

SURVEY REPORT

How Environmentally Friendly Product and Green
Purchasing to Tackle Climate Change



International Green Purchasing Network



About the International Green Purchasing Network

The International Green Purchasing Network (IGPN) is a global multi-stakeholder partnership, launched by Japan Green Purchasing Network in 2005 with the mission: 1) promote globally the development of environmentally friendly products and services and green purchasing activities; 2) share information and know-how on green purchasing and environmentally friendly products and services internationally; and 3) harmonize the efforts of green purchasing and the development of environmentally friendly products and services from a global viewpoint.

The International Green Purchasing Network (IGPN) is composed of the Green Purchasing Networks from countries such as Japan, Korea, Thailand, Malaysia, Singapore, the Philippines, India, Vietnam, China etc., and regions such as China Hong Kong Special Administrative Region, Chinese Taipei.

The International Green Purchasing Network (IGPN) partners with the Global Lead City Network (GLCN) on sustainable procurement. It collaborates with the Sustainable Public Procurement Programme of One Planet Network.

The International Green Purchasing Network (IGPN) Secretariat is hosted by China Environmental United Certification Center (CEC) since 2018.

Foreword

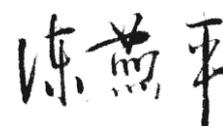
At present, global climate change has evolved from a future challenge to current crisis. The Paris Agreement recognizes that sustainable consumption and production is vital to address climate change. The carbon emission right trading and offset mechanisms have enjoyed fast development with emergence of many different economic policy mechanisms and measures since the Kyoto Protocol. Meanwhile, accelerated technological advance is continually changing production pattern and lifestyle. As a result, global response to climate change has gradually evolved from only centering on change of energy mix to involving all aspects of human production and lifestyle.

Practice shows that advocating and implementing green procurement could effectively facilitate global transition toward sustainable consumption and production pattern. Similarly, green procurement also should become an important tool to promote global carbon reduction and carbon neutrality when human beings are facing “climate crisis”. It is an urgent topic confronting us as how to give full play of the role of green procurement in addressing climate change.

The Survey Report-How Environmentally Friendly Product and Green Purchasing to Tackle Climate Change is another activity of IGPN after the publication of GREEN PURCHASING NETWORK-A Landscape of Practice to Achieve SCP in 2020. It aims at summarizing the experience and practice of many countries on green procurement and climate change; exchanging such experience and practice among relevant members and giving full play to the active role of green procurement in global response to climate change. The Report collects the policies and practice of countries such as China, Japan, Korea, Thailand, Singapore, the Philippines etc., and regions such as China Hong Kong Special Administrative Region on green procurement to address climate change. Meanwhile, it also introduces the experience and practice of Britain and the United States in this field. These experience and practice have played an active role in applying environment-friendly products and green procurement to meet carbon reduction target of each country, which could be learned by other countries.

The findings of this survey report show that environment-friendly products and green procurement are effective approach to promote the synergy of SCP and mitigation of climate change. This requires the integration of green procurement policy and climate change policy in all countries in the world in order to achieve synergy. Moreover, efforts are needed to unite relevant countries and regions developing a cooperation platform to form reproducible and workable experience; and expedite sharing and dissemination of such experience to ensure more countries and organizations taking part in global movement of green procurement.

Finally, I hope that the Survey Report will help the people understand potential contributions of environment-friendly products and green procurement to addressing climate change; and encourage more organizations and institutions achieving the transition to SCP pattern.



CHEN Yanping

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Green Purchasing Network Survey Templet

Members from Green Purchasing Network provided the Survey templet and reviewed the questionnaire which are part of the work. Without their efforts we would not have been able to provide such detailed information on their policies, activities and practices related to the theme of the survey report.

The following are the members from Green Purchasing Network: Atsuko HASEGAWA (Japan Green Purchasing Network);Gakuji FUKATSU (Japan Green Purchasing Network); Yasushi UMEDA(Japan Green Purchasing Network);DING Ling (Green Purchasing Network China, China Environmental United Certification Center); Sang Bum Son (Korea Environmental Industry & Technology Institute);JeeAn YANG (Green Purchasing Network Korea); Chuttree Phurat (Green Purchasing Network Thailand, Thailand Environment Institute); Vincent Teo (Green Purchasing Network Singapore, Singapore Environment Council); Isabella LOH(Green Purchasing Network Singapore, Singapore Environment Council); Maureen Grace Lebria (Green Purchasing Network Philippine, Philippine Center for Environmental Protection and Sustainable Development);Michelle Lapiz (Green Purchasing Network Philippine, Philippine Center for Environmental Protection and Sustainable Development); Linda Ho (Green Purchasing Network China Hong Kong Special Administrative Region, Green Council);Felix Lam (Green Purchasing Network China Hong Kong Special Administrative Region, Green Council).

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Table of Content

Part I. Introduction and Overview	1
Introduction	1
Detailed findings	5
Part II. Measures, Approaches and Practices	12
People's Republic of China	13
China Environmental Labelling Green Public Procurement Impact Response to Climate Change	14
Policy and Measures Respond to Climate Change in China Hong Kong Special Administrative Region.....	19
Japan	22
Expansion of Electric Vehicles under the Japan Green Growth Strategy through Achieving Carbon Neutrality in 2050.....	23
Republic of Korea	27
Green Public Procurement of Korea	28
Thailand	34
GPP Plan and Pilot project of Refrigeration and Air Conditioning for Climate Change Mitigation in Thailand	35
Singapore	41
Mandatory Energy Labelling Scheme to Reduce Carbon Emission in Singapore.....	42
The Philippines.....	47
GPP Practices and Pilot Projects in Response to National Climate Change Target in the Philippines	48
Part III. Complementary and Experience	55
The United Kingdom	56
The “Four Ps”: Green Public Procurement Practice toward Net Zero Emission Target in Britain	57
The United States.....	61
Policy Instrument for US Net-Zero Federal Procurement Target by 2050 ...	62
Part IV. Conclusions	65
Conclusions	66

Part I. Introduction and Overview

Introduction

Context

Climate change presents the global significant challenge people faced at present. Since the Kyoto Protocol issued in December of 1997, the Paris Agreement builds on the UN Framework Convention on Climate Change, provide the post-2020 global climate action, achieving the primary goal-to keep the average global temperature rise well below 2°C degrees and as close as possible to 1.5°C above pre-industrial levels, bringing all nations into a common cause to reduce greenhouse gas emissions rapidly and to strengthen the ability of countries to build resilience and adapt to the impacts of climate change, including through ensuring adequate support for developing countries.

Climate change directly influence the natural resources and ecological system, and it is the single biggest threat to sustainable development as its widespread, unprecedented impacts disproportionately burden the poorest and most vulnerable. At the United Nations Conference on Sustainable Development ("Rio+ 20"), common agreement was made to take measures tackle the climate change promote sustainable development. The climate change target was officially embedded in the 2030 Agenda for Sustainable Development, that is the SDG13 "Take urgent action to combat climate change and its impacts" (* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change). Pursuing climate action and sustainable development in an integrated and coherent approach steadily emerged into the implementation which enable countries to achieve their objectives efficiently and quickly.

As the leading region for global climate action, the <European Climate Law> was firstly issued by EU Commission in June 2021, legally set "a 55% greenhouse gas emissions reduction target by 2030 compared 1990, and achieve net-zero-emission by 2050". Relevant regulations were issued in Asia Pacific region, such as <Propulsion method of global warming countermeasures > in Japan; <Climate Change Act> in Netherlands and the Philippines; <Basic Law on Climate Change Countermeasures> and <Basic Law for low-carbon and green growth> in Korea. So far, regulations and policies include tackle climate change, GHG emission control, low carbon green development and carbon tax etc. are issued in about 20 countries and areas.

Additionally, the fact which should not be neglected, the offset mechanism of carbon emission has been continuously developed, various economic means and measures have emerged gradually, such as carbon sink, carbon compensation, carbon credit, etc. Meanwhile, the acceleration of technology innovation is continuing change the method of producing and life style since the Kyoto Protocol issued. Along with the development of technology, new materials, new production methods, automation methods, new energy and other products/services are constantly aroused and generated, which also provides fundamental technological basis to pursue the goals of the Paris Agreement on climate action. It would be predicted that the approach to tackle the climate change has gradually expanded from energy conversion to all aspects for production and consumption and life style of human beings.

The impact of green purchasing has long been, and remains, in every aspect varied from the energy consumption to quality of life, which is broad and profound as well. The report of <Green Purchasing Network- A Landscape of Practice to Achieve Sustainable Consumption and Production> conducted by the International Green Purchasing Network-IGPN, shows that green purchasing is not only the individual sector, but also in the public sector through the whole supply chain. Accordingly, Green purchasing will pay an important role to tackle the climate change, by promoting sustainable consumption and production based on its applied scenario varies in private, business, market and public sectors, and synergize with the relevant economic measures.

Survey Objective

The aim is to share knowledge among IGPN members, provide suggestion for the implementation by using climate action and sustainable consumption and production in an integrated and coherent approach, through the collection, comparison and analyzation, evaluation, and summarization of the real practical practices of environmentally friendly products/services (and/or) green purchasing in addressing the climate change issue. The following aspects are mainly included:

- Identify policies, measures and instruments for green purchasing (and/or environment-friendly goods/services) in different countries or areas in addressing the climate change issue;
- Confirm the real practical practices of different countries or regions in applying environmentally friendly goods/services (and/or green procurement) in addressing the climate change issue;
- Share knowledge among IGPN members, provide suggestion for the implementation by using climate action and sustainable consumption and production in an integrated and coherent approach.

Survey Scope

The scope covered the products and purchasing perspective based on the identified four high-impact sectors:

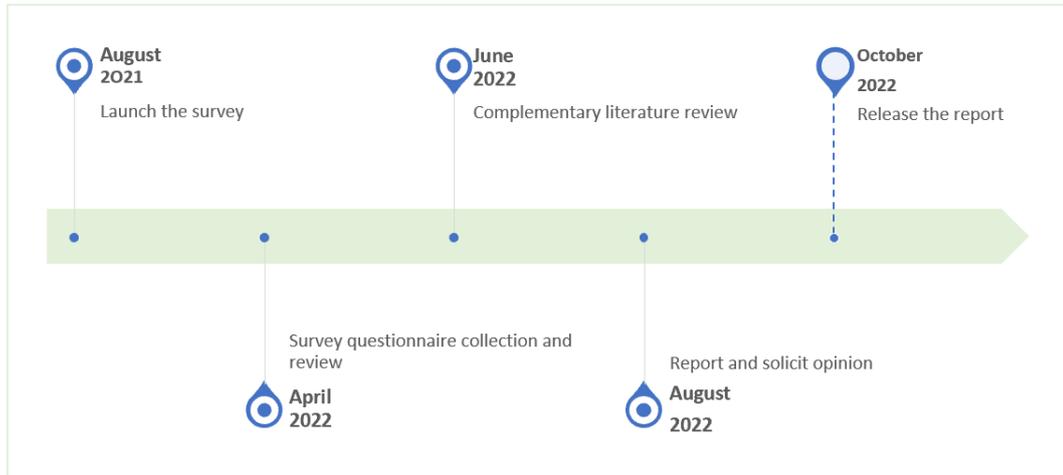
- For the sectors, which are the producing and manufacturing sector, energy and transportation sector, planting and breeding sector, cooling and heating sector.
- For the products/services pillar, which adopt new energy sources, new materials, new production methods and automation methods, including but not limited to:
 - Steel, Cement, Glass, Ceramic, or alternative materials, building etc.;
 - Vehicle, ship, plane or relevant transportation tools, fuel and fuel oil, new business model etc.;
 - Food, Fertilizer etc.;
 - Cooling appliance/ systems, heating appliance/systems etc.
- For the green purchasing pillar, policies, measures, methods and real practical practices relevant to use green procurement tools to address climate change, including but not limited to:
 - Policy: Law, regulation, requirement, notice in national, industry or local level (including purchasing, producing or lifestyle addressing climate change issue etc.)

- Economic instrument/measures: financial, trade, tax, combination of procurement and carbon offsetting such as carbon tax, carbon credit or others;
- Purchasing approach: standard, guidance, pilot, or others;
- Private sector: practice in retail, e-business, life style or others.

Survey Format

The process included several steps as follows, as shown in figure 1:

Figure 1. Survey timeline and format



■ Launch the survey

The survey of environmentally friendly product/service and green purchasing to tackle climate change launched by the Secretariat of International Green Purchasing Network (IGPN) in August, 2021. The work team formulated the survey questionnaire and disseminated to the members of the International Green Purchasing Network (IGPN), Asia Pacific Green Public Procurement Network, One Planet Network Sustainable Public Procurement (SPP) Programme.

■ Survey templet collection and review

Representatives from Japan Green Purchasing Network, Green Purchasing Network China (China Environmental United Certification Center), Korea Environmental Industry & Technology Institute, Green Purchasing Network Korea, Green Purchasing Network Thailand (Thailand Environment Institute), Green Purchasing Network Singapore (Singapore Environment Council), Green Purchasing Network Philippine (Philippine Center for Environmental Protection and Sustainable Development), Green Purchasing Network China Hong Kong SAR (Green Council) submitted the survey templet, provided the detailed information related to the policy overview, practice statue, outputs results, challenge faced, and future perspective related to address climate change through green purchasing, products, production, and lifestyles. Meanwhile, the provided survey questionnaires were reviewed by the IGPN Secretariat.

■ Complementary literature review

In order to better understand of the submitted survey questionnaires from members of Green Purchasing Network, additional literature review conducted focusing on the climate change

policy based on the updated Nationally Determined Contribution (NDC) of Countries such as China, Japan, Korea, Thailand, Singapore, the Philippines etc., and regions such as China Hong Kong SAR. Furthermore, complementary literature review was conducted for the detailed content of United Kingdom and United State on how and what depth of each integrate the climate policy into the green purchasing practice.

