

CURBING CARBON FROM CONSUMPTION

THE ROLE OF GREEN PUBLIC PROCUREMENT



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Executive Summary

Because public entities exercise large-scale purchasing power in contracts for goods, services, and construction of infrastructure, policies prioritizing environmentally and socially responsible purchasing can drive markets in the direction of sustainability. In fact, public procurement accounts for an average of 12 percent of GDP in OECD countries, and up to 30 percent of GDP in many developing countries. Significant GHG emissions are attributable to products and services that are commonly procured by governments, for example, large infrastructure such as roads, buildings and railways; public transport; and energy.

The European Commission defines green public procurement (GPP) as "...a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured".

A wide range of countries around the world practice some form of GPP to promote products and materials that are more environmentally friendly and have lower energy or carbon footprint. This report looks at 30 of those programs, 22 of which are countries in Asia, Europe, North and South America, Africa, and Oceania, and five case-studies at the city and regional level, as well as GPP programs of three multi-lateral banks and the UN to promote sustainable production and consumption. Fifteen of the countries we reviewed are among the top 20 GHG-emitting nations. The GPP programs included in this study are at country-, state-, region-, or city- level.

Although GPP programs vary in the numbers of types of products and services covered, most aim to address a range of environmental concerns from mitigating climate change, reducing GHG emissions, and promoting energy efficiency to protecting soil, water, biodiversity and health. Some GPP programs include social criteria, such as giving preference to small businesses in a percentage of contracts awarded.

A large number of GPP programs rely on in-country, international, or independent eco-labels or other certification schemes such as environmental product declarations (EPDs) to establish the products and services that are eligible to be procured under GPP policies. A popular method of assessing the sustainability of products and services is life-cycle analysis, which examines the environmental impact of a product over its entire lifetime from production through transport, use, and disposal. Training in evaluating life-cycle cost offers procurers a means of weighing environmental benefits in lieu of using the traditional approach of simply awarding public contracts to the lowest bidder.

While there is lack of robust monitoring systems in many countries, those countries that do monitor and quantify GPP program impacts report that implementation of the programs is followed by significant decreases in (embodied) CO₂ emissions and increases in numbers of green products procured and contracts awarded to small enterprises where the latter is part of the GPP criteria.

The foremost recommendation for using the power of public purchasing to foster sustainability is that all countries that do not currently have a GPP program should develop one. Countries that already have GPP programs in place can apply international best practices to improve their programs. Based on this study, we identified GPP program in The Netherlands as one of the world's best practices especially related to GHG reduction from construction materials (cement, steel, etc.). Other GPP best practices are represented by the European Commission's voluntary GPP program, the Flemish government's GPP program, and Japan's GPP program.

Table of Contents

Executive Summary	2
1. Introduction	4
2. International Green Public Procurement Programs	6
2.1. Asia	6
2.1.1. China	6
2.1.2. India	9
2.1.3. Japan	12
2.1.4. South Korea	15
2.2. Europe	19
2.2.1. European Union	19
Case study: European Commission's voluntary GPP criteria for roads	21
2.2.2. Austria	23
Case Study: Vienna's ÖkoKauf (EcoBuy)	26
2.2.3. Denmark	27
Case-study: GPP in Copenhagen	29
2.2.4. Finland	30
2.2.5. France	32
2.2.6. Germany	34
Case Study: Flemish government's GPP for materials used in building renovations	37
2.2.7. Italy	39
2.2.8. The Netherlands	43
2.2.9. Russia	47
2.2.10. United Kingdom	49
Case Study: Procurement for London 2012 Olympic and Paralympic Games	52
2.2.11. Norway	53
2.3. North America	57
2.3.1. Canada	57
2.3.2. Mexico	60
2.3.3. United States of America	63
Case Study: Buy Clean California	67
2.4. South America	69
2.4.1. Argentina	69
2.4.2. Brazil	71
2.5. Africa and Oceania	76
2.5.1. South Africa	76
2.5.2. Australia	78
2.6. Multilateral development banks and United Nations	82
2.6.1. World Bank Green Procurement Practices	82
2.6.2. Asian Development Bank Green Procurement Practices	83
2.6.3. United Nations' Green Procurement Practices	83
3. Barriers to Green Public Procurement	85
4. Summary and Policy Recommendations	89
References	91
List of Acronyms	101

1 Introduction

Public procurement wields enormous purchasing power, accounting for an average of 12 percent of gross domestic product (GDP) in Organization for Economic Cooperation and Development (OECD) countries, and up to 30 percent of GDP in many developing countries (UNEP 2017a). In the European Union (EU), public procurement accounts for an estimated 19% of GDP (2.3 trillion Euros annually) (Interreg Europe 2018). When public entities leverage their large-scale purchasing power by buying sustainable goods and services, they help drive markets in the direction of sustainability, reduce the negative impacts of their use of goods, and produce positive environmental and social benefits (UNEP 2017a).

The products that governments tend to procure (for example, large infrastructure such as roads, buildings and railways; and resources for services such as public transport and energy), account for a large percentage of carbon dioxide (CO₂) emissions. The construction sector alone accounts for 35% of CO₂ emissions in Europe, with a large part of these emissions attributable to construction materials such as cement, steel, and asphalt. In particular, cement and steel production each account for around 6% of global CO₂ emissions (BAX & Company 2019). Not all construction included in these statistics is carried out by public entities, but government construction projects tend to be large scale, so green public procurement (GPP) policies can have a substantial impact on reducing the emissions associated with construction.

The European Commission, in its communication entitled “public procurement for a better environment,” defines GPP as “...a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured” (Interreg Europe 2018).

GPP’s potential has been increasingly recognized both nationally and internationally. The United Nations (UN) also highlighted the importance of public procurement in its sustainable development goals, specifically goal 12 on sustainable consumption and production (Interreg Europe 2018).

Many governments around the world have already recognized GPP’s value as a policy instrument and are trying to leverage the money they invest in large contracts to achieve green goals. Examples of GPP practices include encouraging reducing cement use or embodied CO₂ in cement (rather than those that would have to be transported from elsewhere) in large infrastructure projects. To realize GPP’s potential, policy frameworks such as the European Commitment to Green Public Procurement have been developed (BAX & Company 2019).

In this report, we summarize GPP programs in 22 countries, 15 of which are among the top 20 greenhouse-gas (GHG)-emitting nations. We use a standardized format to describe the GPP programs in for each country so that the programs can easily be compared to one another. The topics addressed for each country's GPP program are:

- Laws, regulations, and policies associated with GPP
- Government agencies and authorities in charge of the GPP program
- Program goals and targets
- Institutions targeted
- Products and categories included in the GPP program
- Government agencies subject to the GPP policies
- Environmental concerns addressed by the GPP policies
- Environmental criteria/standards applied in the GPP program
- Monitoring of program performance
- Tools to aid GPP

We provide references and weblinks where more information is available on the above topics.

In addition to describing national GPP programs, the report describes GPP practices of the EU, multilateral development banks, and the UN.

2.1. Asia

The subsections below describe GPP programs in China, India, Japan, and South Korea.

2.1.1. China

Laws, Regulations, and Policies

The Bidding Law of 1999 initiated China's public procurement processes (Qiao & Wang 2011). GPP began with the Government Procurement Law of 2003, which obligates the government to prioritize environmentally friendly and resource-efficient products (UNEP 2017b). Following the 2003 law, several specific GPP policies were adopted (Qiao & Wang 2011; IISD 2015a; UNEP 2017b):

- In 2004, the Ministerial Regulation for Implementation of Government Procurement for Energy Conservation Products (ECPs) was issued by the Ministry of Finance (MOF) and National Development and Reform Commission (NDRC). This regulation establishes preference for ECPs in government procurement.
- In 2006, the MOF and the Ministry of Environmental Protection (MEP) jointly issued a list of products meeting the requirements for inclusion on China's "environmental labeling products" (ELP) list. The list was for use in government procurement, in accord with the policy entitled "Recommendations on the Implementation of Environmental Labeling Products in Government Procurement" (IISD 2015b, UNEP 2017a, UNEP 2017b).
- In 2007, the Regulation on Compulsory Government Procurement for Energy Conservation Products made it mandatory for government agencies to procure ECPs such as air conditioners, fluorescent lamps, televisions, electric heaters, computers, printers, monitors, urinals, and water faucets (Qiao & Wang 2011, UNEP 2017b).
- In 2008, the Energy Conservation Law established that institutions and organizations that use public funds for procurement should give preference to ECPs (Qiao & Wang 2011, Zhu & Geng 2013).
- In 2009, the Promotion of a Circular Economy Law granted preferential procurement status to products that save energy, water, or materials, or are environmentally friendly or renewable (UNEP 2017a).
- In 2010, MEP began certifying low-carbon-products based on environmental labeling standards for low-carbon products (Zhu & Geng 2013).

GPP was also included in the 12th and 13th Five-Year Plans for National Economic and Social Development of the People's Republic of China (Qiao & Wang 2011; Zhu, Geng, & Sarkis 2013; IISD 2015a).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The key agencies and authorities responsible for GPP in China are (IISD 2015a; UNEP 2017b; UNEP 2017a):

- The Ministry of Finance (MOF) is responsible for developing a centralized purchasing catalog and implementing the ECP and ELP lists.
- The Ministry of Environmental Protection (MEP) is the administrative agency for the China Environmental Labeling Program. This ministry owns the China Environmental Labeling logo and approves and issues environmental labeling standards.
- The National Development and Reform Commission (NDRC) supervises the activities of all government agencies and state-owned enterprises related to government procurement and bidding laws. With MOF, NDRC also manages and publishes the ECP list.
- Government Procurement Centers coordinate and implement green procurement for ECPs and ELPs in accord with the latest procurement lists.
- The China Quality Certification Centre is responsible for implementing the Energy Conservation Certification Scheme and, with NDRC, for developing the ECP list.
- The China Environmental United Certification Centre is responsible for developing certification schemes and, with MEP, the ELP list.
- The Environmental Development Centre is the main institution responsible for developing the China Environmental Labeling standards and the supervising institution for awarding the China Environmental Labeling logo.

Program Goals and Targets

No quantitative GPP targets have been established at the national level (UNEP 2017a,b).

Environmental Concerns Addressed by Policy

China's GPP program prioritizes the following environmental and related goals: reducing air pollution, mitigating climate change, conserving energy, reducing hazardous substance use, protecting human health, protecting local environmental conditions, protecting natural resources, using resources efficiently, protecting soil, minimizing waste, conserving water, and reducing water pollution (UNEP 2017a).

Agencies and Institutions Targeted by / Subject to Policy

GPP applies to all national, state/regional, and local public authorities. Central government institutions formulate the policy framework, and sub-central government entities procure supplies and services in accord with the policies. All central government agencies are required to procure the products identified in the nine categories on the ECP list. Products in other categories can be voluntarily procured from the ECP or ELP list (UNEP 2017b). In addition to governmental agencies at all levels, institutions and organizations that use public funds for procurement are required to prioritize purchasing products on China's ELP and ECP lists (APRSCP 2014; IISD 2015a).



Products and Categories included in Program

Compared to other countries globally, China has the largest total number of products certified for GPP – more than 93,000 products in 44 categories. Key products and categories include (APEC 2013; UNEP 2017a):

- Construction, maintenance, and renovation of public buildings (water, building materials)
- Office products (printers, photocopiers, monitors and screens, light bulbs/light tubes, personal computers and laptops, refrigerators, water heaters/coolers/dispensers, projectors)
- Office supplies (ink and toner cartridges, standard batteries)
- Office paper
- Office furniture (desks/ bookcases, chairs)
- Transport (official vehicles; lightweight cars <2,5Tn, medium-weight cars)

Product / Service Eligibility for Green Public Procurement

The China Standard Certification Centre launched China's energy conservation certification in 1998. The scheme now covers approximately 120 products, including household appliances, office and information technology, industrial equipment, commercial products, and other related products such as water-using products and windows. Energy-conserving products fall into two groups: those for which there are national energy-efficiency standards and those for which there are no national standards.

The China Environmental United Certification Center manages the certification scheme for environmental labeling of products. This scheme, started in 1994, is supported by MEP and now covers 91 product categories. The ELP categories differ from those for energy conservation certification. However, some cross-cutting appliances and office equipment such as air conditioners, faxes, and compact fluorescent lamps are covered by both certification schemes. Environmental labeling certification focuses on building materials and furniture that might contain toxins harmful to human health. The environmental label standards include energy-efficiency requirements for energy-using products; these requirements are the same as those of the national energy conservation certification, which is the certification needed for products to be on ECP list (Hu & Yi 2014).

Monitoring and Measures of Program Success

The Chinese government is in the process of establishing a monitoring system to ensure the promotion and successful implementation of GPP (UNEP 2017b). To date, there is no standardized protocol for evaluating and reporting on the success of the GPP program.

One statistical indicator of GPP uptake by target institutions is that in 2013, 29 percent of all national-level public procurement followed China's GPP regulations (China Green Purchasing Network 2014). Of that, 80 percent was procurement of energy-efficient and environmental labeling products. In 2012, 80 percent of provincial-level expenditures were on energy- and water-conservation products. In wealthier provinces, which tend to more effectively apply green procurement practices, 87 percent of procurement expenditures were for these types of products (Hu & Yi 2014).

In terms of market impacts, the introduction of the ELP and ECP policies appears to have contributed to a significant increase in the number of companies manufacturing certifiable products (UNEP 2017b).

Measuring GPP's success in terms of total amount of public procurement dollars spent, we see 14% (165 billion renminbi) of total governmental procurement expenditures in 2011 were on green products and services (APEC 2013).

