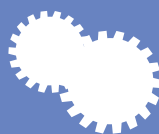
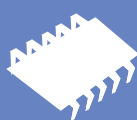


ECO- PRODUCTS DIRECTORY 2008



For Sustainable
Production & Consumption



ASIAN PRODUCTIVITY ORGANIZATION



ECO-PRODUCTS
DIRECTORY 2008

ECO- PRODUCTS DIRECTORY 2008

For Sustainable
Production & Consumption



ASIAN PRODUCTIVITY ORGANIZATION



Environmental initiatives in developing the *Eco-products Directory 2008*

The *Eco-products Directory 2008* is printed on Eco Mark-approved and Green Purchasing Law-compliant matte-coated paper, of which 70% is recycled paper and the other 30% is virgin pulp from forests managed to be socially, economically, and environmentally sustainable. In addition, soy-based ink was used in the waterless printing method for minimum environmental impact.



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Eco-products Directory 2008

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Foreword

The Asia-Pacific region has become a world center of manufacturing with its abundant, hardworking labor force. The Asian Productivity Organization (APO) strongly believes that greening supply chains is one of the best concepts aimed at linking manufacturing with sustainable economic development in the region. More specifically, the goal is to incorporate consideration for the environment into every stage of the supply chains, from the very beginning of the product life till the end, making all chains green. The APO selected the greening of supply chains as a main theme and is working to ensure that Asian governments and enterprises promote the use of environment-friendly products and services as a fundamental strategy.

The fourth edition of the *Eco-products Directory* is being released in conjunction with the opening of the Eco-products International Fair 2008 in Hanoi, Vietnam, in March. The publication has been extensively revised and updated and is now even easier to use and understand. Nearly 20 pages have been added, including enhanced descriptions of many features and new topics such as “rationale for the *Eco-products Directory 2008*” and “main news and topics related to the environment.”

While the global warming issue forces us to make efforts to use resources and energy efficiently and to reconsider socioeconomic activities and lifestyles that involve large volumes of production, consumption and waste, more than 700 products or services are contained in the *Eco-products Directory 2008*, especially more than 400 are categorized as effective in preventing global warming. I hope that this publication will contribute to an appreciation and expansion of eco-product and -service markets in the Asian-Pacific region.

Our sincere thanks go to Professor Ryoichi Yamamoto, Chairperson of the Committee on the Eco-products Database, and all members of the working group for their dedicated leadership and efforts that made this publication possible.

Shigeo Takenaka
Secretary-General

Tokyo
January 2008

Background

The Green Productivity (GP) concept is a strategy for enhancing productivity and protecting the environment. Based on the understanding of this strategy as an effective method for enabling sustainable development in the Asia-Pacific region, the Asian Productivity Organization (APO) has provided training courses on GP, organized a series of Eco-products International Fairs (EPIFs), and published and disseminated several editions of the *Eco-products Directory*. The core projects covered under the GP concept include greening supply chains, energy efficiency, the 3Rs (reduce, reuse, and recycle), and the training of trainers so that member economies can continue to promote and implement the concept on their own.

The APO held the first EPIF in 2004 in Kuala Lumpur, Malaysia, the second in 2005 in Bangkok, Thailand, and the third in 2006 in Singapore. The number of visitors increased for each. The EPIF 2006 attracted about 34,000 visitors, more than three-fold that in 2004. The APO will hold the fourth EPIF in March 2008 in Hanoi, Vietnam.

The *Eco-products Directory* was published annually between 2004 and 2006 to coincide with the opening of the respective EPIFs. The newest edition, the *Eco-products Directory 2008* will also be available at the opening in Hanoi. It will be distributed to governmental authorities and environmental organizations in Asia and beyond, and during high-level international conferences such as major environmental exhibitions in Japan and overseas. The APO also plans to distribute this directory to concerned parties at the G8 Hokkaido Toyako Summit to be held in July 2008.

The data contained in this directory are eco-products and -services developed by environmentally advanced enterprises in Asia-Pacific economies. The APO's goals are to incorporate consideration for the environment into every stage of the production process, including the acquisition of raw materials, purchasing of parts, shipment of environment-friendly products, product and service use, and eventual recycling and disposal. The APO believes that this directory contributes to sustainable development in the Asia-Pacific region through greening supply chains and hopes that governments and business in the region will promote the use of environment-friendly products and services as a fundamental objective.





Dear Readers

More attention was paid to environmental issues in 2007 than ever before. Arctic sea ice is melting at a rate faster than anything seen in more than 30 years. The cost of crude oil and rare metals is rising with unprecedented speed, directly impacting our lives. Large quantities of disposable plastic and electronic products are being exported, creating a serious problem for society. The Intergovernmental Panel on Climate Change released its 4th Assessment Report compiling all of the latest findings related to global warming. Not only did it reveal a nearly universal consensus on the assertion that human activities are the cause of global warming, it warned that major disruptions in our health, ecosystems, industries, social infrastructure, and other areas would result if no action were taken.

To make the right decisions to guide us toward being an environmentally friendly society, each one of us must have a proper understanding of the answers to the following two questions:

“What is happening in society now?”

“What I can do to help society resolve the problems facing it?”

Industry can contribute to this effort by providing goods and services that are environmentally friendly or that reduce their environmental impact. Such products and services are referred to as “eco-products.” Industry is actively working to develop eco-products and -services and to make them widely available to help society. However, no matter how wonderful eco-products may be, if they do not become sufficiently popular to replace existing products, they will not be effective in lessening environmental impacts. Therefore an effort needs to be made to inform general consumers of the types of eco-products and -services available.

The *Eco-products Directory* has been published since 2004 and offers a comprehensive guide to the various eco-products offered by companies. The *Eco-products Directory 2008* offers consumers:

- Straightforward listings of more than 700 leading-edge eco-products; and
- Clear explanations of the varieties and characteristics of eco-products.

In addition, this year’s directory contains the following explanatory information prior to the eco-product listings to help consumers better understand current eco-product-related trends:

- A summary of the year's major environment-related developments to give consumers an overview of environmental and social trends for the year;
- Easy-to-understand explanations of the characteristics and features of current eco-products; and
- A totally revamped design, such as the introduction of icons, for visual emphasis on eco-product features.

To ensure that all of the above were successfully incorporated into the *Eco-products Directory 2008*, the Eco-products Database Working Group held multiple meetings and discussions aimed at crafting and tailoring the information contained to ensure that it is genuinely useful in helping consumers better understand the contents of the directory.

2008 will be an extremely important year for the world. The first commitment period of the Kyoto Protocol has begun. Countries throughout the world are working in unison to reduce emissions of greenhouse gases to meet their targets. The focus of discussions by world leaders at the 2008 G8 Summit to be held by Lake Toya in Hokkaido, Japan, will be on measures to combat global warming. In People's Republic of China, the Beijing Olympics has prompted the government to take action for environmental improvement and management. Governments and people will have a great many discussions about a variety of issues, such as reducing carbon footprints through the sale of products bearing environmental labels, introducing and promoting carbon offsets, greater implementation of the CDM and JI under the Kyoto mechanisms, and the introduction of carbon taxes and emission trading as economic mechanisms. An integral part of all of those will be the popularization and widespread use of environmental impact-reducing technologies and eco-products. Therefore, we believe that the *Eco-products Directory 2008* is a tremendously valuable resource.

My heartfelt thanks go to the organizations those products and services are listed on this directory, the committee and working group on the Eco-products Database, and the Society for Non-Traditional Technology. Publishing the *Eco-products Directory 2008* did not come without their cooperation. I would like to express my sincere gratitude to all the parties concerned.

