



Green Manufacturing for Global Competitiveness

Hiroyuki Sato
Green Purchasing Network (GPN), Japan
International Green Purchasing Network (IGPN)

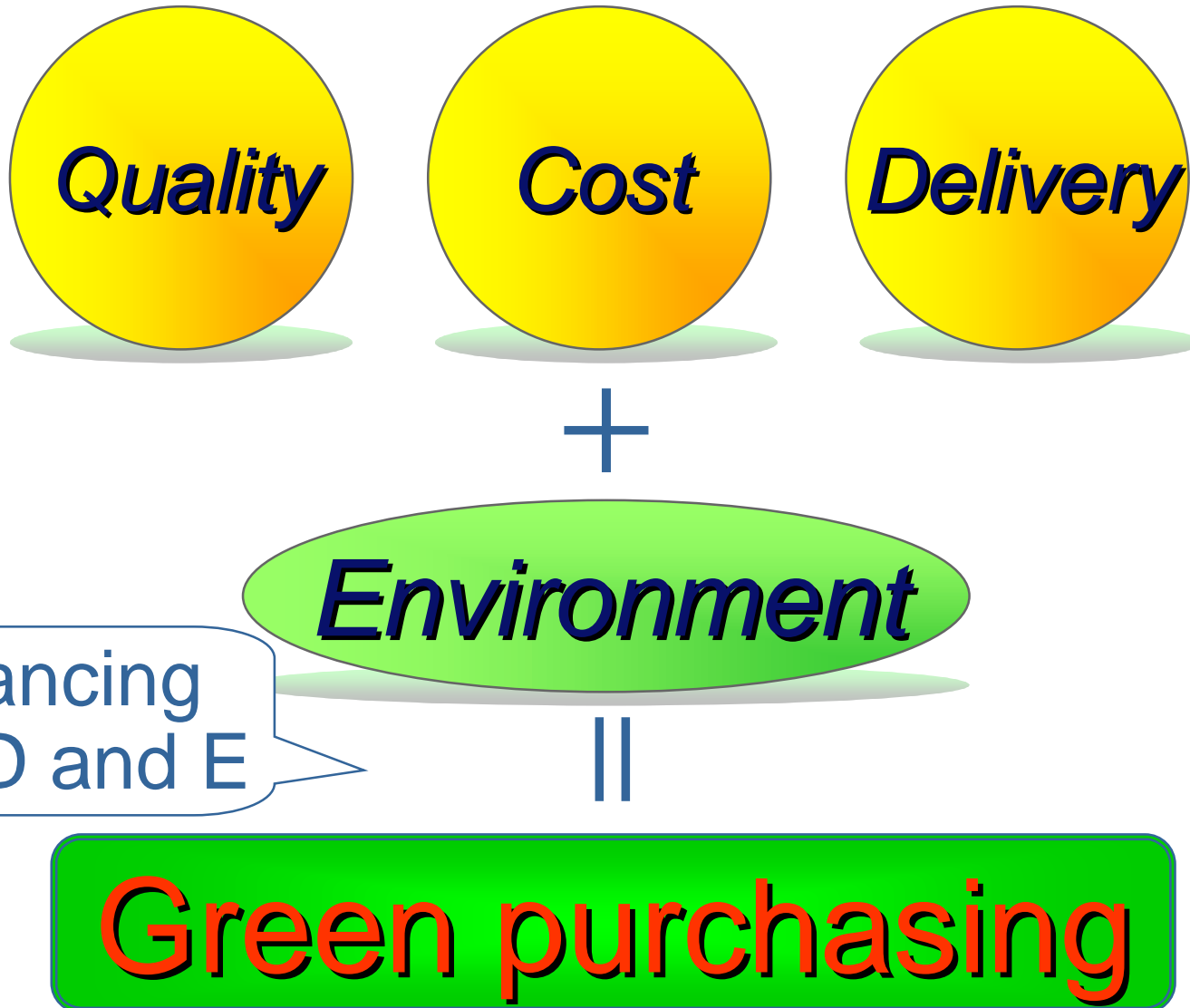








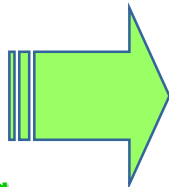
What is “Green Purchasing”?



Find Fundamental Solution by Changing the Input

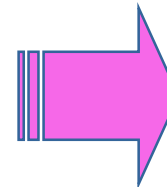
Make the input green

Reduce input
Non-hazardous material
Easy-to-recycle
Energy saving
Resource saving



Reduce the output

Waste
Pollution
Hazardous
substances
Carbon
Dioxide

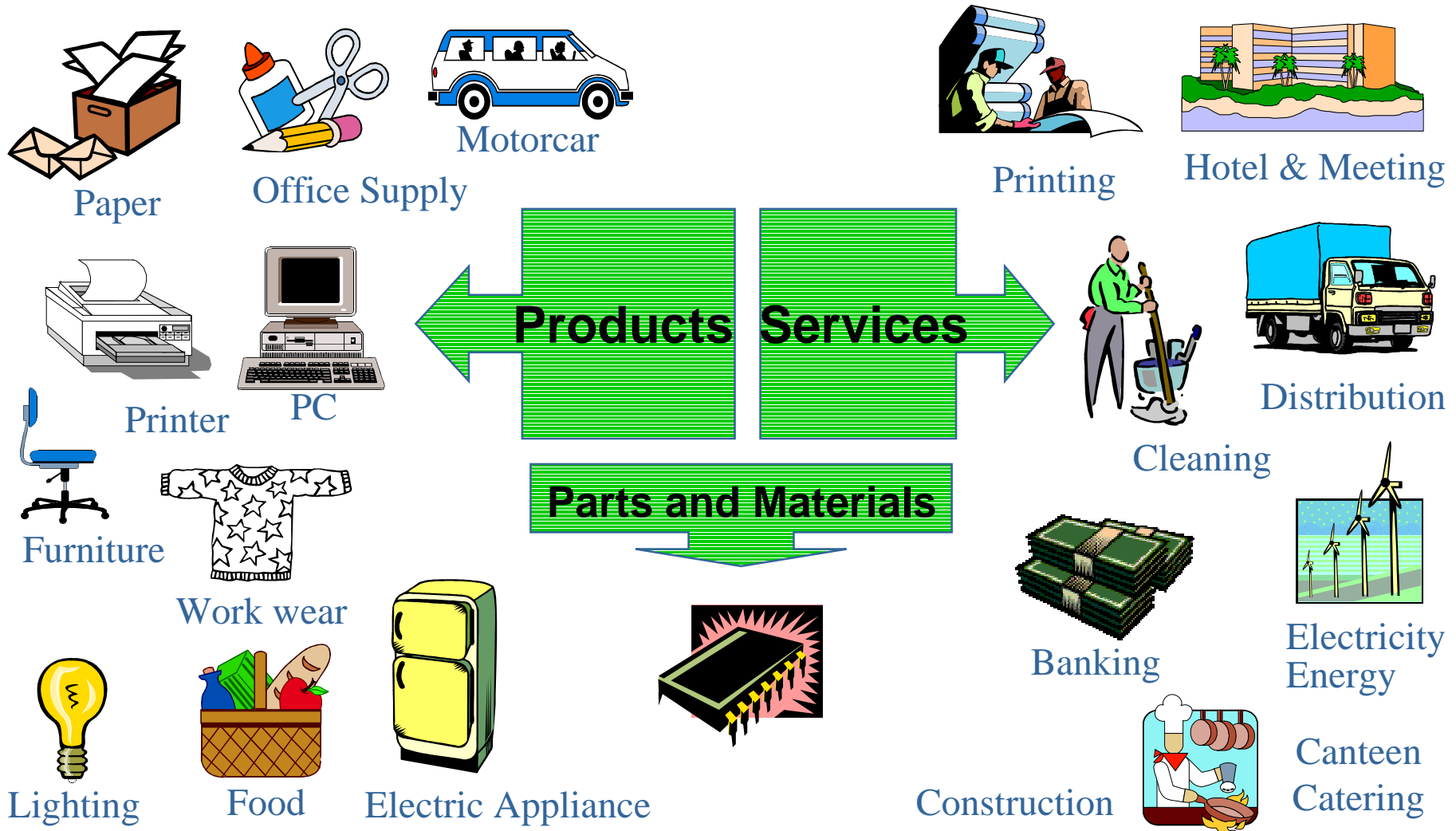


Recycled
material

Recycling

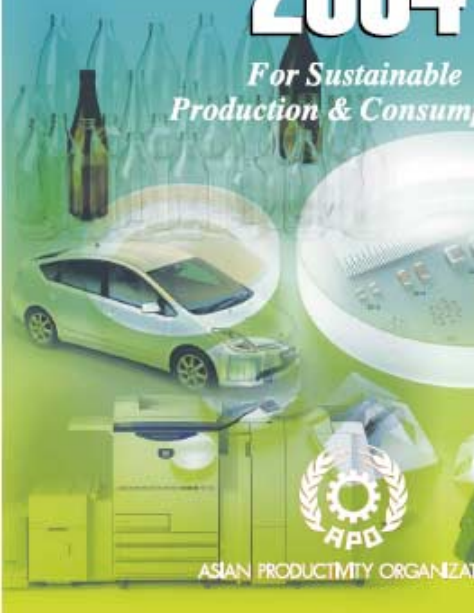


Target fields of Green Purchasing



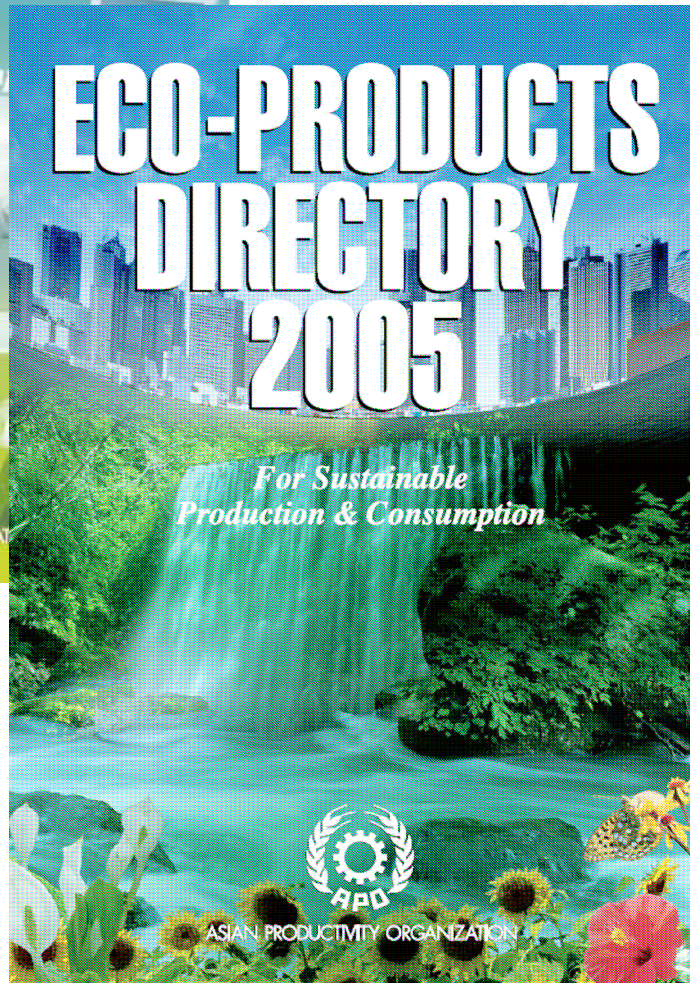
ECO-PRODUCTS DIRECTORY 2004

*For Sustainable
Production & Consumption*



ECO-PRODUCTS DIRECTORY 2005

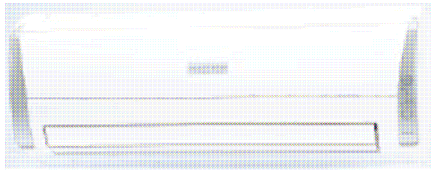
*For Sustainable
Production & Consumption*



- This directory was edited by Prof. R. Yamamoto and published by the Asian Productivity Organization (APO) in 2004 and 2005.
- This databook includes about 700 eco-materials, eco-components, and eco-products manufactured in Japan.