■ **Report and solicit opinion**

Based on the literature and questionnaire review, quantitative and qualitative analysis was undertaken according the composition of participants, composition of environmentally friendly product/service, composition of practices addressing climate change, and linkage among climate change, procurement, and products; common characters were provided in the key findings spontaneously with the challenge faced and future prospect. The webinar on How Environmentally Friendly Product and Green Purchasing to Tackle Climate Change was held to solicit professional opinion in the International Green Purchasing Network. Based on the the overall analyzation, findings and conclusions were provided including policy, implementation approach in term of facilitating climate action and sustainable consumption and production in an integrated and coherent approach.

■ **Release the report**

The survey report was finalized and released, it summarized and extended the experience and practices from countries such as America, Britain, Japan, Korea, Thailand, Singapore, the Philippines, China etc., and regions such as China Hong Kong SAR to tackle climate change, provided recommendations on how to advocate active role of green purchasing and environmentally friendly products and synergize its impact response to achieve climate change target.

Detailed findings

Description of Main Elements

Participants composition

There are two sources of the participants:

- One part was survey for members from Green Purchasing Networks of countries such as Japan, Korea, Thailand, Singapore, the Philippines, China etc., and regions such as China Hong Kong SAR, as shown in Table 1, these were voluntarily submitted survey templates and collected in the report;
- The other was complementary experience and practice from America and Britain, these were conducted by the Secretariat.

Table 1. Participating members from Green Purchasing Networks

Geography	GPN Name	Hosting Organization	GPN Logo
China	China Green Purchasing Network	China Environmental Certification Center	
Hong Kong, China	Green Purchasing Charter	Green Council Hong Kong	
Japan	Japan Green Purchasing Network	Japan Green Purchasing Network	
Korea	Korea Green Purchasing Network	Korea Green Purchasing Network	
Thailand	Thailand Green Purchasing Network	Thailand Environment Institute	
Singapore	Green Purchasing Network Singapore	Singapore Environment Council	
The Philippines	Green Purchasing Alliance Movement	Philippine Center for Environmental Protection and Sustainable Development, Inc.	

General survey information

For the part of survey for members of Green Purchasing Networks, the following outlined the basic character based on geography, sector, product/service, and green purchasing, as shown in Table 2.

Table 2. Basic character from Green Purchasing Networks submitted survey templet

Geography	GPN Name	Sector	Product/Service	Green Purchasing
China	China Green Purchasing Network	Producing and manufacturing	Electronic and Electrical Appliance Construction Materials Packaging products	Policy in national level Procurement specifications, standard, guidance
Hong Kong, China	Green Purchasing Charter	Energy and transportation	Electric Vehicles	Policy Incentives
		Producing and manufacturing	Electronic and Electrical Appliance Construction Materials Plastic Products Other products	Mandatory Energy Efficiency Labelling Scheme Type 1 eco-labelling scheme Type 2 recycled contents certification Government Green Specifications
		Eatery	Plastic tableware	Disposable plastic tableware will be regulated in phases to reduce plastic at source
Japan	Japan Green Purchasing Network	Energy and transportation	Electric Vehicle	Policy, strategy, act and incentives
Korea	Korea Green Purchasing Network	Producing and manufacturing	Construction materials Vehicle or relevant transportation tools Food, Fertilizer etc.	Policy, strategy, act and incentives Procurement specifications, standard, guidance
		Cooling and heating	Cooling/heating appliance	
Thailand	Thailand Green Purchasing Network	Producing and manufacturing	Building materials	Policy in national, industry level Procurement specifications, standard, guidance Practice in private sectors
		Cooling and heating	Cooling appliance and system	Measures for nationally appropriate mitigation action
Singapore	Green Purchasing Network Singapore	Energy and transportation	Energy-saving functionalities Cooling appliance	National action plan, strategy Mandatory Energy Labelling Scheme
The Philippines	Green Purchasing Alliance Movement	Producing and manufacturing	Construction materials Energy-saving functionalities	National Ecolabelling Programme
		Cooling and heating	Cooling appliance and system	
		Service	Eatery Food packaging	Purchasing standard, guidance Pilot project
			Tourism	Roadmap Practice in private sectors

For the part of complementary survey, it was mainly conducted based on the related reference or resources, one is from Britain, the other is from America.

- The survey for Britain:
 - Sustainable lifestyles and sustainable patterns of consumption and production are directly identified as aspirations and priorities aspirations” in the updated Nationally Determined Contribution (NDC);
 - The approach and impact for green public procurement practice toward net zero emission target summarized into its prescriptive regulation, proper implementation, participation of local government and progressive impact.
- The survey for America:
 - Procurement power to support early markets for very low and zero-carbon industrial goods” directly stated in updated Nationally Determined Contribution (NDC);
 - Introduce the newly released policies of "The Federal Sustainability Plan" and EPA “Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing”, to fulfill the sustainable public procurement target set to achieve net-zero emissions from Federal procurement by 2050.

Environmentally friendly product/service composition

Based on the high-impact sectors and product/service category identified in the survey scope, from the provided practices the following outcomes are the survey reached:

- For the industry sectors, mostly was from the producing and manufacturing (41%), energy and transportation (25%); for sectors from cooling and heating and service sector are take equal at 17%, as shown in Figure 2;
- For the product category, mostly was from the energy using product in total at 32%, including Electric vehicles (14%), Electronic and Electrical Appliance (9%), Energy-saving functionalities (9%); the product category of construction/building materials (23%), Cooling/heating appliance (18%), Plastic packaging product (14%) are followed respectively; food (4%) and tourism (4%) was emerging at smaller percentage, as shown in Figure 3.

Figure 2. Survey outcome-industry sectors

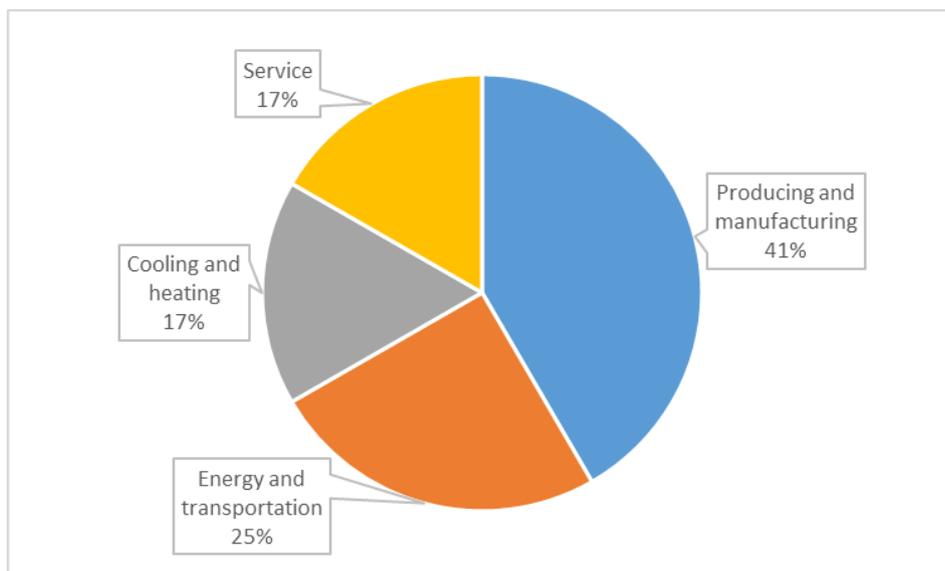
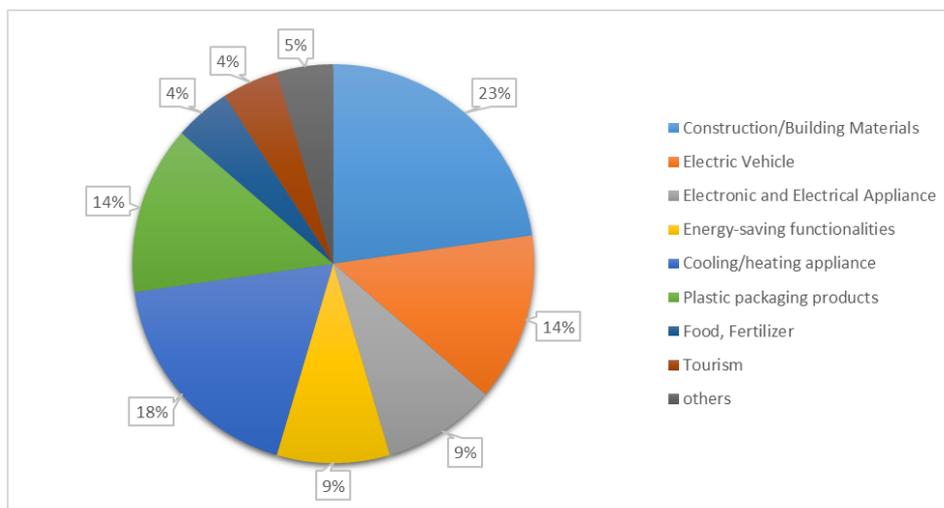


Figure 3. Survey outcome-product/service category

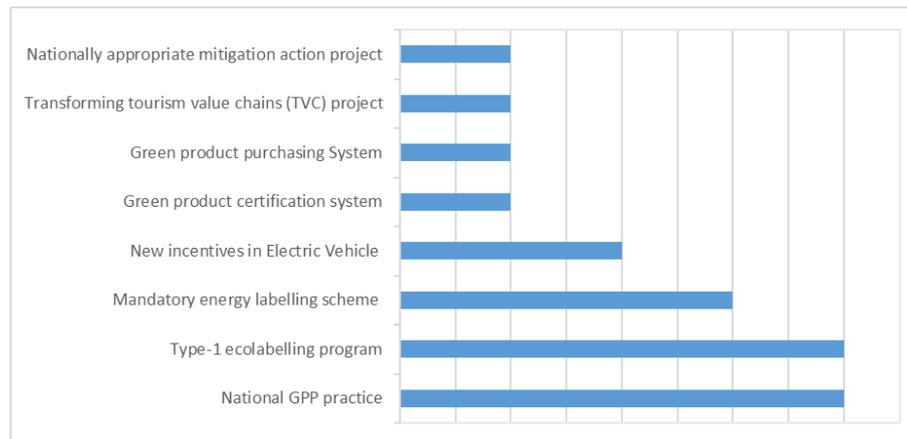


Practices composition response to climate change

Based on the practice type identified in the survey scope, the following outcomes are the survey reached, as shown in Figure 4:

- Early practices of national GPP practice, type I ecolabelling program, mandatory energy labelling scheme are generally in common;
- Emerging practices are the projects in transforming tourism value chains, nationally appropriate mitigation action project, policy measures of incentives in Electric vehicle, these are benefit from the national climate change policies.

Figure 4. Survey outcome-practices composition outline



Linkage among climate change, procurement, and products

Based on policy outline among climate change, procurement and products, the following outcomes are the survey reached:

- For the climate policy, as all participant countries have declared climate change target and set up the updated nationally determined contribution, in order to achieve the declared goal, the national policy scheme generally are:
 - Including climate change into economic and social development plans;
 - Specific national green growth strategy;
 - National carbon neutrality act;
 - National Climate Change Master Plan.
- For the linkage among the product, procurement, and climate policy:
 - Mostly are directly embedded with the national energy regulation improve the energy efficiency of end-use energy products, such as Energy Conservation Act; Renewable Energy Act; Energy Efficiency and Conservation Act;
 - There are GPP Act, such as Act on Promotion of Procurement of Eco-Friendly Goods and Services, but seldom directly state the goal of climate change in these policies;
 - Almost Indirectly interacted in the industry sector, or ministry regulations.

Challenge Faced

Looking at the detailed findings from the survey and facts collected from the participants, the following challenges can be observed:

- Most challenges originated from the policy measures, technology support, tools and methods for the green purchasing practice in public sector with the rising awareness:
 - Policy measures gaps on how to reduce CO₂ emissions from procurement or consumption side and how to stimulate more enterprises and consumers participating in green procurement;
 - Limit access in monitoring and evaluation, due to lack of official system for collecting the amount being procured for green products/services;
 - Slow paced process for criteria development, which could not keep up with the awarding process in advance for the bidding;
 - Less available certified products category due to less abundant criteria, which impede the scale of GPP implementation.
- Most challenges caused by environmentally friendly technology development at this stage for products/service sector:
 - High price cost and less scale due to incapable prevail environmentally friendly technology addressing climate change for manufacturing of products;
 - Unavailable mature technology for environmentally friendly products/service, for instance, the undeveloped charging and refueling infrastructure slowed the development of vehicles (EV); R290 is considered the definitive solution to environmental damage and positioned as the alternative for the next generation of refrigerants for room air conditioners with its zero-ozone depletion potential (ODP) and very low global warming potential (GWP), However, its use is hindered due to its flammability and the resulting concerns on safety;
 - Inactive participation of the whole community due to less awareness or market readiness.
- Most challenges connected with the collaboration of products/service for the green purchasing practice in private sector:
 - Limited number participating, for instance, participants showed only 26% of committed establishments were actively participating; only 13 out of 51 hospitality businesses committed to undergo training;
 - Coordination with the businesses has been a challenge, especially in the time of the pandemic where the sector is highly affected.

Key Findings

Policies guide and promote GPP for national climate change emission reduction targets

Policy represents the government commitment to facilitate the GPP for achieving national climate change target. Though facing the situation of disconnection between climate urgent and practice

available, some countries/areas are advancing to seek inclusive GPP policies being embedded climate target, such as in China, Britain, America, Korea and Japan.

Take an example in America, in order to catalyze the power of federal government procurement for a more sustainable marketplace of reducing climate impacts and preventing pollution, the sustainable public procurement target to achieve net-zero emissions from Federal procurement by 2050 was first established and released in 2021, together with an ambitious path of four key activities while increasing the sustainability of Federal supply chains. Take another example in Britain, addressing climate change has long been throughout the relevant policy documents of its green public procurement system. From listing it as a priority to disclosing the gradual deepening of emission reduction targets, its green public procurement system has given full play to the support of addressing climate change and the national "net zero emissions" target. Additionally, Plans are set to raise green products awareness to 50% by 2025, increase the use closely to daily life from public to private sector in Korea.

From countries/areas in this survey, policies and measures to tackle climate issue mostly have been introduced in national, industry or ministry level, though the content related specific supportive approach or measures to carbon emission reduction and green procurement has not been reflected generally, however along with the rising awareness which green procurement will play an important role in achieving the climate change targets, measures, incentives or specific approaches will definitely come soon in the near future.

