

POLICY MEASURES FOR LOW-CARBON GREEN GROWTH

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Abstract

As the world faces the challenges of climate changes from greenhouse gas emission and imbalance of the supply and demand for energy resources, the global community is seeking global cooperative measures to cope with these issues. In concert with this global efforts, Korea has also set the national vision of “Low Carbon Green Growth” in 2008 and established its strategies for the development of green technology and fostering of green industry. The core values of Low Carbon Green Growth are to achieve sustainable growth through the efficient use of energy and resources, and to minimize pollution and the emission of greenhouse gases. As part of the green growth strategies, green procurement has become an important objective in public procurement. This paper will provide a comparative examination on green public procurement trends in Europe, Japan, and the USA. Based on this examination, this paper will also propose strategies for improving green public procurement framework for Korea.

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I. Foreword

It has been made evident that the main cause of global warming is greenhouse gasses. Global warming is the foremost cause of the destruction of ecosystem, such as forest destruction and the extinction of fauna and flora, as well such natural disasters as floods, heat waves and droughts. A recent research reported that a rise of the earth average temperature by 1.5~2.5°C may result in the extinction of 20~30% of living fauna and flora, and a temperature rise by 3°C may cause the inundation of 30% of the earth's current landmass (IPPC, 2007).

Global warming would bring grave impacts not only on the earth's climate, but also on the global economy. According to Stern Review, a report by HM Treasury of the UK which contains research findings on climate changes and their economic impacts, global warming may cost 5~20% of the world's total GDP and lead to severe economic recession comparable to the Great Depression if it is left unaddressed (HM Treasury, 2006).

With developed countries as the main advocates, voices calling for global collaboration have been spreading. Major international media are alarming the global community on the threats of climate changes. Global warming also has been one of the central issues discussed at global political meetings, such as APEC Summit, OECD Ministerial Meeting, and the World Economic Forum in Davos.

Korea has also set out on this green initiative for sustainable development. The year 2008 marks the turning point in the Korean government, where the Korean government adopted the national vision of "low-carbon green growth." Along with this national vision, the Korean government declared its commitment to investing in green energy and eco-friendly technologies, thereby creating new employments and fostering economic growth.

In this context, Korea's public procurement sector implemented new

schemes with a view to promoting the development of green products, high energy-efficiency products, and products with lower carbon emission. As green products often require high initial investment cost, there is the need for the public sector to provide market opportunities and foster research and development activities. To this end, Korea has implemented the green public procurement scheme that includes a priority purchase requirement for products with eco-friendly certification, high energy-efficiency certification, energy conservation certification, and low stand-by energy certification. As such, Korea's public sector is playing a leading role in realizing the vision of low-carbon green growth.

This paper reviews the awareness and issues on green procurement in the public procurement market, compares the current green procurement trends in Europe, the US, and Japan, and analyzes Korea's green procurement policies. By doing so, this paper intends to propose ways to improve Korea's public procurement policies, cost calculation methods, and bid evaluation schemes for promoting green products. It will also provide further directions for quality assurance schemes for green products, as well as for raising awareness on green procurement among public entities, manufacturers and consumers.

II. The Importance of Green Public Procurement for Green Growth

1. Understanding Green Procurement for Green Growth

The Presidential Committee on Green Growth of Korea defines green growth as “to create a virtuous circle between environment and economy, to maximize the bilateral synergy, and to utilize it for growth momentum.” In other words, it envisions new growth opportunities from shifting the nation's economic growth pattern to a

sustainable mode. It is viewed as a policy solution arising from the viewpoint of causal treatment¹⁾. Samsung Economic Research Institute (2008) defines green growth as a “new growth concept that multiplies the economic growth energy based on the shift towards low-carbon green industry”. Here, the reduction of carbon emission from economic activities is a passive measure against the global climate change, and shifting to green industry is a more active ‘greenization’ where new markets are created from green technology and eco-friendly business operation.

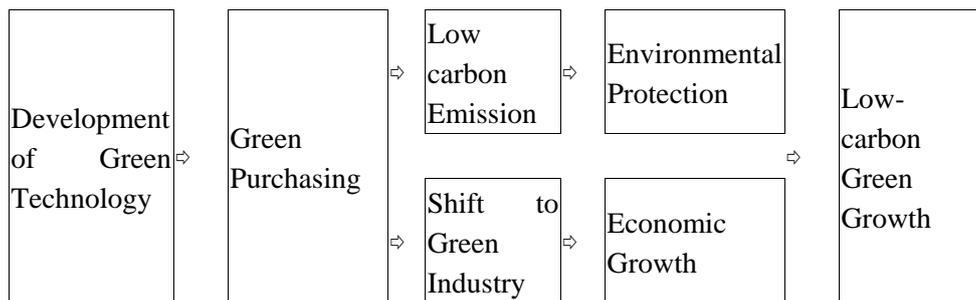
On the other hand, the Framework Act for Low-carbon Green Growth of Korea, effective as of April 14, 2010, defines green growth as “growth in harmony between economy and environment where energy and resources are efficiently conserved, climate change and environmental destruction is minimized, and the energy for economic growth is obtained from research and development on renewable energy and green technology.” According to the United Nations Environment and Sustainable Development Division (UNESCAP, 2006), green growth refers to an economic growth that is environmentally sustainable.

In the situation where climates change and high oil prices have become a global issue, green procurement can be a practical solution for achieving low-carbon green growth. However, products and services born of green technologies can serve to achieve the goal only when they meet sufficient level of sales. That is, the creation of green market is possible only through the shift of purchasing pattern and inducing greater demand for green products. The green market thus created will then lead to higher competition for developing green technologies, thereby contributing to lowering the purchasing cost for green products in the long run. This will improve the economic

¹ Presidential Committee for Green Growth (2009). What Is Green Growth? [online] available at <http://www.greengrowth.go.kr>.

factors in green purchasing and eventually reinforce further expansion of the green market, and its effects towards green growth can be maximized.