Examples of eco-products

Home electric appliances



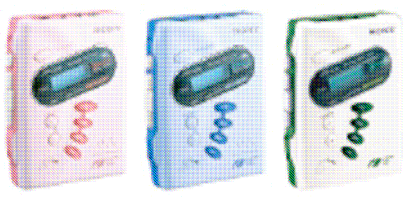
Toshiba Energy saving air conditioner



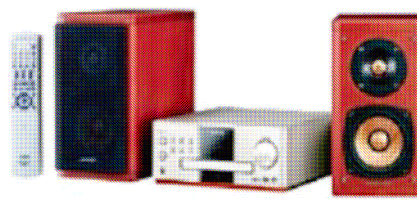
Victor video camera



Cassette with recycled resin



Sony Walkman using bio-plastic



Victor Compact DVD system



Liquid crystal color television



Victor Digital LCA TV



Sharp Plasma-cluster Ion Air purifier



Sony Notebook computer

Examples of eco-products

Home electric appliances



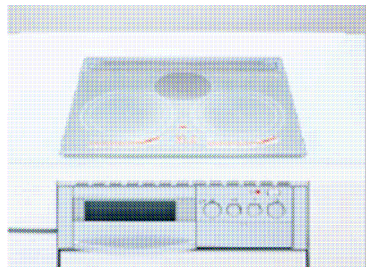
Toshiba Aero-cyclone vacuum



Sharp Washer and dryer



Water-saving dishwasher



Induction heat stove



Compact fluorescent lamp



Sharp Plasma-cluster
Ion refrigerator



Sanyo water heater



Solar-powered charger



Home sewing machine



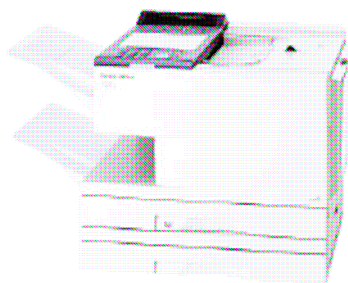
Mitsubishi FHT fluorescent lamp

Examples of eco-products

OA/IT equipments



NEC Lightest Fax



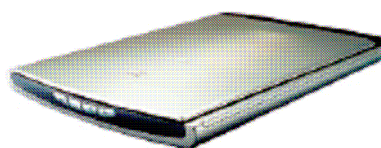
Panasonic high performance fax



NEC Multi-functional copier



Fuji Digital multi-functional machine



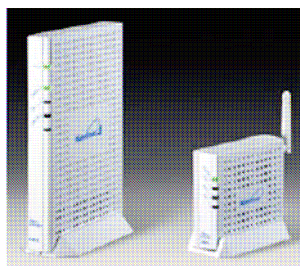
Canon Energy saving scanner



NEC Water-cooled computer



Kokuyo Computer mouse
made from recycled ABS



NEC Wireless broadband router



Canon Inkjet printer
using recycled plastic

Examples of eco-products

Automobiles



Honda Fuel-cell car



Honda Hybrid power car



Isuzu Giga



Natural gas Truck



Isuzu Elf CNG Truck



New Eco-body Truck Model



Car Navigation system



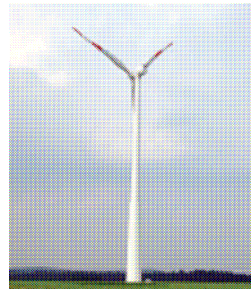
Yamaha Cygnus X scooter

Examples of eco-products

Machines



Ebara 850VA fuel cell system



Ebara wind generator



JSW cogeneration system



Komatsu construction crusher



JFE bigadan biogas system



Yamatake green Bio-Tower



Asashi oil filter



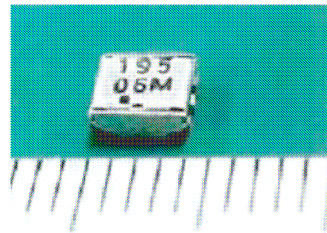
Hitachi laboratory automatic analyzer

Examples of eco-components

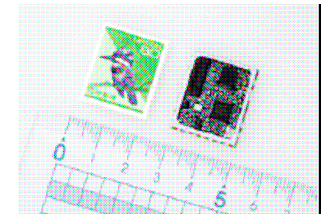
Global warming



High performance roofing "ecolony"



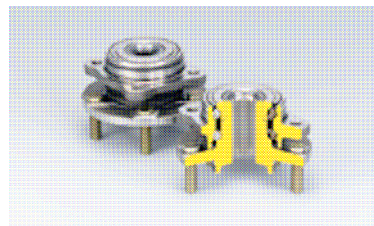
4mm square isolator



Silicon-based TV tuner



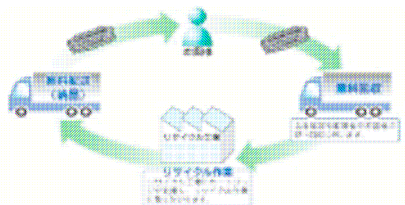
GS ceramic halide lamp



Lightweight hub-unit bearing



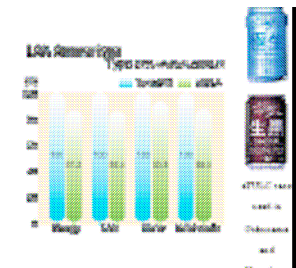
Magnet wire



Recycled toner



RENESIS engine



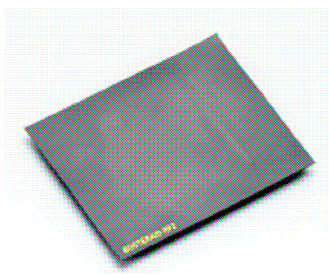
ATULC can

Examples of eco-components

Hazardous-free components



Murata lead-free
transparent ceramics



NEC halogen-free
Noise suppression sheet



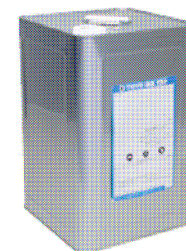
ALMT Cd-free electrical contact



Pb-free electric wire



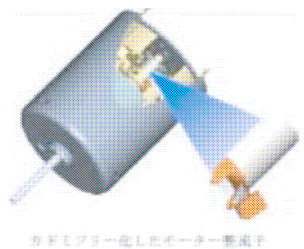
Toyo soybean oil-based ink



Toyo water-based ink



Toyobo water-based printing plate

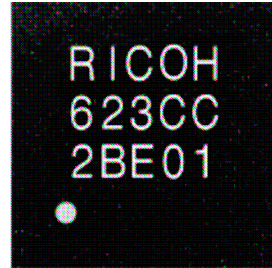


Mabuchi Cd-free motor

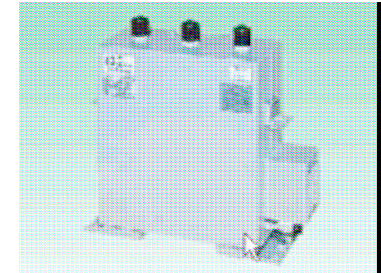


Furukawa halogen and
lead-free electric wire

Higher quality



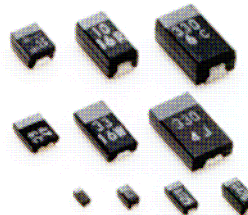
Cellular analog one chip



Nichicon advancing condenser



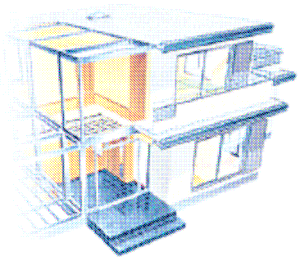
Nichicon power conditioner



NEC Tantalum chip capacitors



Sanyo Al-resin sash



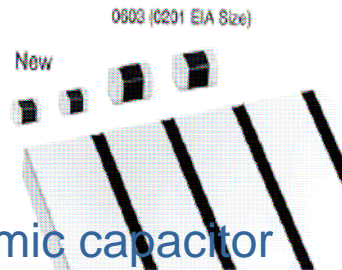
Sekisui corrosion resistant house structure