Environmentally friendly products/service pioneer to response the climate change

Product/services are the core of the application of green purchasing to achieve national climate change emission reduction targets.

The common categories shown in the survey are energy saving product, such as electronic and electrical appliance; construction materials, and plastic products. Firstly, these products are directly energy-using products, the impact contribute to climate change obviously to measure and set standards or requirements; secondly, these products mostly implement the national Eco-labelling scheme spontaneously strived to ultimately respond to the climate change, such as China, Thailand, Philippines etc.; national Mandatory Energy Labelling Scheme such as Singapore; Korean Green Product Certification System including ecolabel products, green recycled products, low carbon products.

Electric Vehicles are the products most recently took attention in the policy response to climate change, for example in Japan, regarding official vehicles, all new installations and renewals will be electric vehicles from 2022 onward, unless there is no alternative electric vehicle, and all official vehicles to be used will be electric vehicles by 2030. Exhaust gas standards and fuel efficiency standards are also set for hybrid vehicles. In China Hongkong, Popularization of electric vehicles has been served as one of the key strategies to strive for carbon neutrality and combat climate change, through advantages provided to the vehicle buyers to waive the first registration tax and to installation of EV charging-enabling infrastructure.

Green purchasing practice pilot to address climate change in private sectors

The green purchasing practice in private sector mostly are project funded with consumer intensive sectors whereas of tourism, food, and cooling system.

For example, the transforming tourism Value chains (TVC) project conducted in Philippines, four solution such as sustainable food value chains, sustainable events, beat pollution, sustainable energy were provided in the roadmap for low-carbon and resource-efficient tourism, aims to reduce GHG emissions from traditional sources of energy by 30% and reduction of food-wastes from MICE by 50% in 2030. For Cooling appliance/ systems, Thailand Refrigeration and Air Conditioning Nationally Appropriate Mitigation Action (RAC NAMA) Project was conducted to promote energy-efficient technologies and practices in the cooling sector. At the same time, a technology shift away from the production and use of fluorinated refrigerants (Hydrofluorocarbons: HFCs) to natural refrigerants with zero ozone depletion potential (ODP) and very low GWP will be promoted.

Additionally, criteria development will serve as an additional market-incentive and recognition to project engaged establishments in private sector. Generally, pilot practice is one of effective way to test the market readiness whether there is sufficient demand for the products/service, or whether the manufacturing and producing is enough to satisfy the market demand before it prevails in large scale.

Systematic approach has representative significant of reference

The survey discovered the systematic approach, which integrated the climate change target into its procurement policy, implemented in a holistic method, from public policy to private implementation-connected the scattered dots of several products into the line of industry and further extend to local or national change or shift for climate change target accordingly.

For example, green public procurement practice toward net zero emission target in Britain has shown this character, which implemented in concrete and systematic method being with prescriptive policy regulation, proper implementation, participation of local government, and with progressive impacts. With the national climate change target in Britain, it integrated carbon reduction requirements to green public procurement since 2011, this enhanced the demonstration role of public departments in carbon reduction, actively guided social orientation to climate-friendly, green, and low carbon consumption. This gained progressive impact, for instance, in 2019~2020, the central government and its affiliated institutions have played demonstration role in reducing GHG emission and achieved emission reduction by 50%, exceeding annual reduction target by 7% and saving the cost of about 148 million pounds.

Additionally, China also showed their GPP progress in tackling climate change in reducing CO₂ emissions, eliminating the application of hazardous chemicals, and application of renewable resources by harmonized with circular economy.

Green procurement, green consumption and green lifestyle has been considered to one of the policy tools for meeting the climate targets. Accordingly, the systematic approach of green procurement will play an important role in achieving their carbon targets respectively.

Part II. Measures, Approaches and Practices

People's Republic of China

China Environmental Labelling Green Public Procurement Impact

Response to Climate Change

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

China, declared in October 2020, aims to peak carbon dioxide emissions before 2030 and achieve carbon neutrality before 2060, lower its carbon intensity by over 65 percent by 2030 from the 2005 level. In order to meet its targets in response to climate change, a variety of strategies, regulations, policies, standards, and actions formulated and implemented nationally.

Incorporating the response to climate change into national economic and social development plans

Starting from the 12th Five-year Plan period (2011-2015), China has incorporated reducing carbon intensity into the outline of the plans for national economic and social development as binding targets, and defined key tasks, priority areas, and major projects. China's Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 sets a binding target of slashing carbon intensity by 18 percent from 2020 to 2025. It requires "actively addressing climate change. Adhering to its target of Nationally Determined Contributions by 2030, China will develop the Action Plan for Carbon Peak by 2030; promote clean, low-carbon, safe and efficient utilization of energy; and facilitate low carbon transformation of areas such as industry, building and transport. Moreover, China will make more efforts in the control of emissions of methane, HFC, PFC and other GHGs and enhance the capacity of ecosystem in carbon sink. China will adhere to the principle of justices, common but differentiated responsibility and the principle of respective capacity; take part in international cooperation on climate change; implement UNFCCC and Paris Agreement; and actively carry out South-South cooperation on climate change". It presents the requirements of "adhering the policy of energy saving as the first priority; enhancing energy saving of industry, buildings and transport as well as public institutions; facilitating higher energy efficiency of emerging areas such as 5G, big data center; strengthening energy saving management of major organizations; carrying out key projects such as optimization of energy system, technical innovation for saving energy; and accelerating the compulsory national standards including energy consumption limit and energy efficiency of products and equipment".

Guidelines on Accelerating the Establishment and Improvement of Green, Low Carbon and Circular Economic Development System

Released in February 2021 by the State Council requires "establishing and improving green, low-carbon and circular economic development system; ensure meeting carbon peak and carbon neutrality targets so as to promote green development of China to a new high".

White Paper of China on Climate Change

Released in October of 2021 by the State Council requires great development of green and low carbon industries. Establishing and improving green, low-carbon and circular economic development system and facilitating comprehensive green transformation of economic and social development are basic solutions to the problems of resources, environment, and ecology. To facilitate green development mode and lifestyle, China has developed National Development Plan for Strategic Emerging Industries. Focusing on innovation and application of green and low carbon technologies, China has guided green consumption, promoted green products, raised the application percent of new energy vehicles and new energy sources, comprehensively promoted the development of industrial system with high energy efficiency, applied advanced environmental technology and circular use of resources, facilitated rapid development of new energy vehicles, new energy source and energy saving & environmental industry, actively enhanced the development of unified green product certification and label system, increased the supply of green products and actively developed green market. Moreover, China has kept on the adjustment of industrial structure, released and revised Guiding Catalogue for Industrial Development, guided the orientation of social investment, improved traditional industries, facilitated high quality development of manufacturing industry, greatly developed emerging industries, and firmly supported the development of green industries focusing on environmental protection, clean production, and clean energy.

1+N policies for peaking carbon emissions and achieving carbon neutrality

The policy scope of “1” means the top-level design document for peaking carbon emissions and achieving carbon neutrality included 2 documents released in October of 2021 by the State Council, one is <**Opinions on Fully, Accurately and Comprehensively Implementing the New Development Concept to Achieve Carbon Peak and Carbon Neutrality**>, one is <**Action Plan for Carbon Peak by 2030**>. The “**Opinions**” put forward 31 key tasks from 10 aspects, playing an overall leading role in the dual carbon policy system. The “**Plan**” identified 10 actions to achieve carbon peak, and made clear the road map and construction drawings of dual carbon targets.

The policy scope of “N” includes carbon peak implementation plans for energy, industry, urban and rural construction, transportation, and other industries, as well as scientific and technological support, carbon sink capacity, energy security, statistical accounting, inspection and assessment, financial and financial price security policies.

Implement Overview

China green public procurement scheme was jointly formulated and promoted by the Ministry of Finance, the National Development and Reform Commission and the Ministry of Ecology and Environment respectively, since the green public procurement policy implemented in 2004, the policy measures and implementation mechanism have been continuously optimized and improved.

So far, in line with the regulations such as <Ministry of Finance, National Development and Reform Commission, Ministry of Ecology and Environment, State Administration of Market Supervision, Notice

on Adjusting and Optimizing the Government Procurement Mechanism of Energy-saving and Environmental Labelling Products》(Treasury [2019] No.9), <Ministry of Finance, Ministry of Ecology and Environment, Notice on the Item List for Government Procurement of Environmental Labeling Products>(Treasury [2019] No.18) , <Ministry of Finance, National Development and Reform Commission, Notice on the Item List for Government Procurement of Energy-saving Products>(Treasury [2019]No.19) etc., item list management shall be implied for the government procurement of environmental labeling products and energy-saving products. Whereas the products to be procured fall within the item list, the procurer and procurement agency shall, based on the certificate which being within the validity period issued by the certification body determined by the state, implement the priority or mandatory procurement of the products.

Up to now, China has released over 110 criteria for environmental labeling products, involving office electronic products (desktop computer, notebook computer, printer and so on), furniture, building material, textiles, and many types of consumer products. Ministry of Ecology and Environment takes charge the promotion and implementation of China Environmental Labelling program with the certification work conducted by certification bodies authorized by the Ministry of Ecology and Environment.

Procurers at all levels directly adopt China Environmental Labelling certification results in procurement activities. In government procurement, ecolabel certification certificate will serve as preference for to review described in the tendering document or other procurement documents. When taking part in government procurement activities, suppliers must provide ecolabel certificate of product as a proof to demonstrate that the purchased products meet environmental requirements.

Output and result

China Environmental Labelling criteria is developed based on life cycle assessment. The prime indicators are reduction of resource consumption and pollutants as well as saving energy. It includes China Environmental Labelling criteria indicators in government procurement, mainstreaming green product meeting ecolabel criteria in government procurement list by adopting certification results. This greatly contributes to the reduction of many types of pollutants as well as the effort in the control and reduction of GHG emissions in China.

Reducing CO₂ emissions

The statistical analysis of government procurement of ecolabel products during 2016~2020 show that office desktop computer and notebook computer have achieved emission reduction of 1.719 million t CO₂, equivalent to annual carbon sink of 191000 ha forest. Moreover, government procurement of ecolabel furniture has achieved emission reduction of 149000 t VOCs.

Reducing the application of hazardous chemicals

Minimizing the utilization of hazardous chemicals and ODS is always an important requirement of environmental labeling criteria. Government procurement of environmental labeling products has

played an active role in reducing the consumption of both ODS and POPs. For example, it is required in the ecolabel criterion for digital copying machine:

- Banning the use of HBCDD and SCCPs in PCB substrate
- Banning the use of any polymers containing chlorine or bromine in any plastic component with mass larger than 25g except the shell and plastic protection components but those in vicinity with heating and imaging component, and flame retardants with addition of any TCEP, TCPP, TDCP, PBBS, PBDES, HBCDD and SCCPs.
- The total benzo(a)pyrene content in shell, various keys and external power line not exceeding 20 mg/kg and total contents of 16 PAHs listed in Annex C should not exceed 200 mg/kg.

Facilitate the development of circular economy

GPP in China also pays attention to the application of renewable resources and waste generation, especially renewable substances as raw materials in product as well as recycling and reuse of waste.

- The Goods Packaging Standard for Government Procurement requires: the application of over 75% renewable fiber for goods paper packaging. This standard is not compulsory. When procurers purchase relevant goods, works and services, the package of relevant goods may refer to the requirements of this standard. According to statistics, over 70% procurers take this standard as a score adding item.
- The Technical Requirements for Environmental Labeling Product — Ceramic Tiles (Boards) requires: The recycling rate of industrial waste solid generated during production should be $\geq 90\%$; and the recycling rate such waste of the current enterprise should be $\geq 60\%$.

Challenge faced

GPP has been carried out in China over the past 18 years and made remarkable achievements. However, it will be a big challenge as how to reduce CO₂ emissions from procurement or consumption and how to guide more enterprises and consumers participating green procurement.

Future prospect

China has developed a series of policies including “1+N” policy after making public its “carbon peak and carbon neutrality” targets. The State Council has distributed the Action Plan for Carbon Peak by 2030. It identifies the followings: the percent of non-fossil fuel consumption reaching 20%, 13.5% reduction of energy consumption per unit GDP, 18% reduction of carbon emission per unit GDP by 2025 as compared with that of 2020, laying a good foundation for meeting carbon emission peak. It is expected that during the “15th Five-Year Plan” period, major progress will be made in industrial structural adjustment with primary establishment of clean, low-carbon, safe and efficient energy system; low carbon development mode of key fields will take shape; energy efficiency of key energy consuming industries will reach internationally advanced level; the proportion of non-fossil fuel will further go up with gradual decrease of coal consumption; key breakthrough will be made in green and low carbon technologies; green lifestyle will become public voluntary option; and policy system for green, low

carbon and circular development will basically be mature. It is expected that the percent of non-fossil fuel consumption will reach 25% with 65% reduction of carbon emission per unit GDP by 2030 as compared with that of 2005, successfully meeting the carbon peak target by 2030.”

Green procurement, green consumption and green lifestyle will be one of the policy tools for meeting the “carbon peak and carbon neutrality” targets. As a result, green procurement in China will play an important role in achieving the above targets.

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Policy and Measures Respond to Climate Change in China Hong Kong Special Administrative Region

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

The Chief Executive of HKSAR announced in the 2020 Policy Address that China Hong Kong will endeavor to achieve carbon neutrality before 2050 and would also pursue more vigorous interim decarbonization targets to reduce its carbon emissions by 50 per cent before 2035 as compared to the 2005 level. Coupled with the transformation of low-carbon power supply, there are other measures underway:

Buildings: account for about 90% of its total electricity consumption, and over 60% of our carbon emissions is attributable to generating electricity for our buildings. To promote continuous decarbonization in buildings, HKSAR have set a target of reducing the electricity consumption of new and existing commercial buildings by 15% to 20%, and that of residential buildings by 10% to 15% by 2035, using the operational conditions of 2015 as the comparison basis. More green innovations and energy efficient elements will also be added to the design of new buildings to improve energy efficiency performance of buildings.