Tools to Aid Green Public Procurement

China's ECP and ELP lists are effective tools for implementing GPP. MOF publishes these lists at www.mof.gov.cn, MEP at www.mep.gov.cn, the Centre for China Government Procurement at www.ccgp.gov.cn, and the China Green Procurement Net at www.cgpn.org. Lists can be downloaded by procurers as well as by the public (OECD 2015).

2.1.2. India

Laws, Regulations, and Policies

There does not appear to be any legislation in India specifically regarding central government procurement. Various government departments and public entities at the central and local levels follow general financial rules (GFRs), which are a set of guiding regulatory principles for public procurement. Based on currently applicable GFRs, the fundamental principles underlying public procurement are efficiency, economy, transparency, and promotion of competition. However, GFRs and existing state laws do not deal directly with GPP.



In 2011, India's Ministry of Environment and Forests formed a committee to develop GPP guidelines. The committee recommended legislation and an institutional arrangement to encourage the central government to procure more green products and services. A year later, the Government of India introduced Draft Public Procurement Bill-2012, which states that the evaluation criteria for procurement may include: (a) price; (b) the cost of operating, maintaining, and repairing goods or works; and (c) the characteristics of the object being procured, such as the functional and environmental attributes (UNEP 2013, Kumar 2014).

In 2012, the Ministry of Micro, Small, and Medium Enterprises (MSME) passed an executive order stating that every central government ministry, department, and public sector unit (PSU) must procure a minimum of 20 percent of its goods and services from micro and small enterprises (MSE). Although this order does not mandate GPP, it sets a precedent for preferential purchasing practices that could be similarly formulated to target environmentally preferable products (GOI 2011, TERI 2013, Modak 2016). The National Environment Policy of 2006 calls for encouraging adoption of environmental management systems through preferential government purchasing of goods that meet International Standards Organization (ISO) standard 14000 for goods and services (CII-ITCO 2008; UNEP 2013).

Finally, in 2018, a Task Force on Sustainable Public Procurement was created with the following scope of work (MoF 2018):

- Review international best GPP practices
- Inventory the current status of GPP across government organizations in India
- Prepare a draft sustainable procurement action plan
- Recommend an initial set of product/service categories (and specifications) for which GPP can be implemented

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Sustainable Procurement Task Force members include joint secretaries, directors general, or other representatives from the following entities: Confederation of Indian Industry (CII), Department of Expenditure, Ministry of Finance, Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Railways (MoR), Bureau of Indian Standards, Bureau of Electrical Energy, Dedicated Freight Corridor Corporation of India, and the Public Procurement Division (MoF 2018).

Program Goals and Targets

The target set in the MSME policy was for all central government ministries, departments, and central public-sector undertakings to purchase a minimum of 20% of their annual value of products and services from MSMEs – either directly or through subcontracts – by 2015-16. Of this amount 20% (i.e., 4% overall) was to come from MSMEs owned by scheduled castes or tribes. To reach this objective, organizations were required to set an annual target of procurement from MSMEs from financial year 2012-13 onward until the overall 20% was achieved by 2015-16, in which year the objective became mandatory. Organizations were also required to prepare annual plans for procurement from MSMEs and to make those plans available on the relevant public-administration websites so that MSMEs could obtain advance information (UNEP 2016).

Environmental Concerns Addressed by Policy

The environmental aspects of products that are addressed by the MSME policy are: energy efficiency, GHG emissions reduction, re-use or recycling, energy conservation, reduction in use of hazardous substances, protection of local environmental conditions and biodiversity, efficient waste disposal, and resource recovery (Modak 2017).

Agencies and Institutions Targeted by/Subject to Policy

All central Indian government ministries, departments, and central public-sector undertakings are be subject to the recommendations of the Sustainable Public Procurement task force mentioned above (UNEP 2016).

Local governments, ministries, and government departments India have undertaken GPP initiatives, such as compact fluorescent lighting (CFL) programs. For example, Indian Railways undertook a unique initiative in 2008 to reduce peak lighting loads in its residential quarters by replacing incandescent lamps with energy-efficient CFLs. The project team used life-cycle costing to demonstrate the potential benefits of using CFLs over incandescent lamps even though the up-front purchase price of a CFL in India at that time was approximately five or six times greater than that of an incandescent light (OECD 2015).

The above initiatives do not form a coherent GPP strategy, however (CII 2012). Some public-sector entities have started internalizing environmental and energy-efficiency criteria in their procurement decisions. For instance, Indian Railways, Bharat Heavy Electricals Limited, National Thermal Power Corporation, and Indian Oil Corporation are promoting sustainable, decentralized procurement at specific project sites with a focus on procuring small-scale energy-conserving equipment. However, these efforts have been undertaken in isolation and have not been replicated or scaled up across organizations, sectors, or government agencies (Modak P. 2014).

Products and Categories included in Program

Six product categories are covered in the work of the Sustainable Public Procurement task force: public works (brick, steel, cement), electrical appliances, information technology (computers & peripherals, photocopiers, telecom), pharmaceuticals (bulk drugs), paper, office furniture, and lighting. These products are mainly characterized by their environmental impact (from production, use, or disposal), volumes in use, and significant share of public spending (IISD 2012).

Product / Service Eligibility for Green Public Procurement

In 1991, India launched a voluntary eco-labeling scheme called Eco-Mark that focused on both environmental and product quality criteria (CII 2012). Ecolabels and environmental standards are not commonly considered as part of public procurement of products, works, and services in India's public sector, and the Eco-Mark label has so far not been widely adopted by manufacturers or buyers (UNEP 2013).

Monitoring / Measures of Program Success

Public procurement in India has been estimated to constitute about 30 percent GDP. Because there is no centralized GPP program, there are no estimates of the extent or impact of GPP. Each government organization is responsible for setting its own targets and monitoring systems related to compliance with the Ministry of MSME's policy on procurement from MSMEs (UNEP 2016). No published information was found about these internal agency processes.

2.1.3. Japan

Laws, Regulations, and Policies

Japan is the pioneer, both in Asia and world, in developing a GPP framework. Japan's policies and regulations to promote and implement GPP have been in place since the late 1980s (UNEP 2017b), starting with the Eco Mark environmental labeling program (Japan MOE 2016). In 1994, one local government began promoting institutional green purchasing.

The first edition of the "Basic Policy for the Promotion of Procurement of Eco-Friendly Goods and Services" (Basic Policy on Promoting Green Purchasing or Green Purchasing Law) appeared in 2001; the most recent version appeared in 2016 (MOE 2016; UNEP 2017a). The law requires that government agencies apply green purchasing criteria when procuring products in a wide array of categories (UNEP 2017b).

Japan's "Basic Policy concerning the Promotion of Contracts considering reduction of GHG Emissions by the State and Other Entities" (Basic Policy on Promoting Green Contract or Green Contract Law) was adopted in 2007 with the most recent revision in 2014 (UNEP 2017a). This law requires government agencies and public institutions to follow green contracting requirements when purchasing electric power, automobiles, energy services, or building design services.

With its focus on GHG emissions reductions, the green contracting law complements the Act on Promoting Green Purchasing (Japan MOE 2016).

Following the 2001 adoption of the Act on Promoting Green Purchasing, the market share of environmentally friendly products increased in Japan. GPP is estimated to have reduced GHG emissions by 210,000 tons of CO₂ equivalent (Japan MOE 2016).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The following organizations are responsible for or involved in GPP in Japan (UNEP 2017b; MOE 2016):

- The Ministry of the Environment (MOE) is the main government agency managing GPP; MOE also develops basic policy details, such as designating evaluation criteria and items eligible for green procurement.
- Individual government agencies and public institutions develop and implement their own procurement policies, evaluate implementation, and report performance to the Minister of the Environment.
- Certification bodies and non-governmental organizations (NGOs) provide information about certification criteria and environmentally friendly products and services for both consumers and suppliers.
- The Green Purchasing Network (GPN) is a non-profit organization established in 1996 that supports nationwide green purchasing activities, particularly by providing training and information.

Public procurement in Japan is decentralized, with each ministry or department carrying out its own activities; there is no central procurement agency managing GPP. MOE monitors decentralized GPP activities (UNEP 2017b).

Program Goals and Targets

The Act on Promoting Green Purchasing requires that each ministry's or agency's procurement policy include GPP considerations and targets. As noted above, each ministry and public agency sets its own targets for the goods and services identified in the Basic Policy on Promoting Green Purchasing (UNEP 2017a; UNEP 2017b).

Environmental Concerns Addressed by Policy

Japan's GPP policies aim to reduce air pollution, preserve biodiversity, mitigate climate change, promote clean technology and eco-innovation, conserve energy, reduce use of hazardous substances, improve health, protect local environmental conditions, reduce ozone depletion, protect natural resources, ensure resource efficiency, protect soil, minimize waste, conserve water, and reduce water pollution (UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

All central government ministries, 47 prefectural governments, and Japan's 700 cities are subject to GPP policies (UNEP 2013). GPP is mandatory for all central government and incorporated administrative agencies (UNEP 2017b; UNEP 2017a). It is voluntary for local government and local administrative agencies (UNEP 2017a). Japan has the highest percentage (70%) of agencies implementing GPP policies compared to other countries in the world (UNEP 2017b).

Products and Categories included in Program

Japan's green procurement list includes 246 items in 19 product and service categories: paper, stationery, office furniture, office machines, mobile telephones, home electronic appliances, air conditioners, water heaters, lighting, vehicles, fire extinguishers, uniforms and work clothes, interior fixtures/bedding, work gloves, other fiber products, facilities, emergency goods, public works projects, and services (UNEP,2013).

Product / Service Eligibility for Green Public Procurement

The Eco Mark labeling scheme, implemented by the Japan Environment Association, is based on ISO standards 14020 (Environmental labels and declarations - General principles) and 14024 (Environmental labels and declarations - Type I environmental labelling - Principles and procedures). Eco Mark program certification criteria differ from the evaluation criteria defined in the government's Act on Promoting Green Purchasing. The act defines criteria based on environmental concerns. Criteria are also based on the volume of GPP and the amount of money spent on public procurement by an agency. By contrast, the Eco Mark Program defines certification criteria to lead the market and drive technological development regardless of the volume of GPP (MOE 2016).

Japan has several eco-labeling schemes in addition to Eco Mark, including the Marine Eco-Label, Comprehensive Assessment System for Built Environment Efficiency, Eco-Rail Mark, Energy Saving Labeling Program of Japan, and the Japanese Agricultural Organic Standard (APRSCP 2014).

Monitoring / Measures of Program Success

Japan's GPP monitoring mechanism is well established. Monitoring takes place at the central and local government levels (UNEP 2017b).

At the central government level, each ministry and administrative agency is required to track totals of procured goods and services that fall into the categories defined in the government's basic policy as well as the ratio of eco-friendly goods to the total number of goods and services and report this information to MOE. The results are compiled and published by MOE on its website (UNEP 2017b). The purposes of this reporting are to: a) quantify the total number of designated products/services purchased (in units) and assess the evolution in overall consumption based on the data, and b) quantify the percentage of designated products that comply with GPP environmental criteria in order to evaluate progress in the level of green purchases. At the end of each fiscal year, each organization submits a standardized report to MOE. Based the reported quantities and ratios of green products purchased, MOE estimates:

- The environmental impact of GPP, based on the consumption and/or use of green products
- The share of green products on the market, based on the percentage of green products procured in each of 10 designated product groups, compared to a year-2001 baseline

Local-government monitoring is based on a questionnaire about efforts by local authorities to implement and promote GPP. Based on the data collected, MOE prepares a general report (UNEP 2017b).

Tools to Aid Green Public Procurement

GPN publishes Green Purchasing Guidelines and maintains an on-line Eco-Products Database of environmentally friendly products and services (Japan MOE 2016).

Green Purchasing Guidelines list key environmental aspects that must be considered when purchasing a product. As of March 2016, GPN had prepared green purchasing guidelines for 19 products and service categories.

The Eco-Products Database is the largest database (more than 15,000 products as of March 2016) of information about products and services and their rating under the Green Purchasing Guidelines. A number of local governments use this database. The database indicates which products meet the criteria of the Basic Policy of the Act on Promoting Green Purchasing.

2.1.4. South Korea

Laws, Regulations, and Policies

South Korea's "Act on Development and Support of Environmental Technology of 1994" established GPP and an eco-label. The 1994 law was replaced in 2011 by the "Provision for Environmental Technology and Environmental Industry" (OECD 2015; UNEP 2017b).

In addition, the 2005 "Act on Promotion of Purchase of Green Products" mandated that all government sector/offices submit to the South Korean MOE an annual green purchasing implementation plan for the current year and performance reporting for the previous year. The 2005 law required all government offices/agencies to buy eco-labeled green products and services (OECD 2015; UNEP 2017b).