Ryoichi Yamamoto

Professor, Institute of Industrial Science & International Research Center
for Sustainable Materials, University of Tokyo
Chairperson of the Committee on the Eco-products Database of the APO
Vice chairperson of the GP Advisory Committee of the APO

1

Main news and topics related to the environment

2006
Sep



Steep rises in nonferrous and rare metal prices



Oct



Asia 3R Conference held in Tokyo, participated in by 19 Asian countries and 8 international organizations



"Preparatory Study for the EuP Directive" conducted on 14 electrical products

Nov



Drastic rises in prices of metal materials caused by a 15% increase in export taxes of People's Republic of China

Dec



Toyota ranked first among manufacturers in the 10th Environmental Management Survey



Stronger measures for the prevention of asbestos damage in Japan



Global warming



Air/Water/Soil



Chemical substances



Waste



Resource



Design



Energy saving



Production

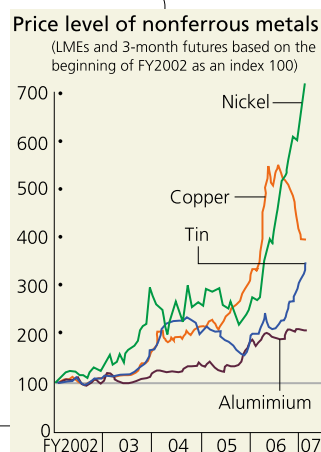
List of Abbreviations

Abbreviation	Full Title
APEC	Asia-Pacific Economic Cooperation
APP	Asia-Pacific Partnership on Clean Development and Climate
CDM	Clean Development Mechanism
COP13	Conference of the Parties to the UNFCCC
CPU	Central Processing Unit
EPA	Environmental Protection Agency
EU	European Union
EuP	EU Directive on Energy Using Products
GRI	Global Reporting Initiative
IEC	International Electrotechnical Commission
IPCC	Intergovernmental Panel on Climate Change
JOGMEC	Japan Oil, Gas and Metals National Corporation
LED	Light Emitting Diode
LME	London Metal Exchange

Sharp rises in nonferrous and rare metal prices

Growing concerns about resources are triggering resource enclosure problems in many countries, causing constant sharp rises in nonferrous and rare metal prices. The distributions of nonferrous and rare metals are uneven, and rapidly increasing demand for these metals in newly developing countries contributes to the problem. The use of such scarce resources could be restricted but comprehensive measures on a global scale are required to promote technological development to ensure performance and quality while establishing recycling programs to use scarce resources efficiently.

Price levels of nonferrous metals <February 22, Nikkei Newspaper>



Stronger measures for the prevention of asbestos damage in Japan

According to the survey by the Ministry of Health, Labour and Welfare, Japan, 1,050 asbestos-related mesothelioma patients died in 2006.

The number is predicted to increase further.












During demolition work of houses and buildings, measures must be taken under the act. However, there was not sufficient information on clarifying how much asbestos was used in building materials. In response, the Japanese government has published an asbestos-containing materials database.













Asbestos

NEDO	New Energy and Industrial Technology Development Organization
NITE	National Institute of Technology and Evaluation
NPO	Nonprofit Organization / Not-for-Profit Organization
PM	Particulate Matter
PRTR	Pollutant Release and Transfer Register
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RITE	Research Institute of Innovative Technology for the Earth
RoHS	Restriction of Hazardous Substances
Sarbanes-Oxley act	Public Company Accounting Reform and Investor Protection Act of 2002
TEQ	Toxic Equivalent
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
ANRE	Agency for Natural Resources and Energy, Japan
METI	Ministry of Economy, Trade and Industry, Japan
MLIT	Ministry of Land, Infrastructure and Transport, Japan

2007 Jan

-  Republic of Korea establishes REACH Business Support Center in compliance with EU chemical substance legislation
-  Republic of Korea's first success in development of environmentally conscious flame retardants
-  Republic of Korea establishes the first climate change fund
-  Japanese Prime Minister Abe directs Minister of the Environment to plan strategies for Japan to become a "nation of the environment"
-  China-Japan-Korea Ministerial Meeting held on science and technology to discuss environmental cooperation
-  Standards for carbon-offsetting schemes proposed by UK government
-  First national report on climate change released by ministries and agencies, including Ministry of Science and Technology, People's Republic of China
-  Development Bank of Japan finances Nara Co-op for environment-friendly management
-  **Japanese home appliance companies cut recycling charges** ●
-  Draft plan of standards for lead contamination at rifle ranges developed by Japanese Ministry of the Environment
-  Bioethanol Japan initiates production of biofuels from used wood-based building materials

Feb

-  Stricter surveillance on illegal imports of used electronic devices from other countries in People's Republic of China
-  Japan-Mongolia dialogue on environmental policies to encourage international environmental cooperation
-  Iwate University, Japan, develops RoHS-compliant, hexavalent chromium-free metal-coating technology
-  UNEP establishes expert working group on effects of mercury on human health and the environment
-  US government supports Vietnam in Agent Orange clean-up
-  East Asia/Southeast Asia 3R Expert Workshops held in Manila, Philippines
-  **IPCC releases 4th report** ●
-  "It is possible to reduce CO₂ emissions by 70% by 2050," assessed by a Japanese national research institution
-  CitiGroup announces 74 awards for commitment to climate change
-  UNEP proposes new treaty on mercury usage in 2020 and 75% reduction compared to 2000

Mar

-  Beijing CO₂ Diet Manifesto proclaimed in People's Republic of China
-  RoHS translated into Chinese, ready to be implemented by most manufacturers
-  **Mass generation of e-waste and countermeasures** ●
-  8 German tourist agents join Carbon Neutral Project
-  People's Republic of China starts Mine Gas CDM Project in Huaibei
-  UK recommendations on EU Greenhouse Gas Emissions Trading Scheme
-  World Bank cohosts ministerial meeting on Environment and Energy for Sustainable Development
-  USA and Brazil engage in technological transfer to third world for further production of bioethanol
-  **Biomass power generation by Japanese electricity companies** ●

Japanese home appliance companies cut recycling fees

Home appliance companies in Japan were considering a reduction in the recycling fees for used air-conditioners from 2008. The main reason was the improved recycling budget subsequent to the rise in the price of copper produced from recycled air-conditioners. Another reason was the development of advanced waste treatment systems as well as recycling designs to support the systems from the initial stage of home appliance production.



At a recycling plant

IPCC releases 4th report

The Intergovernmental Panel on Climate Change (IPCC) released its 4th Assessment Report (Working Group 1: Feb. 2007, Working Group 2: Apr. 2007, Working Group 3: May. 2007). The report confirms that the significant increase in greenhouse gases in the atmosphere since 1750 is human induced and states that it is almost certain that human activities are the cause of global warming. Moreover, the report concludes that it is beyond doubt that all the changes occurring in the atmosphere, oceans, glaciers, and ice caps indicate global warming.

The report also confirms that the average global temperature rose by 0.74 degrees over the last century and predicts that it will continue to increase during this century by approximately 1.8 to 4.0 degrees. Meanwhile, the sea-level rise is predicted to continue from 28 to 58 cm by the end of this century.



Dr R.K. Pachauri, Chairman of the IPCC, delivering the 4th Assessment Report (AP Images)

Mass generation of e-waste and countermeasures

In line with global economic growth and population increase, which are particularly significant in Asia, the amount of waste is also growing worldwide, including electrical and electronic waste (e-waste) and medical waste. The European Environment Agency states that at present e-waste is increasing about three-fold more rapidly than municipal waste and estimates that the total amount of e-waste generated worldwide is some 40 million tons per year.

Solving the E-waste Problem (StEP), an international initiative, was initiated by the United Nations University to encourage cooperation between the public and private sectors so that internationally standardized procedures are set for recycling electrical and electronic appliances.



Recovered electrical and electronic waste (e-waste)










Biomass power generation by Japanese electricity companies

At present, electricity is generated mainly using thermal power, hydraulic power, and nuclear power. Japanese electricity companies have jointly launched the practical application of biomass power to promote the utilization of renewable energy. For example, biomass materials such as sewage sludge produced during the sewage treatment process, wood-based biofuels combusted with coal, methane gas produced from fermented food waste, and poultry manure are already used to generate electricity. Furthermore, the development of more efficient power generation systems using wood-based biofuel and the development of small direct-injection/combustion-type power generation systems are in progress, indicating that biomass power generation will increase in the future.