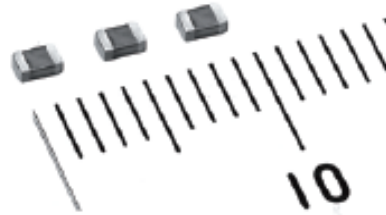
Nishimatsu FRP form

Examples of eco-components

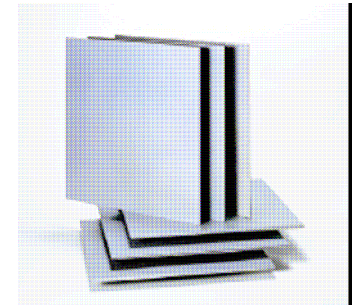
Resource saving



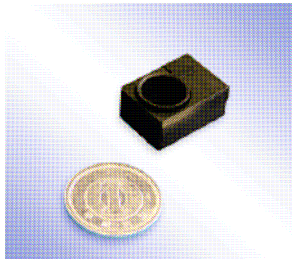
Ultra-small ceramic capacitor



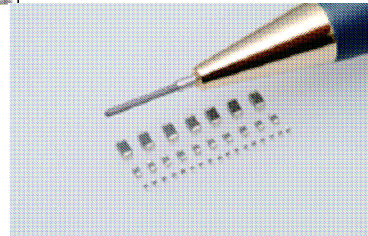
PTC thermistor



Obayashi Alcelite glass



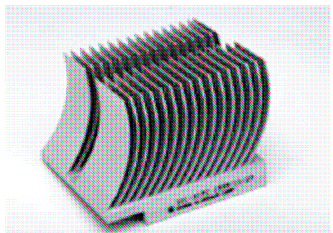
FDK actuator unit



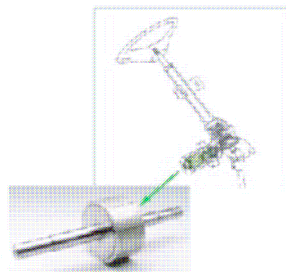
Taiyo high-loss inductor



Taiyo recyclable feeder



Showa Denko heat sink



Neomax permanent magnet



NSK lube guard bearing

Examples of eco-products

Commodity



Table made from agriculture wastes



Recycled resin office chairs



Clothes made from recycled plastics



Eco-hand soap



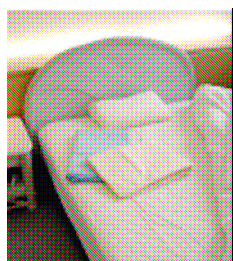
Bio-plastic spoon, fork and cup



Home water purifier



Bio-degradable diaper



Hyper Mat bedclothes



Hyper selan curtain

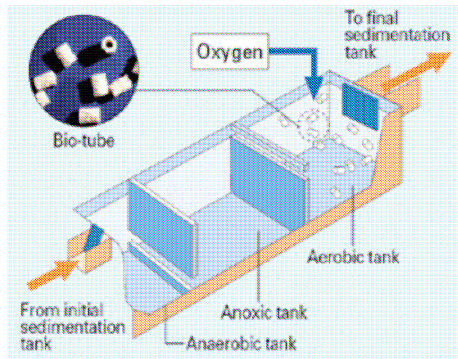


S-wood mouse pad



S-wood desk mat

Eco-Metals



Bio-tube for sewerage treatment by JFE



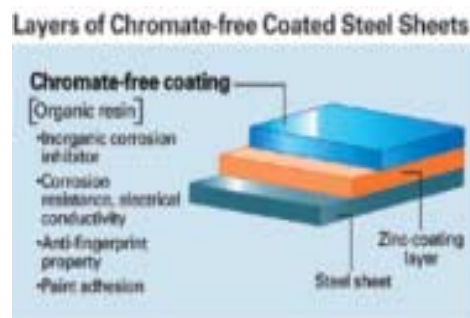
Hitachi FINEMET® EMC



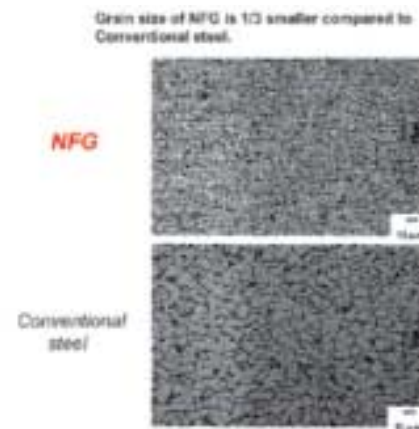
Eco-brass® of Sambo Copper Alloy



Mitsubishi Polycrystalline Silicon



JFE Cr-free coated steel sheet



Nakayama NFG® Ultrafine grained steel sheet

Natural Materials



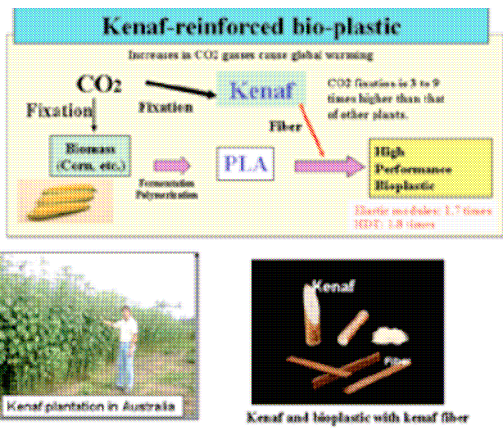
Kurabo Bio-Nature® fabrics



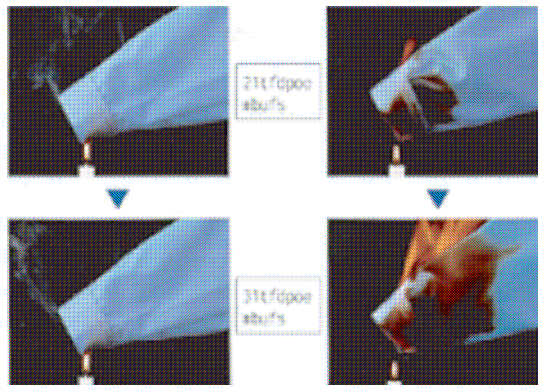
Industrial Hemp for textile fibers



“Hinokitiol” extracted from waste wood anti-microbicide



NEC inflammable bioplastics for PC

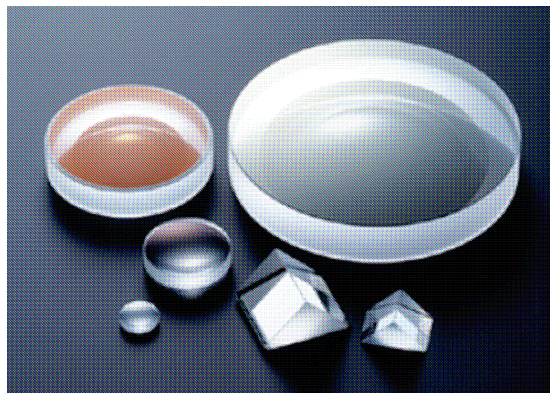


Kurabo “BREVANO ECO” antistatic fabrics



LHT 100% recycled “Technical Wood”

Eco-ceramics and glass



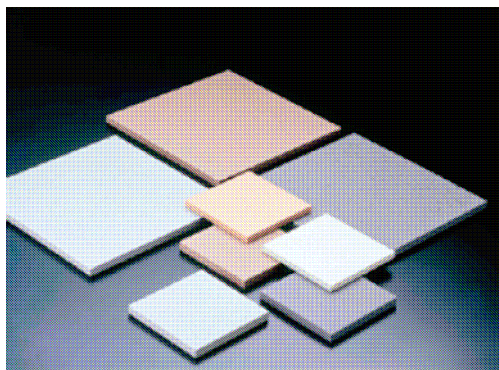
Nikon lead-free optical “Eco-glass”



Taiheiyo “Eco-cement”



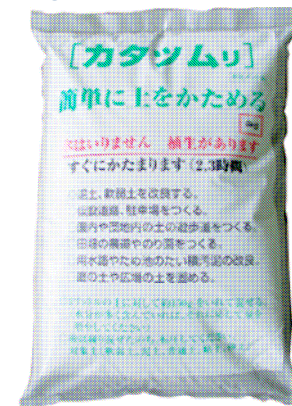
Taiheiyo ST-coating material containing photocatalytic TiO_2



