah Alam 42450 Selangor, Malaysia
Number of Employees:	Professional: 1 Management & Administrative Staff: 4 Full-time Workers: 20 Total: 25 (does not include seasonal or part-time staff)
Nature of Business:	Die-casting & Electroplating
Years of Operation:	2 years (since 2000)
Market:	Largely domestic
Major Products:	Fishing Reel Components, Furniture Fitting & Food Service Equipment Components
Electricity Consumption:	35,000 Kwh/month
Other Energy Consumption:	Fuel – 2,000 liters per month (average)
Water Consumption:	RM600 per month
Production Capacity:	Fishing Reel Components: 12,480 pcs per 8-hours Furniture Fitting: 5,000 pcs per 8-hours Food Service Equipment Components: Between 500 – 1,000 pcs per 8-hours Total: 9.5 - 9.8 million units/annually

## **Input Materials**

The major input materials, quantity and costs figures are as follows:

No.	Input materials	Quantity (per mth)	Total costs (RM)
1.	Zinc - alloy	5 M Ton	5,000 per M Ton
2	Nickel metal	300 kg	25 per kg
3	Copper metal	120 kg	13 per kg

4	Chemicals (general)	NA	13,000
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In addition, the company's electricity bill per month averages RM10,000. The water supply is from the municipal and costs RM 600 per month.

## **Wastewater**

It has been estimated that the volume of wastewater generated per day is around 10 - 13 m<sup>3</sup> per day. The wastewater generated from the electroplating process is discharged into centralized treatment facility within the industrial park. The wastewater is generally alkaline in nature and contained heavy metals. The company has not applied any method to minimize the volume of waste water generation at the moment.

## **Solid wastes & others**

LPC has identified the following solid wastes from the production process:

<b>Solid waste</b>	<b>Source</b>	<b>Quantity (month)</b>
Dross	Zinc alloy preparation	1 – 1.5 ton
Paper	Packing	30 kg

According to LPC, almost all dross are collected and sold to the metal suppliers. The waste paper are dumped at the municipal sites and collected regularly by the local authority.

The production process also generates noise although the noise level has not been measured. The noise is generated from equipment operations in die-casting. On the other hand, small quantity of air emission through the casting, electroplating and drying process are emitted. Typically the emission contains small quantity of SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub> and dust particulates which has not been ascertained at this juncture.

## **Green Purchasing & Other Information**

It is the company's ultimate objective to be ISO certified in the near future. In addition, the management endeavors to monitor and control wastes and wastewater discharge as well as the solid or hazardous waste disposal. In this regard, the company would like to

know more on green purchasing or green procurement network and how this will ensure a better environmental protection for the benefits of the community at large. At the moment, the company has no knowledge on this subject.

The management also realizes there could be room for improvement in term of energy conservation and other process flows. Since there is no monitoring on the air emission at the moment, it may be one area for the company to upgrade the air emission system. In addition, the management would like to improve the quantity of chemical usage and chemical substitutes, improve the drainage system on the production line where wastewater is currently being drained and discharged. The company is also interested to learn more on the possibility of switching over to new technology and practices especially in lowering or eliminating the use of cyanide compounds.

## ***APPENDIX IV: CASE STUDY ON SYARIKAT PROGRESS PLASTIKS, MELAKA***

### **Background**

Syarikat Progress Plastiks (SPP) was formed in 1983 by Madam Lee Gek Chu and a few local entrepreneurs in Malacca State (about 2 hours drive from the capital- KL), Malaysia. Initially, the company had only 3 reconditioned plastic injection machines and operated in a 22 feet x 70 feet shop lot. 6 staffs which included the owner themselves were the pioneers in managing this company initially.

As of 2003, the company has expanded into 2 shop lots. More machines were bought in and as for now, a total of 7 reconditioned Japanese made plastic injection molding machines were bought. However, SPP's scale is considered a small scale of original equipment manufactures (OEM) as they do not have industrial designing capabilities. SPP's core business is to manufacture third party plastic components or products such as plastic latex cup, plastic household products and plastic industrial components.

### **Roles of Purchaser**

The procurement process of SPP is still predominantly based on traditional approaches, tools and communication channels. Being a small SMI, SPP does not have a systematic procurement system. The purchaser, who is the owner herself, relies on market information provided by the sales personnel who visit them on a regular basis. In addition, regular visits to trade exhibitions and subscriptions to trade magazines provide the management some insights on the current industry trend. The primary communication tools are telephone and fax machine. Even though web site and email communication are fast gaining popularity in local community, it is still rarely practiced by the owner of SPP.