<figure 1> Green Purchasing for Low-Carbon Green Growth



2. Importance of Green Purchasing

Green industry, as the growth engine for the next generation, encompasses broad industrial sectors, including technical development, human resources development, construction works and civil engineering as well as related industries such areas as environmental industry and tourism. As green technologies further develop, demands for improvements and innovations may spread and bring changes on the traditional low energy-efficiency buildings and fossil fuel based facilities and equipment. It is highly likely that the influence of green industry eventually grows so large as to overarch all other industries.

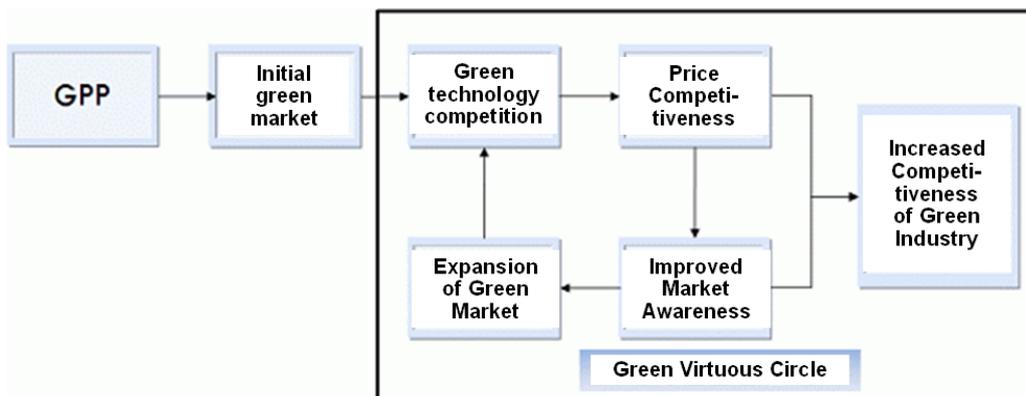
As the definition of green industry revolves around the goal of low-carbon emission, anything that serves to improve eco-efficiency and the Carbon Intensity (CI) in each sector of the society can be categorized under green industry. That is, the essence of green industry reaches beyond the creation of economic benefits, and lies in achieving a society with low carbon emission and producing the

technologies for sustainable development.

However, in the initial development period of green industry, there is the need to concentrate the public sector's purchasing power onto green industry. In general, green products are priced higher cost due to the research and development costs. For this reason, increasing the consumption of green products in the private sector needs to be reinforced with policy incentives such as tax benefits. Of course, the impact of such incentives may be limited if the private sector's understanding and awareness in green purchasing is insufficient. Green public purchasing, on the other hand, is a significant and practical means of increasing the demand for green products.

Through strong policy measures towards this effect, the public sector will be able to concentrate its purchasing power, which amounts to annual USD 100 billion, onto green purchasing and create a green market in a relatively short time. In order for a green market to firmly establish itself, the price competitiveness of green products needs to be further enhanced through technology competition among manufacturers. The price competitiveness thus improved will lead to increased demand and broader market awareness as a matter of course. Through this process, the virtuous circle will be created as illustrated in figure 2.

<Figure 2> GPP, the beginning of the 'green virtuous circle'



the private sector. In doing so, it may also help to establish environmental concerns as a social agenda. Secondly, there are economic benefits. Green public purchasing can ignite competition for green technologies and thereby create the effect of lower prices for green products. It will also give strong motivation to private firms to invest in green technology development and market green products. In addition, it will further spread the purchasing practice based on life cycle cost calculation, thereby contributing to savings of budget and resources. Thirdly, there are benefits in public health and social aspects, as green purchasing will serve to improve the quality of goods and services, and the overall quality of life. Fourthly, benefits can be achieved in the political area. Green public purchasing can serve to form a public consensus on environmental protection. As such, green public purchasing will greatly contribute to low-carbon green growth, while minimizing the environmental impact of consumption and improving the competitiveness of green industry.

III. Green Purchasing Policy Implementation: Domestic and International Trends

The foregoing chapter examined the background and the main objectives of Korea's green growth policy. In summary, green growth policy tries to escape from the seemingly opposing values of environmental protection and economic growth and set a circular relationship between the two. By doing so, it attempts to solve the environmental threats, transform the current fossil fuel based industry structure, and find the momentum for new sustainable growth.

The recent economic recession resulting from the financial crisis of 2007 contributed much to the increased attention to green growth policies, as many countries perceived green policies as equivalent to the New Deal. Therefore, this chapter will examine the roles of green public purchasing in their green growth objectives, and analyze the

relationship between their green purchasing policies and green growth strategies. By doing so, this paper will draw implications for setting the directions for Korea's green public purchasing policy.

1. Green Public Purchasing Policies of EU

EU perceives green procurement as a part of Sustainable Procurement. 'Sustainable Procurement' is understood as a procurement process that considers environmental issues and social issues. Thus, it combines green procurement with the social aspects of procurement.

The green procurement related Ordinances of EU prevails over the laws of the individual member countries. Each member state is obligated to comply with the green procurement related Ordinances of EU, and domestically implement procurement regulations accordingly. Currently there are 3 major EU legislations on green public procurement, including the Directive 2006/32/EC on energy end-use efficiency and energy services.

