

Green Purchasing Initiatives by Obayashi Corporation

1. Introduction

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

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

2. History of Green Purchasing

A. History Outside of Obayashi Corporation

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

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

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

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

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

B. Green Purchasing Initiatives by Obayashi Corporation

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

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

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

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

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

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

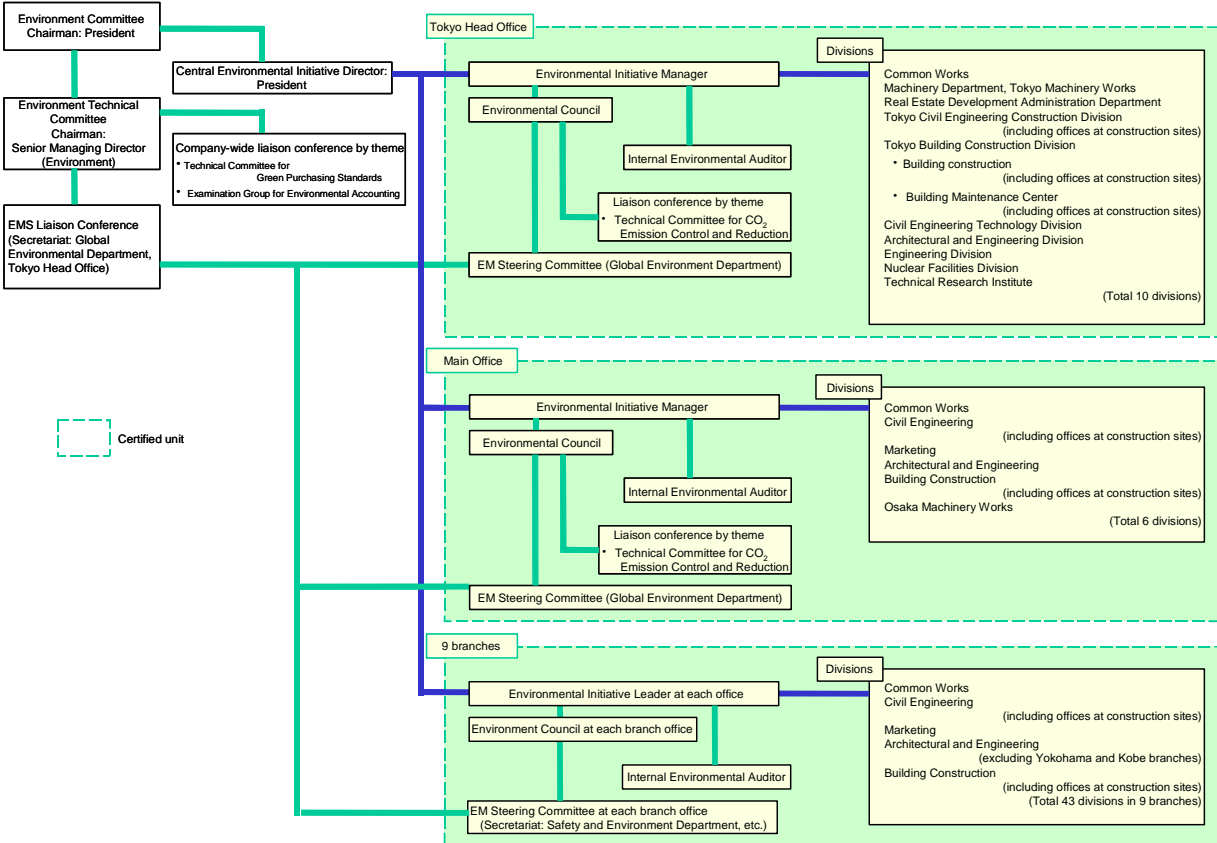
3. Organization and System for Green Purchasing

A. Office Supplies and Equipment

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

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

Figure 1. Obayashi Corporation Environment Management System Organization



B. Construction Materials, Equipment and Products

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

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

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

4. Selection Standards for Construction Materials and Decision-making

A. Specific Items and Criteria

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

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

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

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

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

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

B. Decision-making

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

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

5. Selection Criteria for Suppliers

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

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

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

6. Monitoring Green Purchasing and Obstacles to Green Purchasing

A. Monitoring Green Purchasing

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

Safety and Environment Dept.

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

Purchasing departments

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

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

Global Environment Dept.

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

Machinery Dept.

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

B. Green Purchasing Performance

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

Table 2 FY2001 Green Purchasing Performance

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

7. Obstacles to Green Purchasing and Future Initiatives

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

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

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

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

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

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

Chapter 4: Promoting Green Purchasing

Background

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

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

Purpose

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

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

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

Implementation

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

A. Promoting Green Purchasing of Construction Materials, etc

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

B. Promoting Green Purchasing of Office Supplies

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

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

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

2. Implementation Policies for JFCC, JCECA, and BCS

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

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

B. Information Exchange with Relevant Industries and Government

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

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

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

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