Apr

-  Republic of Korea releases RoHS in Korean and Act for Resource Recycling of Electrical/Electronic Products and Automobiles
-  People's Republic of China plans Car-free Day in 106 cities
-  Germany announces Climate Agenda 2020 to achieve 40% CO₂ reduction
-  Canada imposes greenhouse gas/air pollutant reduction targets on industries
-  4.2 trillion yen to implement soil contamination measures, estimated by Japanese Ministry of the Environment
-  The Japanese Ministry of the Environment creates a manual of asbestos control during earthquake disaster
-  **High expectations for eco-cars** ●
-  Tokyo Institute of Technology announces process for producing electrically conductive alumina cement

May

-  Japanese Agency for Natural Resources and Energy publishes results of material flow survey to secure stable rare metal supplies
-  Strategic Approach to International Chemicals Management (SAICM) holds Asia-Pacific regional meeting in Bangkok
-  Japanese Ministry of the Environment produces An Easy Guide to Chemicals—Detergents and Chemicals for e-learning
-  Greenhouse gas emissions increased by 7.8% since 1990 in Japan as of 2005
-  US President Bush proposes new international framework for climate change measures
-  Japanese government announces “co-benefits” of global warming measures in support of developing countries
-  “Carbon trading prices will triple by 2006,” announces World Bank
-  Copper reduction by 10%—resource saving by Toyota
-  **Yellow dust – transnational air pollution** ●
-  “No asbestos threats in the air”, confirms the survey report by the Japanese Ministry of the Environment
-  Good-bye to the blast furnace—Republic of Korea's POSCO introduces new iron-smelting furnace

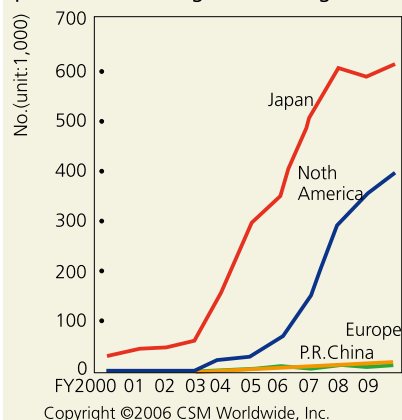
Jun

-  People's Republic of China bans sales of CFC coolant/blowing agent-containing home appliances from September
-  “Strategies for the 21 Century to Become an Environmentally-conscious Nation” approved by the Japanese Cabinet
-  Home appliance companies in Japan reach the recycling target for 2006, meeting the legal standards
-  JOGMEC develops technology to recover rare metals from used cars
-  Concerns over plastic waste treatment heightened by EU Waste Directives
-  The Japanese Ministry of Economy, Trade and Industry proceeds with a review of the Law for PRTR and Promotion of Chemical Management
-  Japan Article Management Promotion-Consortium (JAMP) verifies Guidelines for the Management of Chemical Substances in Products
-  EU implements REACH regulations
-  **G8 Summit talks on global warming** ●
-  23 major financial services companies as members of the United Nations Environment Programme's Finance Initiative announce statements about greenhouse gases for the G8 Summit
-  Japanese government formulates Strategies for the 21st Century to Become an Environmentally-conscious Nation

High expectations for eco-cars

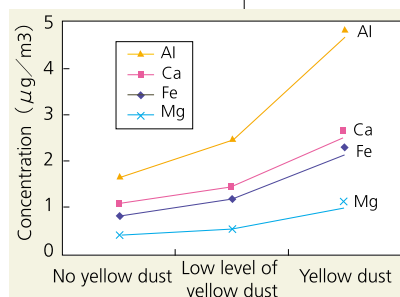
Recently, expectations for eco-cars have been increasing from the perspective of environmental protection. Fuel consumption by vehicles that use petrol has been made more efficient by improving the performance of engines and drive-train systems as well as by reducing body weight. The launch of the Toyota Prius in 1997 heightened expectations for hybrid cars that use both electric motors and petrol engines. Subsequent to sharp rises in crude oil prices, more than 1 million hybrid cars have been sold worldwide, and these eco-cars appeal to consumers. While the fuel-cell car is under development, there are increasing expectations that eco-cars will halve petrol usage compared with conventional vehicles. Meanwhile, diesel-engine vehicles are also fuel efficient. The main automakers and suppliers therefore have been accelerating their R&D on advanced exhaust-purification technologies.

Transition of the number of hybrid car product in each region including forecast



Yellow dust – transnational air pollution

East Asia increasingly suffers yellow dust. The Ministry of the Environment, Japan (MOE) has been conducting research on yellow dust since 2002, in the typical yellow dust season to identify particle size distribution and analyze components. The report states that yellow dust contains high levels of metals from minerals and the contents of sulphate and fluoride, supposedly produced as a result of combustion, change according to weather conditions. These factors therefore influence the form in which yellow dust is blown in various ways. Incidentally, big yellow dust storms were recorded in 2006 and 2007, and MOE will include the results of studies on these cases in the final report.



Concentrations of metals in airborne dust (by MOE)

G8 Summit discusses global warming





The Group of Eight (G8) Summit 2007 took place in Heiligendamm, Germany, where future global actions on climate change were discussed. It is vital that major economies that use the most energy and generate the majority of greenhouse gas emissions agree on a new global framework by the end of 2008, which would contribute to a global agreement by 2009.

The G8 will consider seriously the decisions made by the EU, Canada, and Japan which include at least halving of global emissions by 2050. Because the top Japanese government official stated that climate change would be the top priority on the agenda for the G8 Hokkaido Toyako Summit in July 2008, it is hoped that the G8 will achieve additional progress in setting a global goal for emission reductions.















World leaders at the G8 Summit 2007, Heiligendamm

Jun

-  Dutch government releases Climate Change Monitoring Report 2006 by Meteorological Agency to incorporate climate change measures in policies 2007–2011
-  The Japanese Meteorological Agency releases “Climate Change Monitoring Report 2006”
-  UN Executive Board of Clean Development Mechanism (CDM) approves Ricoh’s reforestation methodology
-  **Material industry in urgent need of low-cost manufacturing methods**





Jul

-  Republic of Korea: Basic Bill for Sustainable Development passes Diet
-  People’s Republic of China promotes production and use of energy-saving, environment-friendly cars
-  The Japan Environment Association sets out Eco Mark standards for reusable and resource-saving containers
-  Japanese firms intensify support for new EU REACH regulations
-  NPO of Minamata City market educational tours to Republic of Korea
-  Joint declaration by Germany and USA (Florida) to consider carbon market partnership to tackle climate issues
-  UK initiates Climate Change Campaign in media
-  Asia-Pacific Partnership (APP) on Clean Development and Climate—4th Policy Implementation Committee Meeting held
-  “1kg CO₂ Reduction per Person per Day” campaign supported by financial institutions
-  The Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure and Transport of Japan introduce a new fuel cost calculation system for car catalogues
-  Japanese Ministry of the Environment sets up working group to find causes of photochemical oxidant increase
-  1.2 billion yen fine on automakers—air pollution lawsuit settled in Tokyo

Aug

-  **Environment-conscious sports events on global scale**
-  Republic of Korea (Gwacheon) announces 5% greenhouse gas reduction by 2015 compared with 2005
-  Discharge into sea exceeds environmental standards, confirms People’s Republic of China
-  20% Energy Saving Campaign initiated by 50 NGOs in People’s Republic of China
-  Beyond standards—excess chemical residues found in vegetables in People’s Republic of China
-  Himalayan glaciers “melting fast”—more global warming threats in Southeast Asia
-  President Bush proposes a 10-year plan to reduce petrol use by 20%
-  Morgan Stanley starts carbon neutral services in USA
-  Lively discussions by Japanese Ministry of the Environment on tackling natural heavy metal pollution
-  Nissan and Honda develop catalyst technology for clean diesel vehicles
-  Toshiba progresses with printing technology for organic EL substrates

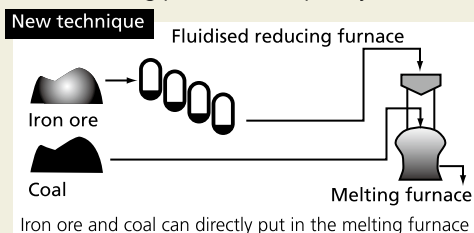
Sep

-  People’s Republic of China publishes mid- to long-term renewable energy development plan
-  **More recycling of food waste**
-  Japanese Ministry of the Environment contributes 150 million yen to fund establishment of 3R promotion for developing countries in 2008
-  International conference on protecting ozone layer ends with governments agreeing to bring forward restrictions on ozone-depleting substances

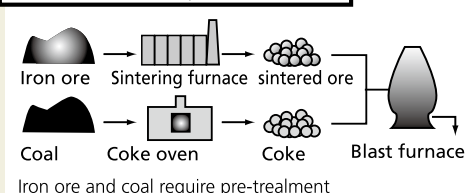
Material industry in urgent need of low-cost manufacturing methods

Subsequent to steep rises in resource prices, the material industry has been tackling the development of low-cost production techniques. Major iron/steel and nonferrous metal companies developed technology that uses low-grade mineral ores. Chemical firms have been promoting the use of materials other than naphtha. The development of processing technologies utilizing low-grade materials that can be disposed of at low cost and have low environmental impact will be the key for material manufacturers in improving their competitiveness. For example, the new iron-smelting process developed by the Republic of Korea's Posco enables the direct insertion of iron ores and coal into the smelting furnace, thus bypassing the preparation process altogether.

