Green Manufacturing for Global Competitiveness

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What is “Green Purchasing”? 

Balancing Quality, Cost, Delivery, and Environment leads to Green purchasing.

Quality + Cost + Delivery + Environment

Balancing Q C D and E
Find Fundamental Solution by Changing the Input

Make the input green

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

Recycled material

Reduce the output

Waste
Pollution
Hazardous substances
Carbon Dioxide

Recycling
Target fields of Green Purchasing

- Paper
- Office Supply
- Motorcar
- Printing
- Hotel & Meeting
- Distribution
- Cleaning
- Banking
- Electricity
- Energy
- Canteen
- Catering
- Furniture
- Work wear
- Food
- Electric Appliance
- Construction
- Parts and Materials
- Products
- Services

GPN (Green Purchasing Network)
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
- 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”
- GS ceramic halide lamp
- Recycled toner
- RENESIS engine
- ATULC can
- 4mm square isolator
- Lightweight hub-unit bearing
- Magnet wire
- Silicon-based TV tuner
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
Examples of eco-components

Higher quality

Citizen high luminance LED

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

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 TiO₂
- 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.

*Established by Green Purchasing Network (GNP)*
Green Purchasing encourage environmentally conscious Management and eco-product development through the market
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/](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)
  - 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**
  - 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

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

- No concerns: 30%
- Having concerns as ever: 42%
- Having less concerns than ever: 11%
- Having stronger concerns than ever: 4%
- Having concerns recently (not having concerns before): 12%

Year 2002
Do You Prefer to Buy Eco-Products?

Not motivated by environmental aspects: 6%
Buying only eco-products: 1%
Taking into account environmental aspect to some extent as well as other aspects: 51%
Preferring eco-products as much as possible: 43%

Year 2001
Green Purchasing in Business Sector

Survey by MoE Japan in 2005

- Already implemented: 57%
- Consider to introduce: 25%
- No plan: 18%

2,524 respondents (large sized companies)
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

Survey by MoE Japan in 2005
Products Areas where Japanese Institutional Purchasers practices Green Purchasing

Findings from survey by GPN in 2002

- Coping Paper: 90%
- Office Supplies: 90%
- Copiers and Printers: 75%
- Computers: 71%
- Uniform and Working Wear: 59%
- Motorcaes: 59%
- Lighting Apparatus and Lamps: 58%
- Office Furniture: 56%
- Home Electric Appliances: 50%
- Construction Materials: 38%
- (Companies only: n=802)
- Packages: 62%
- Parts & Materials: 56%
Market Impact of Green Purchasing

Findings from survey by GPN in 2001

Sales of Green Products

- Increased: 74%
- Unchanged or decreased: 26%

N=673
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
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
Information Found in GPN-Database

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

**Example for “Copiers”**
- Brand name
- Company
- Copying speed
- Energy Star
- GP Law conformity
- Power consumption for stand-by and off mode
- Two-sided copying
- Use of recycled plastics
- Use of reused parts
- Toner cartridge recycling
- Use of PVC
- Eco-Label certification
- Price

*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”
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