Transportation: makes up of about 20% of carbon emissions in China Hong Kong SAR. Popularization of electric vehicles has been served as one of the key strategies to strive for carbon neutrality and combat climate change, through advantages provided to the vehicle buyers to waive the first registration tax and to installation of EV charging-enabling infrastructure. Government will stop the new registration of fuel-propelled and hybrid private cars in 2035 or earlier. Government will also plan to collaborate with the franchised bus companies and other stakeholders in the near future to test out hydrogen fuel cell electric buses and heavy vehicles.

Fossil fuels: including natural gas and coal, account for over 70% of China Hong Kong SAR's fuel mix for electricity generation. Feed-in-tariff schemes have been introduced since October 2018 to promote the electricity generation from renewable energy (RE). The goal is to increase the share of RE in the fuel mix from the existing less than 1% to 7.5% -10% by 2035 and further to 15% before 2050.

Under **Energy Efficiency Ordinance**, there is a **Mandatory Energy Efficiency Labelling Scheme (MEELS)** in which energy labels are required to be shown on the prescribed products for supply to inform buyers of the energy efficiency performance of electrical appliances. Government planned to explore setting a minimum energy efficiency requirement for specified appliances.

Waste contributes to about 7% of carbon emissions in China Hong Kong SAR, with the bulk of them being the GHG generated from decomposition of waste in landfills. The Government promulgated the Waste Blueprint for China Hong Kong SAR 2035, advocating the vision of "**Waste Reduction •Resources**

Circulation •Zero Landfill”. **Municipal Solid Waste (MSW) Charging Scheme** will start to implement in 2023 which encourages waste reduction and recycling, and strengthen community facilities and support.

Currently, plastics take up about 20% of the total amount of MSW disposed of at landfills. Government will go “plastic-free” by adopting a multi-pronged approach. For example, government will introduce legislation in phases from 2025 onwards to regulate disposable plastic tableware, including expanded polystyrene (EPS) tableware, straws, stirrers, cutlery, plates, cups, cup lids, food containers, and food container covers, etc. Specifications of these products are required to match accordingly.

Government departments are required to adopt green specifications for products and services where such specifications have been promulgated by Environmental Protection Department in their purchases as far as practicable; and to make annual report on green product and services purchase. Currently, there are 183 items of products and services on the Government procurement list with green specifications.

Green Council has also issued Type I ecolabel certification (Green Label Scheme) on over 60 products and Type II recycled contents certification for products with recycled contents. The production of products made of recycled materials always incurred less carbon emissions than products made of virgin materials.

Implement Overview

A Steering Committee on Climate Change and Carbon Neutrality under the chairmanship of the Chief Executive of HKSAR was established in mid-2021 to formulate the overall strategy at the highest level and oversee implementation and coordination.

HKSAR will adopt a whole-government approach to formulate more holistic and proactive decarbonization measures, and implement decarbonization action plans in the pursuit of the carbon neutrality target. To ensure effective implementation of the measures and follow-up actions, an Office of Climate Change and Carbon Neutrality is set up to strengthen coordination and promote deep decarbonization, etc. Some inter-departmental Carbon Neutrality Task Force will also bring together the experts from relevant departments to explore forward-looking decarbonization policies, having regard to the latest developments in advance decarbonization technologies globally.

The Government plans to allocate about HK\$240 billion in the next 15 to 20 years to implement mitigation and adaptation measures to combat climate change, including four major decarbonization strategies and measures, namely net-zero electricity generation, energy saving and green buildings, green transport, and waste reduction.

Output And Result

With the implementation of various mitigation measures, China Hong Kong SAR is moving steadily towards the decarbonization target. The carbon intensity in 2019 was about 35 per cent lower than

that in 2005. Preliminary estimation shows that the per capita carbon emissions would be reduced from the peak level of 6.2 tons in 2014 to about 4.5 tons in 2020.

Challenge Faced

Secretary for the Environment, Mr. Wong Kam-sing, said, "Achieving carbon neutrality before 2050 is extremely challenging and requires the participation of the whole community. The public can contribute by practicing a low-carbon lifestyle through energy saving and waste reduction and recycling etc., in their daily lives. I hope that various sectors of the community will join hands with the Government to build a bright future together in a bid to strive towards the goal of carbon neutrality, with a view to achieving the vision of 'Zero-carbon Emissions·Liveable City·Sustainable Development'."

Future Prospect

More educational activities of different nature are required to raise the awareness of the community about climate change, encourage them to practice low-carbon and sustainable lifestyles, and encourage young people to participate in the work of promoting environmental protection and awareness of climate change.

Having supported by government, Green Council also conducted different seminars and training courses to enhance the knowledge of professionals in mitigation of climate change.

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Japan

Expansion of Electric Vehicles under the Japan Green Growth Strategy through Achieving Carbon Neutrality in 2050

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

In October 2020, the Japanese government has declared to achieve carbon neutrality by 2050. Then in April 2021, the government announced a policy to reduce greenhouse gas emission by 46% from 2013 levels. To achieve this ambitious target, it is necessary not only to accelerate efforts toward structural changes in the energy and industrial sectors but also to undertake large scale investment for innovation.

Green Growth Strategy through Achieving Carbon Neutrality in 2050

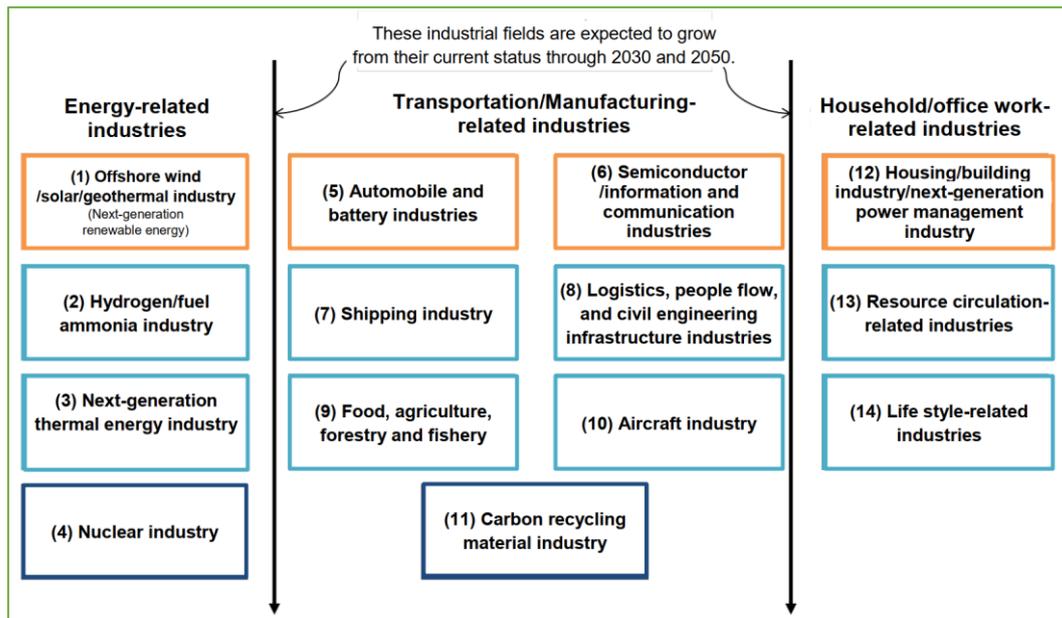
“Green Growth Strategy through Achieving Carbon Neutrality in 2050” is released by the Ministry of Economy, Trade and Industry, in collaboration with other ministries and agencies, including the Ministry of the Environment.

The government committed to lead challenges towards the 2050 Carbon Neutrality to major growth via reforms of industrial structure and economic society. For the each key fields essential to achieving Carbon Neutrality by 2050, an "action plan" will be formulated that includes:

- targets with clearly defined time limits,
- research, development, and demonstration,
- regulatory reform, standardization, and other institutional improvements, and
- international collaboration.

In the action plans, current status, issues, and future initiatives will be indicated, and process charts up to 2050 will be presented. In the process charts, specific measures will be shown to strengthen international competitiveness and to expand the market considering research and development phase, demonstration phase, introduction and expansion phase, and autonomous commercialization phase. In the introduction and expansion phase,, the government will expand demand through public procurement and development of relevant systems such as regulations and standards, and reduce costs through shifting to mass production.

14 key industrial fields (shown as followed figure) have been specified in the strategy, which are expected to grow from the viewpoints of both industrial and energy policies and action plans for each sector has been developed. The strategy directs all available policies to supporting initiatives and efforts toward achieving the target.



Automobile is one of the promising sectors, for example, and the government will take comprehensive measures to achieve the targets:

- For passenger vehicles, electrified vehicles will account for 100% of new vehicle sales by 2035.
- For commercial vehicles, aiming for electrified vehicles accounting for 20-30% of new light vehicles sales by 2030 and electrified vehicles and decarbonized fuel vehicles accounting for 100% by 2040.
- For heavy vehicles, aiming for an advanced introduction of 5,000 vehicles in the 2020s and setting a target for 2040 electrified vehicle penetration by 2030.
- For storage battery, increasing the domestic production capacity for in-vehicle batteries to 100GWh as early as possible by 2030.
- For charging and refueling infrastructure, achieving the comparable level of convenience as gasoline vehicles by 2030 by installing 150,000 charging stations, including 30,000 quick chargers for public use, and installing approximately 1,000 hydrogen stations in optimal locations by 2030.

Act on Promotion of Procurement of Eco-Friendly Goods and Services

Act on Promotion of Procurement of Eco-Friendly Goods and Services (Act on Promoting Green Procurement) is reviewed every year by the Ministry of the Environment.

These target affects the award criteria of the Basic Policy on Promoting Green Procurement by the State and Other Entities. Before the carbon neutral declaration, the Act on Promoting Green Procurement focused on fuel efficiency and emission reduction level as the public procurement criteria for passenger vehicles. The criteria have become strict during the past few years, even though fuel efficiency and emission reduction level are still focused for electric vehicles and hybrid vehicles. Any government agencies are now required to purchasing, leasing, and renting electric vehicles including hybrid vehicles, plug-in hybrid vehicles, fuel cell vehicles, and hydrogen vehicles.

From 2022 onward, regarding official vehicles, all new installations and renewals will be electric vehicles unless there is no alternative electric vehicle, and all official vehicles to be used will be electric vehicles by 2030. Exhaust gas standards and fuel efficiency standards are also set for hybrid vehicles.

Implement Overview

Working basis and market readiness

In Japan, the introduction of electric vehicles will be strongly promoted during this decade to build a world-leading industrial supply chain and mobility society, starting with batteries. The government will take measures in this process, especially for converting small vehicles and commercial vehicles to electric vehicles and fuel cell vehicles.

Applied scope

Passenger vehicles, commercial vehicles, and heavy vehicles

Primary principles

Climate change and other environmental issues are caused by mass production, mass consumption, mass disposal type of economic activities. In order to sustainably utilize limited resources and hand them down to future generations, it is essential to reform the ideal way of economic society and transform it into something that enables sustainable development. To that end, it is necessary to reduce environmental impacts in all sectors and shift our lifestyles to more environmentally friendly. Sustainable procurement is a way to build a sustainable society.

Implementation mode

For government agencies, it is mandatory required to shift to electric vehicles.

Start time and the implementation body

The Ministry of the Environment reviewed the award criteria of automobiles in the Basic Policy on Promoting Green Procurement in February 2022, and that is applied from April 2022.

Output and result

There is no output or result yet. However, the ratio of electric vehicles to new passenger cars has increased from 2.5% in 2008 to 35.6% in 2020 (1,355,000 electric vehicles out of the 3,810,000 units sold). Japanese automakers are also shifting to EV production.

Challenge faced

The number of electric vehicle models is increasing, but is not enough yet. The high price range of electric vehicles is another issue especially for local governments that procure small cars for financial reasons. It is also necessary to improve charging and refueling infrastructure along with the development of vehicles.

Future prospect

Electric vehicles provide opportunities to link the renewable power and low-carbon transport sectors by creating new demand for electricity that can be supplied by renewables. Promoting and advancing technologies for driving safety support system and automated driving system will improve the safety and convenience of transportation.

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Republic of Korea

Green Public Procurement of Korea

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

<The contents of this report below describe the system, implementation procedures and details of procurement of public green products in Korea as a whole.>

The Korean government declared to move towards the goal of carbon neutrality by 2050 in December 2020, and has finalized its 2050 carbon-neutrality scenarios as a follow-up measure. In line with the declaration, it set the updated and enhanced Nationally Determined Contribution (NDC) target which is to reduce total national GHG emissions by 40% from the 2018 level, which is 727.6 MtCO₂eq, by 2030. Accordingly, the Korea government is building up the relevant institutional arrangements and mechanisms to implement its updated NDC.

Framework Act on Carbon Neutrality and Green Growth for Climate Crisis Response

The <Framework Act on Carbon Neutrality and Green Growth for Climate Crisis Response> (or “the Carbon Neutrality Act”) was enacted in September 2021, enshrining the minimum level of a mid-term national GHG emission reduction target as well as a robust implementation mechanism in law to ensure a faithful implementation of its NDC. The Act clearly defines 2050 carbon neutrality as its national vision and stipulates the minimum level of its NDC target for 2030. The Act serves as a legislative basis for the economic and social transition that will ultimately enable the Republic of Korea to achieve its NDC. Sectoral strategies and policy directions of each sector – energy, industry, transportation, buildings, circular economy, and agriculture, forestry, livestock farming and fisheries-will be coordinated consistently with such sectoral strategies. sectoral strategies will be developed and policy directions of each sector – energy, industry, transportation, buildings, circular economy, and agriculture, forestry, livestock farming and fisheries-will be coordinated accordingly.

Act on the Promotion of Purchase of Green Products & Master Plans for Encouraging Purchase of Green Products

In Korea, products that prevent waste of resources and environmental pollution and contribute to greenhouse gas reduction are certified as ‘Green Products’. Furthermore, it was strived to ultimately respond to the climate crisis and contribute to the sustainable development of the national economy by promoting the purchase of these green products.

The <Act on the Promotion of Purchase of Green Products> (2005, Ministry of Environment), focuses strongly on supporting SCP by developing the market for eco-labelled products through public demand. The policy requires all government agencies, including central and local governments and public corporations, institutes, and education institutions, to submit to KEITI an annual GPP implementation plan in which each organization sets its own voluntary target and performance report on the amount,

in expenditure and number, of green products purchased. to strengthen the existing regulations for preferential purchase of green products to mandatory purchase. In addition, the range of green products has been expanded by including Good Recycled products and Low-Carbon products.