The Public Procurement Service (PPS) is the central government procurement agency authorized to set up the country's public procurement infrastructure. To date, the Korean government has implemented its GPP policy as follows:

- MOE was tasked in 2005 with setting up procurement guidelines for environmentally friendly products (PPS 2009).
- A local scheme for ecological and sustainable public procurement was established in 2010 by the "Low Carbon Green Growth Law and Enforcement Decree." In addition, the Construction Law and Energy Use Rationalization Law required sustainable purchases (PPS 2009; PPS 2010).
- A "Green Product Selection Committee" was created comprising several organizations/offices, including the Ministry of Strategy and Finance and MOE, to address strategies for selecting minimum environmental standard products (PPS 2009; PPS 2010). The resulting guidelines for minimum environmental standard products were distributed to enable monitoring of the following regulations: Implementation of Energy Use Rationalization by Public Organizations, Certification of Energy-Efficiency Rating for Buildings, Order for Green Remodeling, and Notice on Designation of Green Construction materials for Direct Purchase (PPS 2010; PPS 2011).
- South Korea's on-line E-Procurement System was established (KONEPS5) (PPS 2009).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

- The Ministry of Environment (MOE) is in charge of overall management, which entails establishing laws, regulations, and master plans for promoting green purchasing and supervising the green purchases of public institutions.
- The Korea Environmental Industry and Technology Institute (KEITI) provides policy support to encourage the purchase of green products by maintaining the Green Product Information Platform, providing education and public outreach on green products, and monitoring and evaluating GPP records at the national level.
- Korean Public Procurement Services (PPS) provides KEITI's green product information to public institutions, operates an on-line procurement platform to facilitate actual purchases of green products, and delivers public institutions' green procurement records to KEITI.
- Public institutions generate annual implementation plans with voluntary green procurement targets, monitor and report green purchases to MOE, and institutionalize the green procurement system by revising municipal ordinances and establishing special contract provisions for green products (KEITI 2014; Lee H., Parasnis S. UNEP 2017a,b).

Program Goals and Targets

GPP targets are set in the Third Action Plan for the Promotion of Purchase of Green Products 2016-2020 (UNEP 2014). Each ministry and agency sets its own GPP targets and reports performance for every fiscal year to MOE (MOE and KEITI 2015).

Environmental Concerns Addressed by Policy

The environmental goals addressed by South Korea's GPP program are: decreasing use of hazardous substances, increasing use of recycled materials, saving energy, decreasing ambient noise, improving recyclability, promoting efficient use of materials, decreasing ecological toxicity, decreasing emissions of indoor and outdoor air pollutants, and protecting human health by decreasing toxic exposures.

Agencies and Institutions Targeted by/Subject to Policy

A total of 883 government and public organizations (38,000 establishments including affiliated organizations) are covered by South Korea's GPP regulations. The central government, public corporations, public educational institutions, and local governments and public institutions are obliged to submit annual GPP implementation plans and performance records (OECD 2015; UNEP 2017b).

Products and Categories included in Program

The products and categories included in the GPP program are (KEITI 2015):

- Building equipment (e.g., water heaters, air conditioners, elevators, lighting)
- Building materials (e.g., windows, floor coverings, wall panels, faucets)
- Building design and construction
- Diverse chemical products (lubricant oils, paints, fire extinguishers)
- Energy supply and energy services
- Execution of work contracts
- Food and catering services
- Furniture
- Household appliances (e.g., TVs, refrigerators, washing machines)

- Infrastructure design and construction
- Cleaning products and services
- Office information technology (e.g., computers, screens, printers)
- Office paper and stationery
- Vehicles (e.g., passenger and light duty cars/trucks, motorcycles, car-sharing services)
- Textiles (e.g., uniforms, gloves, shoes, bed sheets)
- Travel services (e.g., transport and accommodations)
- Waste collection and street cleaning services

Product / Service Eligibility for Green Public Procurement

The products and services eligible for GPP meet the criteria set by the Korea Eco-label, the criteria for the quality endorsement for reused items (Good Recycled Mark), or other environmental criteria set by MOE in consultation with the heads of the relevant ministries (UNEP 2017a).

The Korea Eco-label indicates that a product or service deemed to have relatively low emissions of environmental contaminants or lower life-cycle impacts than other similar products or services.

The Carbon Footprint Label indicates the CO₂ equivalent emissions over a product's entire life cycle from production to transportation, distribution, usage, and disposal (MOE and KEITI 2015; UNEP 2017b).

The Green Standard for Energy and Environmental Design (G-SEED) is a green building certification for the environmental performance of buildings in Korea. G-SEED covers a building's entire life cycle, from production of construction materials through design, construction, maintenance, and management to demolition (MOE and KEITI 2015; UNEP 2017b).

Green Store Certification identifies green stores that facilitate distribution of green products to consumers and that strive to improve their environmental management. This certification aims to encourage energy conservation and GHG emissions reduction among retail stores and ensure easy consumer access to green products (MOE and KEITI 2015; UNEP 2017b).

Monitoring / Measures of Program Success

In 2005, KEITI built an on-line platform, the Green Products Information System (GPIS), which publishes information about green products. GPIS is connected to the Public Procurement Services (PPS) electronic acquisition framework, so the records of green purchases made through PPS are shared with GPIS (OECD 2015).

About 60% of national green procurement data is spontaneously reported via GPIS, which minimizes the administrative burdens of both procurers and KEITI in monitoring and compiling the data. This integrated e-monitoring system was set up with cooperation among key stakeholders including PPS, MOE, and KEITI (OECD 2015; UNEP 2017b).

Having GPP data available on the MOE website and on GPIS enables easy public access as well as media coverage. The latter stimulates competition among public entities. In 2013, 96.4% of state agencies submitted their implementation plans and records, and 97.7% of the organizations reported their performance records, which were then available on these databases (OECD 2015, UNEP 2017a,b).

Total green public purchases increased significantly within a few years following the adoption of the Act on Promotion and Purchase of Green Products of 2005 and continues to increase today. KEITI evaluates annually the financial, environmental, and societal effects of GPP. To date, GPP is credited with having reduced CO₂ emissions by 3.1 million tons and creating more than 12,000 new jobs (OECD 2015).

Reduction of environmental impacts is assessed by comparing the impacts of eco-labeled products to those of conventional products. CO₂ emissions reduction impacts are calculated for 19 product groups (UNEP 2017b).

Tools to Aid Green Public Procurement

Korea's "Online E-Procurement System" (KONEPS) is a unique portal through which most centralized, direct purchases are made. KONEPS also includes an on-line shopping catalog of green products. The system provides comprehensive information on products, including applicable ecolabels and prices. Green procurement data from different agencies are aggregated through the Green Product Information Platform (Kyu Woong Ko and KEITI 2015).

2.2. Europe

The subsections below describe GPP programs in the European Union overall and the individual European nations of Austria, Denmark, Finland, France, Germany, Italy, the Netherlands, Russia, the United Kingdom (UK), and Norway.

2.2.1. European Union

Common voluntary GPP criteria have been developed for purchasers in the EU to avoid distortion of the European single market, enhance EU-wide competition, trigger new green markets, stimulate development of new environmental technologies and greener products and services, and reduce administrative burden. The EU GPP criteria are based on available scientific information and data (including eco labeling), a life-cycle approach, and stakeholder engagement. The EU criteria offer two levels of stringency: core criteria that are designed for easy application of GPP, and comprehensive criteria that encompass more ambitious requirements and/or a greater number of facets of environmental performance than are addressed by the core criteria (UNEP 2013).

The majority of EU member states have adopted a voluntary approach to GPP; however, Austria, the UK, and the Netherlands have introduced mandatory green procurement for their central governments. In France, green procurement is mandated for selected product groups. Voluntary approaches tend to be more common in decentralized countries, leaving as much autonomy as possible to the sub-central government level.

The EU has set a voluntary target of at least 50% of procurement following GPP criteria. Many countries have set their own targets, ranging from as low as 20% in Poland to less than 50% in France and Latvia to as high as 100% in the Netherlands. In some countries, green procurement's scope and targets have not been set. The actual share of GPP compared to total procurement value ranges 0% - 37% for 10 select EU countries, based on 2013 data from the TED portal.¹

A 2012 study by the European Commission found that, based on contracts signed in 2009-2010, Belgium, Denmark, the Netherlands, and Sweden were the top performers in green procurement, with green criteria applied in 40% to 60% of cases. These four were followed by a group of countries applying green procurement criteria in 20% to 40% of cases: Spain, Italy, France, the UK, Germany, Austria, Slovenia, Slovakia, and Lithuania. Countries with less than 20% green procurement were Portugal, Ireland, Poland, the Czech Republic, Finland, Slovenia, Hungary, Romania, Bulgaria, Greece, Latvia, and Estonia. On average, the percentage of purchasing cases in which GPP criteria were applied was approximately 26% across the EU (Andrea Renda et al. 2012). TED data show that green procurement was mainly applied to the purchase of education and training services, and of goods such as electrical machinery, equipment, and consumables.

¹ The TED portal provides EU procurement data. EU member states are obliged to post tenders that are above EU thresholds on the portal. Below-threshold tenders can be posted on a voluntary basis.

Table 1. Green Public Procurement as share of total public procurement in select EU countries (Andrea Renda et al. 2012)

	GPP					
Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)	Total value of procurement procedures per country (in millions)
Austria	40	3%	47€	2%	1,261	2,411€
Spain	517	8%	3,518€	18%	6,115	19,636€
France	5,320	23%	15,928€	37%	23,312	42,842€
Lativa	2	0%	5€	0%	821	1,633€
Netherlands	648	25%	1,788€	32%	2,613	5,531€
Poland	820	4%	2,096€	7%	18,584	28,159€
Portugal	17	2%	24€	0%	729	7,025€
Sweden	96	3%	64€	2%	3,039	3,025€
Slovakia	103	9%	555€	4%	1,125	12,506€
United Kingdom	1,139	27%	40,785€	29%	4,253	141,153€
Total	8,702	14%	64,810€	25%	61,852	263,921€

One 2017 study of select EU countries suggested that survey data supported the conclusion that, the closer to the core of the public sector a respondent worked, the more likely he or she was to ignore GPP. The reasons cited were the lack of information and training of staff and ineffective communication of the link between GPP and having an impact on achieving sustainability goals (SYMBI and FUNDECYT 2017).

Table 2. Shares of different products and services purchased under GPP (SYMBI and FUNDECYT 2017)

CPV Code	GPP	
Education and training services	1,191	17%
Electrical machinery, apparatus, equipment and consumables; Lighting	996	14%
Agricultural machinery	575	8%
Administration, defence and social security services	488	7%
Clothing, footwear, luggage articles and accessories	424	6%
Recreational, cultural and sporting services	378	5%
Other	2,868	41%
Total	6,920	100%

The comprehensiveness of GPP tracking and monitoring varies significantly among EU countries. In many cases, monitoring is carried out on an ad-hoc basis, for instance at the time a policy is to be re-designed. In other cases, such as in France, Latvia, the Netherlands, Sweden, Slovakia, and the UK, GPP is regularly tracked and monitored. Table 3 shows a snapshot of GPP monitoring results for seven EU countries; these data indicate how commonly GPP criteria are applied in procurement.

To increase the number of tenders that take carbon emissions into account, the EU funded the “GPP 2020” project from September 2013 to April 2016. GPP 2020 aimed to mainstream low-carbon procurement in Europe, in support of the EU’s goal of a 20% reduction in GHG emissions by 2020. The project worked with Austria, Croatia, Germany, Italy, the Netherlands, Portugal, Slovenia, and Spain to implement more than 100 low-carbon tenders and track the resulting carbon savings (GPP 2020 2016).

At the EU level, a 2014 study assessing 160 procurement procedures among relevant EU institutions and bodies showed that more than half of the procurement procedures could not be considered “green” or were only marginally so. In some cases, the EU’s core GPP criteria were very easy to meet or did not go beyond what was already required by other legislation. For the procurement of buildings, the EU GPP toolkit’s overall energy consumption standards were significantly lower than the maximum standards specified in relevant legislation. Moreover, none of the audited EU institutions had followed the recommended approach for green procurement of buildings (European Court of Auditors 2014).

Table 3. GPP monitoring results in select EU countries (SYMBI and FUNDECYT 2017)

Country	Latest available year	Institution	Monitoring Results	Methodology
Austria	2008	Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW)	<ul style="list-style-type: none"> 36% of survey respondents make use of GPP criteria “always” or “often” 64% of survey respondents make use of GPP criteria “sometimes” or “never” 	Survey
France	2013	Economic Observatory of Public Purchases (OEAP)	<ul style="list-style-type: none"> 6.7% of contracts above EUR 90,000 included an environmental clause 	Self-declaration
Latvia	2013	Procurement Monitoring Bureau (IUB)	<ul style="list-style-type: none"> 3.9% number of tender procedures with environmental requirements out of all public procurement 7.1% value of tender procedures with environmental requirements out of all public procurement 	Self-declaration
Netherlands	2013	Commissioned by the Ministry of Infrastructure and Environment	<ul style="list-style-type: none"> 59% of respondents “always” included minimum GPP criteria 31% of respondents included minimum GPP criteria “in portion of procurement” 10% of respondents “never” included minimum GPP criteria 	Survey
Poland	2014	Public procurement Office (PPO)	<ul style="list-style-type: none"> 9.25% of tender notices have a sustainable character and/or include sustainable clauses 	Analysis of tender
Portugal	2010	eSPap	<ul style="list-style-type: none"> 56% of procedures include environmental criteria, which represent over 60% of procurement value 	
Slovakia	2010	Slovak Environment Agency (SAZP) and the Ministry of Environment	<ul style="list-style-type: none"> 9.83% number of contracts which include environmental criteria 50.95% value of contracts which include environmental criteria 	Survey (Sample size 242, respondents 86)

CASE STUDY: European Commission’s voluntary GPP criteria for roads

Europe's public procurement expenditures represent about 16% of the European gross domestic product. In 2008, the European Commission recommended that a process be developed for setting common, harmonized GPP criteria across EU member states. The goal was to avoid a distortion of the single market and a reduction in EU-wide competition. In addition, harmonized criteria would minimize the administrative burden of member state governments responsible for GPP and of companies operating in more than one member state. Because GPP criteria are voluntary, member states have adopted or developed a variety of different GPP criteria.