SPP makes their purchasing decisions based on a routine and non-routine basic. Routine purchases will include raw materials (plastic resins), industrial lubricants and other wear and tear components. Non routine purchase will include fixed asset purchases such as additional machines, new shop lots or even new factories.

## **Factors that Affects the SPP's Procurement Decision**

### **Pricing**

The purchase of machines and raw materials are normally done by the Madam Lee. Few factors are taken into considerations below a purchase decision is made. First and foremost, the cost itself. It is a norm for her to source and bargain for the lowest cost for both routine purchase and non routine purchase. Lately, there is an emerging threat by the China made plastic components or end- products as the likely substitute over SPP's products. In order to remain competitive, micro companies such as SPP has to ensure that their operation cost (which include the raw material cost) is minimized.

### **“Guan Xi” or Relationship with the Suppliers**

Apart from that, reliable and reputable suppliers are given priority when come to selecting suppliers. For SPP, “*Guan Xi*” or relationships plays a very significant role in determining the choices of suppliers. Guan Xi simply refers to the relationships or friendship that taken place between the suppliers and the owner of SPP. Apart from Guan Xi, factors such as willingness to give credit terms also being considered. Under normal circumstances, the better the “guan xi”, the longer the credit term period would be provided. Industry standard for credit terms would be either 60 days or 90 days. However, in the case of SPP, some major suppliers could give them credit terms as long as 120 days.

### **Reliability of Suppliers**

In many cases, SPP prefers to deal with reputable or established suppliers due to the following reasons. Firstly, SPP has to ensure that their supply of raw materials is constant in term of quality and quantity as well as the pricing. Secondly, in the case of asset purchase such as additional machines, SPP will be assured of good after sales service from the machine suppliers. This is critical to ensure that all the machines are functioning properly and break down time is minimized.

Apart from that, the suppliers also act as market and product information disseminator. Some of the suppliers will supply up-to-date information and under certain circumstances, their opinions and views will be taken considerations before a major decision is made in the case of SPP.

## **Barriers and Constraints in Implementing GPN**

The information on environmental issues is lacking. When contacted, the management of SPP does have some basic understanding on the importance of ISO 9000 and 14000 series, but adoption effort is low. In addition, there is no GP awareness. In regards to house keeping, SPP only performs the basic house keeping as required by the local authority.

For SPP, the process of designing and implementing an effective GP practice may be constrained because the priority is profit, rather than environmental issues, thus management commitment is lacking. In addition, the management of SPP is has very little information and knowledge about GP practice. SPP are skeptical about the benefits, cost savings and customer rewards associated with positive environmental action.

To the owners of SPP the environment is not a core business issue and the lack of allocation of resources conspire to keep the status of environmental issues low on the business agenda. SPP feels that it lacks resource personnel and technical know how in carrying out GP practice. As a company, SPP's internal resource is limited. Documentation could be a deterrent. Companies may feel that GP practice may lead to generation of too much paperwork and hence may not implement the system. Customer indifference to SPP environmental performance is another key reason why SPP considers environmental issues unimportant to business.

## **Conclusion**

Most small companies, such as SPP are still lacking and adopting a 'wait and watch' policy in pursuing activities in regards to environmental factors. A huge effort needs to be carried out to promote GP practice to micro companies such as SPP. Awareness need to be created by relevant authority in order to attract more companies like SPP to implement GP practice. SPP is willing to start its GP practice with the right support and guidance. In this context, the role of supporting agencies like the Green Productivity Association Malaysia, and related government bodies could play a significant role in promoting awareness of existing environmental practices that may generate better environmental performances. Various approaches such as technical demonstration,



public awareness and training programs, information services, and offering financial incentives could be held simultaneously in creating the awareness of GP practice.

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# **Survey of Selected Companies on Green Purchasing in Malaysia**

## **Overview**

Green Purchasing is very new concept in Malaysia. There are no green purchasing laws or regulations in Malaysia however other relevant laws and regulations are enacted. Malaysia, like many developing countries, in the early days of abundant resources and minimal development pressures, little attention was paid to growing environment protection and conversation. However, since the enactment of the Environmental Quality Act in 1974, and the subsequent establishment of the Department of Environment, environmental management in Malaysia began to be more formalized and structured. Department of Environment Malaysia (DOE), under the Ministry of Science, Technology & Environment, Malaysia was formed to administer and enforce, amongst other environmental laws and regulations, the Environmental Quality Act, 1974 (Amendments 1985, 1996) and Section IV of the Economic Exclusive Zone Act, 1984.