The <Master Plans for Encouraging Purchase of Green Products> are established every five years, and Guidelines for Purchase of Green Products are distributed every year.

The first Plan (2006-2010) focused on the implementation of green procurement in the public sector using eco-labelling as the principal tool.

The second Plan (2011-2015) was established to raise awareness on sustainable lifestyles and boost green consumption among general consumers, introducing the Green Credit Card and green store certification as new instruments.

The third Plan (2016-2020) covers various policy instruments including GPP, eco-labelling, Green Credit Cards, and green store certification. The new goal is to increase the purchase of green products in the public sector, stipulating a target of at least 60% of GPP by 2020.

The fourth Plan (2021-2025) plans to raise the awareness of green products to 50% by 2025, increase the number of green products closely related to daily life to 3,000, and achieve KRW 6.444 trillion in green product transactions in the public and private sectors.

Green Product Certification System

Classification	Eco-label certified products	Good recycled (GR) products	Low carbon products
Certification mark			
Operational purpose	Certification for products with excellent environmental quality throughout the entire process	Certification for high-quality products among products manufactured by recycling waste resources	Products with reduced greenhouse gas emissions among products with certification of environmental product declaration
Target products	165 product groups including office equipment, home appliances, and household supplies	17 fields including waste paper, waste rubber, waste plastic, and waste wood	All products except medical devices, pharmaceuticals, primary agricultural, fishery, livestock, and forestry products

Number of certified products	4,603 companies / 17,874 (basic) products (As of April, 2022)	254 companies/299 products (As of May, 2022)	113 companies/380 products (As of April, 2022)
Certification authority	Ministry of Environment/Korea Environmental Industry & Technology Institute	Korean Agency for Technology and Standards, Ministry of Trade, Industry and Energy /Resources Circulation Industry Certification Institute	Ministry of Environment/Korea Environmental Industry & Technology Institute
Homepage	greenproduct.go.kr	buygr.or.kr	edp.or.kr

Implement Overview

Green Product Purchasing System

The green product purchase promotion system started in 1992 with eco-label certification system. In order to promote the purchase of certified products, based on the <Act on the Promotion of Purchase of Green Products>, public institutions can preferentially purchase green products when purchasing goods.

In addition, the Green Purchase Support Centers have been established and operated to stimulate the public's consumption of green products by providing information on green products, education, and publicity, and it has been institutionalized to install and operate a place to sell green products in large-scale stores.

The green product purchase promotion system is being managed in general by the Ministry of Environment, and the Korea Environmental Industry & Technology Institute has been commissioned by the Ministry of Environment to perform tasks such as receiving purchase records from public institutions, providing information on green products, training, and designating green stores.

Applied scope

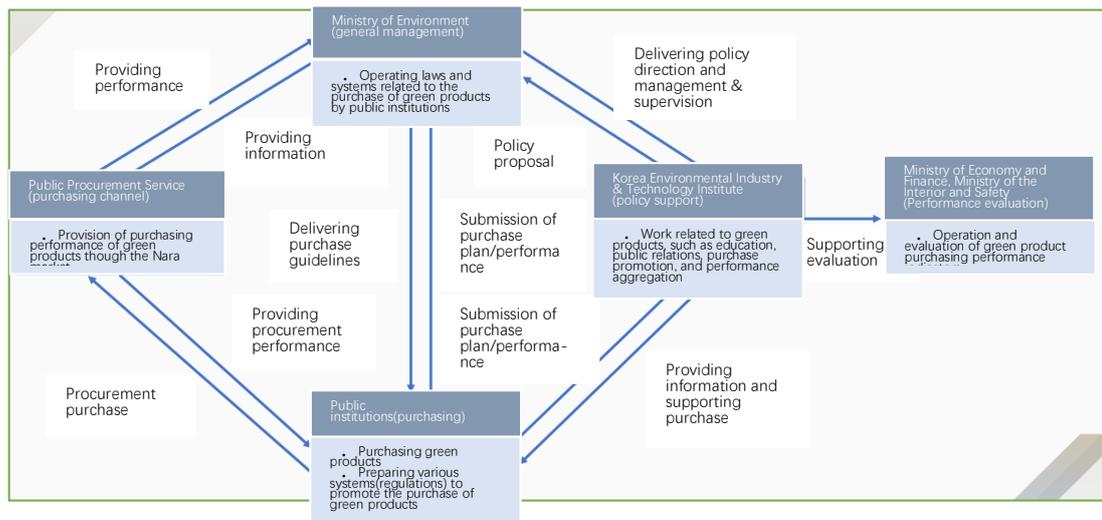
- Public institutions such as national agencies, local governments, local public corporations and local industrial complex, quasi-governmental institutions, and public corporations must implement the mandatory green product purchase system. The relevant public institution shall purchase green products in all cases, such as direct purchase of goods, procurement of goods, purchase through service contracts, and third-party materials purchased by construction companies during construction work, unless there is a special reason.
- Private sector, distribution stores such as department stores, shopping centers, and convenience stores, which are the contact points of consumer life, are designated as 'Green Stores' in order to expand the green product market and establish a virtuous cycle of green product production and consumption. As of 2021, 718 green stores are in operation.

- Eco-friendly consumption practices are being laid the groundwork for by fostering Green Purchase Support Centers in each region (10 centers) across the country so that people can practice green life through consumption of green products.

Implementation mode

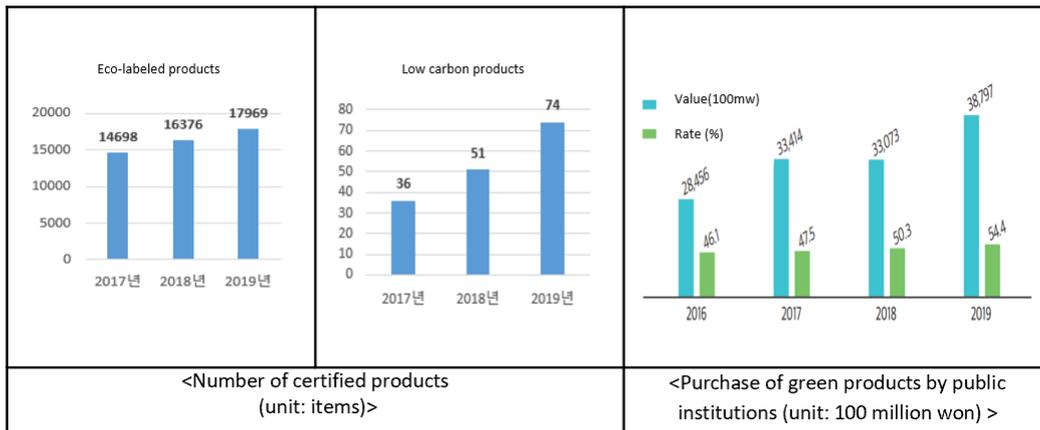
Mandatory purchase of green products by public institutions is implemented through close cooperation of various institutions.

- The Ministry of Environment improves laws and regulations and oversees the system, while the Korea Environmental Industry & Technology Institute is in charge of collecting and managing purchasing performance and facilitating purchases.
- The Public Procurement Service provides the purchasing performance of green products by public institutions through the Nara Market to the Korea Environmental Industry & Technology Institute, and provides information on whether the goods to be purchased by public institutions are green products or not.
- The Ministry of Economy and Finance and the Ministry of the Interior and Safety encourage the purchase of green products by evaluating the purchasing performance of green products by local governments and quasi-governmental organizations.



Output and result

In 2019, the number of eco-labeled products was identified as 17,969 and the number of low-carbon products as 74. As such, Korea is continuously increasing the production of green products and promoting purchases through the operation of a system for promotion of purchase of green products.



Future prospect

In order to 'promote the transition to a green society by making eco-friendly consumption in a daily life', the vision of the 4th Master Plan for Encouraging Purchase of Green Products (2021-2025), Korea plans to raise the awareness of green products to 50% by 2025, increase the number of green products closely related to daily life to 3,000, and achieve KRW 6.444 trillion in green product transactions in the public and private sectors. To achieve this goal, Korea encourages companies to produce green products when producing goods, ultimately contributing to waste of resources, prevention of environmental pollution, and reduction of greenhouse gas.



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Thailand

GPP Plan and Pilot project of Refrigeration and Air Conditioning for Climate Change Mitigation in Thailand

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

Thailand government intend to reduce its GHG emission by 20% from the projected business-as usual (BAU) level by 2030. The level of contribution could increase up to 25% subject to adequate and enhanced access to technology development and transfer, financial resources, and capacity building support. Currently, a long-term Greenhouse Gas Emission Development Strategy is being elaborated to help reach carbon neutrality, has announced several major policies aiming at increasing climate ambition and sustainable development in recent years.

National Climate Change Master Plan (2015-2050)

National Climate Change Master plan (2015-2050) is designed to help Thailand achieve sustainable low carbon growth and climate change resilience by 2050. Main Purposes of the Master Plan are:

- To provide a long-term national framework for climate change adaptation and low carbon growth promotion according to sustainability development principle;
- To provide a policy framework for the development of mechanisms and tools, at sectoral and national level, to achieve effective resolutions for climate change.
- To provide government agencies and relevant organizations with a framework for detailed action plans; facilitating awareness and mutual understanding by means of a common framework of reference points, thereby increasing integration and reducing redundant processes.
- To provide budgeting agencies with a clear framework for budget allocation, thus enabling the mobilization of concrete climate change resolutions.

For the master plan there are some parts the GPP can be involved such as:

- Encourage business operators to develop and adopt appropriate standards by rewarding compliance with incentives and privileges, such as Green Procurement listing, international trade promotion privileges, and Payment for Ecosystem Services (PES) to support the protection and restoration of ecosystems for sustainable tourism.
- Green procurement in commercial building, focusing on the shift to energy-saving equipment to promote green building with emphasis on green design and the sourcing of energy efficient and eco-friendly materials.
- Mandate carbon footprint labelling of major commercial products to provide consumers with information for their decision-making and as selection criteria of green products and services for green procurement.
- Stipulate the minimum ratio of green procurement for government and business sectors with clear pre-qualifications and capacity, such as companies listed on the Stock Exchange of Thailand.

Sustainable Consumption and Production Roadmap (2017-2036)

Sustainable Consumption and Production Roadmap (2017-2036) announced by Ministry of Natural Resources and Environment. There are three main strategies (1) Lifting Thai society to meet the sustainable production strategy (2) Lifting Thai society to meet sustainable consumption strategy (3) Lifting Thai society to apply supported factors for sustainability strategy.

Ministerial regulations

For Producing and manufacturing there are the **Ministerial regulations “Determine the supplies that state wants to promote or support and determine how to arrange Procurement of supplies by selective and specific methods (2017)”** and the Ministerial Regulations **“Prescribing Supplies and Procurement Methods of Supplies that the Government Wants to Promote or Support (no 2) B.E. 2563 (2020)”** which set supporting requirements relate to provide supplies made or sold by Small and Medium enterprises, Domestic production promotion, and Environmentally friendly products/services. The Eco-friendly product and service will be in accordance to the list of ecofriendly products and services that the Pollution Control Department has registered. This law has determined the method of procurement of materials that are environmentally friendly in 3 cases. (1) if the product/service to be procured has only one seller or service provider; to government agencies Procurement by a specific method directly from the seller or service provider. (2) if the product/service to be procured has two or more sellers or service providers, the Agency of the state procurement by selection method. (3) If a government agency does not wish to make procurement by the method under (1) and (2), it shall use the General invitation notice.

Minister of Finance releases the Ministerial regulations. The first release in 2017 is for general procedure but 2020 is for support green product in section 7/2. However, those products shall be in the list of environmentally friendly products/services managed by Pollution Control Department.

CASE 1. GPP PLAN

Implement Overview

Office of Natural Resources and Environmental Policy and Planning (ONEP), Pollution Control Department (PCD) has been implementing green public procurement since 2005, in order to create a market for environmentally friendly products and services. The truth is that the government is one of the largest consumers that can drive manufacturers to produce environmentally friendly products. Moreover, the government can play an important role in changing consumer behavior towards environmentally friendly products and services. The first Green Procurement Promotion Plan (GPP), approved by the Cabinet on 22 January 2008, set the goal to increase government’s spending on environmentally friendly products and services from 2008 – 2011. The PCD has been assigned to implement GPP Plan with relevant ministries and stakeholders including Thai Environment Institute (TEI), National Science and Technology and Development Agency (NSTDA).

Afterward, the 2nd Green Public Procurement Plan (2013 – 2016) was approved to encourage more governmental units to implement GPP as well as to support private sector to switch to green production and to increase domestic market for green products. The Department of Environmental Quality Promotion (DEQP) has implemented public awareness campaign to change people’s behavior towards more environmentally friendly and sustainable choices. The works also include database development and knowledge sharing; green label promotion; and supporting sustainable tourism through Green Hotel Project. The Green Hotel Project is aiming to encourage hotel owners to promote environmental awareness in hotel operation such as energy savings, resource consumption and waste minimization.

Working basis and market readiness

- Industry sector: Thailand industry aims to change continually to meet sustainable production and be friendly with society and environment by setting emphasis on production process development, Green Industry certification and integrated solid waste management.
- Agriculture and food sector: Agricultural and food sector of Thailand intends to change constantly until they meet sustainable agriculture and food practices, emphasizing on reduction of climate change and prevention of pollution discharge into the environment.
- Service sector (including tourism): The purpose of tourism industry and other services in Thailand is to provide benefits for all sectors with balance based on their social and environmental carrying capacity.
- Green Public Procurement and Eco Label: All governmental sectors aim to drive and promote green products and services by enforcing government organizations to buy continually the green products and services.
- Cities and Local governments: Cities and local authorities aim to achieve sustainable city by applying resource efficiency with balance, lessening pollution discharged and living with happiness.
- Awareness raising and Education: Both organization and individual consumers concern impacts of ecosystem and environmental problems.