New iron-making process developed by Posco



Conventional technique (blast furnace)



New iron-smelting process developed by the Republic of Korea's Posco

Environmentally conscious sports events on a global scale

Environmental consciousness is not only about providing eco-products and eco-services. It is also considered at various types of events. Large-scale sporting events play a significant role in raising environmental consciousness. For example, the FIFA World Cup in Germany in 2006 supported a scheme to reduce greenhouse gases produced in developing countries by implementing carbon offsetting, due to which the CO₂ gas emitted during the event was virtually zero. The Beijing 2008 Olympic Games also involves a variety of environmental measures including waste treatment, traffic control, water treatment and a perfect provision of a green environment.

More recycling of food waste

As consumers lifestyles become more diverse, huge quantities of food waste are generated. The annual volume of food waste in Japan is approximately 110 million tons and food waste recycling has been promoted nationwide. As a step forward in promoting the recycling of food waste, such as unsold food products from supermarkets and leftovers from catering establishments, the Ministry of the Environment and the Ministry of Agriculture, Forestry and Fisheries of Japan have set target recycling values by food category for food providers to comply. These targets are: 85% for food manufacturers, 70% for food wholesalers, 45% for food retailers and 40% for caterers. These targets are to be reached by 2012.

Food waste recycling by registered food providers and recyclers – examples



By food providers















Food waste collection truck













By registered recyclers

Sep

-  Fuji Xerox develops chemical substance information system to team up with 1000 domestic and overseas firms
-  France releases report on health risks from climate change
-  APEC sets targets to be achieved through energy efficiency improvement and reforestation
-  US EPA teams up with India's largest oil company to reduce methane gas emissions
-  Arctic ice area hits all-time low
-  Japan-China agreement on energy-saving project at 2nd Japan-China Energy and Environmental Forum
-  **Soil contamination puts pressure on economic activities**
-  Photochemical oxidant standards yet to be met by most measurement stations
-  Increasing use of white LED products for PCs and cars
-  Mitsui Engineering & Shipbuilding develops new technology with higher bioethanol productivity
-  RITE and Honda develop technology to synthesize polypropylene from weeds
-  Obayashi develops biodegradable pipes for tunnel construction










Oct

-  **Nobel Peace Prize 2007 goes to IPCC and Gore**
-  IEC finalizes plan for international eco-design standards
-  **Steep rise in crude oil prices—\$100 a barrel**
-  Japanese Ministry of Agriculture, Forestry and Fisheries organizes Forum for Environmentally-Conscious Pest Control
-  World Environment Day 2008 celebrated in New Zealand with focus on low-carbon economy
-  Japanese government starts pilot sales of bioethanol-containing (3%) petrol (E3) in Osaka
-  UNEP says regulatory systems will be most effective in reducing greenhouse gas emissions from buildings
-  World Tourism Organization holds 2nd International Conference on Climate Change and Tourism
-  Reduce, Reuse, and Recycle (3R) Month promoted by 8 Japanese ministries
-  Asia-Pacific Summit held in Oita, Japan

Nov

-  Republic of Korea releases EuP manuals
-  Japanese government intensifies international regulations for waste disposal into sea

Dec

-  Ministry of Economy, Trade and Industry and Ministry of the Environment of Japan add LCD TVs to list of recyclable home appliances
-  Japanese Ministry of Land, Infrastructure and Transport promotes power generation using waste wood-based building materials, classification rules, and quality standards
-  Investors' awareness of social responsibilities heightened
-  Japanese version of SOX Act underway
-  UNFCCC COP13 held in Indonesia, where global warming prevention post-Kyoto debate creates Bali Roadmap
-  Republic of Korea to join CO₂ reduction scheme in 2013, with huge impact on Korean industries
-  Republic of Korea determines climate change measures including carbon tax and expansion of nuclear power generation
-  Japanese government makes first purchase of greenhouse gas quotas from Hungary
-  Average global land temperature increased 0.67 degrees since 1880

Soil contamination puts pressure on economic activities

Land with value much lower than its potential with few uses because of soil contamination is called a “brownfield.” Owners of brownfields struggle to sell them because the cost of tackling soil contamination may be prohibitive. Many cases have been reported of brownfield owners giving up on selling their land. The Japanese Ministry of the Environment reported that brownfields in the country total 110,000 ha, with clean-up costs estimated at 17 trillion yen.



Brownfield being treated

Nobel Peace Prize 2007 goes to IPCC and Gore

The Norwegian Nobel Committee announced on 12 October 2007 that the Nobel Peace Prize for 2007 was to be shared equally by the Intergovernmental Panel on Climate Change (IPCC) and former US Vice President Albert Gore, Jr. for their efforts to disseminate knowledge on man-made climate change and to lay the foundations for the measures needed to counteract such changes. The committee hoped that the work of the IPCC and Gore would increase the focus on decisions and processes necessary to protect the global climate, thus reducing threats to mankind's security



an inconvenient truth
– special collector's
edition, Paramount
Japan K.K.



Steep rise in crude oil prices—\$100 a barrel

Crude oil prices rocketed in November 2007 to almost \$100 a barrel as oil-producing countries were becoming politically unstable and the demand for petrol in newly developing economies rose. The prices of everyday items such as plastic and food products were also affected. In the past, the extraction of oil from oil sand was considered economically unfeasible but now it has developed into a full-scale business. It is difficult to predict oil prices, and steep price increases are a major worry to consumers as well as to businesses.

2

Rationale for *Eco-products Directory* 2008 including related products

1. Food products

Three reasons why food is the center of attention this year

Sustainable food procurement became a key issue in 2007 for three main reasons: 1) The main exporting countries suffered drought and abnormal weather conditions, resulting in crop yield declines, especially in Australia. 2) Food prices rose sharply in response to rapidly increasing demand for biofuel. Increases in prices of grains for animal feed also directly affected meat and dairy product prices, which in turn increased total imports of commercial products in such countries that rely on imports. 3) In countries that registered rapid economic growth, such as People's Republic of China and India, the demand for food increased explosively.

Steady increase in food-related energy

The food situation worldwide is a very serious matter, presenting many problems in terms of environmental protection and sustainable food supplies. One problem is the increased use of chemical fertilizers and energy, which assures high production efficiency. The increased use of chemicals in crop cultivation, however, continues to cause adverse effects on soil, water, and the atmosphere.

Another problem is increasing **food waste** occurring with the diversification and enhancement of the food system, which is a huge environmental challenge for the Asia-Pacific region. Dietary habits are changing from fresh to highly processed food, individual sales rather than bulk sales, and ready-cooked meals instead of home cooking as the catering industry expands. In addition, food products are more readily available as retail and distribution systems improve. Commodities, consumption, and industrial structures are also taking different forms, while problems including the increased use of packaging materials, food waste, and energy consumption are becoming evident.






For example, Japan is still struggling to improve its food self-sufficiency from a low ratio of 40%. This means that much of the food on dinner tables in Japanese homes is from abroad. Global warming and natural disasters reduce crop yields. Importing food from faraway countries is very energy-consuming in terms of transport (**food mileage** increase). People's Republic of China has recently changed its status from a food exporter to a food importer. These facts all contribute to the very serious question of how to sustain food supplies.

Achieving sustainable food supplies

Asian economies have made consideration for the eco-friendly food products by promoting fresh and processed products using organic, specially

cultivated, and locally produced food while refraining from the use of excessive packaging. Moreover, product ID numbers such as EC-6-003 and EC-6-004 refer to weight-saving products packaged in containers with different shapes and/or thinner materials. Also, the use of waste wood to produce the paper packaging for drink containers (product ID numbers EC-6-007 and EC-6-006) encourages the sustainable use of forest resources. These containers are also recyclable after use, like milk cartons. Product ID number EC-6-005 refers to whisky bottle-tops made from used barrels and casks. This product also contributes to the efficient use of resources.

Marine Stewardship Council (**MSC**)-**approved** marine products are certified to be sustainable and appropriately managed and have been promoted by major supermarkets since 2006. Leading Asian food manufacturers are also developing a range of environment-conscious products. Thus, environmental awareness has been steadily established among food manufacturers and retailers.