## **NSK (M) SDN. BHD.**

Nature of Business: Bearing Manufacturer

Market: all over the world

Major Products: Bearings, Precision Machine Parts and Automotive Parts.

## **Introduction**

NSK (M) Sdn. Bhd. (NSK Malaysia), a subsidiary of NSK Ltd., Japan (NSK Japan), was established in 1993, to promote sales of NSK Products in Malaysia. NSK Japan was established in 1916. Over its long history, NSK Japan has developed various types of bearings and supplied them to customers all over the world, contributing greatly along the way to the advancement of industries and machinery. At present, NSK Japan is the largest bearing manufacturer in Japan and the second largest in the world. From early on, NSK Japan has utilized its expertise accumulated through bearing engineering and production to expand into automotive components, precision machinery and electronic components. Along with product diversification, NSK Japan has expanded its production capacity to include 17 plants in Japan and a global sales and manufacturing network. Starting with an American sales and distribution base established in 1962 in Ann Arbor, Michigan, the company has expanded its network to cover 25 countries in North and South American, Europe, Asia, Oceania and Africa. In 1972, NSK Japan established a production foothold in a suburb of Sao Paulo, Brazil. Today, NSK Japan has 48 manufacturing plants operating in the United States, Europe and Asian countries other than Japan.

## **Green Procurement in NSK Ltd. Japan**

NSK Japan has also taken actions to protect the environment beyond its corporate operations by encouraging their suppliers to take environmentally friendly actions. To this end, they published the Green Procurement Standards and NSK Chemical Substance Control List, and distributed them to their 181 suppliers (93% of their total purchases). In order to promote green purchasing of general goods such as paper and office supplies, they published the Green Purchasing Guidelines and started to apply these guidelines internally.

## **Policies and Activities**

### **Green procurement (raw materials, parts, material resources, etc.)**

- Reduce the environmental impact of our use of raw materials, parts, and material resources
- Promote controls for hazardous chemical substances

- Encourage suppliers to implement voluntary environmental measures

#### **Green purchasing (general goods)**

- Reduce the environmental impact of general purchases
- Raise employees' awareness of environmental issues

#### **Green Procurement of Raw Materials, Parts and Material Resources**

NSK Japan approaches to the conservation of the environment has been recorded in their Green Procurement Standards and NSK Chemical Substance Control List, and distributed to 181 suppliers. In the Green Procurement Standards manual, suppliers to NSK Japan are advised to evaluate their activities for the environment using three points scale. This approach encourages voluntary activities for building an environmental management system by grading activities in terms of improvement needed. For procurement, they have published requirements regarding energy and resource conservation, recyclability, and the management of hazardous chemical substances, as well as concerns related to packing and packaging. These requirements efficiently reduce the environmental impact of materials supplied to their company.

#### **Green Purchasing of General Goods**

In order to promote green purchasing of paper, office supplies, OA equipment, and vehicles throughout the entire company, they published NSK Green Purchasing Guidelines. The document has been posted on their intranet, and all staff is encouraged to switch to products that meet the standards proposed in these guidelines. By advertising through a medium, such as internal newsletters and ECO news, NSK management has endeavored to raise the environmental awareness of its employees. As a result, 1,113 computers that were scheduled to be upgraded were replaced with energy-saving computers in accordance with the standards, further reducing electric power consumption. In addition, the sales and manufacturing divisions purchased 7 low-emission vehicles. At the headquarters division, paper for photocopying and printing as well as for bookkeeping were replaced with 100% recycled paper with 70% degree of brightness. Furthermore, 62,120 NSK diaries distributed to their employees and customers, were made from 100% recycled paper. Other printed items, such as the Green Procurement Standards and NSK Chemical Substance Control List as well as a periodical technology newsletter, the "NSK Technical Journal," were printed using recycled paper made of 100% used paper, and soy ink.

#### **Environmental Practices in NSK (M) Sdn. Bhd.**

The companies have a varied environmental policies and practices. NSK Japan established the Global Environmental Protection Committee in 1993 and since then NSK has engaged in the development of environmentally friendly products as well as the reduction of energy consumption, waste management and the reduction of hazardous substances at each manufacturing site, including in Malaysia. NSK Malaysia also practiced some form of environmental policies with their headquarters in Japan insisting on an environmental policy e.g. Green Purchasing policies for their products which are being supplied to various multi-nationals like Sony. They possess ISO 14001 certification though they do not have any kind of eco-labeling as yet (UPM. 1999).