Applied scope

GPP criteria published in 2020: Portland and hydraulic cement, Thermal insulator, Steel bar

GPP criteria published in 2021: Brick and block, PVC pipe

Primary principles

Producing and manufacturing green building materials products based on Green label or Green Procurement criteria, which the environmental impacts have been concerned through the life cycle consideration. Moreover, the life cycle assessment also been applied to those products.

Implementation mode

Voluntary mode

Output and result

GPP products list (2021) in total are 1,385 product/services registered and from 794 trademarks. The number of building material listed in GPP by PCD are paint (280 models), Portland and hydraulic cement (6 models), Thermal insulation (18 models), PVC pipe (7 models), and Brick or blocks (6 models).

All of the previous list also being certified Green Label. Moreover, the GPP products also include construction materials that got certified Carbon footprint reduction label 31 models.

Challenge faced

GPP in Thailand facing the difficulty in the monitoring and evaluation. There is no official system for collecting the amount of green products/services procured. Only partial data were collected from the cooperating agencies.

Future prospect

To cope with the problem from GPP monitoring and evaluation, PCD incorporation with EU SWITCH Asia are outsourcing the database developer to create the national Green Directory which will be able to reach from all kind of consumers (general public and government organizations).

CASE 2. REFRIGERATION AND AIR CONDITIONING NATIONALLY APPROPRIATE MITIGATION ACTION (RAC NAMA) PROJECT

Implement Overview

Thailand Refrigeration and Air Conditioning Nationally Appropriate Mitigation Action (RAC NAMA) Project is to promote energy-efficient technologies and practices in the cooling sector in Thailand is expected to have important impacts that promote sustainable economic, environmental and societal development by the end of the NSP and beyond, including:

- Improved skills of head technicians and chief trainers in the RAC sector by facilitating training on servicing RAC equipment using natural refrigerant for at least 222 technicians/trainers;
- Improved quality of technical training by establishing at least eight training centers;
- Improved competitiveness and technical capacities of the local RAC industry;
- Raising awareness by providing at least 10,000 consumers and 500 companies with information about the benefits of RAC technologies based on natural refrigerants;
- Strengthened policy framework by adopting or amending low-carbon policies, regulations or standards in the cooling sector.

RAC NAMA is released in April 2016 to March 2021. The project is commissioned by the NAMA Facility on behalf of the German Ministry for the Environment, Nature Conservation, and Nuclear Safety and the UK's Department for Business, Energy & Industrial Strategy and implemented by GIZ with support

from Department of Alternative Energy Development and Efficiency (DEDE) and Office of Natural Resources and Environmental Policy and Planning (ONEP).

Supporting climate friendly and energy efficient cooling technologies the RAC NAMA project supports Thailand in reaching its energy saving as well as its climate targets. It supports the industry in staying competitive and will bring international climate finance to the country.

Working basis and market readiness;

The financial support for the whole demand and supply chain of refrigeration and air-conditioning (RAC) sector: consumers, producers, SMEs and testing laboratories

- Consumer Finance: Marketing and sale promotions for domestic refrigerators and air conditioners with high energy efficiency and natural refrigerants.
- Credit Line for Producers: For product development, production-line conversion and expansion toward natural refrigerants.
- Credit Line for SMEs: To encourage adoption of green commercial refrigerators, air conditioners and chillers.
- Sub-Grant for Producers: For production line conversion with proper technical support if needed.
- Sub-Grant for Training and Testing Facilities: For investment in testing equipment and training services for Thai workforce.

Applied scope

Refrigerators, air conditioners and chillers producers, consumers and testing laboratories

Primary principles

Nowadays, the use of refrigeration and air-conditioning (RAC) technologies accounts for approximately 50% of the electricity consumed in Thailand. Without effective intervention, the growing energy demand for cooling is projected to double by 2030. As the RAC sector is also one of the country's largest greenhouse gases (GHG) emitters, reducing emissions from this sector will be key to help Thailand achieve its ambitious GHG mitigation targets of 20-25% by 2030. At the same time, Thailand is an important industrial hub in the global RAC sector. To remain competitive, producers need to be well prepared to adjust to the changing requirements driven by international agreements. Consequently, their challenge will be to produce highly energy-efficient and climate-friendly technologies.

Implementation mode

Voluntary mode

Output and result

From 2016 to the present day, RAC NAMA has successfully supported Thailand's energy savings and climate change targets through the introduction of climate-friendly and energy-efficient cooling technologies. RAC NAMA has assisted ten domestic producers in moving towards the production of

cooling equipment that is both more modern and energy efficient. Through this intervention, more than 150,000 green cooling units, which are using natural refrigerants, are climate friendly and energy efficient, have been produced for the domestic and export markets, contributing to 350,000 tCO₂eq of GHG mitigation. Notably in the commercial refrigeration sector, it is projected that the cooling units will attain 90% of the domestic market reach in the next 3 years.

Challenge faced

Thailand is aiming to increase the share of natural refrigerant used in the refrigeration and air-conditioning (RAC) technologies but a series of challenges still stand in the way of this transition. With its zero-ozone depletion potential (ODP) and very low global warming potential (GWP), R290 is considered the definitive solution to environmental damage and positioned as the alternative for the next generation of refrigerants for room air conditioners. However, its use is hindered by its flammability and the resulting concerns on safety.

Future prospect

A shift away from the production and use of fluorinated refrigerants (Hydrofluorocarbons: HFCs) due to their high Global Warming Potentials (GWP), in refrigeration and air conditioning systems, supporting Thailand on its way to becoming a low-carbon society. The use of natural refrigerants is promoted, so called Green Cooling, since they are substances that exist naturally in the environment and do not harm the ozone layer. They also come with zero ozone depletion potential (ODP) and very low GW.

Key Reference

1. Thailand refrigeration and air conditioning nationally appropriate mitigation action, <https://racnama.org>
2. Pollution Control Department (PCD), <http://gp.pcd.go.th/>
3. The Thailand updated nationally determined contribution, <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs>

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Singapore

Mandatory Energy Labelling Scheme to Reduce Carbon Emission in Singapore

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

Singapore government has pledged to **reduce its Emissions Intensity (EI) by 36 percent from 2005 levels by 2030, and stabilize emissions with the aim of peaking emissions at 65 MtCO₂e around 2030.**

In order to achieve the ambitious targets under its 2030 pledge, the target of carbon reduction was decomposed into industries, key areas and quantitative targets were identified, which require concerted efforts by the government, businesses, households, and individuals.

Improve energy and carbon efficiency				
Industry	Buildings	Transport	Household	Water & Waste
<ul style="list-style-type: none"> • Increase industrial energy efficiency • Reduce non-CO₂ GHGs from industrial processes • Adopt cleaner fuels 	<ul style="list-style-type: none"> • Achieve BCA Green Mark standards for 80 per cent of buildings by 2030 • Improve energy efficiency of building tenants • Improve energy efficiency of data centres 	<ul style="list-style-type: none"> • Achieve 75 per cent use of public transport by 2030 • Encourage cycling and walking • Improve vehicle fuel efficiency 	<ul style="list-style-type: none"> • Raise Minimum Energy Performance Standards (MEPS) for household appliances and introduce MEPS for more appliances • Encourage adoption of efficient appliance models • Introduce smart home technology 	<ul style="list-style-type: none"> • Reduce plastics incineration • Improve energy efficiency in desalination and used water treatment
Reduce carbon emissions in power generation				
<ul style="list-style-type: none"> • Adopt more efficient power generation technologies • Increase deployment of solar photovoltaic systems • Increase efficiency of waste-to-energy plants 				
Develop and deploy low carbon technology				
<ul style="list-style-type: none"> • Develop Singapore's research and development capabilities • Scale and deploy technology in Singapore's test-beds and "Living Labs" 				
Encourage collective climate action				
<ul style="list-style-type: none"> • Build knowledge and awareness • Promote action on climate change • Support international cooperation 				

Among them, due to the Singapore's geographical constraints limit the extent to which alternative energy can be deployed, increasing Energy and Carbon Efficiency continue to be a key strategy to reduce its carbon emissions.

The Energy Conservation Act

Originated 2012, covers energy-intensive industrial firms, will be reviewed regularly so that it remains effective in supporting energy efficiency improvements. Energy-intensive users in the industrial sector are required to appoint an energy manager, monitor, and report energy use and GHG emissions-related information annually. They also must submit an energy efficiency improvement plan and review this plan annually.

The Energy Conservation Act (Cap. 92C) 2014 Edition

Operated on 31 May 2014, the Energy Conservation Act mandated energy efficiency requirements and energy management practices to promote energy conservation, improve energy efficiency and reduce environmental impact, and to make consequential and related amendments to certain other written laws,

Under Part III Division 1 of the Energy Conservation Act (Cap. 92C), it required:

- A person must not supply regulated goods in Singapore, on or after the effective date of the requirements prescribed under the Act, unless the goods comply with the requirements prescribed;
- Any importer and manufacturer that intends to supply any regulated goods in Singapore, on or after the effective date of those goods, must apply to the National Environment Agency (NEA) to be a registered supplier.
- The registered supplier must also register the regulated goods before supplying the goods in Singapore.

The Mandatory Energy Labelling Scheme (MELS)

Introduced in 2008 for regulated goods (i.e. **air conditioners, refrigerators, clothes dryers, TV, general lighting, 3-phase VRF air conditioners, 3-phase induction motors**) to help consumers compare the energy efficiency and make more informed purchasing decisions.

This was followed in 2011 when the **Minimum Energy Performance Standards (MEPS)** was mandated to raise the average energy efficiency of regulated goods in the market. **Minimum Energy Performance Standards (MEPS)** remove the most energy-inefficient appliance models from the market. MEPS were first introduced for air-conditioners and refrigerators in 2011 and have since been extended to clothes dryers and lamps.

To effect the above mandates, the National Environment Agency implemented the following Regulations:

- Energy Conservation (Composition of Offences) Regulations 2013;
- Energy Conservation (Exemption for regulated lamps) Order 2015;

- Energy Conservation (Prescribed regulated goods) Order 2017;
- Energy Conservation (Prescribed regulated goods) (Amendment) Order 2021;
- Energy Conservation (Regulated goods and Registered Suppliers) Regulations 2017;
- Energy Conservation (Regulated goods and Registered Suppliers) (Amendment) Regulations 2021.

The scheme is mandating the sale of regulated goods with minimal energy efficiencies and empowering consumers to make informed choices on energy efficiency will reduce power consumption nationally.

Implement Overview

All regulated goods must be labelled since the Mandatory Energy Labelling Scheme (MELS) introduced in 2008. The Minimum Energy Performance Standards (MEPS) was implemented in 2011 after which regulated goods that do not comply with the requirements are not allowed to be sold.

Appliance	MELS	MEPS
Air-Conditioners	<ul style="list-style-type: none"> • MELS implemented on 1 Jan 2008 • MELS/MEPS extended to large capacity inverter air-conditioners on 1 Sep 2013 • Revised energy rating system for MELS implemented on 1 Sep 2014 	<ul style="list-style-type: none"> • MEPS implemented on 1 Sep 2011 (old 2-tick level) • Tightened MEPS implemented on 1 Sep 2013 (old 3-tick level) • MEPS raised on 1 Sep 2016 for single- and multi-split air-conditioners (current 2-tick level) • MEPS for casement and window air-conditioners raised to 2 ticks on 1 Jan 2022 • MEPS for split-type air-conditioners raised by seven per cent (7%) within the 2-tick level on 1 Jan 2022
Refrigerators	<ul style="list-style-type: none"> • MELS implemented on 1 Jan 2008 • Revised energy rating system for MELS implemented on 1 Sep 2014 	<ul style="list-style-type: none"> • MEPS implemented on 1 Sep 2011 (old 2-tick level) • Tightened MEPS implemented on 1 Sep 2013 (old 3-tick level) • MEPS raised on 1 Dec 2017 for refrigerators with freezer and an adjusted volume of up to 300L (raised by 5%), and for all other refrigerator categories (raised by 13%) • MEPS for all refrigerators raised to 2-tick level on 1 Jan 2022
Clothes Dryers	<ul style="list-style-type: none"> • MELS implemented on 1 Apr 2009 • Revised energy rating system for MELS implemented on 1 Sep 2014 	<ul style="list-style-type: none"> • MEPS implemented on 1 Apr 2014 (old 3-tick level) • MEPS for clothes dryers raised to 2-tick on 1 Jan 2022
Televisions	<ul style="list-style-type: none"> • MELS implemented on 1 Apr 2014 	<ul style="list-style-type: none"> •
General Lighting	<ul style="list-style-type: none"> • MELS implemented on 1 Jul 2015 • MELS was extended to common CFLni, fluorescent tubes and their LED direct replacements on 1 Nov 2019 	<ul style="list-style-type: none"> • MEPS set at 1-tick level for incandescent lamps, 2-tick level for CFLi and LED lamps on 1 Jul 2015 • MEPS was raised for incandescent lamps on 1 Nov 2019

	•	• MEPS was introduced for fluorescent lamp ballasts on 1 Nov 2019
Three-Phase VRF Air-Conditioners	• MELS implemented on 1 Apr 2021	• MEPS implemented on 1 Apr 2021
Three-Phase Induction Motors		• MEPS implemented on 1 Oct 2018

Working basis and market readiness

Business and consumer outreach was conducted well before the launch of MEPS and MELS.

Applied scope

Only regulated goods that comply with the minimum efficiency requirements are allowed to be sold and these goods are required to be labelled to inform consumers of their power consumption.

Primary principles

By only allowing goods with a minimum level of energy efficiency, goods that consume high levels of energy are gradually phased out, reducing the amount of energy consumed to power these goods.

Implementation mode

Regulations are required to be promulgated.

Start time and the implementation body

MEPS was implemented in 2011 and MELS, in 2008 by the National Environment Agency

Output And Result

All regulated equipment must comply with the requirements

Challenge Faced

Goods with better energy efficiency typically cost more as they use newer and better technology.

Future Prospect

The MEPS limits are typically reduced as technology advances and more energy efficient features are introduced.