Since the 2008 recommendation, the European Commission has developed GPP criteria for 19 product and service groups, including for roads and for office building design, construction, and management. Priority sectors for implementing GPP were selected through a multi-criteria analysis that investigated the scope for environmental improvement, scope of public expenditure potential impact on suppliers, potential for setting an example for private or corporate consumers, political sensitivity, existence of relevant and easy-to-use criteria, market availability, and economic efficiency. The GPP criteria are typically updated every couple of years (European Commission 2016).

Award criteria for road construction materials range in ambition and technical complexity as follows: 1) life-cycle assessment (LCA) criteria require bidders to evaluate the life-cycle impacts of the main road elements; 2) carbon footprint (CF) criteria require that bidders evaluate the life-cycle global warming potential (GWP) associated with the extraction, manufacturing, and transport of the materials for constructing the main road elements; 3) recycled and re-used content criteria require that bidders use materials that contain a minimum amount of recycled and/or re-used content for main road elements; 4) reduced emissions criteria for transport of heavy materials reward low CO₂-e emissions resulting from transportation of aggregates used for main road elements (European Commission 2016).

For the use of LCA or carbon footprint as a criterion for evaluating the impact of construction materials, the voluntary GPP criteria on roads stipulate that either a Bill of Materials for a reference road should be provided to bidders as a basis for comparison, or designs submitted by different bidders are to be compared during a competitive process. Points would be awarded on the basis of the lowest LCA expressed as a single score, or as the highest improvement of the road's carbon footprint. Bids must include a number of main road elements compared to a reference road or other competing designs. The calculations would have to comply with relevant ISO standards or equivalent (ISO 14040/44 for LCA and ISO 14067 for carbon footprint).

For new construction or major extensions, the criteria apply to: sub-grade structures, including earthworks and ground works; sub-base; base, binder, and surface or concrete slabs; and, optionally, to additional ancillary road elements. For maintenance and rehabilitation, the criteria apply to: base, binder, and surface or concrete slabs. The criteria also require that the successful tenderer prepare a handover document with key assumptions and results specifically including: earthworks and groundwork solutions, materials suggested for use, techniques applied, recycled or re-used content and/or by-products, CO₂-e emissions per ton of transported materials from production site to the worksite, percentage of recycling or re-use of excavated materials and construction and demolition waste on site and off site, and maintenance activities and frequency.

Additional information on the above and other criteria for roads can be found in both the background document and the procurement practice guidance document accompanying the GPP criteria for roads. Similarly, the GPP criteria suggested for the product group "office building design, construction, and management" include LCA for the main building elements, or, alternatively, aggregation of environmental product declarations, including declaring the total embodied CO₂ emissions expressed as global warming potential (European Commission 2016).

2.2.2. Austria

Laws, Regulations, and Policies

The following laws and policies lay out Austria's public procurement energy-efficiency and sustainability strategies:

- Federal Act on Public Procurement, Art. 19, 2006
- National Action Plan on Sustainable Public Procurement, 2010 Sustainability Strategy for Federal and State Governments, 2010
- Energy-Efficiency Act, 2014

Introduced in 2006, the Federal Act for Public Procurement presented Austria's first set of green procurement policies. The act requires that environmental impacts be considered in the federal procurement process and sets energy-efficiency requirements more stringent than EU thresholds for purchases by the central government.

With the goal of reducing GHG emissions, the Ministry of Finance directed that the Federal Procurement Agency, which is the country's largest public-sector purchaser, apply ecological criteria for 16 procurement categories.

In July 2010, the National Action Plan on Sustainable Procurement was developed with the aim of making GPP a key practice. The plan defines 14 product groups, 10 of which were derived from the EU's GPP guidelines (UNEP 2017a).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The following agencies oversee Austria's GPP activities (UNEP 2017a):

- The Federal Chancellery and Federal Finance Ministry are responsible for designing and coordinating the green procurement framework.
- The Federal Ministry of Sustainability and Tourism and Federal Procurement Agency are responsible for green procurement framework design and coordination and for policy implementation

Program Goals and Targets

With the recently revised National Action Plan, Austria aims to establish itself as a leader in GPP within the EU by obligating federal and subnational authorities to procure sustainable products. However, although the plan demonstrates the central government's outlook for an increasingly sustainable nation, the plan does not define any quantitative targets. The plan's general objectives, as outlined by the United Nations (UN), include: integrating sustainable public procurement as a core criterion in tenders, coordinating activities to overcome barriers to sustainable public procurement, and achieving a leading role in sustainable public procurement within the EU (UNEP 2017a).

Environmental Concerns Addressed by Policy

The environmental goals addressed by the GPP are reducing air pollution, mitigating climate change, promoting clean technology and eco innovation, reducing use of hazardous substances, protecting public health, protecting natural resources, and minimizing waste (UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

GPP is mandatory for the central government and voluntary for state, regional, and municipal governments in Austria (UNEP 2017a).

Public procurement is fairly decentralized in Austria, with responsibilities split among federal, regional, and local authorities. At the municipal level, quite a bit of joint procurement takes place through inter-municipal cooperation. At the same time, for reasons of efficiency a meaningful share of standardized purchases of goods is centralized at the Federal Procurement Agency (EC 2017). As noted above, the National Action Plan targets both federal and subnational authorities.

Because all federal procurement is managed by the Federal Procurement Agency under the Ministry of Finance, individual federal ministries do not call for tenders on their own. However, some have taken the initiative and integrated sustainable procurement into their environmental management systems (UNEP 2017a).

Products and Categories included in Program

The national plan defines green procurement guidelines for 14 categories. The 14 categories are:

1. Building materials, equipment, design, and construction
2. Chemical products
3. Energy supply and services
4. Food and catering services
5. Furniture
6. Household appliances
7. Infrastructure design and construction
8. Cleaning products and services
9. Office information technology equipment
10. Office paper and stationery
11. Vehicles
12. Textiles
13. Travel services
14. Waste collection and street cleaning services

Green procurement policies do not need to be applied to products from categories for which guidelines are not defined.

Product / Service Eligibility for Green Public Procurement

GPP criteria are modeled to some extent after the EU GPP and Ecolabels criteria and vary by product category.

The Ministry of Environment has considered a total-cost-of-ownership (TCO) approach, including environmental impacts alongside the direct and indirect costs of products. This approach has not yet been implemented. Social criteria have also been considered but have not so far been adopted (BMLFUW 2013).

Monitoring / Measures of Program Success

From 2005 to 2010, the Austrian Environment Agency analyzed GHG emissions and electricity use over time to determine the impact of procurement criteria. During those years, renewable energy sources associated with products procured went from 40% to 100%, and use of certified green electricity increased from 0 to 3%. Overall in Austria, GHG emissions from electricity consumption decreased during that time period even though electricity consumption increased (OECD 2015).

The law initially required all federal authorities subject to GPP requirements to be monitored every three years, starting in 2014. Standardized questionnaires and personal interviews were to be used to evaluate performance (BMLFUW 2013). However, the first evaluation of federal GPP has not yet been finalized, and legal restrictions allowed for only voluntary monitoring of municipalities, so very few authorities at that level have participated in evaluations. There are, therefore, no current estimates of GPP impacts from that monitoring program, and monitoring activities have been placed on hold (UNEP 2017a).

Even though the first evaluation has not been finalized, it offered two general conclusions: 1) GPP criteria are being implemented by the Federal Procurement Agency, and 2) Use of environmental requirements in tenders has increased across all organizations (OECD 2015).

A 2011 study stated that 50% of Austrian public authorities include GPP requirements in their procurement process. A 2012 survey concluded that 73% of public contracts included at least one of the EU core GPP criteria (EC 2017).

Published data from 2008, based on a telephone survey on GPP uptake by 372 procurement officials at various government levels, showed that 36% of respondents made use of GPP criteria “always” or “often,” and 64% did so “sometimes” or “never” (EC 2016c).

In Austria, public procurement represented 11% of GDP or just over 35 billion euros, with 5,600 contracting authorities involved. About 53% of public tenders still use price as the sole criterion for selecting offers (UNEP 2017a).

Tools and Activities to Aid Green Public Procurement

The Federal Procurement Agency holds an annual national conference on GPP for public procurers and offers training and relays information to other government organizations to aid procurers, decision makers, business representatives, and others who are subject to GPP guidelines. Each year about 150 people participate in GPP workshops (EC 2017b).

Although little training is offered at the regional and local levels, cooperation between national and subnational entities takes place through an on-line platform (which includes a help desk, e-mail contact information, and discussion groups) as well as an extensive on-line network of procurement officers (EC 2017b).

On-line resources to help procurers navigate GPP guidelines are:

www.nachhaltigebeschaffung.at

www.innovationspartnerschaft.at

Helpful TCO tools for information technology equipment/buildings are:

www.klimaaktiv.at/bauen-sanieren/gebaeudedeklaration/econcalc2.html

www.gpp-proca.eu/downloads/calculation-tool/

CASE STUDY: Vienna's ÖkoKauf (EcoBuy)

The city of Vienna has been pro-active in GPP since 1998 when it set up the ÖkoKauf (EcoBuy) program for procurement of green products and services. The city's public procurement expenditures amount to about 5 billion Euros annually, of which approximately 50% is spent on supplies and 50% on works and services (OECD 2014).

Since 2003, all of Vienna's institutional procurers have to comply with ÖkoKauf, integrating relevant language into their tender documents and making sure that specific GPP requirements are incorporated into contracts. As a result of the program, the city estimates that it reduces carbon dioxide emissions by about 15,000 tons and saves approximately 1,5 million Euros per year (Municipal Department MA 22 / ConPlusUltra 2014).

A complementary program, ÖkoBusiness (EcoBusiness) Vienna, supports GPP at private companies in Vienna. More than 740 local businesses have participated in the program so far, saving an estimated 55.7 million Euros in aggregated operating costs. The city's ÖkoKauf program encompasses 12 product groups, one of which covers construction projects. Each group has its own set of criteria, broken down by sub-group. Model language is provided for incorporation in tender documents (City of Vienna 2019).

To support developers in purchasing ecological construction materials, the city has developed a the "Baubook ökologisch ausschreiben" ("Construction book green procurement," available in German and English). The Baubook includes minimum criteria that must be followed and optional, stretch criteria that procurers may include (ÖkoKauf Wien 2019).

The Baubook provides procurers with a range of information:

- An extensive set of environmental criteria for building products, consisting of multiple categories, including criteria for the use of substances, production of materials, indoor air emissions, and disposal of materials
- Environmental tender specifications, which provide legally compliant, product-neutral, customizable language
- The software tool "eco2soft" (available in German and English), which allows a user to calculate the environmental life-cycle impact of construction materials, building components, and even entire buildings
- A continually updated catalog of locally available construction products that meet the eco criteria and local companies that can provide these products

The Baubook does not include specific criteria for CO₂ emissions. However, the "eco2soft" tool allows for life-cycle calculations that can compare individual building products or entire building designs for their global-warming potential, expressed as kilograms CO₂ equivalent emissions per square meter of built area. The program also includes other indicators to inform decisions about how to reduce the environmental impacts of construction procurement.

In addition to the City of Vienna's GPP Baubook platform, several other "Baubook" platforms are available. These include a regional platform and a platform specifically for the national "Klima Aktiv Haus" voluntary building standard. The voluntary building standards uses a point system with a minimum level and a level comparable to Passive House certification. There is also a platform for the Ökoindex, which is a national, environmental assessment method for building materials; it estimates a material's global warming potential, acidification potential, and the demand for non-renewable primary energy during its production. The index is applied in the certification of Klima Aktiv Haus buildings, among other uses (IBO 2019).



2.2.3. Denmark

Laws, Regulations, and Policies

Denmark has 275 municipalities, 14 counties, and more than 100 governmental institutions; the public purchase of goods and services amounts to about 19 billion Euros annually. Of this total, 19% is purchased by national institutions, 13% by regional, 23% by local, and the remaining 45% by publicly owned companies (Statistics Denmark 2001).

The existing procurement regulations in Denmark are in the form of the Danish procurement law of 2013, which is based on EU procurement directives. There are also green procurement provisions in a “circular on energy efficiency in government institutions,” 2005; and a “circular on securing sustainable wood in state agreements on supplies, services and works,” 2014 (UNEP 2017a).

Denmark’s previous government adopted the “Strategy for intelligent public procurement” in 2013, but the current government has not yet renewed the strategy, which articulates three general goals: efficiency, innovation, and sustainability (UNEP 2017a).

The Danish Ministry of Environment has also articulated a strategic focus on sustainable procurement of transportation, buildings, and food products (Open House 2012).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Ministry for Environment, the Ministry of Finance, National Procurement Ltd. – Denmark, and the State Procurement Office at the Danish Agency of Governmental Management are responsible for GPP in Denmark (EC 2016a).

Program Goals and Targets

Denmark has adopted the EU target of 50% green tendering and is aiming to further increase the share of GPP (EC 2016a,b).

Environmental Concerns Addressed by Policy

Denmark's GPP program addresses the environmental concerns of conserving energy, reducing GHG emissions, using materials efficiently, ensuring recyclability, using water efficiently, and prioritizing eco-friendly materials.

Agencies and Institutions Targeted by/Subject to Policy

All national, state/regional, and local public authorities are subject to GPP regulations (UNEP 2017a).

Products and Categories included in Program

The products and categories included in Denmark's GPP are: buildings and construction, transport, food, transport of food, timber, children's products, information technology, paper and printing, cleaning supplies, professional kitchen supplies, lighting, and textiles and textile services (SPP Regions 2015).