<Table 1> Major EU Legislations on Green Public Procurement

| OVERVIEW OF THE EU LEGISLATION WITH REFERENCE TO GPP | | |
|--|---|--|
| MANDATORY REQUIREMENT | | |
| LEGAL ACT | BRIEF DESCRIPTION | PROVISIONS |
| Directive 2006/32/EC of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC | <ul style="list-style-type: none"> - The Directive aims to raise the efficiency of the energy use and reduce the energy demand throughout EU - Within 9 years from 2008, member states should reduce the final energy consumption by 9% | <ul style="list-style-type: none"> Article 5 Energy end-use efficiency in the public sector ANNEX VI List of eligible energy efficient public procurement measures |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> - Member states should design rational and cost-effective means of measurement to achieve the goal - For the expenditure on energy related equipment and services, public sector of the member states should create best practices for investment, maintenance and repair. - Furthermore, public sector should strive to apply the energy efficiency criteria in public procurement tenders | |
| <p>Regulation(EC) No 106/2008 of the European Parliament and of the Council of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment (Energy Star)</p> | <ul style="list-style-type: none"> - The Regulation was established based on EU-US Agreement on Energy Efficiency Labelling of December 20, 2006. - The regulation applies to office equipment (computers, monitors, visual equipment). - The central government and each EU entity are obligated to comply with the energy efficiency criteria. | <p>Article 6 Promotion of energy-efficiency criteria</p> |

| | | |
|---|---|--|
| <p>Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles</p> | <p>- The Directive applies to contracting authorities and service suppliers for the purchases of vehicles for road transportation.</p> <p>- For the purchase of vehicles, energy consumption, CO₂ emission, and the emission of other pollution substances must be considered.</p> <p>- Energy consumption, emission of CO₂ and other pollution substances should be considered as external cost.</p> <p>The Directive provides for the specifications and award criteria for environmental performance for the purchase of vehicles.</p> | <p>Article 3 Scope</p> <p>Article 5 Purchase of clean and energy-efficient road transport vehicles</p> |
|---|---|--|

In order to overcome the barriers for green procurement²⁾, EU implemented the Training Toolkit for green procurement, consisting of three individual modules. The Strategic Module is designed to enhance the political support from the decision makers of government institutions. It is the action plan for green public procurement, containing strategic and economic information. This

² In its report in 2008, EC DG-ENV identified the barriers for green procurement as following: ① Relatively high price of green products, ② insufficient environmental knowledge, ③ insufficient political and administrative support, ④ lack of means and information, ⑤ lack of education

module provides the methodology for the gradual introduction of green procurement at individual government institutions, and its effective implementation. The Legal Module aims to clarify the legal issues throughout the strategy and implantation stages, and to reach a solution. This module provides clear examples of how and where to integrate environmental criteria into the public procurement process whilst fully respecting European public procurement legislation. As this second module is designed in such a way that follows each steps of procurement, it is easily applicable not only to green procurement, but also to the training of general procurement operation. Lastly, there is the Practice Module specifically designed for purchasing officers. It includes concrete examples of environmental criteria which can be readily introduced in tender documents for 11 product and service groups³, established on the basis of broad stakeholder consultation.

The green purchasing policy of EU is characterized by the public sector's leading role. This is due to the fact that, because of the high price of green products, the voluntary purchase of green products by consumers is limited. Also, by introducing the minimum green requirement, the EU policy provides a guideline for green specification, core criteria and comprehensive criteria. In addition, it encourages voluntary green purchasing and monitors the performance.

EU's recent directions on environmental preservation and green purchasing show a notable transition. They show a shift from the traditional focus on the end-of-pipe products to production processes and methods (PPMS). It also strengthened the Integrated Product Policy (IPP) and introduces life cycle assessment (LCA) that takes into account the whole production process.

EU's green procurement policy demonstrates the public sector's

³ Paper, cleaning product, office machinery, construction, transport, furniture, electricity, food and catering service, textiles, gardening, medical and health sector

means of overcoming such barriers of green procurement as the relatively high cost, insufficient environmental knowledge, insufficient political and administrative support, lack of means and information, and lack of education. It also highlights the importance of the public sector's pioneering role, which is encouraged through the Training Tool Kit for the decision makers on procurement related issues in the political and legal arena. The public sector fosters the green public market by introducing green criteria for select product groups, and propels a gradual market transition through voluntary green procurement program. Meanwhile, the responsible public entities play the role of constant monitoring, enabling a circular feedback across the society.

2. Green Public Purchasing Policies of the US

The federal government of the United States operates a variety of programs for promoting the purchase of environment-friendly products including recycled content products and high energy efficiency products. These are collectively defined as green procurement. Relevant laws and regulations include Energy Conservation Act (2005), Energy Independence and Security Act (2007), Executive Order (EO) 13101, Green the Government Through Waste Prevention, Recycling, and Federal Acquisition (1998), and subparts 23.2, 23.4, 23.8 of Federal Acquisition Regulation (FAR). Green procurement aims to preserve resources, minimize environmental pollution and waste, and remove threats to human health and security by purchasing environment-friendly products and services. The US green procurement programs include 6 mandatory elements and 1 voluntary element.

<㉔> Green Purchasing Programs of the US

| Category | Programs |
|--------------------|--|
| Mandatory Elements | Recycled content products |
| | Energy Star and energy-efficient products, energy efficient standby power devices. |
| | Alternative fuel vehicles, alternative fuels, and fuel efficient vehicles |
| | Biobased products |
| | Non-ozone depleting substance |
| | EPA Priority Chemicals |
| Voluntary Element | Environmentally Preferable Purchasing |

Recycled Content Products Program requires that, for the products designated by EPA, federal entities purchase products with recycled contents. Exceptions are allowed in cases where such a purchase is not possible within reasonable time at a reasonable price or where it is not possible to purchase such a product that complies with the required performance standard. The list of products designated by EPA is announced on a federal gazette named Comprehensive Procurement Guide (CPG). EPA also provides purchasing guidance through Recovered Materials Advisory Notices (RMANs), which provides the standard specifications on the recycled contents for designated products.