Key Reference

1. The climate action plan: take action today, for a carbon-efficient Singapore, https://www.strategygroup.gov.sg/images/PublicationImages/nccs_mitigation_fa_webview-27-06-16.pdf

2. The national environment agency about mandatory energy labelling scheme and minimum energy performance standards, <https://www.nea.gov.sg/our-services/climate-change-energy-efficiency/energy-efficiency/household-sector/about-mandatory-energy-labelling-and-minimum-energy-performance-standards>
3. Singapore's update of its first nationally determined contribution (ndc) and accompanying information, <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs>

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The Philippines

GPP Practices and Pilot Projects in Response to National Climate Change

Target in the Philippines

Policy Overview Addressing Climate Change Through Green Purchasing, Products, Production, And Lifestyles

The Philippines government commits to a projected GHG emissions reduction and avoidance of 75%, of which 2.71% is unconditional and 72.29% is conditional, representing the country's ambition for GHG mitigation for the period 2020 to 2030 for the sectors of agriculture, wastes, industry, transport, and energy. This commitment is referenced against a projected business-as-usual cumulative economy-wide emission of 3,340.3 MtCO₂e for the same period.

Climate change policy in the Philippines is institutionally well organized through the activities of the Climate Change Commission. The relevant policy are as follows:

Climate Change Act (2009)/ National Framework Strategy on Climate Change (NFSCC) (2010-2022)/National Climate Change Action Plan (2011–2028)

The Climate Change Act (Republic Act 9729) was enacted into law in 2009. The law mandates the mainstreaming climate change (CC) considerations into government policy and planning. This piece of legislation provided the foundation for the creation of the Climate Change Commission, the National Framework Strategy on Climate Change (NFSCC)(2010-2022), and the National Climate Change Action Plan (NCCAP) for 2011-2028.

The National Climate Change Action Plan(2011-2028) established the seven thematic areas of government action to address climate change, namely food security, water sufficiency, ecological and environmental stability, human security, climate-smart industries and services, sustainable energy, and knowledge and capacity development, which are pursued coherently with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction.

Philippine Green Building Code (2015)

- RE capacity to double from 4,500 MW to 9,000 MW
- energy conservation programs
- All new or refurbished hotels above 10,000 sqm need to achieve the Green Building Code standards

Renewable Energy Act (2008) and Energy Efficiency and Conservation Act (Filed 1988, approved 2019)

- Feed in tariffs
- Renewable energy equipment free of import fees and capped tax
- Standardize energy efficiency and conservation measures by regulating the use of energy efficient technologies in buildings.

The Tourism Act of 2009 and National Tourism Development Plan (2016-2022):

Provided by Republic Act 9593 or the Tourism Act of 2009, the plan is evolution from its predecessor covering the period from 2011 to 2016, with the vision to develop globally competitive, environmentally sustainable, and socially response tourism industry. The strategy are as follows:

- Improving competitive and enhancing growth;
- Pursuing sustainability and inclusive growth.

Roadmap for low-carbon and resource-efficient tourism in the Philippines

Transforming tourism to achieve sustainable Accommodation & Meetings, Incentives, Conferences, and Exhibitions (MICE) developed during the assessment phase of the Transforming Tourism Value Chains (TVC) project last 2017 to 2018.

The Roadmap has four (4) systemic solutions, namely: Sustainable Food Value Chains; Sustainable Events; Beat Pollution in tourism; Sustainable Energy.

This strategic document is designed to assist hotels and MICE establishments align with the Paris Agreement and reduce GHG emissions by 30% by 2030, also by achieving a 50% reduction in food waste, and a 30% reduction in non-renewable energy use by 2030. A supporting target is also zero untreated sewage from hotels and venues going into the sea by 2025. To reach these targets, the Roadmap has a list of recommended activities and stakeholders to involve or engage in order to implement said activities. Sustainable Procurement is one of the recommended activities under the Sustainable Food Value Chains systemic solutions and is also encompassing all other systemic solutions.

CASE 1. National Ecolabelling Programme-Green Choice Philippines (NELP-GCP)

Implement Overview

PCEPSDI is a non-stock, non-profit organization. Its main advocacy is sustainable consumption and production (SCP). PCEPSDI is the administrator of the Type 1 Ecolabelling Programme, National Ecolabelling Programme-Green Choice Philippines (NELP-GCP). NELP-GCP and green procurement are the primary strategic approach by PCEPSDI to mainstream SCP. The organization implements sectoral projects to assist the government and private sector in supporting these strategies. Through the NELPGCP and sectoral projects, the organization has developed ecolabelling criteria, industry roadmaps, sustainable procurement studies, and information campaigns to address climate change.

The NELP-GCP has developed ecolabelling criteria for high carbon-emission industries such as GCP 2006009 - Cement (first issued in 2006) and GCP PRP 2010003 - Ceramic Tile (first issued in 2010). These two criteria have included the reduction of carbon dioxide emissions as the main environmental requirement.

Aside from construction products, energy-saving functionalities were part of the requirements for computer products (GCP 2008022 - Desktop Computer, GCP 20080023 - Laptop Computer, GCP 20170024 - Computer Monitor) initially published in 2008.

In 2017, the Advanced SCP Project of GIZ Thailand initiated the development of NELP-GCP criteria to integrate climate-friendly requirements. The project reviewed existing criteria: GCP 20170024 - Computer Monitor, Record Book (GCP 20170006 - Printing and Writing Paper), GCP 20170002 – Tissue Paper Products, and developed new ones: GCP 20170035 - Plastic Furniture, and GCP 20170036- Refrigerators and Freezers.

In 2019, The Sustainable Diner Project spearheaded by the World Wide Fund for Nature-Philippines(WWF-PH) in partnership with the Philippine Center for Environmental Protection and Sustainable Development Inc., reviewed existing criteria: GCP 20190034 - Food Service Establishments.

In 2022, PCEPSDI's implementing a project, dubbed as "Sustainable Packaging Towards Marine Litter Reduction", that would promote the use of sustainable packaging by developing and piloting the National Ecolabelling Programme – Green Choice Philippines (NELP-GCP) criteria for packaging, developed a new criteria: GCP 20220037 - Packaging Products.

Output And Result

- Ecolabelling criteria for different products
 - GCP is guided by the principles of ISO 14024 (Type 1 Ecolabelling). Type 1 ecolabelling is a third-party certification, using life-cycle based criteria, and helps consumers distinguish the true environmentally sustainable products/services from greenwashed products/services
 - the criteria development of any product undergoes extensive research (market readiness study, feasibility study, comparative analysis, etc.), technical committee meetings, stakeholders consultation, and NELP-GCP board approval before any criteria could be published.
 - after publishing the approved criteria, interested parties may apply for certification (if there is criteria available for the product/s to be applied)
 - if there is no criteria yet, GCP can start developing a new criteria that will undergo the same process aforementioned.
- Awarding of the GCP Seal of Approval

Challenge Faced

Firstly, Criteria development undergoes extensive research and development, amendments and approval, as it should, before it is subjected to publication. Thus, it is slow-paced process.

Secondly, Since product certification is limited only to the available criteria present, the programme cannot cater all the products that wish to be certified immediately. A criteria development process would need to be conducted prior to awarding these products.

Future Prospect

Expanding ecolabelling criteria (or green public procurement specifications) through collaboration with other organizations.

CASE 2. TRANSFORMING TOURISM VALUE CHAINS (TVC) PROJECT

UN Environment, PCEPSDI, and the Department of Tourism have been implementing the Transforming Tourism Value Chains (TVC) Project since 2017. The Philippines is one of the pilot countries of the project. Its main goal is to reduce greenhouse gas emissions and increase resource efficiency in Hotels, MICE, and cross-cutting their food and beverage (F&B) operations.

The implementation phase of the TVC project cuts across training and webinars of sustainable topics and tools, promotion of case studies, development of research outputs and guidelines, and technical assistance in the development of a climate action plan per business.

The following documents, developed by the TVC Project, serve as a guide for the tourism sector to reduce their GHG emissions based on the roadmap:

Country Report on the Assessment of Sustainable Procurement Practices at National Level-Philippines released in 2019 served as the status report of sustainable procurement in tourism. The report identified opportunities and barriers in the implementation of sustainable procurement which are:

- adapting of international trends on procurement systems;
- increase awareness on the significance of environmental protection;
- the lack of effective coordination and collaboration of the government and other stakeholders; and
- the lack of awareness regarding green products, environmental information, knowledge, and training.

Local Market Readiness Analysis for Sustainable Procurement of Selected Products in the Philippine Hospitality Sector: Air Conditioning and Cooling Equipment, Fresh Fruits and Vegetables, and Single-use Plastic released in 2019 also shares general recommendations in the context of the procurement roadmap such as: formalize purchasing practices across the hospitality sector, develop a checklist of sustainable criteria, improve means of sustainability verification, among others.

Transforming Tourism Through Sustainable Procurement authored by UN Environment in 2019. It outlines key recommendations on how to implement sustainable procurement with complementary case studies as examples. The recommendations are:

- Working together with all relevant stakeholders along the tourism value chain is essential to maximize impact.
- Empowering travelers to drive change is critical to achieve transformation
- Capacity building initiatives towards corporate buyers and staff are required to accelerate the adoption of sustainable procurement practices

- The role of certifications and consumer information tools is key to support the adoption of sustainable procurement practices, as they guide consumers and procurers to make better choices and recognize progress made in offering more sustainable options.
- Measuring and reporting on the economic, social and environmental benefits and impacts of sustainable procurement help to understand how such practices can be best implemented to benefit businesses along the value chain.

Business case studies and business case videos to promote sustainable procurement. Further, to promote and advocate for Sustainable Procurement in the Philippines, **two (2) local case studies of Accommodation Businesses** were developed to be part of this publication.

- Daluyon Beach and Mountain Resort showcased their procurement of energy-efficient equipment following their 3R strategy: Reduce energy consumption, Replace inefficient appliances and equipment, and Redesign buildings into more self-sufficient and carbon-neutral structures.
- El Nido Resorts-Ten Knots Development Corporation, wherein they implemented procurement of local food supplies with local communities. Their strategy was to partner with the El Nido-based farmers that guarantee the business supply of at least one ton of vegetables per week. All the while, El Nido Resorts trains the local farmers and even local weavers.

Awareness Campaign on Sustainable Procurement

A six-week online awareness campaign series on sustainable procurement, “Adopting Sustainable Procurement in the Tourism Sector,” launched by the project communicated practical strategies to the target sector. Additional infographics and articles were shared with stakeholders on sustainable procurement from project reports and other sources.

Its objective is to provide recommendations and case studies of existing businesses that integrated this concept into their operations; feature the environmental impacts of **three selected product categories (air conditioners and cooling equipment, single-use plastics, and fresh fruits and vegetables)**; and advise how tourism businesses can purchase more sustainable alternatives.

The campaign's target audiences are the Purchasing, Engineering, F&B departments, or the Management, should they be interested in greening their business value chain.

Output And Result

- Driving Innovation and Food Value Chains (IFVC) Roadmap
- Resource Efficiency (RE) Tool:
 - businesses that are interested to be trained undergo capacity building programs
 - 13 hospitality businesses (as of writing) have engaged and received technical assistance on GHG monitoring using the tool
 - developed to track direct emissions, as well as indirect emissions due to electricity, food wastes, food purchases, and specific types of waste
 - monitoring of plastic purchases.

- Roadmap for low-carbon and resource-efficient tourism in the Philippines: Transforming tourism to achieve sustainable Accommodation & Meetings, Incentives, Conferences, and Exhibitions: aims to reduce GHG emissions from traditional sources of energy by 30% and reduction of food-wastes from MICE by 50% in 2030 for Four (4) Systemic Solutions:
 - Sustainable food value chains: seeks to reduce food waste by 50% by 2030
 - Sustainable Events: reduce the impact of the MICE sector by improving resource efficiency, reducing waste, and incorporating sustainability requirements in procurement
 - Beat pollution: stop untreated sewage from accommodation sector, eliminate use of SUPs, and improve solid-waste management
 - Sustainable energy: intends to increase energy-efficiency and the use of renewable energy in hotels and conference venues through government policies

Challenge Faced

- only 26% of committed establishments are actively participating (as of writing)
- only 13 out of 51 hospitality businesses who signed commitment to undergo training on RE Tool are actively participating on trainings and capacity buildings
- coordination with the businesses has been a challenge, especially in the time of the pandemic where the sector is highly affected

Future Prospect

Development of a GCP Criteria for the Accommodation and MICE Establishment (service) will serve as an additional market-incentive and recognition to project engaged establishments.

Key Reference

1. Roadmap for low-carbon and resource-efficient tourism in the Philippines: Transforming tourism to achieve sustainable Accommodation & Meetings, Incentives, Conferences, and Exhibitions, https://www.oneplanetnetwork.org/sites/default/files/transforming_tourism_through_sustainable_procurement_2019.pdf
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Part III. Complementary and Experience

The United Kingdom

The “Four Ps”: Green Public Procurement Practice toward Net Zero

Emission Target in Britain

The Britain is the first country not only identifies mid- and long-term carbon reduction target but also lead the green public procurement implementation in the world.

With the target of net zero emission by 2050, it has conducted green public procurement integrating carbon reduction requirements, enhanced the demonstration role of public departments in carbon reduction and actively guided social orientation to climate-friendly, green and low carbon consumption, through the large amount of green public procurement to advocate the green Low-carbon product production and service supply. Perhaps surprisingly, there are four pillars in play and the simple framework could be summarized as “The Four Ps”, which are Prescriptive regulation, Proper implementation, Participation of Local Government, Progressive impacts.

Prescriptive Regulation

Climate change is always the focus of British GPP policy document. From priority item to disclosing emission reduction targets, these policies have given full play to the role of GPP system in supporting climate change and “net zero emission” target.

The “**Procuring the Future -National Action Plan for Sustainable Procurement**” released by British Ministry on Environment, Food and Rural Affairs in 2006 regards climate change as a top priority for implementation of GPP.

In 2001, British Ministry on Environment, Food and Rural Affairs and Cabinet Office released the “**Green Government Commitment**” requiring public institutions including central and local governments to procure sustainable and efficient products and services to achieve comprehensive and long-term social benefits. It has identified carbon emission and reduction targets of different departments and required annual disclosure of the information on the improvement of emission, which requires reducing domestic flights, reducing carbon emissions of transport and supply chain as well as specific measures.