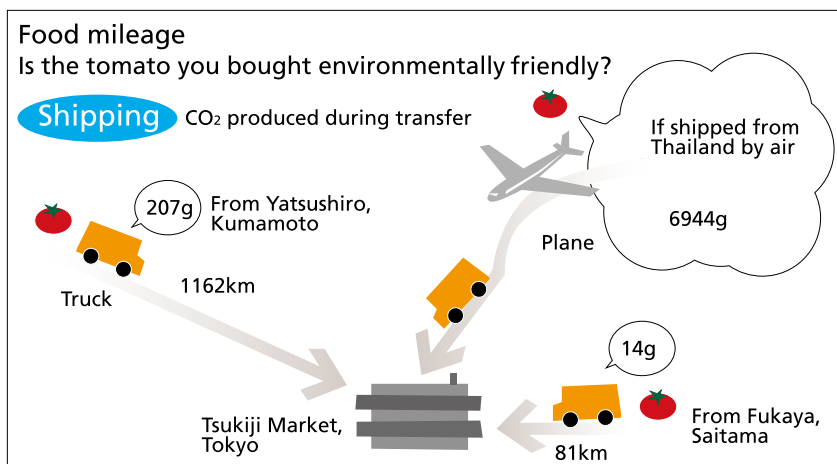
-  **EC-6-003**
<beer>
-  **EC-6-004**
<beverage>
-  **EC-6-007**
<cartcan>
-  **EC-6-006**
<milk cartons
for infants and
children>
-  **EC-6-005**
<whisky>

In Japan, **the Institute of Life Cycle Assessment** carries out life cycle assessment research, while **the Green Purchasing Network (GPN)** is engaged in the formulation of guidelines for purchasing environment-friendly food products. While much effort is made to promote such food products, initiatives to encourage consumers, i.e., purchasers, to buy them are soon to be implemented.

In the UK, the Carbon Trust, a government-funded independent company, formulated and announced guidelines for displaying life cycle CO₂ emissions on products. Walkers Snacks Ltd. took a progressive approach by displaying **carbon footprint** figures on its bags of potato crisps.

Hopes for green purchasing

Food policies to guide decision making on which types of food ingredients and food products to purchase, obtain and consume are closely related to global environmental issues, and consumers are encouraged to choose environment-friendly items. Such products should be chosen not only by consumers who are already concerned about the environment but also by the majority of ordinary consumers on a daily basis. It is hoped that through activities like the ones mentioned here, **green purchasing** will gradually penetrate into consumers' everyday lives and environmental consciousness will be firmly established within the food industry.



Source by Shihoko Nemoto, Nihon University



CO₂ emission level displayed on a Walkers bag of potato crisps, UK



MSC logo


2. Resources and recycling

Rare metals: the focus of attention

In recent years, the economies of Brazil, Russia, India, and People's Republic of China have made remarkable progress. In line with this progress, the demand for so-called rare metals, such as nickel and chrome, has increased drastically. Subsequently, sharp rises in metal prices have become the center of attention due to fierce competition for metal resources. Rare metals can be described as metals that occur rarely or those that are extremely difficult to extract. Some, such as titanium and silicon, are present in the earth's crust in large quantities but their ores are so difficult to smelt that they are classified as rare. Compared with base metals such as iron, copper, and aluminum, the quantity of rare metals is extremely low. Nonetheless, they are widely used in the basic materials industry (e.g., stainless steel) and in **high-tech fields** (e.g., electrode materials, high-performance magnets, and high-performance catalysts for flat-screen TVs). Rare metals are therefore indispensable to Asian industries.

Problems in rare metal supply

The Asia-Pacific region has **the world's highest demand for rare metals**, and at the same time, it is a supplier of basic materials, including rare metals, and high-tech products. However, the supply structure is rather fragile because mineral resources are unevenly distributed and available in only some countries, metal production is also limited to specific countries, and supply is often disrupted by conflicts and facility accidents. Therefore, sharp rises in international prices often occur. Moreover, the rapid economic growth of newly emerging economies in recent years and subsequent fierce competition for metal resources have created a situation in which the Asia-Pacific region can no longer guarantee stable, sustainable supplies of rare metals. This is a difficult situation that can be described as "nothing comes from nothing." Under such circumstances, Asian economies are consolidating state control of rare metals. As one example, Japan has developed a **stockpile system** as a short-term measure to reserve the seven rare metals nickel, chrome, molybdenum, tungsten, cobalt, vanadium, and manganese. Other rare metals are as valuable as these seven, and Japanese industries that depend on high-tech materials want to be assured of the stable procurement of the entire range of metal resources, from rare earths to precious metals. It is risky to rely completely on exporters of metal resources, and technical measures such as boosting productivity in manufacturing, using general alternative metals, and promoting the recycling of used products are required.

EM-1-019 
 <cold-rolled
 special steel
 sheets>

ID number EM-1-019 is all-purpose stainless steel which does not contain such rare metals as nickel or molybdenum but ensures high corrosion resistance equivalent to SUS304 (18mass% Cr - 8mass% Ni stainless steel).

Expectations for 3R technology and substituting technology

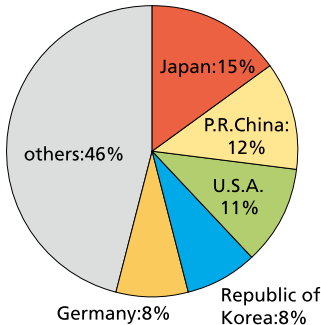
Points that must be kept in mind are: 1) rare metals create a huge impact on the environment during the smelting process, and 2) rare metals are most often used in unrecyclable products. Global environmental issues are a great concern to everyone. The Asian-Pacific region as one of the largest consumers could preserve resources by applying the world's most advanced recycling technology and substituting technology. To achieve this goal, the above-mentioned points must be fully recognized in radical technological innovation in which techniques can be developed to recycle and replace products currently unrecyclable and for which substitutes are not available. For example, items classified under product ID number ES-2-002 could be recycled as a raw material of tungsten carbide powder for superhard tools if defects rejected during the manufacturing process were collected.

➡ **ES-2-002**
<tungsten>

Consumption of rare metals in the world

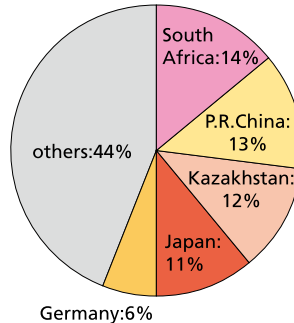
Ni

1,253,000 ton (2004)



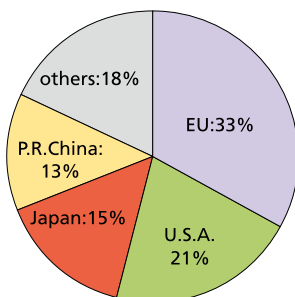
Cr

4,695,000 ton (2003)



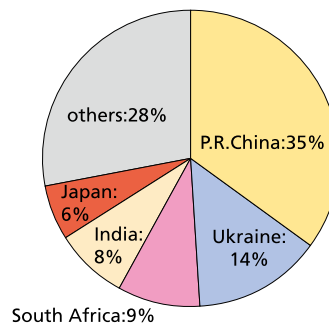
Mo

175,000 ton (2004)



Mn

19,630,000 ton (2001)



3. Energy

Biomass: a foremost energy source

To reduce the use of crude oil for transport energy and to control greenhouse gas emissions, the adoption of **biomass fuels** (produced from organics of biological origin) as an alternative to automotive fuel which can be used in vehicles with conventional engines is attracting attention.


Biofuels and carbon dioxide


In the growth process, biomass absorbs carbon dioxide in the atmosphere through photosynthesis. Because the amount of carbon dioxide burned as biofuel equals the amount of carbon dioxide absorbed during photosynthesis, this **carbon-neutral** concept implies that biomass fuels do not affect the level of carbon dioxide in the atmosphere, thus helping to control greenhouse gas emissions. The carbon-neutral concept also supports the development and application of biomass-based bioplastics (product ID number EM-2-006). In recent years, bioplastics have been used for making IT equipment (e.g., product ID numbers EP-9-007, EP-3-053, and EP-3-021). However, it should be noted that energy generated from crude oil, natural gas, and electric power is used during the process of producing biofuels from biomass, i.e., carbon dioxide is still emitted during biofuel production.