Energy-efficient Products Program requires that federal entities purchase energy-efficient products in accordance with FEMP⁴⁾ of the Department of Energy. For instance, federal entities must purchase energy-star qualified products, products that comply with FEMP's stand-by energy recommendations, etc. Energy-star qualification is jointly operated by Environmental Protection Agency and the

⁴ FEMP: Federal Energy Management Program

Department of Energy on 14,000 products in 40 product groups. The Department of Energy has also developed the procurement language for 50 frequently purchased product types to be used among federal entities for preparing tender notices.

The program for alternative fuel vehicles, alternative fuels, and fuel efficient vehicles applies to the purchase of all vehicles, except military, law enforcement and emergency vehicles, as well as the purchase of alternative fuel vehicles. The Energy Policy Act provides that 75% of vehicles purchased after the year 1999 shall be alternative fuel energy, and alternative energy⁵⁾ shall be used to meet the majority of the fuel requirement of these vehicles by the end of 2005. Also, the executive order 13149 requires that federal entities improve the fuel economy of transport vehicles and light trucks by 1 mile per gallon by 2002 compared to those procured in 999, and 3 miles per gallon by 2005.

Bio-based products program is a priority purchase program for bio-based products ⁶ designated by the Department Agriculture. Designated bio-based products include hydraulic fluid for mobile equipment, diesel fuel additives, roof paint, water tank paint. The program's scheme is similar to that of Recycled Content Products Program in its prior purchase requirement and exceptions.

Non-ozone Depleting Substance Program is used to reinforce the US policy of restricting the use of substances destructive to the ozone layer. In consistency with this program, each federal entity has strived to minimize the use of EPA priority chemicals⁷⁾.

Lastly, Environmentally Preferable Purchasing (EPP) refers to the purchase of products or services that have a lesser or reduced effect on human health and the environment when compared with

⁵ Bio-diesel, electricity, ethanol, hydrogen, natural gas, etc

⁶ Products that use biological resources. The use of bio-based products minimizes the environmental pollution and toxic waste from the use of petro-synthetic substances.

⁷ 31 substances including benzene, lead, cadmium, mercury, etc.

competing products or services that serve the same purpose. This does not mean the purchase of recycled content products or energy-efficient products. Rather, it means the environment-friendly purchase that considers the whole process from the extraction of materials to disposal⁸). EPP is a general guideline, and in practice, it applies flexibly depending on the federal entity's circumstances and the types of the products to be purchased. Depending on each entity's need, the environmental attributes are modified. For instance, the southwestern part of the US where water resources are scarce, the efficiency of water resources is more important than other regions.

Regarding EPP, Federal Acquisition Regulations (FAR) provides for the responsibilities of related institutions, and the implementation of cost-effective preferential contracting programs for energy efficiency, preservation of water resources, and the promotion of environment-friendly procurement of goods and services. It also stipulates the implementation of procurement strategies to achieve the environmental goals, such as the maximal use of environment-friendly goods and services, energy efficiency and the promotion of water resource preservation, and minimization of hazardous wastes.

There are a number of implications found in the US green purchasing policy. Firstly, there is the need for concentrated efforts in preparing green specifications and green procurement guidelines. As observed in the cases of the Environmental Protection Agency and the Department of Energy, the development of green specifications and green procurement guidelines is essential in realizing green procurement. This entails the introduction of specifications for recycled content products, energy-efficient products, and bio-based products, as well as the guideline for EPP. This is similar to the procurement policies of some of EU member states including the UK

⁸ While most environmental procurement programs consider a single environmental factor (portion of recycled contents, energy efficiency, etc.), EPP considers combined factors.

and the Netherlands. Also, for early expansion of green procurement, there is the need for a monitoring scheme on the effect of green procurement, rather than on the compliance with regulations and guidelines. That is, the monitoring needs to focus on the effect (the amount of carbon emission achieved, budget savings, etc) rather than the purchase volume of green products. This will effectively constitute the rationale for green procurement.

3. Green Public Purchasing Policies of Japan

Japan's investment in environment and energy sector began early. Japan perceived that, in order to create a recycling-oriented society, efforts on the demand side are as important as those on the supply side. From this perspective, it enacted the Green Purchasing Law (Law No. 100) on May 31, 2000, as an individual law of the Basic Law for Promoting the Creation of a Recycling-Oriented Society, and the law has been effective since April 1, 2001. Its purpose lies in creating a sustainable society with less environmental load through promoting the public sector purchase of goods and services that help to reduce the environmental load⁹.

Japan also enacted the Law concerning the Promotion of Contracts Considering Reduction of Greenhouse Gas Emissions by the State and Other Entities (Green Contract Law) in May, 2007, which provides for the awarding of contracts to the providers of products and services with the best environmental performance based on a comprehensive evaluation on the price as well as the environmental performance. The Green Contract Law aims at establishing a systematic mechanism in which, for the contracts by public entities including the State, public enterprises and local government entities, the bid evaluations include the assessment of environmental performance while maintaining price competitiveness. By doing so,

⁹ Article 1 of Green Purchasing Act.

the Green Contract Law attempts at reducing the environmental load and creating a sustainable society.