Crystal Clay FP-series from waste glass



Kajima Artificial lightweight aggregate

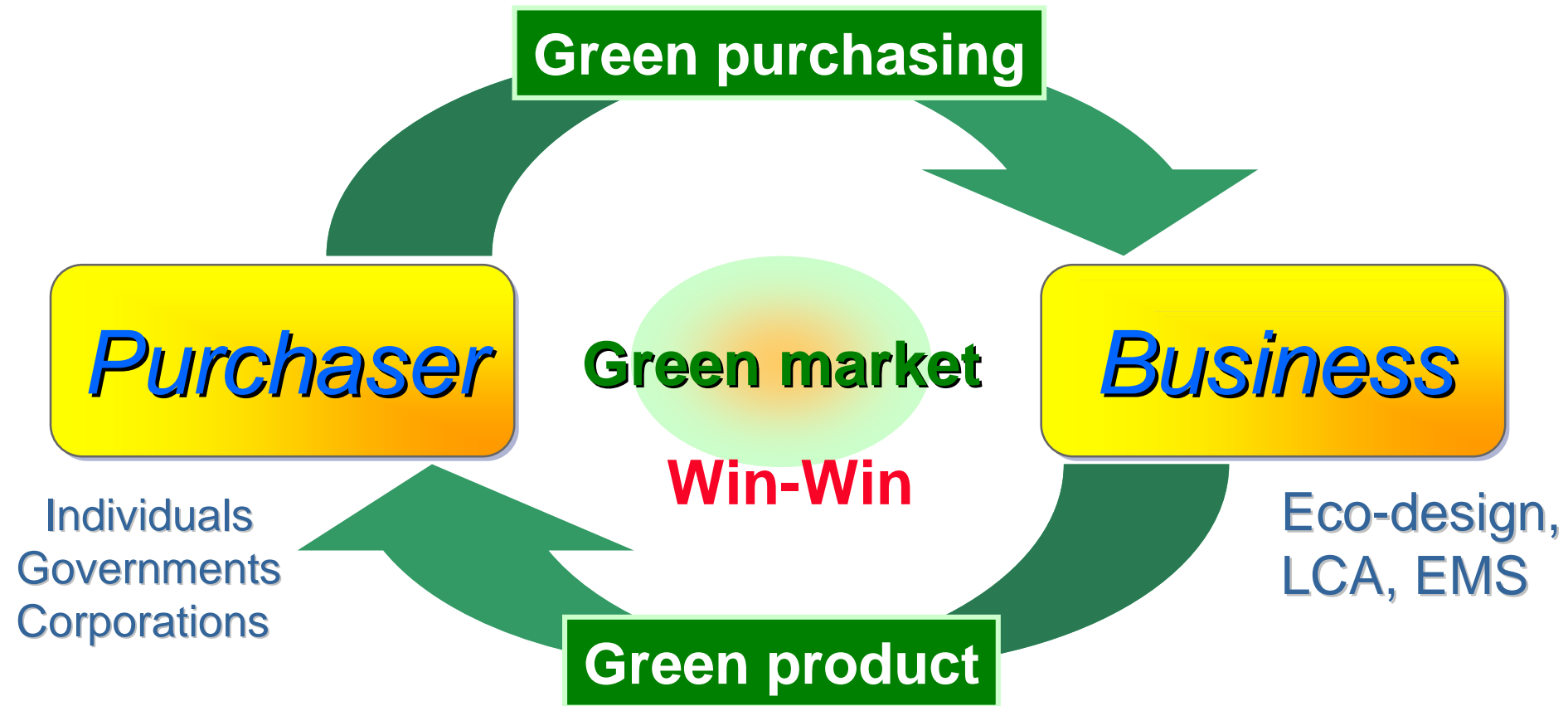


Baio “Katatumuri” soil conditioner

Principles of Green Purchasing

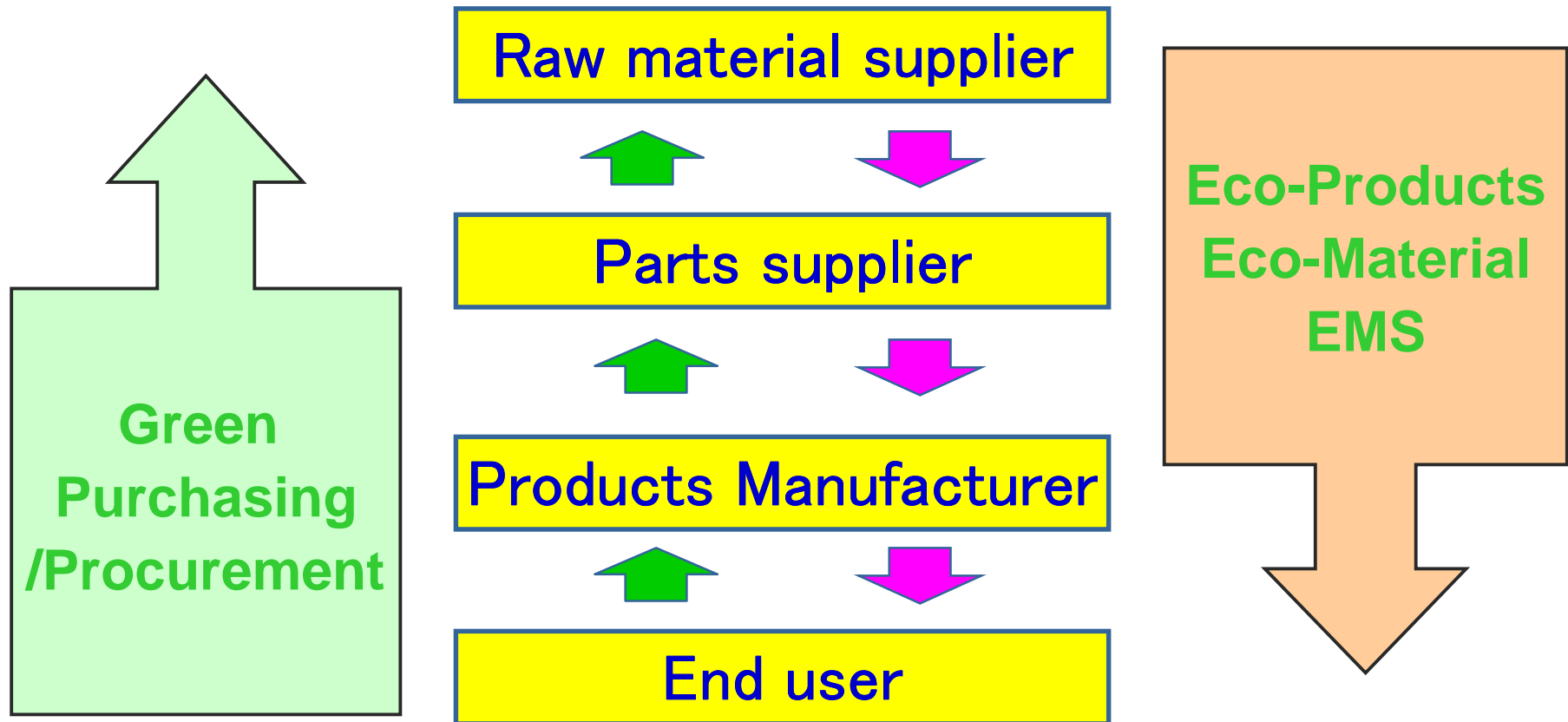
- **Principle 1** – Consider whether a product is needed before purchasing it or not.
- **Principle 2** – Purchase a product considering the various environmental impacts over its life cycle - from extraction of raw materials to disposal.
- **Principle 3** – Select suppliers who make a conscious efforts to care for the environment.
- **Principle 4** – Collect environmental information on products and suppliers.

Green purchasing & Green Business



*Green Purchasing encourage environmentally conscious
Management and eco-product development through the market*

Greening Supply Chain



To be competitive in the global market, all the businesses “must” enhance green manufacturing.

Green Purchasing Policies of Public Organizations

Purchasing Power of Public Organizations

- **Europe:**

- Public purchasing: 1 trillion EURO/year
- Over 14% of GDP



- **US:**

- Federal government spends \$500 billion/year
- State/local governments spends \$400 billion/year



- **Japan:**

- National government spending: ¥14 trillion/year
- Local governments spending: ¥44 trillion/year
- Totally 17.6% of GDP



- **UN:** \$3 billion/year—value of business opportunities linked to UN direct/indirect spending: \$30 billion



EU Green Purchasing Activities



- **Commission Interpretative Communication (2001)**
on the Community law applicable to public procurement
and the possibilities for integrating environmental
considerations into public procurement
- **New Public Procurement Directives (March 2004)**
 - clarify possibilities for integrating environmental
considerations at different stages of a public
procurement procedure
- **Handbook on Environmental Public Procurement
« Buying green! » (August 2004)**
 - give further explanations and best practice examples
- **General legal principles;**
 - Transparency, Non-discrimination, Link with subject
matter of contract, mutual recognition of equivalent
products /specifications/production methods/labels



EU Green Purchasing Activities -2



- **European Green Procurement Database**
 - Covers more than 100 product and service groups
 - Provides key environmental aspects, and existing Eco-labels for the product groups
 - http://europa.eu.int/comm/environment/green_purchasing/cfm/fo/greenpurchasing/
- **Status on green public procurement in EU;**

Percentage of administrations that include environmental criteria for more than 50 % of their purchases (study in 2003)

 - Average in EU: 19%
 - Sweden: 50%, Denmark: 40%, Germany: 30%, Austria: 28%, UK: 23%

US-EPA Green Purchasing Activities

- **Energy Star program (1992)**
- **Comprehensive Procurement Guidelines (1995)**
 - Promote purchasing recycled products
 - CPG Supplier Database
- **Farm Bill (2004)**
 - Encourage purchase of bio-based products
- **Environmentally Preferable Purchasing(EPP) program**
 - Based on “Executive Order 13101” (1998) which requires all the procurement officials to give preference to environmentally preferable products and services
 - **EPP Database**: Cover 53 products and service groups and link to various information sources
 - contract language, specifications, and policies
 - Environmental standards and guidelines
 - vendor lists of product brands
 - **Product focused EPP Guides, web-based training guide, Case studies, Pilot projects, role model of EPA**



JAPAN Green Purchasing Activities

- **Green Purchasing Network (GPN)**



- Founded in 1996
- 2,800 members (2,200 companies, 300 governments, 300 NGOs)
- 15 Purchasing Guidelines, Product DB(12,000 products registered), Hotel DB, Award, Training/Seminar, etc.

- **Government - Green Purchasing Law**

- Action Plan for Greening Government Operations (1994)
- Green Purchasing Law enacted in 2000
- All the national institutions must draw up annual purchasing policy, implement, and report results.
- 201 items are designated with criteria

- **Eco Mark Program**

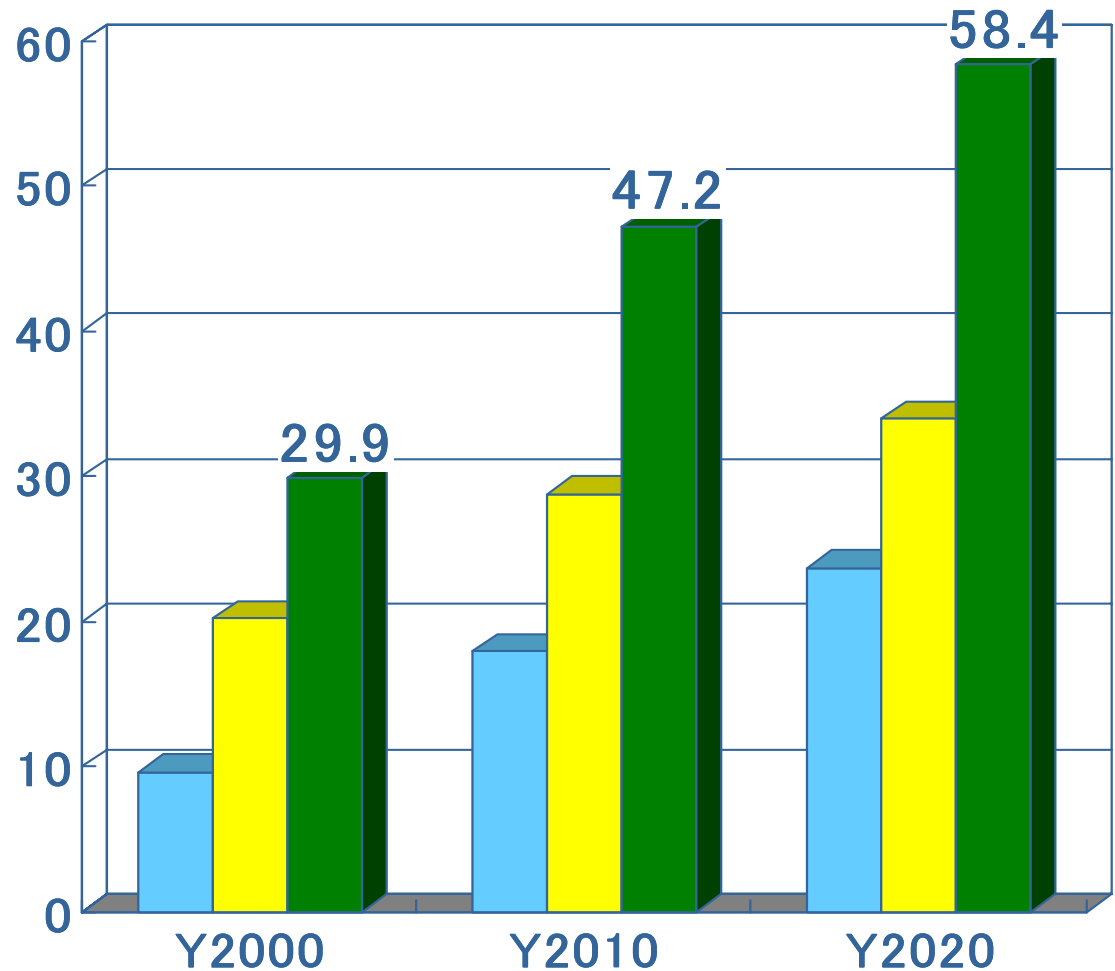
- Since 1989 by Japan Environment Association (JEA)
- 5,000 certified products within 45 categories



Market Size of Environmental Business of Japan

Government estimates 47 trillion yen (4,200 billion US\$) in 2010.