Product / Service Eligibility for Green Public Procurement

Mandatory environmental criteria have been incorporated into central government purchasing agreements for 20 product groups. Some Danish national GPP criteria have been developed, but, for the most part, Denmark refers procurers to the EU's GPP criteria. For timber, electricity-using products, and road transport vehicles, national procurers are obliged to follow rules or guidelines (EC 2017b) set by the Partnership for GPP in Denmark as follows (SPP Regions 2015):

Building and Construction

- By 2016, 25% of new construction was to have been least one low-energy class better than required by legislation; by 2018, 100% of new construction was to have met this requirement.
- All involved agencies must set guidelines for environmental and energy-efficient renovation.

Food

- Procurers are encouraged to purchase seasonal fruit and vegetables.
- A minimum 60% of coffee/tea and sugar procured by the central government should be organic or fair trade.
- All packages should be free of polyvinyl chloride and phthalates.
- The source of organic foods must be clearly identified.

Transport

- Cars and vans must meet the Euro 6 standard and energy label A+.
- Smart systems must be used for mapping of fleet.
- Individual fuel consumption reduction targets that have been defined must be met.

Tools to Aid Green Public Procurement

Denmark's "Responsible Purchaser" web tool evaluates products and manufacturers/suppliers based on environmental and social criteria as well as based on ethical considerations in production processes. Ethical considerations include human and labor rights, environmental protection, and anti-corruption practices (EC 2016a).

The Partnership for Green Public Procurement and the Forum for Sustainable Procurement support the implementation of GPP and sustainable procurement (EC 2016b).

Case-study: GPP in Copenhagen

The Copenhagen 2025 Climate Plan aims to make the city the world's first carbon-neutral capital by 2025. Under the plan, CO₂ emissions had been reduced by 21% in 2011, compared to 2005 emissions. GPP is a primary strategy for the achievement of five major goals for 2025, which are to (Københavns Kommune 2012):

1. Reduce energy consumption in city administration buildings by 40% compared to 2010 levels
2. Meet 2015 building code requirements in municipal buildings built before 2015, and meet 2020 building code requirements for all new buildings constructed 2015-2020
3. Power all city administration vehicles with electricity, hydrogen, or biofuel
4. Reduce energy consumption for street lighting in Copenhagen by 50% compared to 2010 levels
5. Install 60,000 square meters of solar panels on municipal buildings

The Copenhagen 2025 Climate Plan also states the intent to incorporate life-cycle costing and functional tendering into procurement. The construction sector has been identified as a key area in which to achieve the above goals and to implement new tendering processes.

By the end of 2015, 59% of municipal vehicles were to have been electric or hydrogen powered. The city aims to be the first carbon-neutral city in transport as well as a fully carbon-neutral city by 2025 (Procura Plus 2019).

As of August 2016, 88% of public-sector meals (for public offices, kindergartens, schools, etc.) were organic. The goal is 90%. The transition to organic meals aims to protect not only the environment but also the health of citizens (Procura Plus 2019).

Using a competitive-dialogue procedure, Copenhagen replaced approximately 45,000 outdoor light fixtures with light-emitting diode bulbs with smart controls, resulting in energy savings of up to 60% as well as substantially reduced maintenance costs (Procura Plus 2019).

Copenhagen's 2010 Sustainability in Construction and Civil Works document contains binding standards for construction, remodeling, renovation projects, and civil works that involve the city. These standards must be incorporated into tenders for municipal construction and civil-works projects.

The city is also actively introducing new tendering practices, including performance-based specifications and total-cost-of-ownership (TCO) criteria, particularly when procuring electronic devices/equipment and transport services. Contract clauses have been introduced requiring suppliers to give advice to product/service end users (if products are leased, for instance) regarding TCO. In its 2017-2020 roadmap, the city also recognizes the role that eco-labeled goods and services can play in procurement processes (EC 2016b)

2.2.4. Finland

Laws, Regulations, and Policies

According to Eurostat calculations, the value of public procurement in Finland in 2010 was approximately 35 billion Euros, which represents approximately 19.4% of the Finnish GDP. A majority of the procurement (nearly 75%) was by municipalities, joint municipal authorities, and other municipal organizations. The value of procurement by budget agencies and departments was a little more than 25% of all public procurement. Not all public procurement is subject to Finland's Act on Public Contracts. Exceptions include internal procurement by municipal organizations, rent paid for premises, and procurement that is critical to national security (Finland MOE 2017).

The 2007 Act on Public Contracts states that contracting authorities must try to organize their procurement procedures as economically and systematically as possible, in combinations that are as appropriate as possible, while taking environmental considerations into account. The act covers public contracts in the water, energy, transport, and postal-service sectors and prescribes a procedure called "competitive dialogue" that can be used for complex or challenging procurements. This procedure allows greater flexibility to purchase innovative solutions (Finland MOE 2017).

In addition, energy and environmental impacts must be taken into consideration in central government information technology and office equipment procurement (Regulation [EC] No. 106/2008 of the European Parliament and of the Council) as well as vehicle and transportation service procurement (Act on Consideration for the Energy and Environmental Impact of Vehicles in Public Procurement 1509/2011). In addition, the Energy-Efficiency Directive (2012/27/EU), which took effect at the end of 2012, requires that member states set energy-efficiency goals for publicly procured goods and services (UNEP 2017a; Finland MOE 2017).

Since 2009, a "government decision-in-principle" has been in effect to promote sustainable choices in public procurement. In 2013, a similar decision was made to promote sustainable environmental and energy solutions. Public procurement legislation reform is under way at the time of this writing. The new rules are expected to address social, environmental, employment, and health-related issues (UNEP 2017a).

A 2013 sustainable procurement resolution obligates the Finnish state and municipalities to consider energy-efficient and environmentally sound (cleantech) solutions in all public procurement processes (PMO 2017).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The government agencies and authorities in charge of GPP in Finland are the Ministry of Environment, Ministry of Finance, and Ministry of Employment and Economy (Temmerman & Habets 2013).

Program Goals and Targets

Targets have been set for several product areas: food and catering, vehicles and transport, construction, energy, services, energy-related products (PMO 2017).

The city of Helsinki's goals are:

- 50% of city procurement processes were to have included environmental criteria by 2015.
- 100% of the city's procurement processes will include environmental criteria by 2020.
- Environmental criteria can be either absolute requirements or selection criteria.

Environmental Concerns Addressed by Policy

The environmental aspects of products that are covered by Finland's GPP are: reducing air pollution, preserving biodiversity, mitigating climate change, fostering clean technology and eco-innovation, conserving energy, reducing use of hazardous substances, protecting natural resources, using resources efficiently, and minimizing waste (UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

GPP is mandatory for national public authorities and recommended (voluntary) for all regional and local public authorities (UNEP 2017a).

Products and Categories included in Program

Finland's GPP program covers the following products and categories: food and food services, energy-saving services, passenger cars and vans, information technology and office equipment, public transport, furniture, heating, energy production, construction and buildings, cleaning services, techno- chemical products, electricity, textiles, and lighting (MOTIVA 2019b).

Product / Service Eligibility for Green Public Procurement

EU GPP criteria are the basis for Finland's for national guidelines and criteria. A procurement guide has been developed with voluntary criteria to reduce the carbon footprint of building projects implemented with public funds under the Act on Public Procurement and Concession Contracts. Recommendations include using at least 10% re-used or recycled materials. The guide also provides information on low-carbon innovation and carbon footprints of the different phases of procurement (GBC-Finland 2015). Particular focus is placed on calculating a building's life-cycle carbon footprint, starting during the planning stages of a project (Finland MOE 2018). Finland's national Energy and Climate Strategy 2016 set the objective of reducing the carbon footprint of construction and construction products (Huttunen 2017). A 2013 government resolution recommends taking the carbon footprint of materials into consideration for public buildings (MEAE 2013). The Ministry of the Environment has launched a drafting process to incorporate the carbon footprint of construction in legislation by the mid-2020s.

Monitoring / Measures of Program Success

The following comparison and calculation methods are included in the recommended criteria for low-carbon public-building procurements (GBC-Finland 2014; GBC-Finland 2015):

- Carbon footprint calculation
- Life-cycle cost calculation
- Measurement of electricity, fuel, and district heat consumption of the construction site, and calculation of emissions
- Determination of the proportion of renewable and recycled materials
- Verification of innovation
- Correspondence of the criteria to the EC's Green Public Building criteria
- Correspondence of the criteria to the most common environmental certification systems for buildings

Responses to questionnaires circulated in 2012 and 2017 showed that about 50% of Finnish municipalities apply GPP. Most set their GPP goals at a fairly high level, but only a quarter had defined detailed GPP criteria.

Tools to Aid Green Public Procurement

Finland has set up a “centre of competence for sustainable and innovative public procurement” known as KEINO. KEINO aims to launch an accelerator for low-carbon public procurement. KEINO also intends to establish buyer groups to facilitate peer learning and knowledge transfer; mutual goal setting; and buying strategies in the fields of health care and social services, construction and energy, and transport and logistics, to support a circular economy (MOTIVA 2019 a).

The JUHILAS Carbon Footprint tool, developed by the Finnish Environment Institute (SYKE website, a) is available free of charge. Five modules are available, including information technology, paper, office chairs, and lighting. The tool calculates carbon over a product's life cycle.

In addition, the SYNERGY Carbon Footprint Tool has been developed – not specifically for GPP purposes – to calculate the carbon footprint of building structures (SYKE Website, b).

2.2.5. France

Laws, Regulations, and Policies

France's current GPP policies include the 2006 Public Procurement Code, the 2015 Ordinance n° 2015-899 concerning public procurement, and the 2016 Decree n° 2016-360 concerning public procurement (UNEP 2017a). The National Action Plan for Sustainable Public Procurement, first edition, covered the years 2007-2010; the second edition covers 2015-2020). The national action plan encompasses 52 actions intended to help top management incorporate GPP through improved procurement planning and professionalization of public procurers. This includes harmonization of training and development and provision of on-line tools and information on GPP (UNEP 2017a). The 2008 Prime Minister Circular n° 5351/SG, on the topic of the state setting an example of sustainable development in the operation of services and public facilities, is updated regularly, with the most recent version in 2015 (n° 5769 concerning the Inter-ministerial Action Plan “Exemplary Administration” for the environment 2015-2020) (EU 2014; UNEP 2017a).

The “Grenelle Roundtable on the Environment,” convened in 2007, aimed to define key points of public policy related to the environment and sustainable development. Among the commitments emerging from that process were those related to reducing energy consumption in public buildings.

Government Agencies and Authorities in Charge of Green Public Procurement Programs

Different agencies participate in implementing France’s GPP policies, which are coordinated through an inter-agency committee. The agencies involved are:

- State Procurement Direction, under the authority of the Prime Minister and the Minister of Economy and Finance, provides strategic guidelines, support, and performance monitoring.
- The Ministry of the Environment, Energy, and Sea is responsible for the environmental areas of focus in the program and the National Action Plan for Sustainable Public Procurement.
- The Ministry of Social Affairs and Health is responsible for social inclusivity.
- The Ministry of Economy and Finance oversees all state procurement with the aim of optimizing economic performance, purchases from small and medium-sized enterprises, purchases of innovative solutions, and environmental performance of products and services (UNEP 2017a).

Program Goals and Targets

The State Procurement Direction for 2020 sets the following objectives for all state buyers and agencies: 30% (in number) of purchases above 90,000 Euros must include environmental clauses, 15% (in number) of purchases above 90,000 Euros must include social responsibility clauses, 2% (in volume) of purchases must include provisions to promote innovation, and 25% (in volume) of purchases must be directed to small and medium enterprises (UNEP 2017a).

Environmental Concerns Addressed by Policy

The environmental aspects of products covered by GPP for the building and construction sector are GHG emissions and energy use (Sebi & Schleich 2018).

Agencies and Institutions Targeted by/Subject to Policy

The National Action Plan for Sustainable Public Procurement is voluntary for all national, state/regional, and local public authorities. The Inter-ministerial Action Plan for an Exemplary Administration is compulsory for national and state/regional public authorities (UNEP 2017a).

Products and Categories included in Program

Six guidebooks have been published by the Groupe (Permanent) d’Etude des Marchés Développement Durable, Environnement (GEM-DD). These guidebooks cover ecological products and services, timber and wood products, ecological paper, energy-efficient services for buildings (heating and cooling), wood as a building material, environmental characteristics of public buildings, textiles, and office cleaning.

Product / Service Eligibility for Green Public Procurement

Certification labels from NF Environment, France are used to determine eligibility of products for GPP. These labels affirm that products and services comply with national, European, and international standards and technical specifications. The requirements that must be met for a particular product or service category are specified in the corresponding NF certification document (<http://marque-nf.com/en/>), which has validated by parties from the relevant sector (NF 2019).

The French building code requires that all new buildings meet near-zero energy building (nZEB) standards (Sebi & Schleich 2018).

In November 2016, Alliance HQE-GBC, in conjunction with the French government, launched a voluntary labeling system E+C- (energy plus and low-carbon buildings) to promote energy efficiency in the buildings and construction sector to help meet the country's climate change goals. The certified E+C- label covers all energy uses during building operation, including energy consumed by occupant equipment, on-site production of renewable energy, and emissions linked to building energy demand (both operational and embodied carbon from construction and buildings equipment). The label also provides life-cycle assessment of various environmental indicators and includes GHG emissions from refrigerant leaks. The first seven E+C- labels were awarded to successful projects in France in July 2017 (UNEP & World-GBC 2017).