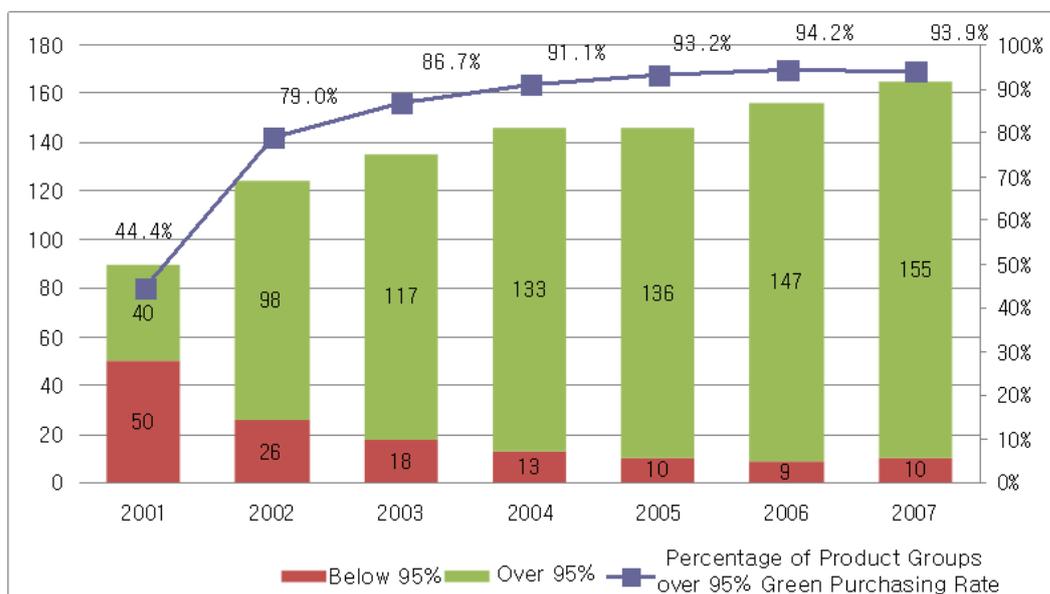
<Figure 3> Comparison of the Green Purchasing Law and the Green Contracting Law

| | Green Purchasing Law | Green Contracting Law |
|------------------------------|--|---|
| Character | <ul style="list-style-type: none"> Regulates the environmental performance of products and services Contracting principle is based on lowest bid price awarding (Environmental considerations are made within the framework of open competition) | <ul style="list-style-type: none"> Provides the framework of contracting methods Contracting is based on comprehensive evaluation, proposal-based evaluation, etc., depending on the types of contracts contract types. |
| Goal | <ul style="list-style-type: none"> Procurement of goods and services that meets the set level of environmental performance. | <ul style="list-style-type: none"> Contracting for the goods and services with highest environmental performance. |
| Scope of Application | <ul style="list-style-type: none"> 264 products in 19 groups, including paper, stationary, OA equipment, uniforms, work garments, construction, services | <ul style="list-style-type: none"> 4 contract types (purchasing of electricity, vehicles, ESCO lease contracts, construction design) |
| Entities Governed by the Law | <ul style="list-style-type: none"> Mandatory: central ministries, independent public administration entities, national | <ul style="list-style-type: none"> Mandatory: central ministries, independent public administration entities, national |

| | | |
|----------|--|---|
| | universities · Obligation to make due efforts: local public entities | universities · Obligation to make due efforts: local public entities |
| Contents | · Cabinet decision on the decision criteria for environmental products · Green purchasing in accordance with basic principles · Governed entities publicly reports the procurement performance | · Cabinet decision on the means of contracting · Green contracting in accordance with basic principles · Governed entities publicly reports the contracting performance |

In 2001, the number of product groups with over 95% of green procurement rate was 40 out of total 90 groups, marking 44% of the total. By 2007, it increased to 155 out of total 165 groups, reaching 93.9% of the total. The overall market share of green procurement products has also increased. In particular, the market shares of staplers and fluorescent light bulbs that meet the environmental specifications have risen to 90.1%, 83.4% respectively by 2007.

<Figure 3> Green Purchasing Trend



The lessons from Japan's green purchasing policy are: 1) the government needs to establish a committee to annually review and re-evaluate the selection of goods and services for green purchasing, and their criteria and specifications, 2) the government needs to enact laws and policies for green purchasing, separate from the general public procurement laws and regulations, 3) the government needs to define green industry and green technology, 4) the government needs to establish an integrated information system that enables the sharing of information between the public sector and the private sector, on the selection of goods and services designated for green purchasing, green criteria for good and services, such as public construction projects and building managements, 4) it is essential to refine the priority purchase criteria for green products and SME products, and 5) the government needs to exchange creative ideas with local government organizations.

4. Green Public Purchasing Policies of the Republic of Korea

In the Republic of Korea, the public sector is taking the lead in green and environment-friendly purchasing. As of 2008, the composition of the domestic market for environment-friendly products breaks down to 60% of public sector purchases (1,584 billion Korean won), 27% of the household purchases (708 billion Korean won), and 13% of private enterprise purchases (320 billion Korean won). This composition is expected to remain steady for the next few years, and the 2012 prospect is composed of public sector purchases of 3,500 billion Korean won, household purchases of 1,000 billion Korean won, and private enterprise purchases of 600 billion Korean won.

The public sector's purchases and its portion in the total have constantly increased. The purchase amount has increased five times from 262.6 billion won in 2003 to 1,343.7 billion won in 2007. The public sector's portion in the total domestic purchases of

environment-friendly products has increased from 31% in 2003 to 69% in 2007. This incremental role of the public sector is expected to continue.

<Table 4> Public Sector Purchase of environment-friendly products

Unit: billion KW

| Year | 2003 | 2004 | 2005 | 2006 | 2007 |
|-----------------------|-------|-------|------|-------|---------|
| Amount | 262.6 | 254.9 | 787 | 861.6 | 1,343.7 |
| Portion in the Market | 31% | 31% | 43% | 58% | 69% |

By product categories, the public sector purchases are concentrated on office supplies and office equipment, and their portion in the total public sector procurement amount to 57.3%. Construction and civil engineering materials, which accounts for 42% of the total products with environmental certifications, amount only to 19.4% of the total public sector purchases.