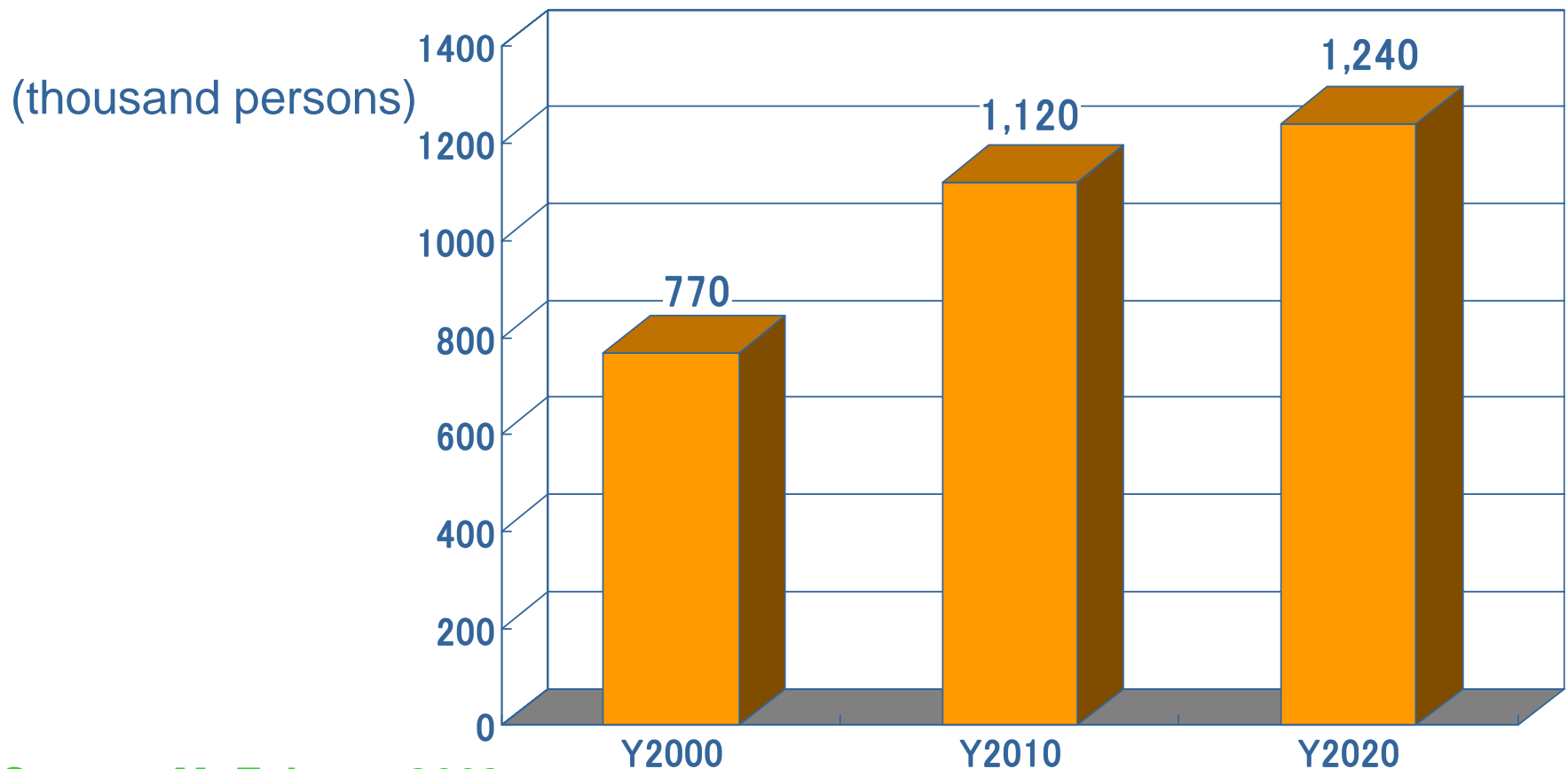
(Trillion yen)



Source: MoE Japan 2003

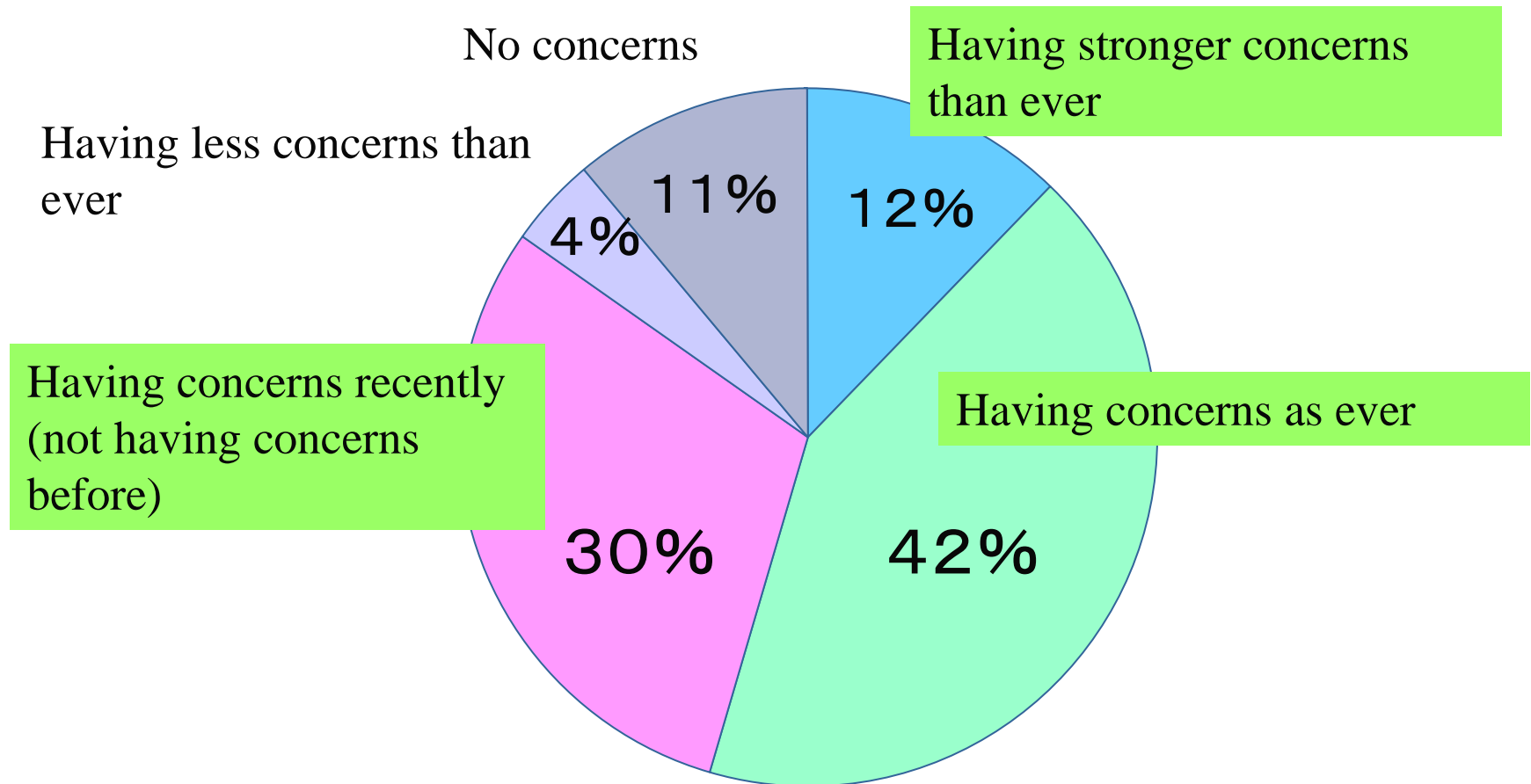
Employment Size of Environmental Business of Japan