Monitoring / Measures of Program Success

The Action Plan for an Exemplary Administration steering committee meets annually to review the performance of each ministries in complying with the plan.

The EU began testing a new voluntary reporting framework called Level(s) in late 2017. Level(s) seeks to improve the sustainability of buildings through a common framework to measure environmental performance. The tool aims encourage life-cycle planning from the design stage through to building operation and occupation. It will also take into account other aspects related to building energy and environmental performance, ranging from health and comfort to life cycle costs and potential future risks association with a building's performance (UNEP & World-GBC 2017).

Tools to Aid Green Public Procurement

One Click LCA and Solinnen have partnered to deliver easy to use "environmental product declaration" (EPD) tools. Demand for EPDs for construction materials is growing rapidly in France and globally. Requirements for EPDs are changing as well. The European Commission has mandated a revision to EN 15804+A2, the essential EPD standard that sets new requirements for EPD tools (One Click LCA 2019).

The first EPD tool to be modernized by One Click LCA and Solinnen is BETie, the ready-mix concrete EPD tool, managed by the French ready-mix concrete industry association SNBPE. The new tool will be released in 2020 and will offer an advanced version for manufacturers. These EPDs will be helpful for the French building embodied-carbon regulation that is under development (One Click LCA 2019).

2.2.6. Germany

Laws, Regulations, and Policies

The German Procurement Regulation states that all public tenders must provide government procurers with a life-cycle cost analysis. State and federal laws propose consideration of ecological factors in procurement (Coggburn 2004). Germany adopted the world's first eco-label, the "Blue Angel" certification, in 1978. The German government also initiated a climate action program in 2014, which contains more than 100 measures to be implemented by 2020 with the aim of reducing GHG emissions by at least 40 percent compared to 1990 levels (FMENC 2019).



Government Agencies and Authorities in Charge of Green Public Procurement Programs

The German government entities responsible for GPP are the German ministries of the environment, nature, and nuclear safety in conjunction with the German environmental agency (UNEP 2017a).

Program Goals and Targets

A national regulation developed in 2008 and revised in 2012 and 2013 targeted the use of life-cycle cost analysis in public tender and procurement process. In addition, German authorities set a goal of reducing carbon emissions associated with public procurement by 35% by 2020. The second target was to increase the number of GPP tenders to reduce carbon emissions by more than 500,000 tonnes (European Commission 2016c).

Other goals included:

- A 95% increase in the use of recycled paper by 2020
- A reduction in car CO₂ emission to 110 grams per kilometer (g/km) by 2018 and then to 95g/km by the end of 2020
- A 50% increase in procurement of sustainable textiles throughout Germany by 2020 (UNEP 2017a)

Environmental Concerns Addressed by Policy

German GPP considers a product's or service's environmental impact over its entire life cycle. Among the environmental concerns addressed by the various criteria are carbon and pollutant emissions of products and services. See the "Product / Service Eligibility for Green Public Procurement" subsection below for details.

Agencies and Institutions Targeted by/Subject to Policy

Federal, state, and local government institutions are subject to the GPP policy.

Products and Categories included in Program

Sustainable procurement criteria are available for different products and categories. These include (European Commission 2016c):

- Construction equipment and materials: for example, water heaters, lighting, elevators, air conditioners, windows, wall panels, floor materials, faucets
- Chemical products
- Furniture
- Home appliances
- Office information technology: for example, computers printers.
- Transportation equipment and services: for example, motor vehicles, motorcycles, car-sharing
- Textile products

Product / Service Eligibility for Green Public Procurement

In Germany GPP criteria are based on four types of standards: life-cycle assessment, carbon footprint evaluation, EPDs, and eco-labels.

Using life-cycle assessment, procurers evaluate the environmental effects of building products over their entire lifetimes. This assessment considers energy consumption, materials choice, water consumption, and a product's end-of-life disposition. The tool used to evaluate construction projects considers human health impacts, resource consumption, and environmental effects over the life of a construction project from "cradle to grave."

Germany's federal states also analyze the carbon emissions associated with construction materials such as steel and cement, from raw material extraction through production and transportation. Bidders for public contracts are required to evaluate carbon emissions as well as other environmental impacts of primary building materials used in a project.

EPDs are also used to evaluate a product's or project's carbon footprint. Bidders must present global-warming-potential information in the form of CO₂ emissions data and must prove their ability to minimize emissions from material transportation (Palmujoki and Ekroos 2010).

Germany's "Blue Angel" eco-label is part of the GPP process. Criteria for awarding the Blue Angel label are product- or category-specific and are reviewed every three to four years. Examples of criteria are carbon and pollutant emissions of construction products and energy efficiency and recyclability of computers and other electronics (Blue Angel: The German Eco-Label) | <https://www.blauer-engel.de/en/our-label-environment>). As new products come on the market and older products evolve, the federal environmental agency, in collaboration with other German organizations, develops new criteria for awarding the label (OECD 2015).

Federal tender-awarding authorities may require eco-labeled products as part of green procurement. For example, in 2013, the ministry of the interior published a tender for more than 40,000 computer systems valued at more than \$10 million. The contract included environmental requirements using eco-labels and saved an estimated 580 gigawatt-hours (GWh) of electricity representing 25,000 tonnes CO₂ (OECD 2015).

Since 2009, the agency for labeling building materials has developed evaluation criteria for materials with adhesive components, including paint and floor covering. The same criteria have been to assess products like mattresses and furniture. The green label has been awarded to highly energy-efficient multi-functional and office devices.

Monitoring / Measures of Program Success

Germany does not currently have a GPP monitoring process, but one is under development that will include a survey of procurement agencies and other related stakeholders. The monitoring will be done by federal authorities, with annual reports. Reports will include results from the survey and data provided by procurement and environmental stakeholders. Currently, a monitoring study entitled "Elektronische Vergabestatistik" ("electronic procurement statistics") is under way by the ministry of economic affairs and energy (EU 2016; Coggburn 2004).

Tools and Other Supports to Aid Green Public Procurement

Berliner Energieagentur is the life-cycle analysis tool for green energy, vehicles, and home appliances. Zentralverband Elektrotechnik is the primary life-cycle analysis tool for large projects such as sewage system construction (Testa, & Frey 2016).

Training to aid green procurement is being developed with the help of the Ministry of Education and educational stakeholders. GPP curricula are being designed to train individuals at national contact points. In addition to training, national and international cooperation forums and networks support green procurement activities (UNEP 2017a; Günther and Scheibe 2006).

CASE STUDY: Flemish government's GPP for materials used in building renovations

The Flemish Government introduced GPP in 2014. The program covers 19 product groups and a range of sub-groups with a target of 100% sustainable public procurement by 2020. Mandatory criteria have been developed for a number of product groups, including paper, textiles, vehicles, electricity, information technology, and cleaning products. For other product groups, voluntary criteria are provided. One of the product groups is "materials for building renovation." No specific criteria are being provided for new construction although the Flemish government refers to the EU GPP criteria for the design, construction, and maintenance of office buildings (Overheid Vlaanderen 2019).

For materials used in building renovation, a guidance document (in Dutch) has been published that suggests considerations for procurers and describes criteria that could be applied. The guidance document is meant to provide the procurer with guidance in case an evaluation of the sustainability of the building renovation at the entire building level is not deemed feasible. Separate guidance is available for specific building components such as indoor lighting, flooring, wall panels, and roofing materials for flat roofs (Vlaamse Overheid 2017).

The guidance document refers to several external methodologies and frameworks. For example, a methodology has been developed to calculate the life-cycle impacts of building components. An updated version (Tool to Optimize the Total Environmental impact of Materials or TOTEM), applicable country-wide and available in three languages, was launched in early 2018. Although not yet incorporated in the guidance document, the tool is said to provide a user-friendly, transparent means of calculating the environmental impact of building materials, components, and entire building designs. In addition, under TOTEM's predecessor, life-cycle cost analysis profiles were made available for 115 building components, divided into 10 product groups (Vlaamse Overheid 2018).

Since 2014, every supplier of construction materials in Belgium that claims certain environmental attributes for their products has to provide an EPD based on life-cycle analysis. The EPDs are registered in a central, federal database, accessible to the public since 2017. The Flemish government is currently considering how to integrate these EPDs into tendering processes for construction projects. Currently, the volume of registered EPDs is too small for them to be mandated as proof of environmental credentials during the tendering process (FPSH/FCSE 2019).

An evaluation framework (in Dutch) is available on the website of the Flemish agency in charge of responsible material, waste, and soil management (OVAM). This framework supports building designs that allow for future adaptability, including incorporation of materials that can be re-used, recycled, or easily disassembled at end of life (OVAM 2019). Additionally, a national guidance document (in Dutch and French) describes the use of life-cycle costing in public procurement and is accompanied by a life-cycle cost tool developed and available in multiple languages (FIDO 2012).

Finally, model language and different forms of evidence are provided for criteria that award points to bids for sustainable materials management including products designed for disassembly, for collection and re-use, or incorporating recycled or renewable materials.

2.2.7. Italy

Laws, Regulations, and Policies

The following laws, regulations, and policies have articulated the evolving principles underlying GPP in Italy:

- Environmental action strategy for sustainable development in Italy, 2002 (UNEP 2017a)
- Action plan for the environmental sustainability of consumption in the public administration sector, 2003, which established a national goal to bring the level of “environmentally preferable” procurement into line with the highest European levels by 2009 (Italy MoE 2003)
- Law 296/2006 2006, which launched the GPP National Action Plan and monitoring of the plan’s impact (UNEP 2017a)
- Legislative Decree 163/2006, which revised the public procurement code to more explicitly include environmental and social considerations than were included in earlier versions (UNEP 2017a)
- GPP National Action Plan 2008, revised 2013 (UNEP 2017a), which describes activities to be undertaken to promote green public procurement Law 221/2015, which made the use of minimum environmental criteria mandatory in public procurement (UNEP 2017a)
- Procurement Code Legislative Decree 50/2016 on public procurement and concessions, amended by art. 23 of the Legislative Decree 56/2017, which made GPP mandatory for all types of contracting authorities and for the full value of a tender as well as for procurement below fixed threshold amounts (Italy MoE 2019a,b) (EC 2017a).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The National Action Plan on Green Public Procurement (GPP NAP) was developed by the Ministry of the Environment and the Protection of Natural Resources together with the Ministries of Economy and Finance and of Economic Development. The same agencies are also involved in implementation (UNEP 2017a). The Ministry of the Environment issues the decrees defining minimum environmental criteria to be applied in procurement decisions (UNEP 2017a).

GPP is coordinated through an Inter-ministerial committee consisting of the above three ministries as well as: the Ministry of Agriculture and Forestry, the Italian National Institute for Environmental Protection and Research (ISPRA), the Central purchasing body (CONSIP), some Regional Environmental Protection Agencies (ARPAs), some regions, the National Committee for Research into Nuclear and Alternative Energy Sources (ENEA), the Office of the Prime Minister, and the National Anti-Corruption Authority (ANAC) (UNEP 2017a).

Program Goals and Targets

Law 221/2015 states that GPP must be included in all tenders for products and services directly related to energy usage (for example, energy services, office information technology, street lighting, buildings) and in 50% of tenders in other product categories (UNEP 2017a). Consistent with European Commission guidance, the Italian Action Plan aims to encourage the spread of GPP through the following:

1. Involvement of GPP stakeholders at the national level
2. Dissemination of knowledge about GPP among public organizations, by means of training and information campaigns
3. Methodological guidance for setting up sustainable procurement processes and environmental criteria for prioritized categories of products and services
4. Definition of national targets to be attained and redefined every three years
5. Periodic monitoring and dissemination of GPP and analysis of its environmental benefits

Environmental Concerns Addressed by Policy

The environmental concerns addressed by Italy's GPP are (UNEP 2017a):

- Reducing air pollution
- Preserving biodiversity
- Mitigating climate change
- Promoting clean technology and eco-innovation
- Conserving energy
- Reducing use of hazardous substances
- Protecting health
- Protecting local environmental conditions
- Reducing ozone depletion
- Protecting natural resources
- Using resources efficiently
- Protecting soil
- Minimizing waste
- Conserving water
- Reducing water pollution

Agencies and Institutions Targeted by/Subject to Policy

All national, state/regional, and local public authorities are required, under Law no 221/2015, to follow GPP policies, for all categories covered by minimum environmental criteria (UNEP 2017a).





Products and Categories included in Program

Priority product categories are as follows (UNEP 2017a):

1. Building equipment
2. Building design and construction
3. Diverse chemical products
4. Energy supply and energy services
5. Food and Catering services
6. Furniture
7. Household appliances
8. Cleaning product and services
9. Office information technology
10. Office paper and stationery
11. Vehicles
12. Textiles
13. Travel services
14. Waste collection and street cleaning service

Product categories are prioritized based on a national government expenditure analysis (economic relevance), expected impact, and the market readiness and response capacity in the country.

Product / Service Eligibility for Green Public Procurement

Under art. 34 of Legislative Decree 50/2016 on public procurement and concessions, as amended by art. 23 of Legislative Decree 56/2017, minimum environmental criteria technical specifications and associated contract clauses must be used in tender documents, regardless of the value of the tender. Award criteria must be taken into account when a contract is based on quality-price ratio. A specific exception is allowed for renovation, demolition, and rebuild contracts. EU GPP criteria and EU Ecolabel criteria are the main reference documents (EC 2017a).