In June of 2021, the **National Procurement Policy Statement** was released as the program document for reform of GPP system after Leaving EU. It is applicable to all procurement bodies such as central and local governments, national health service institution and wider public departments, requiring all procurement bodies prioritizing national strategies including climate change strategy in their procurement activities. In the same month, the **Taking Account of Carbon Reduction Plans in the procurement of major government contracts** (PPN 06/21) was also released, which requiring suppliers carbon neutrality commitment before taking part in any public works with contract value exceeding 5 million pounds and making public a detailed and credible carbon reduction plan in their bidding document. This requirement has been implemented since September 30, 2021 and applicable to all central and local governments as well as non-government public institutions.

Proper Implementation

Compulsory carbon reduction requirements for procurement contract

Government Procurement Criterion is part of British procurement policy, which includes compulsory procurement criteria and prioritized procurement criteria. There are more than 60 government procurement standards for product and service such as cleaning, vehicles, household appliances, furniture, ICT, paper, textile, buildings, water consuming products, food and catering in 11 categories, which cover energy efficiency, resource efficiency, low hazard & toxicity, recycling & reuse and other general environmental performance requirements.

- For any product/service with large amount of direct and/or indirect carbon emissions such as vehicle, building, timber, ICT, electronic and electric products, which has established different requirements based on characteristics and environmental impacts of such product.
- For vehicle, it requires all central and local governments as well as relevant public institutions prioritizing zero or low emission vehicles with the average carbon emission not more than 95 g/km as of 2020. All procured vehicles in the fleet of central government since 2022 should meet 25% electrification target identified in the Government Fleet Commitment.
- For building lighting system, in addition to higher energy grade and performance factors it releases different low carbon and efficiency requirements for light source products with different power, illumination and color temperature with reference to the illumination guidance of Carbon Trust and light source guidance of Energy Saving Trust.
- For office furniture, it presents “reuse, redecorate, eco-design and timber source” requirements. Timber sources involve the impacts of forest carbon sink on climate change. The Monetary Value of Meeting Government Procurement Criteria for Office Furniture published by British Ministry of Environment, Food and Rural Affairs in 2014 indicates total environmental benefits of GPP being 49.9 million pounds, in which the economic value of carbon reduction is equivalent to 1.5 million pounds.
- For ICT and electric & electronic products, it supports government procurement with relevant energy efficiency data mainly with reference to “Energy Star” criteria.
- Systematic evaluation on carbon emissions of all processes such as transportation, circulation, trade, and production also be considered, which covers material acquisition to final product use stages in order to release general comparable carbon emission evaluation criteria for products.

Releasing the Guidelines for Disclosure of Carbon Emission Information

In view of relevant requirements of Document PPN06/21, the carbon information disclosure guidelines for carbon reduction statement of the suppliers participating GPP was also published. It included the Technical Standard for Implementation of Carbon Reduction Plan and PPN06/21 Implementation Guidelines, providing application guidance for suppliers to disclose their environmental management measures for reducing GHG emissions. It required suppliers to confirm their commitment to meeting carbon neutral target by 2050; provide the emissions from the sources included in range 1 and 2 accounting of the Greenhouse Gas Protocol as well as the emission of part of range 3; provide carbon

emission report of 6 GHGs covered in Kyoto Protocol; effective environmental management measures including the adopted specific carbon reduction measures and effective measures at the time of implementing contract in order to support the achievement of carbon neutral target by 2050; and make public carbon reduction plan on its website, which at least including the emission range, verification method and renewal frequency.

Guiding application tools

The application tools are the basic tools for guiding suppliers how to meet GPP requirements. In carbon reduction, there are mainly carbon emission verification criteria and carbon financial instruments (tools). Financial instruments include Energy Star, Carbon Label Scheme, Carbon Information Disclosure Plan, Carbon Trust, Energy Saving Trust and so on. Among them, the Carbon Label from Carbon Trust includes carbon footprint, carbon reduction series criteria and various label. Lifecycle carbon evaluation of product is carried out in accordance with (PAS2050) and Product Carbon Footprint-Quantify Requirements and Guidelines (ISO 14067); and the obtained carbon label can be used as transparent information element for identifying meeting relevant procurement requirements. These application tools offer relevant implementation approaches to enterprises going the process such as carbon verification, carbon information disclosure, adopting carbon reduction measures to carbon neutral.

Participation of Local Government

Central and local governments are working together to develop partnerships that leverage the unique position of local governments to integrate carbon reduction measures into strategic plans in areas such as health care, transport and housing, and contribute to achieving regional emission reduction targets.

As part of the UK100 network, nearly 70 local authorities have signed up to go 100% clean energy by 2050, unlocking powerful integrated local energy solutions through partnerships between public, private and community sector organizations. 13 Local Enterprise Partnerships (LEPs) have been funded in England to develop local energy strategies and obtain a low carbon energy procurement framework.

Progressive Impact

In 2011, British Ministry of Environment, Food and Rural Affairs released the “Green Government Commitment-Operation and Procurement”. It declares reduction of GHG emissions, waste and water consumption as well as sustainable procurement during 2010-2015. The procured goods and services should meet the minimum requirement of “GPP criteria”. This document also identifies the purchasing budget under 80% carbon reduction target by 2050. Statistics show that up to 2017, British central and local governments as well as public departments such as health, education and emergency service have reduced 40% carbon emissions by means of raising energy efficiency and market mechanism compared with 1990 level. During 2019~2020, the central government and its affiliated institutions have played a demonstration role in shouldering GHG reduction responsibility with 50% reduction of emissions, exceeding annual reduction target by 7% and saving about 148 million pounds.

Supply chain is a key focus of government procurement in Britain. Minimizing the overall environmental impacts of supply chain is both the core of GPP and an approach for corporate participation in market mechanism. According to 2016 statistics, carbon emissions of British National Health System (NHS) accounted for 1/3 of total carbon emissions of British public institutions; and annual carbon emission of energy consumption of supply chain and business travel was as high as 7.40 million t. In the ten years from 2006 to 2016, NHS reduced 3.6 million t carbon emission each year by means of compulsory management plan for reducing carbon emission, raising energy efficiency, increasing local energy supply and streamlining business trips, saving nearly 2 billion pounds.

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The United States

Policy Instrument for US Net-Zero Federal Procurement Target by 2050

The US federal government is the single largest purchaser in the world spending more than \$650 billion on products and services each year and, in leading by example, has the power to catalyze a more sustainable marketplace for all - reducing climate impacts, improving the health of frontline communities, preventing pollution, and increasing US industry competitiveness.

On December 8th, 2021, the **Executive Order 14057** on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability issued by US government, accompanying **Federal Sustainability Plan** (collectively referred to as "The Federal Sustainability Plan") sets out a range of ambitious goals to deliver an emissions reduction pathway of reducing US greenhouse gas emission by 50–52 percent from 2005 levels by 2030 and limiting global warming to 1.5 degrees Celsius. Among them, the sustainable public procurement target was set to achieve **net-zero emissions from Federal procurement by 2050**, together with an ambitious path of four key activities while increasing the sustainability of Federal supply chains. In order to fulfill the objective, respond the Executive Order, the EPA revised the <Framework for the Assessment of Environmental Performance Standards and Ecolabels for Federal Purchasing> and released the <Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing> to carry out.

Federal Sustainability Plan

Base on target of net-zero emissions from Federal procurement by 2050 set in the <Federal Sustainability Plan>, there are four key activities specified:

- **Require major Federal suppliers to publicly disclose emissions and set reduction targets.**
Major Federal contractors will publicly report their annual corporate-level GHG emissions and set targets to reduce them. Major contractors will also disclose climate risks and vulnerabilities that may affect their future economic stability or their ability to deliver goods and services that are critical to Federal agency missions. These requirements will improve the resilience of Federal supply chains to increasing climate risks, strengthen the competitive position of American companies, and help to reduce contract costs through increased efficiency.
- **Launch a Buy Clean initiative for low-carbon materials.**
Production of high-volume materials associated with the construction of buildings and infrastructure, especially concrete and steel, is a major source of global GHG emissions. Reducing these emissions, referred to as "embodied" emissions because they are emitted during the manufacture of purchased products, is a critical piece of reducing emissions in the Federal supply chain.
- **Change Federal procurement rules to minimize the risk of climate change, including factoring in the social cost of GHG (SC-GHG) in procurement decisions.**

Agencies are already required to consider the lifecycle cost of alternatives in procurement decisions. Strengthening lifecycle cost approaches, where feasible and applicable, to include the SC-GHG—the incremental future economic damages caused by each ton of carbon pollution—can be a valuable tool to guide agencies toward investments that are compatible with the low-carbon economy of the future. Calculating and applying SC-GHG in procurements is an emerging field, which the Administration will advance through an iterative, whole-of-government approach that includes agency-level pilots.

- **Maximize the procurement of sustainable products and services.**

The Federal Government will maximize procurement of sustainable products and services, including ENERGY STAR rated equipment; products that are bio-based, made from recycled content, water-efficient, fuel-efficient, made with safer chemical ingredients, and non-ozone-depleting; and products that have earned third-party ecolabels reviewed and recommended by the Environmental Protection Agency. Additionally, agencies should avoid the procurement of products containing perfluoroalkyl or polyfluoroalkyl substances (PFAS).

- **Establish the Net-Zero Emissions Procurement Federal Leaders Working Group, including a Buy Clean Task Force, to drive strategy and implementation.**

The Working Group will provide semiannual reports to the National Climate Task Force on actions, findings, and progress toward governmentwide goals.

Executive Order 14057

The sustainable acquisition and procurement elements are specified required in relevant items which is as follows:

- Agencies shall reduce emissions, promote environmental stewardship, support resilient supply chains, drive innovation, and incentivize markets for sustainable products and services by prioritizing products that can be reused, refurbished, or recycled;
- maximizing environmental benefits and cost savings through use of full lifecycle cost methodologies; purchasing products that contain recycled content, are biobased, or are energy and water efficient, in accordance with relevant statutory requirements;
- and, to the maximum extent practicable, purchasing sustainable products and services identified or recommended by the Environmental Protection Agency (EPA).
- consider establishing Federal food procurement policies to reduce associated greenhouse gas emissions and drive sustainability in the Federal food supply chain.

EPP Recommendations

<Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing> is the key component of the Environmentally Preferable Purchasing (EPP) Program, help federal purchasers identify and procure environmentally preferable products and services.

The Recommendations leverage private sector approaches to defining and measuring sustainability by including over 40 private sector standards/ecolabels in 30 purchase categories. The Recommendations

give preference to multi-attribute/life-cycle based standards/ecolabels that address key impact areas (aka hotspots) and where product conformance is determined by a competent third-party certification body.

The Recommendations supported multiple administration priorities, currently Standards and ecolabels recommended and influenced by EPA incentivize focus on the climate change impact reductions, chemical safety, circular economy, and environmental justice. For the climate change impact reductions perspective, specified in high impact sectors such as renewable energy use and energy efficiency in supply chains, lower global warming potential process chemicals, greener transport/shipping.

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Part IV. Conclusions

Conclusions

This survey report had three rather expansive goals. First, it provided a new outlook of environmentally friendly products and green purchasing in response to climate change, although these are dispatched in dots or lines, which allows us to aggregate them into several distinct phenomena while still considering their collective impact on climate change. Second, it presented facts that shows how environmentally friendly products and green purchasing has and is being contributed over time and its relationship to the climate change priority. Third, it found out a casual model to explain in public sector how successful the green procurement helps to achievement national zero carbon emission target. In short, this survey report aimed to respond to clear gaps in existing work by providing fresh and much needed facts and further refining in the future for more in-depth analysis and theoretical accounts.

Moreover, there were three basic conclusions for the survey. First, Sustainable public procurement was recognized as a powerful tool to guide market transformation and achieve sustainable consumption and production. The awareness of using government green procurement system to promote climate change goals has been gradually increased, but the government green procurement policy system integrating climate change goals has not yet been fully developed. Although there were many forms of sustainable public procurement policies in the world, including green procurement law, procurement directive, procurement planning, procurement policy, action plan, procurement regulation, political commitment, quantitative targets, etc.

Second, policy implementation was essential to facilitate. Labeling, standard and guidelines have played main content in advancing to achieve national climate target. For example, the Eco-labeling program, the Energy Efficiency Labeling systems, and so on. These included practices in Singapore, Thailand, the Philippines, and China. However, inefficient method of data collections and lack of measurement tools were the predominate obstacles faced in the implementation stage.

Third, several countries have begun to experiment in the private sector, including Thailand and the Philippines, through foundations or other cooperative funds, with some success in supply-chain response to climate change in the refrigeration industry in the tourism sector This also created opportunities in the private sector to encourage companies to engage in carbon reduction and green procurement practices and play a role in the global response to climate change.

Of course, there were some limits for what this survey did. The main contribution of the survey was mostly from members of the International Green Purchasing Network, which account for empirically informed facts based on ecolabels, green public procurement, and green purchasing. Science proved that climate change has been long- standing issue along with the human economic and social development, the unsustainable consumption and production pattern result in the deterioration of global climate change crisis. Green purchasing, with its mission to facilitate Sustainable Consumption and Production, should become the essential approach to advocate global carbon reduction and carbon neutral movement. Thus, timely integrated green purchasing into addressing climate change mechanism as main stream to achieve national climate change target will be required.

The promising point was, from the view of the Green Purchasing Networks, the rosy picture existed there that more and more countries and areas had realized the increasing critical role to address the environmental crises of climate change by shifting to sustainable consumption and production patterns, which drive the government turn to plan the policies, formulate strategies, and carry out real actions on the track. In sum, this survey report engaged primarily to track the stock in view of years progresses on what green purchasing had contributed to achieve climate target, help to identify the barriers and challenges in implementation, encourage to formulate feasible problem-solving approaches, synergize the development of sustainable consumption and production response to climate change accordingly.

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CEC is engaged in China Environmental Labelling Program, strive to advocate China green public procurement development. On doing this, CEC holds the secretariat of International Green Purchasing Network (IGPN) since 2018, works as UNEP one planet network sustainable public procurement program co-leads implementation entity since 2019, proactively contribute the implementation of sustainable public procurement globally.

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