More than million employment within several years

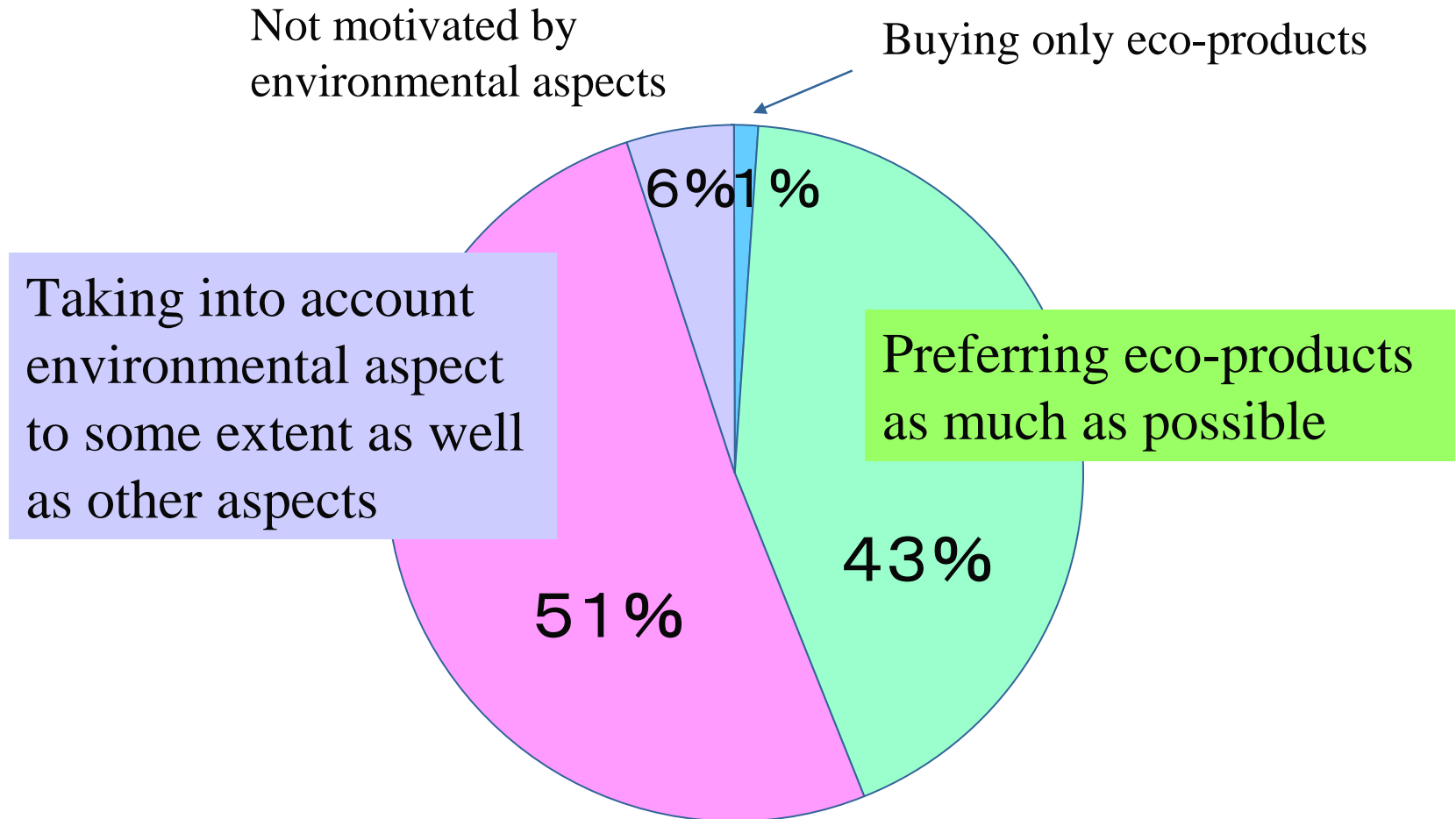


Source: MoE Japan 2003

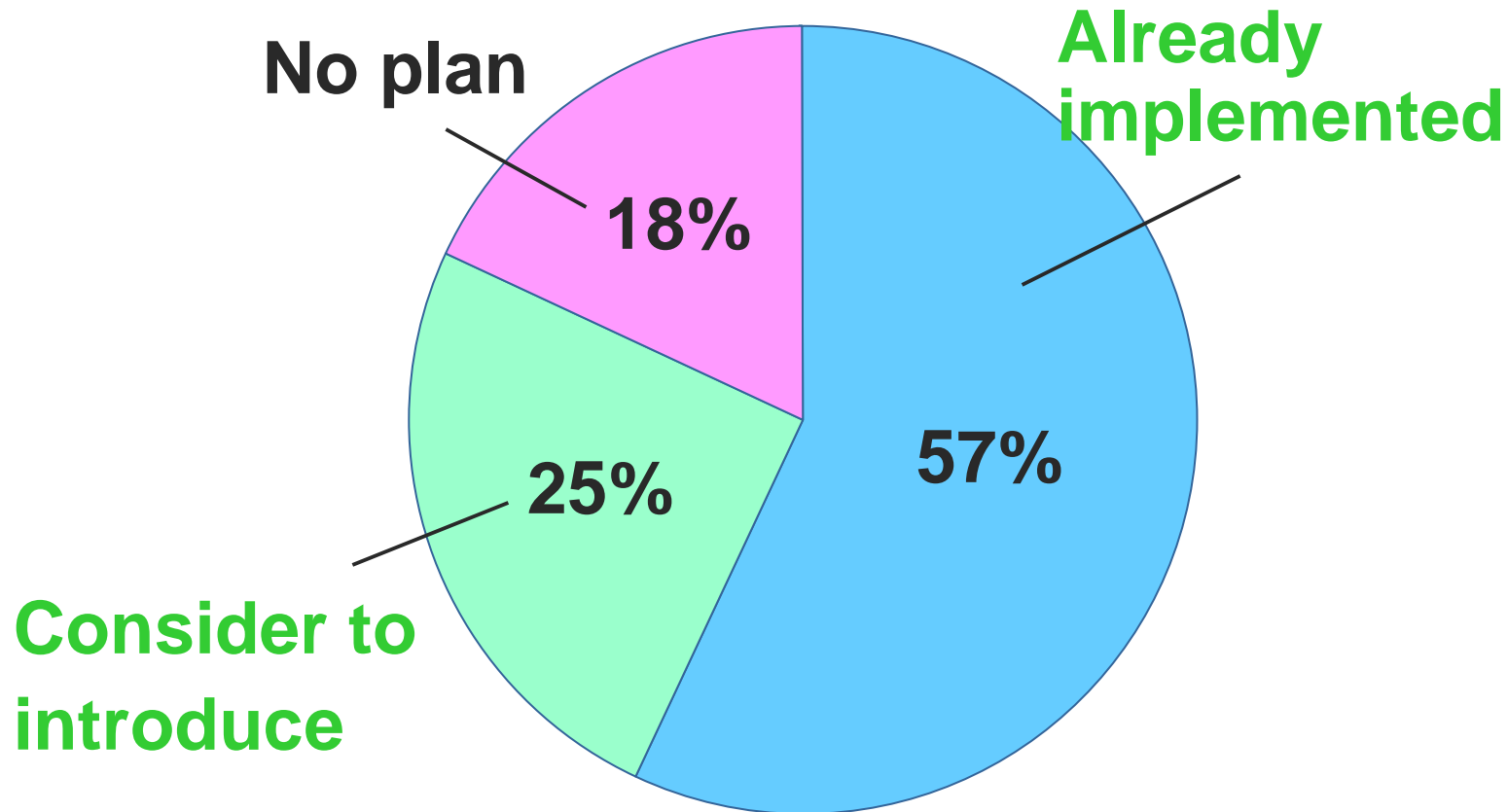
Concerns about Environmental Issues



Do You Prefer to Buy Eco-Products?



Green Purchasing in Business Sector



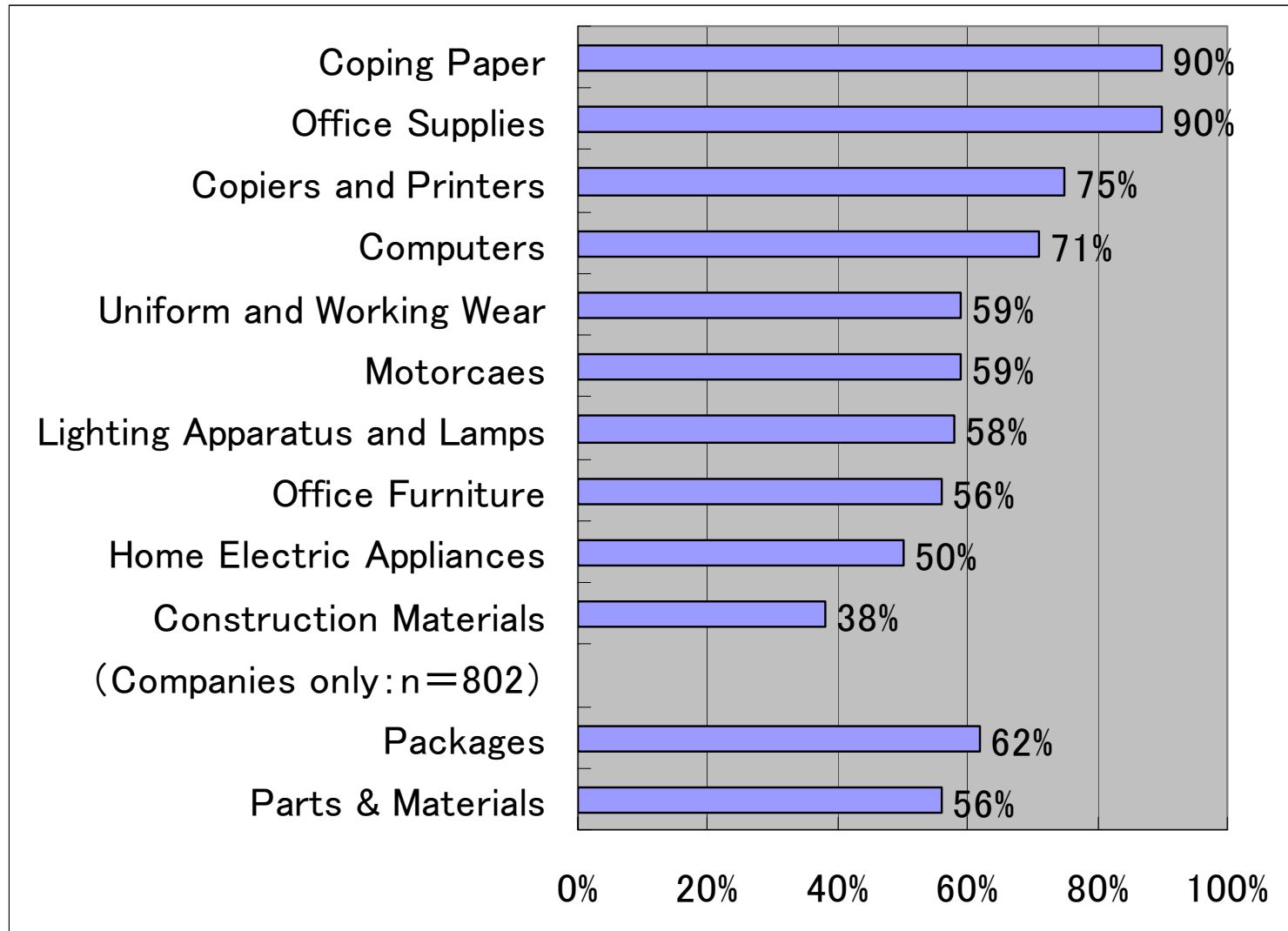
2,524 respondents (large sized companies)

Survey by MoE Japan in 2005

Green Purchasing in Public Sectors

- **All** the central government ministries practice green purchasing
- **100%** the 47 prefectural governments and 12 designated cities are engaged in green purchasing
- **68%** of 700 cities systematically implement green purchasing
- Particularly advanced areas : papers, office supplies, office furniture, OA & IT equipments, motorcars, uniforms, and electric appliances

Products Areas where Japanese Institutional Purchasers practices Green Purchasing