According to the OSH officer, NSK Malaysia, they have not begun with green procurement yet. But they have been practicing to reduce the waste. In terms of main waste for reuse and recycling, this is limited to the cutting oil used in the machines. In the case of their main input, it involves steel or pellet which belong to the customers. The wastes in the form of chips are sent back to the customers for recycling. Other recycled materials are the normal office materials such as stationary and office supplies. This is only small thing, but this is also the beginning of the step for green purchasing.

NSK Group of Companies has taken note of the growing environmental concerns and a

comprehensive mid-term goal was outlined in the year 2000. Under these voluntary action plans, the companies enact and strive to achieve environmental protection activities throughout the entire company. The companies have also introduced LCA activities and successfully reduce negative impact on the environment including the waste management goals.

In terms of green purchasing and green procurement, the midterm goals were two-folds:

- 1) to adopt green procurement standards; and
- 2) to adopt guidelines for green purchasing.

In these efforts, the companies had compiled standards and adopted them for 93% (in terms of total volume of purchase made) of vendor companies. In green purchasing, guidelines for papers, office equipment, stationary and vehicles were established. On the other hand, they have minimum related information utilizing green purchasing such as eco-labeling criteria or guidelines, products database and other parameters.

### **MSP INDUSTRIES SDN. BHD.**

MSP Industries is related to NSK Micro Precision Co. Ltd., in Malaysia, which is also a subsidiary of NSK Ltd., Japan. MSP Industries Sdn. Bhd. was established in 1995 with fifty-one employees. Their annual sales are RM 14 million in 2001. MSP Industries is a manufacturer of miniature ball bearing parts. MSP has been processing in full pursuit of high precision, high cleanliness, and the metal stamping, plastic injection moulding and mould processing are their specialties. Since the beginning of operations, MSP was very much aware of environmental issues and safety measures. MSP has acquired ISO 14001 certification in 1996 and has been continuously promoting improvement activities in an attempt to reduce environmental impact. One of the approaches in green purchasing is that MSDS comes to hand at the time of an estimate or product investigation.

- 1) Check whether there is any burden to environment, or there is nothing (Consideration of a substitute)
- 2) Check the management approach and the method of handling
- 3) Check and train the solution when spilling
- 4) Check the discarding process

It corresponds to the earth as much as possible so that a toxic substance may not be discarded. Green purchasing in MSP is in the process of practicing and might be a long-term process to meet the requirements for specification of Green Purchasing Guidelines in the NSK group. However MSP is willing to promote the activity.

### **Barriers**

It was noted that not all of the suppliers to NSK Group, unlikely MSP Industries Sdn. Bhd. do not have ISO 14000 certification and do not have a policy of environmental conservation policies either. Their purchasing of final products, parts and materials do not take into account of life cycle assessment. It was told that there are at present no legal requirements for these green practices in Malaysia. However, the following company has acquired ISO 14000 and been trying to make efforts to implement .green purchasing concept.

# **REM CORPORATION SDN. BHD.**

## **Introduction**

REM Corporation Sdn. Bhd. was established in 1983 as a Resource Environmental Management Company as a small and medium enterprise (SME) with total staff of twelve persons. At the early time of their business activities were earthwork, road, drainage, sewerage, construction, waste paper recycling, precious metal recovery, hazardous wastes and environmental pollution consultancy. During the later part of 1980s, the company diversified into fruit wine and brandy production thus, became the first and only company to be awarded a manufacturing license by the Custom and Excise Department of the Ministry of Finance to produce wine using the local starfruit as its raw material. The company produced perhaps the first Starfruit Wine (**Rambola**) and Starfruit Brandy (**Stargnac**) in the world. In the later part of 1999, it was granted the Good Manufacturing Practice (GMP) license by the Ministry of Health to produce traditional herbal medicine.

## **REM and the environment**

REM is sensitive to the environmental aspect of its business due to the background of its founder. The founder of REM is a veteran environmental scientist with a doctorate in environmental health. The early business activities were in the environmental protection realm such as consultancy in environmental pollution and resource recovery. REM recently began a new business of manufacturing of starfruit wine and brandy to prevent mass disposal of starfruits. During a glut of starfruits (*Averrhoa carambola L.*) in Malaysia, many farmers discarded them in order to reduce their losses. Confronted with the fluctuation of the growing seasons, the supply and demand of the markets, REM Corporation decided to make history by converting the good quality off grade fruits into fruit wine and fruit brandy. REM's customers are wholesalers, retailers, night spots in Malaysia, Singapore and Japan.