<Table 5> Public Sector Purchase of Environment-friendly Products by Product Groups

Unit: billion KW, (%)

| | Total | Office Supplies & Equipment | Electronics & Furniture | Textile & Sanitary Products | Chemicals & Fire Safety | Vehicles & Transport | Construction Equipment | Construction & Civil Engineering Materials | Road Equipments | Others |
|----------------------------|----------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------|------------------------|--|-----------------|-------------|
| 2007 Public Purchase Total | 1,343 (100) | 7,704 (57.3) | 1,730 (12.9) | 668 (5.0) | 445 (3.3) | 198 (1.5) | 445 (3.3) | 2,047 (15.2) | 120 (0.9) | 80 (0.6) |

When considering the environmental attributes (energy and resource conservation, minimization of greenhouse gasses and pollution) of the product groups designated in the legislation proposal for the Enforcement Decree of the Low-carbon Green Growth Act , products with the following six certifications can be categorized as green products.

<Table 6> Products Categorized as Green Products

| Description | Relevant laws | Number of products |
|--------------------------------------|---|--------------------|
| Energy Consumption Label | <ul style="list-style-type: none"> · Article 15 of Energy Use Rationalization Act · Designates products to be subjected to energy consumption labeling. Stipulates energy-consumption labeling of the designated products | 23 |
| High Energy-efficiency Certification | <ul style="list-style-type: none"> · Article 22 of Energy Use Rationalization Act · Certification for high energy-efficiency equipments to promote their use | 46 |
| Low Stand-by Energy Certification | <ul style="list-style-type: none"> · Article 18 of Energy Use Rationalization Act · Designates products to which the Low Stand-by Energy Certification shall apply. Certifies products that meet the certification criteria | 22 |
| Renewable Energy | <ul style="list-style-type: none"> · Article 13 of the Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy | 21 |

| | | |
|---------------------------|---|-----|
| | <ul style="list-style-type: none"> · Promotes the diffusion of renewable energy equipment and foster their development | |
| Eco-Label Products | <ul style="list-style-type: none"> · Article 18 of the Development of and Support for Environmental Technology Act · Labels products that generates lower pollution and conserves resources compared to other products of the same purpose. | 140 |
| Recycled Content Products | <ul style="list-style-type: none"> · Article 33 of the Act on the Promotion of Saving and Recycling of Resources · Commercialized products that utilizes domestically recycled materials | 245 |

The purchase of eco-label products and recycled content products is a legal obligation for public entities in Korea. By an administrative instruction from the Prime Minister's Office, public entities are also required to purchase high energy-efficiency products and the products with 1st grade energy consumption label. In addition, public entities are required to preferentially purchase the products with low stand-by energy certification.

Korea has a centralized public procurement system, which works advantageously in implementing and promoting the government's green procurement policy. Public Procurement Service (PPS), the central government procurement agency, plays a central role in Korea's public procurement, and establishes the public procurement infrastructure such as Korea ON-line E-Procurement System (KONEPS) and Online Shopping Mall.

4.1 Advantages of PPS's Green Purchasing Policy

PPS conducted the government procurement volume of 28.7 trillion Korean won out of Korea's total public procurement of 101 trillion Korean won in 2008. Upon the receipt of purchase requests from the requisitioning public entities, PPS reviews the purchase requirements, and it may advise the requisitioning entity to modify the specification to reflect green requirements. Therefore, PPS's transition towards green procurement would have a significant dissemination effect in public procurement.

The procurement schemes and criteria developed by PPS is benchmarked and adopted by other public entities. Therefore, once the legal basis for mandatory or preferential purchase for green procurement is established and the green purchasing criteria is developed by PPS, it facilitates the dissemination of the green criteria among all public entities¹⁰). Such effect would become greater if PPS is endowed with the responsibilities of selecting the product groups for the mandatory or preferential public purchases.

62.4% of Korea's total public procurement, or 63 trillion Korean won in value, is electronically conducted via KONEPS, the national e-Procurement system operated by PPS. KONEPS enables the real time monitoring of the green procurement performance of public entities, and easy dissemination of green procurement related information among its 40,000 public users and 180,000 private users. With its large customer base, it would provide an effective platform for disseminating the information related to green procurement, such as the green purchasing guideline.

¹⁰ In a survey in 2006, conducted by Gyeonggi Research Institute, showed that the public procurement officials in Gyeonggi Province obtain information on environment-friendly purchasing mainly from the Ministry of Environment (40.5%) and PPS (25.4%). (*Measures for Promoting Green Production and Consumption in Gyeonggi Province*, Gyeonggi Research Institute, 2006.6)

<Table 7> KONEPS's Share in Korea's Total Public Procurement

Unit: Trillion Korean won, %

| | Total Public Procurement (A) | e-Procurement Volume | | | e-Procurement Ratio (%) | |
|------|------------------------------|----------------------|---|-----------|-------------------------|-------------|
| | | KONEPS (B) | Independently Operated Systems ¹¹⁾ | Total (C) | KOENEPS (B/A) | Total (C/A) |
| 2007 | 92 | 56 | 18 | 74 | 60.9 | 80.4 |
| 2008 | 101 | 63 | 24 | 87 | 62.4 | 86.1 |

The volume of transactions made through the Online Shopping Mall of PPS¹²⁾ is 11 trillion Korean won in 2008, for 320,000 registered products, and the total transaction volume and registered products are on an incremental trend. This can be used as an easy platform for green procurement, since, once green products are registered in the Online Shopping Mall, public entities can place orders for them directly online. Such expansion of green procurement via the Online Shopping Mall may reduce the administrative and economic costs associated with the training and decision-making for green procurement.