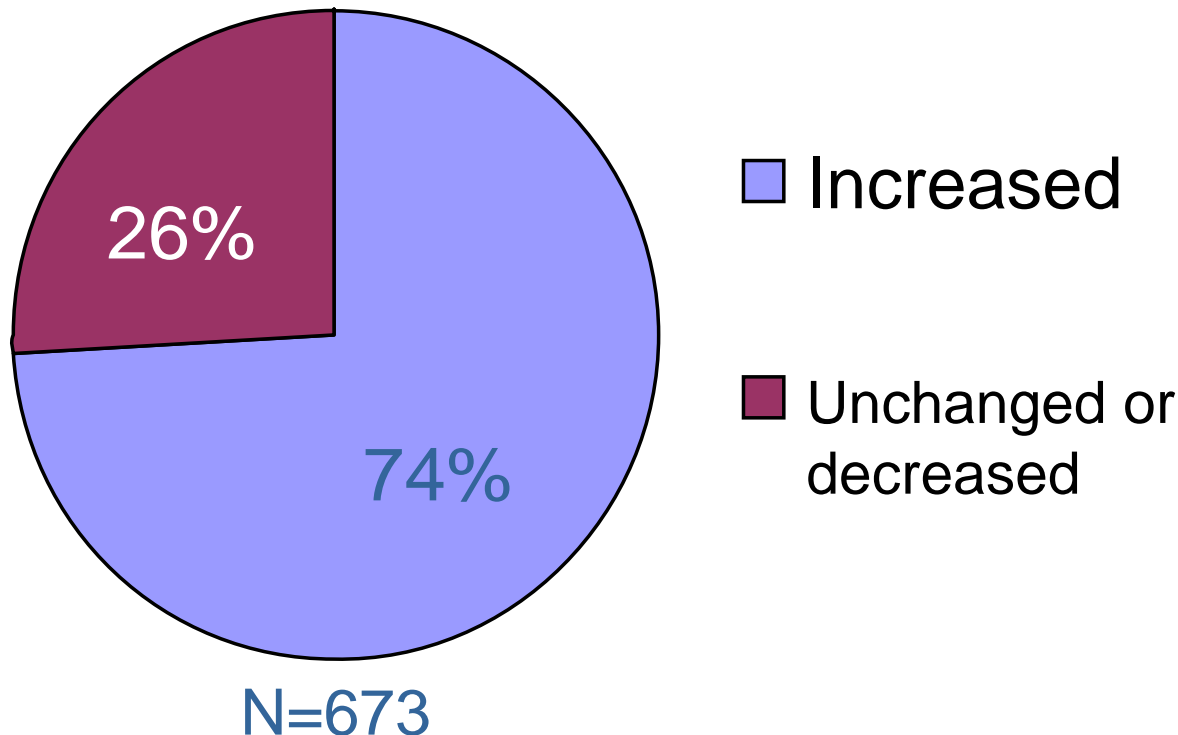


Findings from survey by GPN in 2002

Market Impact of Green Purchasing

Findings from survey by GPN in 2001

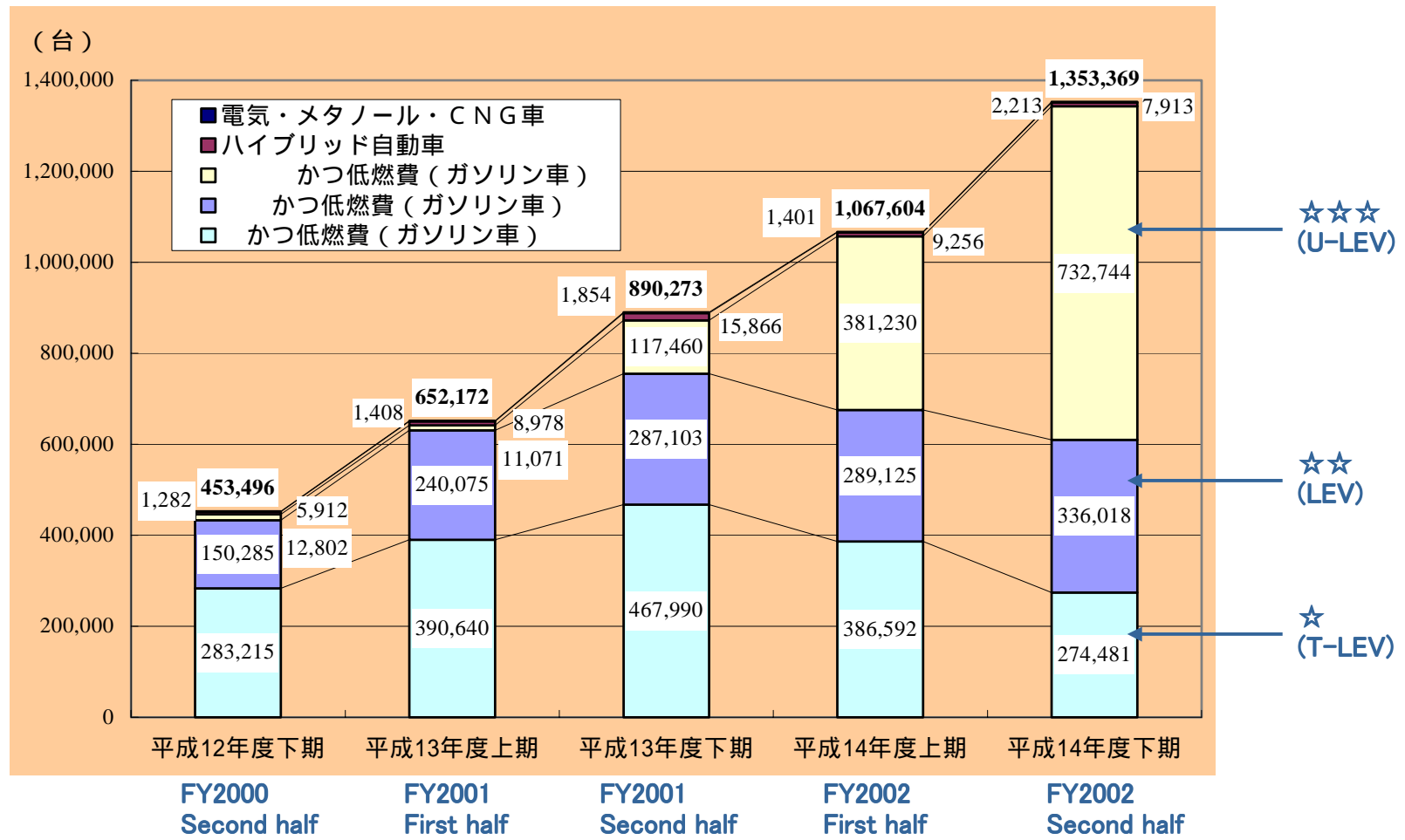
Sales of Green Products



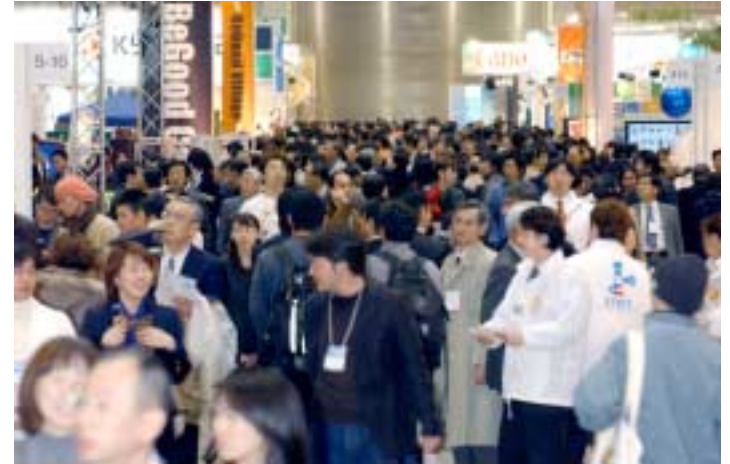
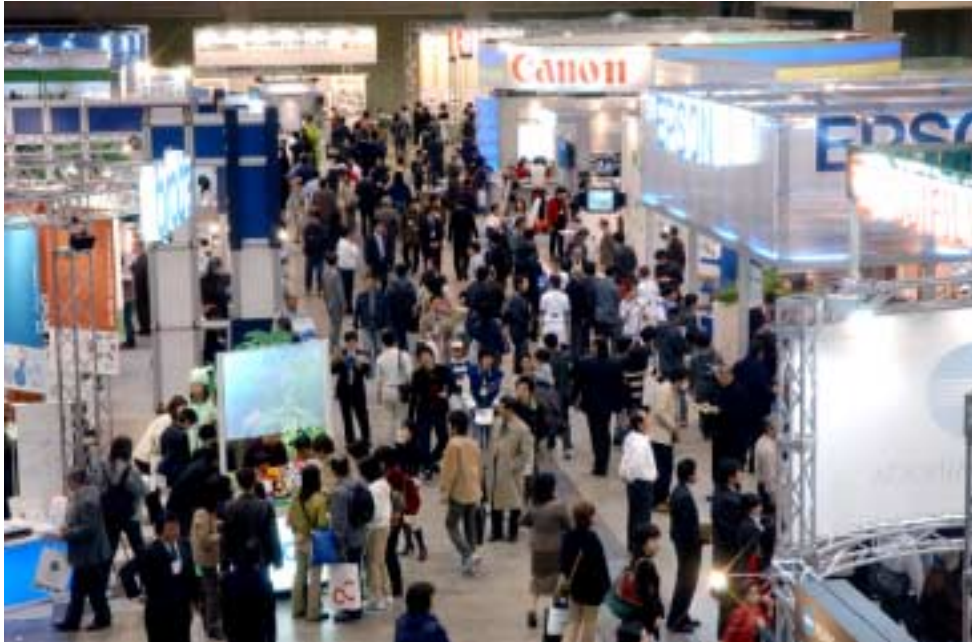
Effect of Green Purchasing

Market impact – Surveyed by MoE, Japan

Sales of lower emission and fuel efficient vehicles rapidly increased after enforcement of Green Purchasing Law



Eco-Products Exhibition in Tokyo



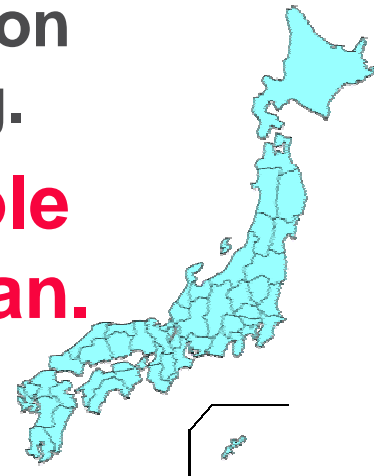
***More than 400 companies,
Exceeds 140,000 visitors***





Green Purchasing Network

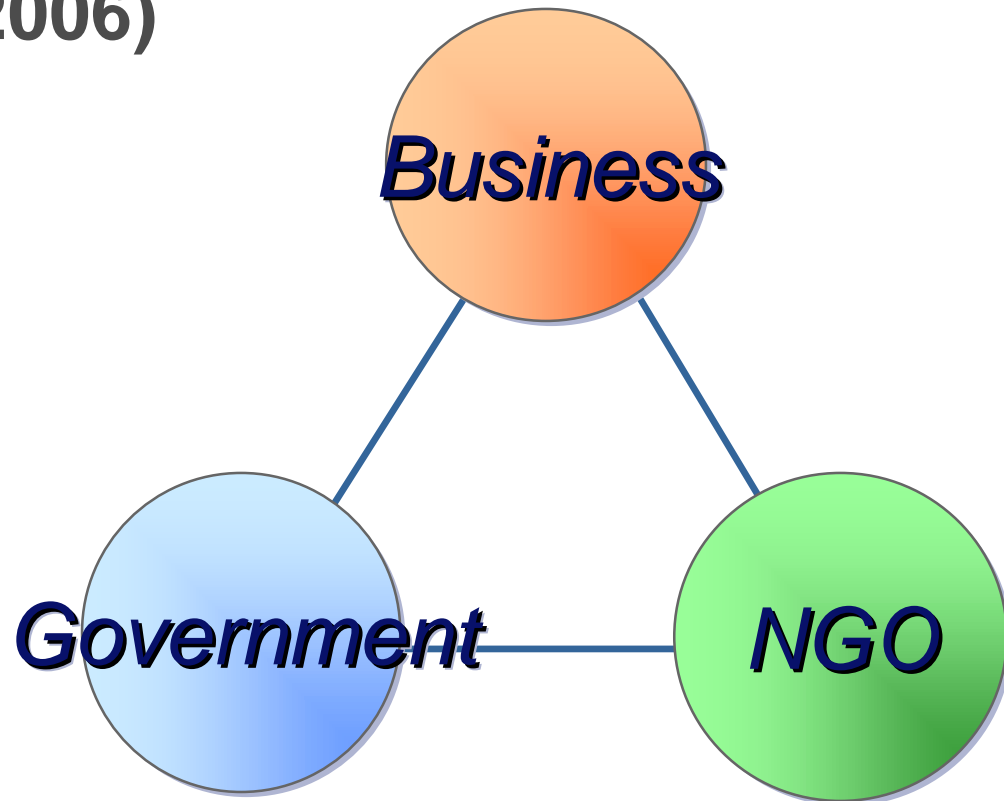
- Founded in February 1996 to promote green purchasing in Japan by the initiative of the Environment Agency
- The mission of GPN
 - to promote the concept and practices of green purchasing
 - to provide guidelines and information necessary for practicing green purchasing.
- **Since then GPN has taken a leading role in promoting green purchasing in Japan.**





More About GPN

- Independent non-profit organization
- **2,860 members** (Jan. 2006)
 - 2,261 corporations
 - 317 governments
 - 282 NGOs, NPOs
- Executive Committee
 - 39 members