Mandatory minimum environmental criteria have so far been defined by ministerial decree for 17 product and service categories, including one criterion that focuses on social aspects such as fair labor and similar practices. These criteria were defined based on national and international research, taking into consideration “critical” environmental issues and procedures for verification of the impact of the criteria in those areas (UNEP 2017a).

The life-cycle cost methodology established in directive 33/2009/EC is mandatory for buying, leasing, or renting of buses and for evaluating certain CO₂ limits for other vehicle categories.

Monitoring / Measures of Program Success

One of the duties of the GPP NAP Management Committee, which was established by Ministerial Decree 185 (18 October 2007), is to monitor the effectiveness of the action plan and the progress toward the plan’s objectives (Italy MoE 2019 a,b). Data are gathered annually from a representative sample of public bodies (central, regional, provincial, and commune authorities and ARPAs). GPP implementation problems and the effectiveness of measures adopted by the Management Committee can also be assessed in more detail (Italy MoE 2003).

An electronic monitoring system has been in place since 2010, but so far no useful data have been collected. Legislative Decree 56/2017 states that ANAC must monitor the application of the minimum environmental criteria in procurement processes (tenders, procurement orders and/or contracts), including sustainability criteria (UNEP 2017a). The Ministry of Environment has proposed cooperating with ANAC on this activity (EC 2017).

Tools and Other Activities to Aid Green Public Procurement

The Ministry of Environment hosts a GPP site on its website and provides a help desk service, as well as, since December 2015, a monthly newsletter on GPP. The ministry also publishes a handbook on minimum environmental criteria (Ministry of Environment) (EC 2017a).

After the minimum environmental criteria became mandatory, the Ministry of Environment planned a series of training sessions for relevant stakeholders (UNEP 2017a).

National and local events, seminars and workshops on GPP are also organized. The Ministry of the Environment and Protection of Land and Sea is developing an information and training plan with the support of National Operational Program on Governance and Institutional Capacity funds (EC 2017a).

The Ministry of Environment also signed an agreement with regional entities to improve training programs and action to facilitate GPP application. A similar agreement has been signed among metropolitan areas (EC 2017a).

2.2.8. The Netherlands

Laws, Regulations, and Policies

In 2005 the Netherlands introduced its first set of comprehensive GPP criteria and targets for the approximately 7,500 contracting authorities that are involved in public procurement. The Procurement Law of 2012 established the Netherlands' Socially Responsible Procurement Policy and criteria and was based on the political commitment in the 2005 parliamentary motion Koopmans/De Krom.

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Ministry of Infrastructure and the Environment is responsible for GPP policy development and leadership-by-example initiatives. PIANOo, the Dutch public procurement expertise center, provides information on sustainable procurement.

Program Goals and Targets

The Netherlands is a frontrunner in GPP, having achieved, according to its own monitoring results, the government's ambitious 2005 target of 100% GPP by 2010 for central government procurement. Subsequently a 100% target was set for other public authorities to meet by 2015 (DMIE 2010) (see Table 4).

Table 4. GPP targets for various levels of Dutch government for 2010 and 2015 (DMIE 2010)

GPP Targets	2010	2015
Central government	100%	100%
Provinces	50%	100%
Municipalities	75%	100%
District waterboards	50%	100%

Environmental Concerns Addressed by Policy

Environmental issues considered by the DuboCalc software tool, which is used to support implementation of the Netherlands' GPP policy, are: global warming; ozone layer depletion; toxicity to humans; ecotoxicity to fresh water, marine, and terrestrial environments; photochemical oxidation; abiotic depletion; depletion of fossil energy sources; eutrophication; acidification; and carbon emissions. DuboCalc can calculate CO₂ emissions as kilograms (kg) CO₂-eq, and includes other GHG emissions such as CH₄ and N₂O (Rijkswaterstaat 2019).

Agencies and Institutions Targeted by/Subject to Policy

The agencies and institutions targeted by the Netherlands GPP programs are the central, provincial, and municipal governments as well as district water boards.

Products and Categories included in Program

The Dutch government has developed sustainable purchasing criteria for all major products and services that are procured. This covers 45 product groups that are broken down into seven clusters. This includes a cluster for office buildings which encompasses seven product groups, and a cluster for civil and hydraulic engineering that encompasses 17 product groups. Example product groups include civil engineering structures; earthworks; roads; and new construction, renovation, and demolition of buildings (PIANOo 2019).

Product / Service Eligibility for Green Public Procurement

Minimum GPP criteria are evaluated annually and amended if needed to raise the bar for suppliers.

A range of environmental impacts including carbon emissions is assessed and converted to monetary values, with an imposed aggregated cap per specified unit. As noted above, sustainable procurement criteria are available for 45 product groups.

In addition to the GPP policy set at the national government level, the Dutch “Rijkswaterstaat”² has developed guidelines to enhance sustainable procurement in the construction sector. Tenders are assessed based on quality and price. Quality elements include the CO₂ emissions performance of a design, based on the DuboCalc life-cycle analysis tool and the Dutch CO₂ performance ladder certification system.

DuboCalc is a software tool created in 2002 to calculate the life-cycle environmental impacts of materials and energy, from extraction to the demolition and recycling phase, for designs associated with infrastructure tenders. DuboCalc translates impacts into a single number, the environmental cost indicator (ECI), to allow procurers to compare bids and identify the bid with the best price-quality ratio. DuboCalc’s methodology is based on life-cycle analysis according to ISO standard 14040 and the NEN-EN 15804 Environmental Assessment Method Buildings and Construction (Rijkswaterstaat 2019). DuboCalc focuses mostly on the environmental quality of a design and uses the ECI value both as a cut-off (maximum allowable value) and as an incentive to perform better.

DuboCalc is particularly well suited to tenders based on most economically advantageous tender (MEAT) criteria. A procuring agency sets a maximum ECI value for a tender; this value cannot be exceeded. The tool allows suppliers to calculate the ECIs of different design options, which incentivizes optimization during the design phase. In addition, parties with a better ECI may get a competitive advantage in the tendering process as described below.

Use of the DuboCalc software raises the floor of a tender received because tenders whose environmental performance is below a minimum threshold cannot be considered. In addition, both DuboCalc and the CO₂ performance ladder are used to raise the ceiling of a tender by incentivizing bidders to incorporate environmentally responsible carbon-reduction opportunities in their products and processes. The monetized value of these benefits is subtracted from the quoted price to provide bidders with a “discount” that gives a competitive advantage compared to lower-priced but potentially less sustainable bids (European Commission 2013).

² The implementing body of the Ministry of Infrastructure

The CO₂ Performance Ladder scheme, developed in 2009 and now adopted by a wide range of Dutch government entities and private companies, is used for procurement of construction works and materials. The scheme is managed by an independent non-profit party, SKAO (SKAO 2019). The CO₂ performance of suppliers participating in the scheme is certified at levels ranging from 1 to 5, with incentives to continually improve. The CO₂ Performance Ladder is entirely voluntary and focuses on the embodied carbon emissions of activities and processes involved in a project (OECD 2015).

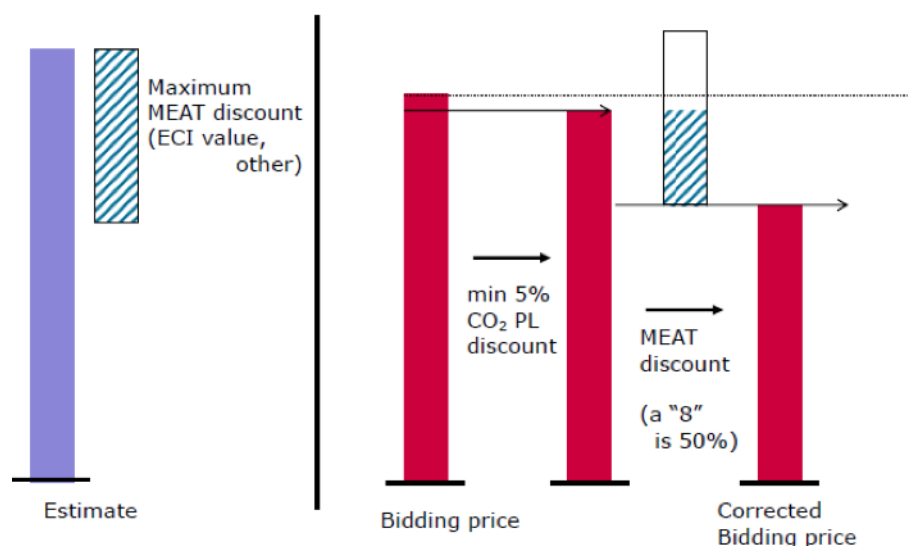


Figure 1. Example of the maximum MEAT discount available, and how a combination of CO₂ Performance Ladder and low ECI value per the DuboCalc tool allows the bidder to receive the discount (OECD 2015)

The government makes procurement data available on TenderNED, the Dutch public procurement portal, every six or 12 months. TenderNED data show that, for the first half of 2017, more than 3.3 billion Euros worth of (construction) works were procured. The value during the second half of the year was almost 2.2 billion Euros although the data set was missing many tender-value entries (TenderNED 2017).

Rijkswaterstaat keeps bidders on their toes by applying functional / outcome-based tender specifications and increasing performance over time. The CO₂ Performance Ladder also keeps raising the bar to push companies that achieve level 5, the highest level, to continue innovating. In some cases, the pace of innovation is reported to be so fast that it can be difficult for GPP requirements to keep up.

Monitoring / Measures of Program Success

To track GPP progress, the Dutch national government published monitoring reports in 2006, 2008, and 2010. The 2010 report was based on a survey of more than 250 respondents (out of a total pool of 384, i.e., a 66% response rate) from various levels of government. Only tenders with a value of 50,000 Euros or more were considered. On average, 94% of all surveyed followed GPP principles for all product groups and government bodies involved (DMIE 2010).

For the civil engineering cluster, most product groups showed GPP uptake of 90% or more although a lower percentage was reported for municipalities with less than 100,000 residents. For the office buildings cluster, most product groups scored high except for building demolition, which had only 55% uptake of GPP; building maintenance and repair which showed only partial uptake of GPP criteria; and building renovation where some government bodies did not apply any GPP criteria. About 70% of Dutch government bodies included GPP as mandatory in the early phases of tender specifications development, 72% used MEAT, and more than 60% included TCO in their tender evaluations (DMIE 2010).

Although surveys show the Dutch GPP program reaching most of its targets, a 2013 GPP policy evaluation shows that 59% of respondents always included minimum GPP criteria, 31% included minimum GPP criteria in a portion of their procurement, and 10% of respondents never included minimum GPP criteria (Ecofys 2013). This discrepancy could stem from the tender value. The 2010 monitoring report considered GPP uptake for tenders greater than 50.000 Euros; for tenders with a value of under 50.000 Euros, the study stated that only 4% of respondents applied GPP for all procurement, and 59% applied all relevant GPP criteria for less than half of their procurement.

Looking at the impacts of environmental criteria, a 2013 analysis of Dutch procurement concluded that CO₂ emissions had been positively affected. At the same time, about half of existing environmental criteria were found to be as stringent as current industry standards, suggesting that such criteria quickly become obsolete. Because some businesses have been quite vocal about the Dutch GPP approach, which focuses strongly on criteria, the approach is mainly “means-oriented” (rather than “goal-oriented”), which some argue limits innovative solutions (European Commission 2016).

To ensure effective program implementation and achieve the anticipated impact, GPP programs need regular updating and strengthening as both the public and private sectors improve their capacity to implement GPP. Since 2014, PIANOo has been the central point of contact for all GPP queries and requests for support of Dutch public procurers. PIANOo provides active support to procurers to accelerate the uptake of GPP and ensure its rigorous application within Dutch government procurement processes.

Tools to Aid Green Public Procurement

A tool is available that allows procurers to quickly collect relevant GPP criteria for products: <https://www.mvicriteria.nl/en>.

The DuboCalc life-cycle cost and carbon emissions tool is described in the “Environmental Concerns Addressed by Policy” and “Product / Service Eligibility for Green Public Procurement” subsections above.

The CO₂ Performance Ladder scheme is described in the “Product / Service Eligibility for Green Public Procurement” subsection above: https://www.skao.nl/home_en (Manual part 1 and 2, Handbook, and Procurement Guide).

2.2.9. Russia

Laws, Regulations, and Policies

The Russian Federation adopted a sustainable development strategy in 2002. A key aspect is sustainable procurement, for which there had previously been no term in Russian (Romodina & Silin 2016b).

Since January 1, 2014, Russia's system of public procurement has been regulated by Federal Law 44 2013, the Law of Contractual Relations. This law includes some elements of sustainable procurement. It uses the "contract life cycle" in accounting for life-cycle values of projects (Federal Law No44, ch. 16, art. 34) and requires some GPP elements in procurement documentation (Romodina & Silin 2016a). Life-cycle contracts apply only in specific cases stipulated by the Government of the Russian Federation; the list of cases is narrow, encompassing only contracts for certain types of infrastructure facilities and transport (Resolution of the Government of the Russian Federation 2013).

2017 was designated the "year of ecology" in Russia. Federal laws were adopted to address waste management, green technologies, and GPP (Ecological Union 2016).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Ministry of Environment and Natural Resources is the main agency overseeing Russia's GPP program.