Trends in using biomass fuel and issues to be addressed


Representative biofuels are **bioethanol**, an alternative to petrol, and **biodiesel**, an alternative to light oil. Bioethanol is produced from sugarcane, corn, and straw and wood. These organic materials contain molasses, starch, and cellulose, respectively, which are glycosylated as well as fermented to produce energy. Biodiesel is made from vegetable oil crops such as rapeseed and palm as well as from discarded cooking oil. Bioethanol is already commonly used in Brazil and the USA and biodiesel in the EU as automotive fuel. Biomass fuel is also used for power generation (e.g., product ID numbers EP-8-052, EP-8-029, and ES-2-005). Power generation from biomass fuel results in overall energy efficiency not only due to its carbon-neutral feature but also due to heat recovery.

At present, most biomass fuels tend to be produced using molasses, starch, and oil from plants due to the low material cost. This situation raises concerns about **competition against food supplies**. In the future, unwanted biomass, such as agricultural waste (e.g., rice straw and rice husk) and wood waste (e.g., discarded timber and leftover timber in forests), will therefore be used to produce biomass fuel to avoid competition against food supplies. This concept will become a major issue in biomass energy technology.

EM-2-006 
<polylactic acid
fiber, resin, and
materials>


EP-9-007 
<plastic cards>

EP-3-053 
<cellular/PHS
telephone sets>

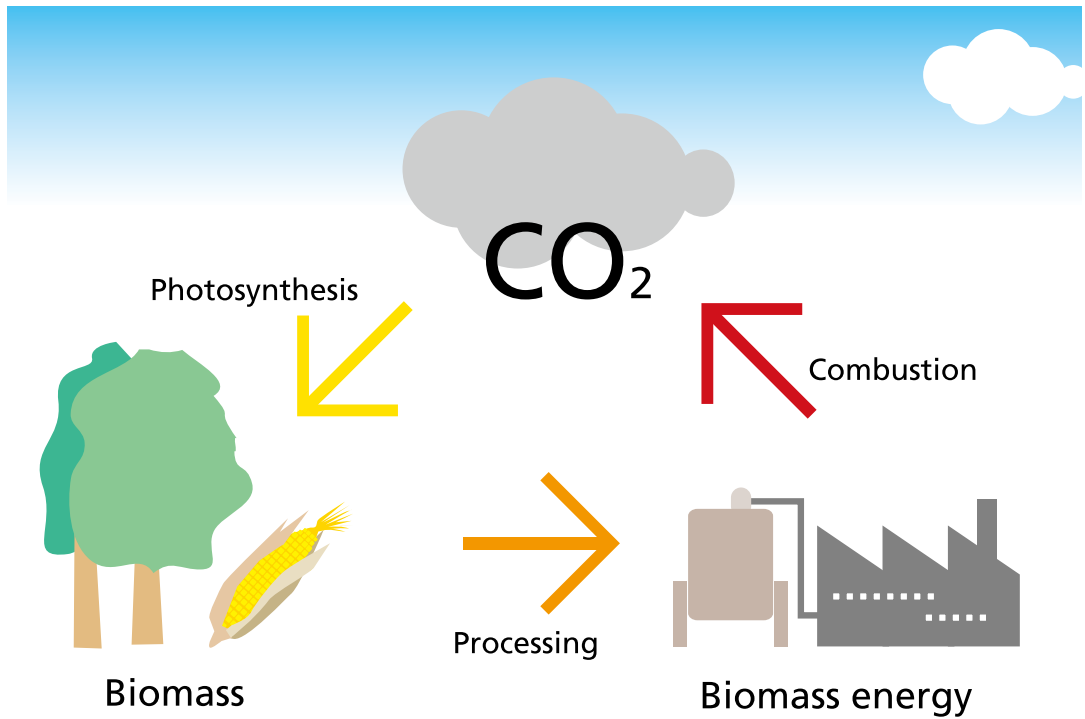
EP-3-021 
<full-color
copying
machines>

EP-8-052 
<generators>

EP-8-029 
<boilers,
excluding
hot-water
boilers>

ES-2-005 
<biomass
cogeneration>

Carbon-neutral concept



4. Chemical substances

Products based on chemicals

Chemicals enrich our lives. For example, over-the-counter cold medicines contain numerous ingredients that may sound unfamiliar. Some reduce fevers and others relieve cough. On the other hand, an overdose can cause harm. Thus, chemicals can be medicines and poisons simultaneously. Therefore, consumers must “not use chemicals that are difficult to handle” and “handle chemicals appropriately.”

Trends in products listed this year

Many products comply with the **Restriction of Hazardous Substances (RoHS)** legislation, which went into effect in the EU in 2006, are listed in the *Eco-products Directory 2008*. The RoHS directive prohibits the use of six specific substances, lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers. They are extremely hazardous if used in electrical and electronic products and then released into the environment. These substances are **“not to be used as they are difficult to handle.”** People's Republic of China and the Republic of Korea will soon implement similar regulations on chemicals. Various techniques have been developed to replace products that contain these six chemical substances.

EC-3-001

<communications cables>

For example, product ID number EC-3-001 are RoHS-compliant communication cables (flexible flat cables) used in many home electric appliances and office equipment. Product ID number EP-9-012 comply with RoHS by using lead-free solder while increasing power efficiency.

EP-9-012

<digital cameras>

Many of the household products listed in the *Eco-products Directory 2008* reflect the aim of reducing volatile organic compounds (VOCs). VOCs cause dizziness and nausea and are cited as one cause of **“sick building syndrome”** if inhaled in large quantities. New products are therefore being developed using safer substances without compromising performance.

EC-1-002

<fabrication of finished plastic products>

Insulators classified under product ID number EC-1-002 are a good example. They do not contain any VOCs. Instead, they utilize a spray-type polystyrene foam, which can also be a substitute for hazardous substances such as asbestos. Products classified under product ID number EP-7-009 use natural materials, thus preventing VOC contamination as well as condensation due to their humidity control function.

EP-7-009

<cement products>

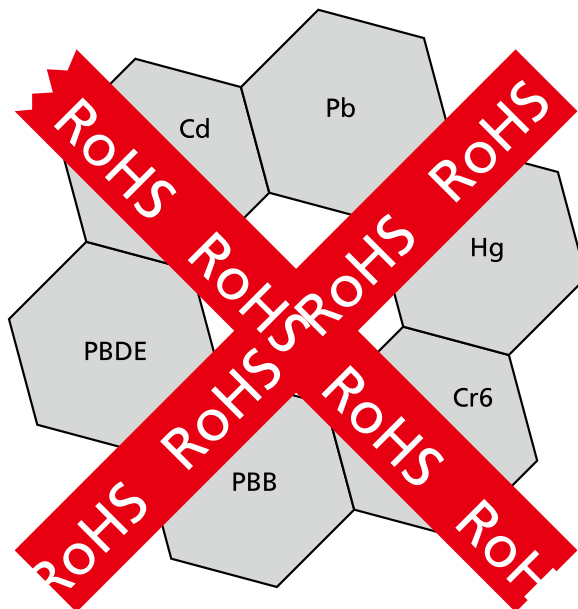
Handling of chemical substances

One of the methods to “manage chemicals appropriately” is the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Producers are requested to stipulate the hazard level of a chemical substance clearly using the GHS-specified label. While the GHS is still a developing system, it is important in terms of promoting the appropriate handling of chemical substances.

Balance between utility and risk

It is hoped that the European **REACH regulations** will result in the appropriate handling of listed hazardous chemical substances based on risk assessment rather than imposing a total ban on the chemicals. Such regulations are in force not only in Europe but also in Japan where the Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances has been revised and made more stringent. Therefore, manufacturers must ensure the correct handling of chemical substances and that all information on chemical substances is fully understood within supply chains to enable the production of safe, secure products. Meanwhile, consumers must also be able to **understand information on the risks of chemical substances** so that they can appreciate their “appropriate use.”



5. Finance and insurance

The environment and economy

Many environmental issues originally emerged as a result of economic activities. One important measure to tackle environmental issues is the promotion of environment-friendly products, as explained in the *Eco-products Directory 2008*. Another important initiative is to make economic activities more sustainable by changing the flow of money. A simple way in which the flow of money can be changed is to purchase more **environment-friendly products** instead of selecting products simply based on price and performance. Such awareness plays a significant role in promoting sustainable economic activities. This is called **green purchasing**.