***One of the largest
environmental organizations in Japan***

Activities of GPN

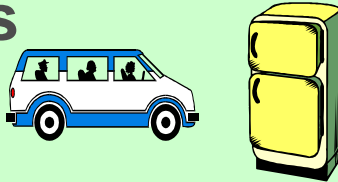
- Conferences, Seminars, Exhibitions
- “Green Purchasing Award”
- Training Course
- Case study on success stories
- Newsletter, Website
- Promotion pamphlet, posters
- Regional Networks
- Annual Surveys
- Principles of Green Purchasing
- **Purchasing Guidelines**
- **Products Database**
- **Hotel Database**
- **Information Plaza**



Green Purchasing Guidelines for 15 Products and Service Areas

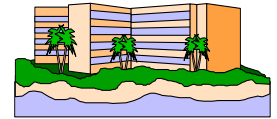
Products

- Printing and Copying Paper
- Copiers, Printers, Facsimiles
- Personal Computers
- Stationery and Office Supplies
- Office Furniture
- Motor Vehicles
- Refrigerators
- Washing Machines
- TV Sets
- Air Conditioners
- Toilet and Tissue Paper
- Lighting Equipment
- Uniforms and Work Wear

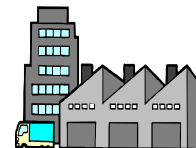


Services

- Offset Printing Service
- Hotels and Inns



Suppliers Evaluation Checklist



GPN Purchasing Guidelines



Personal Computers

- 1) Minimal power consumption during operation and standby mode (fulfilling requirements for “low energy consumption rate” as stipulated in the Law Concerning the Rational Use of Energy, and the International Energy Star program)
- 2) Capacity for upgrading and expanding functions in order to make long-term use feasible, and full maintenance service provided by the manufacturer
- 3) Designed to facilitate recycling and re-use of component parts
- 4) The manufacturer promotes the re-use of its own product after initial sale and usage, and endeavors to increase the recycling ratio of materials that cannot be re-used
- 5) Made with a large amount of recycled material
- 6) Does not contain lead, mercury, cadmium, hexavalent chromium compounds, or specific bromine-based flame-retardants (PBB, PBDE), to the utmost extent possible
- 7) When packaged with an in-house user manual, the manual is made and printed with consideration for the environment

[Information Requirements]

Use of PVCs (for the chassis of the PC, display, and keyboard)

GPN Products and Service Database

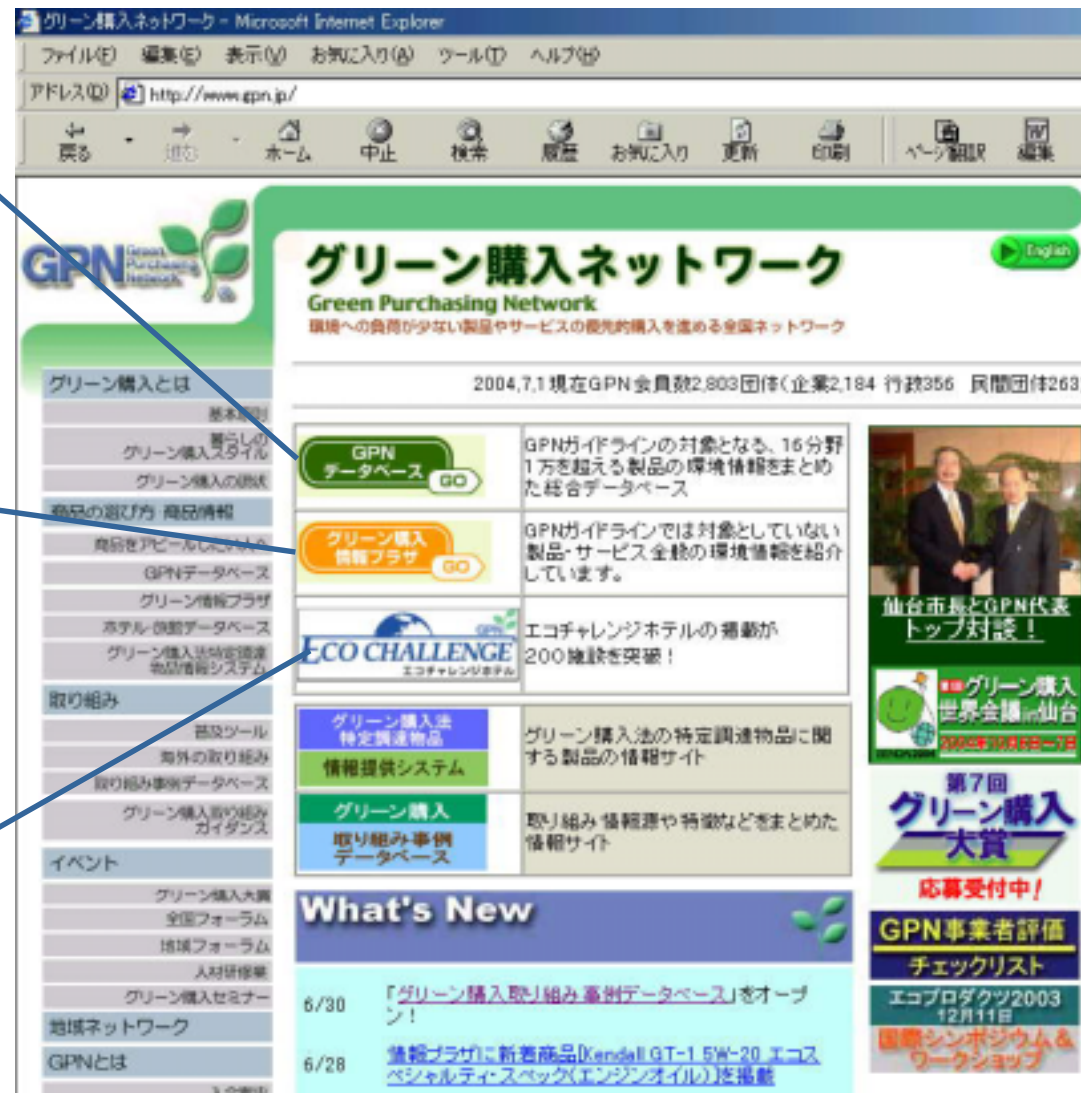
GPN Database

13 products area where purchasing guidelines exist

Green Purchasing Information Plaza

Various products and services not listed in GPN database

Eco-Challenge Hotel Database



グリーン購入ネットワーク - Microsoft Internet Explorer

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

アドレス(A) http://www.gpn.jp/

戻る 進む ホーム 中止 検索 履歴 お気に入り 更新 印刷 ページ翻訳 編集

GPN Green Purchasing Network
グリーン購入ネットワーク
環境への負荷が少ない製品やサービスの優先的購入を進める全国ネットワーク

2004.7.1 現在GPN会員数2,803団体(企業2,184 行政356 民間団体263)

GPN データベース GO
GPNガイドラインの対象となる、16分野1万を超える製品の環境情報をまとめた総合データベース

グリーン購入情報プラザ GO
GPNガイドラインでは対象としていない製品・サービス全数の環境情報を紹介しています。

ECO CHALLENGE
エコチャレンジホテル
エコチャレンジホテルの掲載が200施設を突破！

グリーン購入法特定調達物品情報提供システム
グリーン購入法の特定調達物品に関する製品の情報サイト

グリーン購入取り組み事例データベース
取り組み情報や特選などをまとめた情報サイト

What's New

6/30 「グリーン購入法取り組み事例データベース」をオープン！

6/28 情報プラザに新着商品[Kendall GT-1.5W-20 エコスペシャルティスベック(エンジンオイル)]を掲載

仙台市長とGPN代表トップ対談！

第7回グリーン購入大賞
応募受付中！
GPN事業者評価チェックリスト
エコプロダクツ2003 12月11日
国際シンポジウム＆ワークショップ

About GPN Database

Product Environmental Performance Database

- More than **12,000 products** registered
- About 600 companies participating
- **300,000 page-views** monthly

Currently Japanese language only

Product Categories

- Printing and Copying Paper
- Copiers, Printers, Facsimiles
- Personal Computers
- Stationery and Office Supplies
- Office Furniture
- Motor Vehicles
- Refrigerators
- Washing Machines
- TV Sets
- Air Conditioners
- Toilet and Tissue Paper
- Lighting Equipment
- Uniforms and Work Wear



Users can get and compare environmental performance information for hundreds of registered brands.

Price

[illegible]

Information format is consistent with relevant GPN Purchasing Guidelines

GPN DB - Registered Products



Eco-Challenge Database for Hotels

- Database **specific to Hotels and Inns**
- Provides environmental performance information on hotels.
- Based on GPN guidelines
- Self-declaration system
- Started in 2003
- Any hotel meeting minimum requirements can be registered.
- 89 check points
- **240 facilities** are registered
- From “Beginner” to “Top Class”



The screenshot shows the homepage of the GPN Eco-Challenge Hotel Database. The header features the 'Eco CHALLENGE' logo and the title 'GPNエコチャレンジホテル登録データベース'. Below the header is a banner image with the text '~環境にやさしいホテル・旅館のガイド~'. The main content area includes a search bar with options for '検索方法' (Search Method) and '検索表示順' (Search Order). There are also links for 'お知らせ' (Notice) and 'ピックアップホテル紹介' (Featured Hotel Introduction). The 'ピックアップホテル紹介' section features a photo of a hotel and a table of scores for various environmental criteria.

環境への取り組み状況 (0/50点満点)	
環境への取り組み姿勢	4.8
環境管理システム	4.4
環境管理システム	4.8
環境管理システム	4.8
環境管理システム	4.8

Conclusions

Key Factors for success in Japan -1

[First stage (1995-2000)]

- Pioneering activities by lots of environmentally conscious major companies and local governments, which stimulated competitors and neighbors.
- Green Purchasing Network (GPN) has succeeded to involve wide range of businesses, public and NGO sectors.
- GPN and its members succeeded to make a nation-wide big social trend.
- The Ministry of the Environment (MoE) backed up the voluntary movements and GPN.
- Success stories were introduced by the award and seminars by MoE and GPN.
- Businesses made considerable efforts to develop eco-products.

Conclusions

Key Factors for success in Japan -2

- It became much easier to get product environmental information from GPN Data Base, Eco-mark, suppliers catalog, etc.
- The movement was concurrent with popular trend of getting certificate of ISO14001.

[Second stage (2000-)]

- The mandatory Green Purchasing Law dramatically disseminated the activities among governmental sectors.
- Companies which products designated by the law worked hard to meet the criteria.
- EU RoHS directive accelerated corporate green procurement activities through supply chain.

Conclusions

- **Customers** already started green purchasing/procurement across the world and had made reasonable successes.
- **Businesses** are increasingly required to supply eco-products, eco-components, and eco-services from customers throughout the supply chain.
- **To be competitive** in the global market, businesses should enhance green manufacturing.

*Thank you for your kind
attention.*

GPN Website : <http://www.gpn.jp>