REM does not have written environmental nor green purchasing policy. Although it has the business philosophy of keeping their production clean with minimum wastage, and the staff can work in a safe and comfortable environment, they have not been practicing green purchasing yet. However, this concept of the use of starfruits is one of activities of green purchasing. Since majority of their customers are Japanese companies, the environmental aspect, such as organic, may be able to be widely promoted by appealing to a customer and conversely a customer may ask for the environmental consideration or organic in the process of production in the future.

## **REM as a purchaser of environmentally less damaging good and services**

The most critical issues affecting REM's purchasing decisions are quality, consistency and reasonable price structure. Currently, environment aspect of the product does not critically affect its purchasing decision; REM only asks for the standard product specification. REM will be compelled to ask for environmental-related information when the quality is below acceptable standards. REM does not consider genetically-modified organism as a critical issue in the winery industry. However, REM would consider these products as priority if it were to incorporate green purchasing; concentrates, fruit quality, herb quality (basically the raw material for production).

## **REM as a producer of environmentally less damaging good and services**

REM does not reuse their bottles due to health safety reasons. However, there are used bottles collectors who sell them to recycling plant. REM's used paper materials are sold to waste contractors who send the waste papers to recycling plant. The waste pulp from their extracted starfruits is sent for land filling. REM does not use plastic containers for their packaging. The owner thinks that they are practicing or not practicing green purchasing consciously or unconsciously in accordance to its definition. This is still a new concept to them. The practice of green purchasing is a long term

process which requires well structured framework of guidelines and policies for different industries and countries.

**REM as a supplier of environmentally less damaging good and services**

The most critical aspects of the beverage industry are chemical residues and microbial contamination. REM has taken action to minimize environmental impacts of your operation by reducing wastage and reusing by-products and rejects (for example odd-sized fruits). The actions taken are due to legal requirements, customer demand and it is cost effective to do so. REM does not disclose the environmental measures, for example on the labels, it has taken on its products because it is not required at the moment.



## **LEP PRECISION COMPONENTS SDN. BHD.**

### **Introduction**

LEP Precision Components Sdn. Bhd. (LPC) is established in 2000 as a SME of die-casting and electroplating. It consists of twenty-five people and has a capital of RM 100,000 and in terms of sales, 1.5 million in 2001. LPC produces completed consumer and industrial products as well as intermediate parts to other companies. Some of the company's products include furniture fittings, food service equipment components, architecture handles and fishing reel components. The products are electroplated with copper, nickel or zinc. A certain volume of its products is exported to Singapore as well as contracted work for a Japanese company, Shimano Inc. If the company face problems in its waste treatment and pollution control such as the treatment of its polluted wastewater, it can result in the destruction of environmental balances and pose health hazard to both human and animals dependent on these water bodies.

### **Green Purchasing with Shimano Inc. Japan**

LPC produces fishing reel components as the contracted work for Shimano Inc., Japan. Shimano has written environmental philosophy, principle and guidelines. Shimano does not have specific green purchasing standard or green procurement guideline, however they have an environmental policy. In a part of the policy, they state that to perform the product development, the technical development and the material procurement which mitigate environmental load as apart in the environmental guideline. Once Shimano will actively promote and practice green purchasing, they would have the potential for tremendous impact on their related companies and correspondent firms, including LPC. From the viewpoint of the conditions, LPC would also eventually promote and implement the concept of green procurement and purchasing and in the future.

### **Green Purchasing & Other Information at LPC**

It is the company's ultimate objective to be certified ISO 14001 in the near future. In addition, the management endeavors to monitor and control wastes and wastewater discharge as well as the solid or hazardous waste disposal. In this regard, the company would like to know more on green purchasing or green procurement network and how this will ensure a better environmental protection for the benefits of the community at large. At the moment, the company has no knowledge on this subject.

The management also realizes there could be room for improvement in term of energy conservation and other process flows. Since there is no monitoring on the air emission at the moment, it may be one area for the company to upgrade the air emission system. In addition, the management would like to improve the quantity of chemical usage and chemical substitutes, improve the drainage system on the production line where wastewater is currently being drained and discharged. The company is also interested to learn more on the possibility of switching over to new technology and practices especially in lowering or eliminating the use of cyanide compounds.