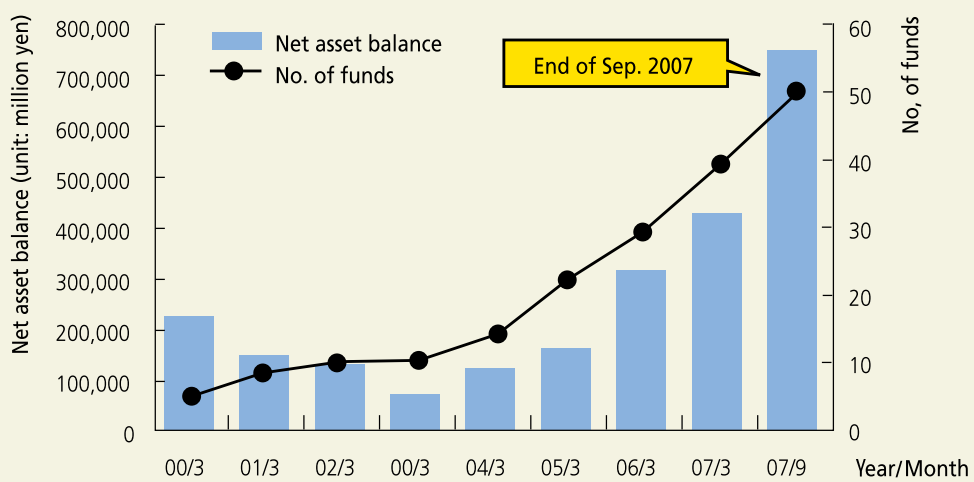
Socially Responsible Investment

Because enterprises can have a significant influence on the economy, they should play more crucial roles in activities such as green purchasing compared with individuals. The promotion of green procurement is one type of commercial economic activity. However, business firms cannot be involved in any activity if there is a risk that shareholders may suffer losses as a result. They must therefore give priority to cost over willingness to procure products that do not harm the environment. The mechanism called **socially responsible investment(SRI)** was developed to support enterprise environmental activities by investing in them.

Future of the SRI market

The latest investment boom has encouraged many ordinary investors to enter the SRI market, and more are investing in the best interests of their own children and their future as well as for profit. Because public awareness of environmental issues such as global warming is also increasing, it is expected the number of SRI funds will increase. For example, there are funds for investing in the development of wind-power generation and fuel cells, which help to prevent global warming. It is hoped that in the future not only private investors but also institutional ones such as pension funds will pay more attention to environmental issues so that the SRI market will expand.

Transitions in the net asset balance of SRI funds and number of funds



Products listed in the *Eco-products Directory 2008*

About eco-products

"Eco-products" generally refer to environment-friendly products, but there is no strict definition. In the *Eco-products Directory 2008*, "eco-products" are defined as "products and services that comply with environmental regulations or are environment-friendly, reflecting manufacturers' voluntary efforts to care for the environment." Eco-products include not only industrial products but also products and services in the areas of agriculture, tourism, and finance. They also include products and services aimed directly at environmental impact reduction (i.e., eco-businesses, such as the production of pollution control devices, waste disposal/recycling, and consulting). In the *Eco-products Directory 2008*, eco-products are classified into four categories: materials, components, products, and services.

Eco-products listed in this directory

Many eco-products come with environmental labels that state product features to inform and appeal to consumers. They certify that products are eco-products according to standards independently set by countries, regions, organizations, and providers.

The International Organization for Standardization (ISO) classifies environmental labels into Type I, Type II, and Type III and environmental labels are then given based on compliance certification, producers' self-declaration of commitment to environmental preservation, and the verification and disclosure of quantitative environmental impact data. There are also environmental labels given under standards and criteria other than the ISO's.

In addition to environmental labels, there are also other initiatives to raise consumers' environmental awareness, including the creation of databases where self-assessed compliant products may be registered. Those initiatives are individual ones and thus differ.

ISO environmental labels

Type I (ISO 14024) <Seal of approval—compliance approval>

Description: Product classification and criteria are set by third-party organizations in line with ISO standards, where submitted products are assessed for approval and if successful, awarded Type I environmental labels.

Examples: Eco Mark (Japan), Blue Angel (Germany), Green Label (Singapore)



Type II (ISO 14021) <Single attribute—producers' self-declaration of commitment to the environment>

Description: Product providers independently demand environment-related improvements in their products. There is no intervention by any third party.

Examples: Hitachi Ltd., Matsushita Group, Sharp Corporation



Type III (ISO 14025) <Report card—verification and disclosure of quantitative environmental impact data>

Description: Type III labels are not seals of compliance. They quantitatively disclose the environmental impact of the entire product life cycle from resource collection to manufacturing and distribution. Only the reliability of disclosed data is verified and product evaluation is left to consumers.

Examples: Eco Leaf (Japan), EPD (Sweden), EDP (Republic of Korea)



Other environmental labels

There are other environmental labels apart from those of the ISO, such as Energy Star labels in Japan, the US, EU, and Australia. Energy Star labels indicate that products comply with the International Energy Star Program of the US Environmental Protection Agency (EPA). These labels are for energy-saving appliances such as OA equipment.>



Various environmental labels have been created in many other areas including the building industry and food industry.

Other initiatives to raise environmental awareness

Apart from the promotion of environmental labels, there are other initiatives to raise consumer awareness of the environment. For example, the Green Purchasing Network (GPN) in Japan formulated guidelines for purchasing environment-friendly products, together with important points to consider, in 18 categories including printing and communication paper, stationery and office products, and vehicles. In line with the guidelines, the GPN Database provides the public with environmental information on products. The database contains information on registered providers who independently confirm that their products are environmentally compliant.

The products listed in the *Eco-products Directory 2008* are considered to be eco-products if any of the above-mentioned environmental labels have been received or declared, or otherwise they are registered in the GPN Database, which is based on the provider's initiatives for environmental impact reduction. Relating to the listed products that have not received environmental labels or have not been registered in the GPN Database, the Eco-products Database Working Group decided the judgement based on whether the information submitted by the providers reflects the initiatives for environmental impact reduction in line with the categories showcased in following pages.

Understanding of eco-products

To ensure an accurate understanding of eco-products, the following three categories were developed for the *Eco-products Directory 2008*:

A: "Which" environmental issues are eco-products intended to address?

B: "How" do eco-products address environmental issues?

C: "When" and "where" in the product life cycle do eco-products address environmental issues?

Which

A: "Which" environmental issues are eco-products intended to address?

This category helps consumers understand which environmental issues eco-products are intended to address. The focus is global warming and resource consumption. Issues related to pollution and contamination (air, water, and soil), which are serious problems in developing economies, and waste disposal, one of the weighty environmental problems in Japan, are also included. A total of five initiatives are therefore listed:

Global warming prevention



Helps reduce emissions of greenhouse gases such as carbon dioxide. This initiative includes the direct reduction of greenhouse gas emissions as well as energy saving and the reduction of deforestation.

Air/water/soil pollution prevention



Helps reduce emissions of substances contained in the air, water, and soil, such as photochemical oxidants (e.g., nitrogen oxides) and suspended particulate matter (e.g., sulphur oxides), which are substances restricted by environmental standards including air pollution control laws. This initiative contributes to preventing ozone depletion and product oxidization. The clean-up of air/water/soil pollutants is also included in this initiative.

Chemical substance reduction



Helps reduce and clean up eco-toxic chemical substances harmful to humans and the environment. These chemicals include substances specified by laws that identify the environmental impact created by emissions of specific chemical substances and that promote better management of such substances. This initiative includes the reduction and purification of hazardous substances by recycling and reuse as well as products containing low levels of or no hazardous substances.

Waste reduction



Helps reduce final disposal volumes by changing products, manufacturing processes, and packaging. This initiative includes waste weight/volume reduction within the circulation system.

Resource saving



Helps reduce the consumption of resources, such as mineral, forest, and water resources. This initiative includes resource saving by reusing and recycling as well as resource saving in products and the manufacturing process.

How

B: "How" do eco-products address environmental issues?

This category explains how eco-products support environmental impact reduction in response to the five initiatives listed in A. The category is subdivided to provide comprehensive support for various environmental measures widely practiced at present. This clarifies whether resource saving is achieved through enhanced product performance, longer product life, or improved product recyclability.



Recyclability/reusability/refillability

Raw materials can be recovered, processed, and recycled for reuse. Alternatively, they can be recycled efficiently by using designs that are easily disassembled. Reusable and refillable designs may be used in packaging and products.