<Table 8> Transactions via Online Shopping Mall

| | 2007 | 2008 | 2009 |
|---------------------------------------|---------|---------|----------|
| Registered Products | 207,509 | 264,877 | 321,035 |
| Transaction Volume (Unit: billion KW) | 6,650.6 | 8,734 | 11,255.2 |

¹¹ Independently operated systems: 24 public entities run their own e-Procurement systems, including Korea Defense Procurement Administration, Korea Electric Power Corporation, Corporation, etc.

¹² PPS establishes unit-price contracts for products that are repetitively purchased by public entities. The products thus contracted for are made available for online ordering for all public entities in Korea.

IV. Policy Measures for Green Purchasing with a View to Low-carbon Green Growth

The core element of low-carbon green growth is to enhance the use efficiency of energy and natural resources, thereby minimizing the pollution and the emission of greenhouse gasses. Much focus is currently concentrated on the energy efficiency of end-of-pipe goods and services. However, a significant reduction of the waste in the use of energy and resources can be achieved through monitoring the overall process of production, distribution, use, and disposal for a broad range of products used in transportation, industries, and business operation, thereby maintaining an optimal use efficiency.

Advanced countries have adopted the principle of selection and concentration by designating product groups to be subjected to green procurement policies, and introducing the criteria and specifications for them. European countries in particular, where green public purchasing has made the greatest progress, typically designated around 50 product groups for the initial implementation of green criteria and specifications. In Korea's case, however, the number of designated product groups is excessively large (140 for eco-label products, 245 for recycled content products), which makes it difficult for procurement personnel to obtain all the relevant information, and for the government to monitor the compliance and implantation by public entities. Hence, there is the need for strategically select the products groups with maximal potential effects and concentrate the implementation and monitoring efforts on them.

Also, Korea needs to gradually introduce green criteria for each product group, reflecting the major environmental attributes. Considering the realities of current technology level, Korea needs to separately introduce the minimum criteria and recommended criteria. The latter should reflect the diverse circumstances faced by each

public entity as well as specific environmental attributes of each product group (energy conservation for electronics, recycling for paper products, toxic contents for chemicals, etc.) and indicate future directions. To this end, this paper proposes the measures for effective implementation of green purchasing in the following arena: legal and institutional support, marketing support for green products in the public sector, and lastly, training in green purchasing and promotion of green products.

1. Legal and Institutional Support

1.1. Comprehensive Bid Evaluation System with Environmental Criteria

The Comprehensive Bid Evaluation System is a contract awarding mechanism where bids are evaluated on various aspects of the product's values, reflecting on price factors as well as non price factors including performance, quality, and energy efficiency. Previously, however, the evaluation on the environmental factors was centering on energy efficiency, and considerations for environmental impacts were not sufficiently reflected in the evaluation criteria. Therefore, PPS needs to further study international best practices for reflecting environmental impacts into public procurement and complement its evaluation criteria.

Among the early starters of sustainable procurement policies such as EU, Japan, and the US, the concept of Life Cycle Costing (LCC) has grown into active use. The LCC method uses a longitudinal evaluation of diverse aspects of a product's values and risks, and allows the selection of environmentally preferable products based on the environmental stress associated with a product's manufacturing process, use, disposal and recyclability. At the policy level, however, green procurement policies in the majority of advanced countries still

lack strong enforcement mechanism, resembling a promotional program. Currently, the eco-label in Europe, environmental mark in Korea, environmentally preferable mark of the US, and environmental mark of Japan are programs where public entities are wholly or partially mandated to purchase products with such marks, or subsidies are provided for the purchase of such products.

However, it is very difficult to find a program in which the environmental stress is incorporated in the bid evaluation criteria, along with price, performance and quality, for large scale public purchases. PPS of Korea is currently preparing a new awarding framework that assesses the environmental stress associated with a product during the process of raw material collection, production, use/consumption, and disposal/recycling, and reflect it onto contract awarding. This new contract awarding mechanism is expected to lay the long-term foundation for fostering the technology for environmentally preferable products.

1.2 Bidder Evaluation Scheme for Improved Competitiveness of Green Products

As green products require large initial investment, their price competitiveness is at a disadvantageous condition in public tenders. Therefore, during the early developmental stage, green industry needs the government's policy supports to attain a market foothold. This support can be implemented through PPS's Comprehensive Performance Capability Assessment process. Currently, this process assesses the bidder's contract performance capability on the price, past performance, technological capacity, financial status, and credit rating. In order to support the providers of green products for improved market competitiveness, it is also advisable for PPS to allow additional points for green products.

2. Marketing Support for Green Products in the Public Sector

2.1 Introduction of Minimum Green Criteria

The establishment of Minimum Green Criteria is a method devised to produce immediate effect in enforcing green procurement and to effectively provide marketing support for green products in the public sector. It is a program where the minimum environmental standards are set up for specific product groups, and products that do not satisfy the minimum standards are excluded from public purchases. For maximal effect, the Minimum Green Criteria are established for products that meet the following conditions: a. there is high public sector demand for the product, b. it is relatively easy to set up clear environmental criteria for the product, and c. the implantation of the environmental criteria for the product is expected to produce immediate and large effect.

In January 2010, PPS has implemented Minimum Green Criteria for 17 products including desktops, monitors, TVs, refrigerators, air conditioners, paper products, etc. The selection of the products and the preparation of Minimum Green Criteria for each product was conducted by a working committee consisting of Presidential Committee on Green Growth, Ministry of Knowledge Economy, Ministry of Environment, Public Procurement Service, Small and Medium Business Administration, Korea Environmental Industry & Technology Institute, etc. The green criteria is divided into core criteria and more comprehensive recommended criteria. The core criteria serves as the minimum requirement to comply with in order to participate in public tenders, and the recommended criteria serves as a signal for future directions and guides the private sector's future technology development. The implementation schedule was carefully deliberated to ensure market feasibility and to reflect the current technology level. For instance, for 8 products in the low stand-by

energy requirement group, the initial stand-by energy requirement of 1W or below was set up for 2010, and the requirement is scheduled to become 0.5W in 2013. For 6 products in the energy-efficiency requirement group, only the products with 1st grade energy-efficiency certificate will be considered for PPS contracts, but the effective dates are set differently for each product to ensure the market availability of compliant products. Also, considering the technology gap between large companies and SMEs, the implementation schedule is set up differently for large companies and SMEs, so that it can alleviate the impact on the industry and allow SMEs the time required for technology development.

In operating this program, the purchase requests from requisitioning entities will be reviewed for possibilities for applying green criteria, and the use of green products will be expanded to construction materials and equipment. To assist public entities, the green criteria for designated products and services will be advertised via KONEPS and PPS homepage. Last but not least, the implementation procedures of minimum green criteria need to be closely monitored to be used later when preparing the green procurement guidelines and improvement measures.

2.2 Phase-out of Low Energy-efficiency Products

Along with the incentives for green products in the public sector, restrictive measures on low energy-efficiency products should be introduced to gradually phase them out in the public sector market. Products that do not meet the stand-by energy criteria, currently required to mark the stand-by energy warning, should be excluded from unit-price contracts for public purchases, and eventually, measures need to be taken to exclude them from all public biddings. For products that receive low grades in energy consumption labeling, restrictive measures are needed to restrict them in public biddings.

However, the implementation schedule for such measures needs to be prepared based on a close examination on the market situations.

2.3 Introduction of Green Products Mall

One of the problems in green purchasing is that the procuring entities often lack the information on the available green products. Therefore, an information system on green products needs to be established. The system should be able to exchange real-time data with green certification agencies, and should offer green products search functions. A possibility for easy implementation is to open a Green Products Mall in the Online Shopping Mall of PPS, as it can easily serve as the single channel for searching for green products and ordering them directly online.

3. Training in Green Purchasing and Promotion of Green Products

For the early settlement of green purchasing in the public sector and ensuring the effectiveness of green purchasing policies, it is very important to raise awareness among public consumers as well as throughout the society. For this purpose, it is critical to prepare and circulate a green purchasing guideline that illustrates the green criteria and preferential purchasing programs for the procurement officials at public entities. The guideline should also provide information on the list of product types subject to mandatory green purchasing, detailed specifications for each product type, and information on the related certifications and labels such as the E (environment) mark, GR (good recycling) mark, and energy-efficiency certification.

On another front, professional training courses need to be developed for both procurement officials in the public sector and private sector suppliers. The courses should focus on the practical aspects rather

then at the legal and institutional aspects, illustrating how to apply to green criteria and how to reflect the green requirements on the tender notice and the specifications. It is also important to promote green purchasing in the private sector and raise public awareness.

V. Conclusion

Many advanced countries are implementing green purchasing as part of the government's strategies in anticipation that green purchasing will soon become a critical issue in public procurement. Such strategies do not merely aim to increasing green purchases, but seeks to incorporate green purchasing in the bigger framework of consolidating the foundation for the future green growth. In the current context where the climate changes have become a global concern, green purchasing is as much an economic strategy for industrial shift and technology competitiveness as it is a strategy for environmental protection.

Economic growth and the environment are often viewed as in opposition to each other. Needless to say, the environmental goal in this paper's context is not to return to the pre-industrial era. Rather, it is to conserve the environment via technological advancements, and to use the technological advancements for economic growth. This paper's aim is to propose measures to create a virtuous circle between the economy and the environment. This virtuous circle does not represent a simple bilateral relationship, but it should be viewed in a much broader context that encompasses the environment, business competitiveness, employment creation, and ultimately improving the overall standard of living. Therefore, green purchasing policy should not remain in the realm of restrictive environmental measures. It should actively invite the participation of private businesses through public-private cooperation, so that the demands

from the industries may be reflected in the government policy, and the government's policy objectives are promptly signaled to the private sector.

So far, the Korean government's environmental policies were focused on restrictions and monitoring. Future policies, however, should focus on fostering an active green market, and allowing the creative and competitive ideas of the private sector to serve as a new propulsion for environmental protection. The government should particularly focus on its roles of coordinating for the green market and setting directions for its expansion. By applying appropriate policy measures and utilizing its large purchasing power, the government should increase the supply and demand for green products and technologies supply and nurture the growth of the green market. The increase of green consumption will lead to greater investment in green technologies, which will in turn serve to lower the prices of green products. This will again lead to further increase of green consumption, completing the virtuous circle.

There are three main axes in green growth that should function in organic combination. They are, firstly, the companies that develop green technologies and manufactures green products, and secondly, the consumers of green products, and lastly, the government that lays the infrastructure and sets the policy directions. Thus, on the one hand, the government should support private companies and assist them with their creative technology development. On the other hand, it also needs to encourage the consumers towards green consumption through, for instance, taxation policies where greater taxes apply to low energy-efficiency products and fossil fuel based products while smaller taxes apply to high energy-efficiency products and renewable energy based products. At the same time, the public sector should carry the role of vitalizing the green market through selection and concentration strategies. Legal and institutional support is also required, and for facilitating cross-governmental coordination, a

committee needs to be established with participation by the stakeholders in both the public and private sector.

While all of these tasks are important, the greatest priority is that the government sets an example itself as the principal agent of green purchasing. The government's pioneering role functions as a strong leadership in the market. As the public sector purchases can create the initial green market, and reduce the uncertainties of the arising market, it is more effective than any other institutional policies.

At the base of green growth, there lies the fundamental value of living together. Despite the differences in the economic, industrial, and environmental circumstances, it is time for all the countries and people on earth to join efforts and resources for green growth.

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