Long life

With long-life designs and enhanced durability and performance with repairs and maintenance, product life can be prolonged, leading to the reduction of raw materials and waste.



Degradability/compostability

Products, packaging, and their components are biodegradable into substances that are relatively homogeneous and stable. They can also be degraded to some extent under certain conditions within a predetermined time.



High quality/performance

Product quality and performance improvements enable environmental impact reduction, subsequently leading to material and waste reduction.



Energy saving

Efficient process designs and product weight reduction enable energy saving. This initiative includes the use of energy recovered instead of being disposed of.



Environmental clean-up products

These products detoxify and clean up hazardous substances.



Using recycled materials

Recyclable materials (pre- and post-consumer) and recovered and recycled materials are used in the manufacturing process, either entirely or in high volumes.

When Where

C: "When" and "where" in the product life-cycle do eco-products address environmental issues?

This category helps determine when and where within the life-cycle stage environmental initiatives are reflected in eco-products. The product life-cycle stage is broken down into six steps: material extraction, material and component production, design, manufacturing, product use, and disposal.



Extraction of materials (resource)

In this step, resources needed for product manufacturing are collected. Equipment is used for environmental impact reduction in this stage.



Material and component production (material/parts)

This is a stage where interim products including materials and components are manufactured. Such interim products and their designs are intended for environmental impact reduction.



Design and material selection (design)

In this step, designs and materials are carefully selected for product manufacturing, including environmentally compatible designs.



Product manufacturing (production)

Products are manufactured in this step using materials and components. This step includes products that help reduce environmental impact during the manufacturing process.



Product use, maintenance, and repair (use/repair)

In this step, products are used by consumers and maintenance and repairs are carried out. This step includes considerations of energy saving and environmental clean-up as well as for prolonging product life by repairs and product life improvement.

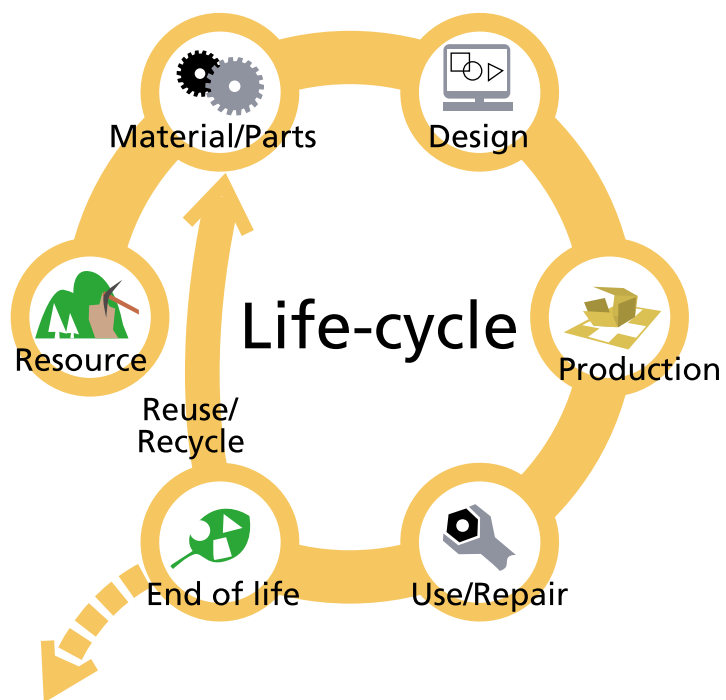


End of life

In this step, products are disposed of and recycled. Included in this step are products that contribute to the reduction of final disposal volumes and can be disassembled, are easily reusable, easily recyclable, and compatible with well-established recycling systems.

Each product listed in the *Eco-products Directory 2008* is categorized by maximum 4 items in above mentioned category A and B and also by maximum 2 stages in category C.

Product Life-cycle Stage - Schematic Diagram



Product data display in the *Eco-products Directory 2008*

The *Eco-products Directory 2008* is intended to enlighten people, mainly those in the Asia-Pacific region, on eco-products and –services available. As many as possible are listed in this directory. To make it simple and easy for all environment-minded individuals to understand, the product data are sorted and arranged in the directory as shown below. Thanks to the providers of the listed products and services.

The screenshot displays a product entry for 'JEMAI-LCA Pro' within the 'Eco-services' category. The entry is highlighted with an orange border. Numbered callouts identify the following elements:

- 1: Product ID number (ES-4-032)
- 2: Main features (LCA software "JEMAI-LCA Pro")
- 3: Product details (Description of JEMAI-LCA Pro software and its functions)
- 4: Company information (Japan Environmental Management Association for Industry (JEMAI))
- 5: Sales territory (Available in : Worldwide)
- 6: Common product name (LCA software)
- 7: Categories (Material, Design, Resource, Production, End-of-Life, Use / Repair)
- 8: Product photo (Image of the JEMAI-LCA Pro software box)
- 9: Photo caption (JEMAI-LCA Pro)

- | | |
|-----------------------|-----------------------|
| ① Product ID number | ⑥ Common product name |
| ② Main features | ⑦ Categories |
| ③ Product details | ⑧ Product photo |
| ④ Company information | ⑨ Photo caption |
| ⑤ Sales territory | |

① Product ID number

All product ID numbers are displayed as below:

ES-4-032

main entry subentry product item no.

(1) Main entry

In the *Eco-products Directory 2008*, the information on each eco-product is provided in four categories: 1. Materials, 2. Components, 3. Products, and 4. Services. The product data also use frames of different colors for different main entries (1. pink, 2. blue, 3. green, and 4. orange).

Eco-materials **Eco-components**
Eco-products **Eco-services**

(2) Subentry

Each main entry is divided into subentries as shown below:

EM

- 1 Metals
- 2 Polymers
- 3 Natural materials
- 4 Foam
- 5 Ceramics and glass
- 6 Composites
- 7 Others

EC

- 1 Construction components
- 2 Electrical and electronic components
- 3 Semiconductor manufacturing devices
- 4 Machine parts
- 5 Automobile parts
- 6 Packaging
- 7 Others

EP

- 1 Home electric appliances / Lighting
- 2 Carriers / Automobiles
- 3 OA / IT equipment
- 4 OA / Furniture
- 5 Apparel / Textiles
- 6 Interior decoration/Exterior decoration or furniture
- 7 Building and civil engineering
- 8 Machines and equipment
- 9 Others

ES

- 1 Product-related services
(maintenance, upgrading, repair / reform)
- 2 Reuse and recycling services
(collection, etc.)
- 3 Outsourcing services
(waste disposal, control of hazardous items, chemical treatment, facility management)
- 4 Management-related services
(consulting, accreditation, analysis, evaluation, etc.)
- 5 Others
(e-commerce, eco-tourism, hotels, information transfer, etc.)

These subentries are shown the right side of the line for product ID numbers as follows:

Eco-materials

EM-1-001

Metals

Eco-components

EC-1-001

Construction components

Eco-products

EP-1-001

Home electric appliances / Lightings

Eco-services

ES-1-001

Product - related services

(3) Product item number

Each subentry lists product items in numeric order in accordance with the Japanese Statistical Standard Industry Classification.

② Main features

Brief descriptions of how products have been improved to contribute to environmental impact reduction are provided in this section.

③ Product details

Detailed descriptions of how products have been improved to contribute to environmental impact reduction are provided in this section.

④ Company information

The contact details of product providers are listed in this section.

⑤ Sales territory

Where each product is available is found in this section.
(Sales territories are not always stated, as this is a free listing section.)

⑥ Common product name

The common name of each product is given in this section (e.g., camera, pencil, desk, etc.).

⑦ Categories

How eco-products reflect certain environmental initiatives is indicated graphically according to the following three categories:

A: "Which" environmental issues are eco-products intended to address?

B: "How" do eco-products address environmental issues?

C: "When" and "where" in the product life-cycle do eco-products address environmental issues?

The icons indicate items (maximum of 4) selected from A: “Which” and B: “How.”

<icons>

A: “Which”



Global warming



Air/Water/Soil



Chemical substances



Waste



Resource

B: “How”



Recyclable



Long-life



Degradable



High quality



Energy saving



Purification



Recycled materials

The yellow dots indicate items (maximum of 2) selected from C: “When” and “Where.”



⑧ Product photo

One photo is inserted for each product.

⑨ Photo caption

The caption provides a brief description, e.g., product model, of each product photo.