Program Goals and Targets

In 2016, green procurement goals were included in the Department of Natural Resources and Environmental Protection of Moscow's work plan. Ecological Union public authorities, environmental organizations, and business and science representatives contributed to ideas for developing GPP criteria. The first step is to be the formation of a list of product groups for which procurement criteria will include environmental aspects. One criterion for choosing a product group is that it has a stable, competitive market (e.g., buildings, electronic goods). For each product group, environmental criteria are to be developed based on measurable, objective requirements. Eco-label criteria that comply with ISO 14024 and ISO 17065 can be used as a basis for GPP criteria, as has already been done in the EU. Products that obtain an ecolabel will automatically comply with the GPP criteria. This use of eco-labeling relieves the procuring agency from having to develop competence to evaluate compliance with GPP criteria (Ecological Union 2016).

Environmental Concerns Addressed by Policy

The greatest potential for environmental improvement through GPP was determined to be in transportation (buses) and construction. This determination was made by experts within the European Commission who assessed environmental impacts through products' life cycles, the availability of cost-effective environmentally preferable solutions, and the importance of products within the typical public authority budget (Romodina & Silin 2016b).

In regard to application of ecological criteria to building projects, construction of the park for the 2016 Olympics at Sochi was an important project because of the volume of human, natural, and energy resources involved during all stages of the construction process. The "sustainable" construction elements considered were energy efficiency (energy types, sources, consumption) and use of eco-friendly building materials (Russian Green Building Council 2012; Romodina & Silin 2016b).

Agencies and Institutions Targeted by/Subject to Policy

Government agencies at all levels are targeted by Russia's GPP policies (Romodina & Silin 2016b). The Russian Organizing Committee for Olympic Sochi 2016 was also subject to the policy.

Products and Categories included in Program

The products and categories included in Russia's GPP are: transport, cleaning products and services, electricity, food and catering services, information technology, and building construction/ renovation (Romodina & Silin 2016b).

Product / Service Eligibility for Green Public Procurement

International standards ISO 14021, 14024, and 14025 and their Russian equivalents establish the requirements for three types of voluntary environmental certification schemes.

Technical specifications for the buses for Sochi Olympics included environmental standards. Emission standards were set at the minimal level of Euro-4 standard (By contrast, the Procura+ manual suggests the enhanced environmentally friendly vehicles standard, which would mean a minimum of the Euro-5 standard) (Romodina & Silin 2016b).

The Organizing Committee Sochi 2014 flagship building was completed in 2012. The technologies used in that building met the highest European standards of sustainability in building (especially those used by Building Research Establishment Environmental Assessment Method (BREEAM) (Russian Green Building Council 2012; Romodina & Silin 2016b).

Monitoring / Measures of Program Success

The Olympic Games in Sochi were the first large-budget project in Russia that was required to meet ecological standards in construction, food and catering, transport, electricity, etc. This was required by the International Olympic Committee (IOC), and the Russian organizing committee stated that its intent was to host the greenest Olympic Games ever. Procurement for the event included the latest standards for green construction, eco-friendly buses, eco-certification for competing firms, and others. Russian federal laws regulated the procurement procedures and contents of tender documentation. The Procura+ manual was used as a framework for ecological criteria for transport (Romodina & Silin 2016b).

Tools to Aid Green Public Procurement

Russia's unified information system of government procurement (UES) will be the heart of the government's contract system, covering all stages of procurement from the publication of the procurement notice through audit, monitoring and control of public procurement. Under Law 44-FZ, the UES should contain: short-term and long-term procurement plans (annual and three-year) and information about their implementation; information on procurement regulations and procurement and contracts compliance; a registry of contracts; a registry of complaints; records of scheduled and unscheduled inspections along with their results and any associated instructions; a database of standard contract terms and conditions; monitoring results; information on audit and control of procurement; and catalogs of goods, works, and services. It is expected that, by 2020, UES will serve 2 million users and reduce costs for procurers and suppliers. (OECD 2016).

2.2.10. United Kingdom

Laws, Regulations, and Policies

In its Interpretative Communication of July 4, 2001, the European Commission (EC) laid out the possibilities offered by community law to integrate environmental considerations into public procurement procedures. The EC public procurement directives adopted on March 31, 2004 specifically mention the possibilities for adopting environmental considerations in technical specifications, selection and award criteria, and contract performance clauses (DEFRA 2007).

In its 2005 Sustainable Development Strategy, the UK government stated the ambitious goal of becoming one of the EU's leaders in sustainable procurement by 2009. The government recognized that current initiatives alone would not meet that goal (SPTF 2006), so the Sustainable Procurement Task Force (SPTF) was set up to challenge the UK Government to "use its immense buying power" to make rapid progress toward the country's sustainable development goals. The National Action Plan "Procuring the Future" published findings and recommendations on June 12, 2006 (SPTF 2006; DEFRA 2007). The UK Government Sustainable Development Strategy "Securing the Future" led to publication of "Transforming Government Procurement" on January 23, 2007, which defined a strategy for achieving the country's sustainability goals (DEFRA 2007).

Then, in 2010, the UK Department for Environment, Food, and Rural Affairs (DEFRA) published the "Action Plan for driving sustainable operations and procurement across Government," in support of policy goals to lead by example (DEFRA 2010). Following the National Action Plan of 2006 Greening Government Commitments, all central government departments and related organizations must ensure that they meet the mandatory levels of the government buying standards. The Greening Government Commitments set out overall policy for the central government on greening operations and procurement for central government and related agencies (EC 2017); these commitments were updated for 2016 to 2020. Annual reports are published by DEFRA (DEFRA 2016).

Public Procurement Policy and Government Buying Standards (GBS) 2012, and the National Procurement Strategy for Local Government in England 2014 (Local Government Association 2014) were also designed to support GPP both at national and local levels.

The importance of training and capacity-building is clearly identified in the National Health Services (NHS) GPP Action Plan, which aims to develop an introductory training module for use across the department and other NHS procurement organizations to embed effective sustainable procurement processes. The module will provide an extensive range of guidance and training to the NHS in areas such as energy, waste management, and sustainable development. Enhanced capacity will also result from DEFRA's work with the National School of Government on improving public servants' sustainable development skills (DEFRA 2007).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

Sustainable procurement policies are developed by the Sustainable Products and Consumers section within DEFRA. Overall public procurement policy is developed by the Cabinet Office's Efficiency and Reform Group (EC 2017). The Crown Commercial Service (CCS) is responsible for the legal framework for public-sector procurement and leads development and implementation of government procurement policies (DEFRA 2014).

Program Goals and Targets

SPTF made recommendations to aid the UK in becoming a leader in sustainable procurement in the EU and to achieve a low-carbon, resource-efficient public sector (SPTF 2006). DEFRA responded to these recommendations with the following goals (DEFRA 2007):

- Reduce carbon footprint of government activities and support a lower-carbon public sector consistent with government messages to businesses and citizens on climate change; showcase sustainable buildings, products, and solutions in use (e.g. in schools, highways).
- Effectively use government procurement power to transform the market for innovative and sustainable solutions, and make these available and affordable to citizens and corporate buyers.
- Increase strategic procurement across government to ensure: strategic engagement with the marketplace; pan-government procurement meetings and agreed-upon sustainability standards; improved departmental procurement capabilities supported by knowledge base of environmental impacts of products; and informed public-sector clients who engage early with the market, use outcome based specifications, and are receptive to choosing innovative solutions.
- Support voluntary initiatives to reduce carbon footprints of key government suppliers.
- Foster process improvements to drive delivery of sustainable procurement by: strengthening leadership and accountability, prioritizing low-carbon solutions, building capacity in sustainable procurement tools and techniques, and ensuring greater use of whole-life costing and social cost of carbon to inform purchasing decisions.

The 2010 revised Action Plan sought to (DEFRA 2010):

- improve transparency by releasing departmental and supplier data
- build strong relationships with suppliers to manage government risk and costs effectively
- deliver greater efficiency allowing DEFRA to lead across government and beyond

The following statements by DEFRA concerns environmental issues and GPP after Brexit: “Human health and the environment are currently protected by a large body of existing EU environmental law covering areas including air quality, waste and resources, water, wildlife and habitats, chemicals and pesticides. There is also a large body of domestic environmental legislation covering the UK, England, Scotland, Wales and Northern Ireland. This is monitored or enforced by bodies such as the Environment Agency. The UK government is committed to maintaining environmental standards after we leave the EU, and will continue to uphold international obligations through multilateral environmental agreements. The EU Withdrawal Act 2018 will ensure all existing EU environmental law continues to operate in UK law, providing businesses and stakeholders with certainty as we leave the EU. On 18 July 2018, the government announced it will bring forward the first Environment Bill in more than 20 years. The Bill will apply to England and reserved matters and will incorporate a range of issues, including clean air. It builds on the vision set out in the 25 Year Environment Plan to achieve a ‘Green Brexit’ and ensure the environment can be cleaner and greener for future generations” (DEFRA 2018).

Environmental Concerns Addressed by Policy

The goal of the UK’s GPP is to reduce the footprint of public procurement in three key environmental areas: carbon, water, and waste. The government aims to apply this framework to large-budget projects as part of a move towards a carbon-neutral, low-water-use, zero-waste public sector (SPTF 2006).

Agencies and Institutions Targeted by/Subject to Policy

The Greening Government Commitments apply to all government departments and related agencies. The commitments are political and administrative but not a legal requirement. Where centralized contracts are developed (in which the government buying standards are embedded), it is mandatory for departments to use these standards (EC 2017). Local authorities are also subject to GPP (Local Government Association 2014).

Products and Categories included in Program

The 18 categories of government spending identified as priorities for GPP are (SPTF 2006): construction (building and retrofit), construction (highways and local roads), construction (operations and maintenance), health and social work (operating costs of hospitals, care homes, social care provision), food, uniforms, clothing and other textiles, waste, pulp, paper and printing, energy, consumables (office machinery and computers), consumables (white goods), furniture, transport (business travel), transport (motor vehicles), information technology services/computer services, pharmaceuticals, telecommunications, radio, TV, and chemicals.

Product / Service Eligibility for Green Public Procurement

Government buying standards are a set of easy-to-use product specifications for public procurers. They are designated as either “mandatory” or “best practice.” The standards are owned by DEFRA. Individual standards are developed with input from across government, industry, and other stakeholders. Standards are extensively reviewed with market research and analysis to establish criteria that take long-term cost effectiveness and market capacity into account (DEFRA 2014).

For construction projects, BREEAM standards are used. All new projects are to achieve an “excellent” BREEAM rating, and all major refurbishment projects are to achieve a “very good” rating (DEFRA 2012).

Monitoring / Measures of Program Success

The Cabinet Office monitors compliance with Greening Government Commitments by regular surveys that all relevant organizations must complete. An environmental assessment method such as BREEAM or an equivalent (e.g., CEEQUAL, DREAM, etc.) that is appropriate to the size, nature, and impact of a project must be carried out on all projects, using the Treasury Green Book or other appropriate guidance provided by government (DEFRA 2012).

Tools to Aid Green Public Procurement

DEFRA’s National GPP Program includes training courses on topics such as sustainable procurement, carbon literacy and sustainable food procurement as well as a “Train the Trainer” program. The program has been adopted by most of the UK public sector. Procurement training including sustainability is also provided by the National School of Government, and Chartered Institute of Purchasing and Supply (EC 2017a).

The Flexible Framework spreadsheet and guidance is a widely used self-assessment package that allows organizations to measure, monitor and improve how they procure. The tool helps organizations prioritize their sustainable procurement activities in key product areas. It also helps in developing procurement strategies and action plans that address economic, environmental, and social issues (DEFRA 2014).

CASE STUDY: Procurement for London 2012 Olympic and Paralympic Games

In London's bid to host the 2012 Olympic and Paralympic Games, the city pledged to hold the greenest games of modern times. Procurement was an important tool to help deliver on that promise. To help perpetuate the legacy of the 2012 Games, the national government, through DEFRA, facilitated the development of a guide on sustainable procurement for construction projects, outlining the approach and lessons learned from the olympics (DEFRA 2013).

The approach to procurement taken by the London Organising Committee of the Olympic and Paralympic Games was based on eight key principles:

1. Seek a clear and public commitment to sustainability at the highest level of the organization.
2. Prepare thoroughly, including early consideration of sustainability.
3. Set specific, clear, challenging sustainability targets from the outset.
4. Be an intelligent client: get the right people on board, define the project, and set the budget.
5. Embed sustainability objectives throughout the team and supply chain.
6. Identify and use low-impact, responsibly sourced products and materials and ensure good supply chain management.
7. Create a structure that supports a collaborative approach.
8. Organize procurement so that services can be shared.

In addition, a number of tools and approaches were developed covering the entire procurement "value" chain to ensure sustainably constructed games infrastructure and buildings.

Pre-procurement: To get the very best from suppliers and manufacturers meant explaining requirements and talking to industry at an early stage. London organized industry days and established an Olympic Liaison Group to communicate opportunities; keep parties informed; and allow identification of best practices as well as innovative products, materials, and suppliers. It also provided a supplier guide and organized "meet the buyer" events.

Tender Specifications: A comprehensive design brief was developed, integrating sustainability requirements with a focus on reducing embodied carbon through efficient structural design.

Pre-qualification: To prevent small and medium size enterprises (SMEs) from feeling disadvantaged and being deterred from bidding, the CompeteFor on-line portal was developed, which informed SMEs about the requirements and helped them demonstrate that they were ready to do business with the olympics.

Award Stage: A balanced scorecard was used to assess all bids. Tenders were assessed based on a set of evaluation criteria that extended beyond the traditional themes of cost, time, and quality to also include sustainability. Tenders were evaluated using MEAT criteria, with technical evaluation criteria scores weighted (often as much as 70%) relative to financial scores.

Contract Stage: The contract requirements included detailed, “SMART” sustainability requirements. Rigorous monitoring of contractor compliance with key performance indicators post-award was written into the contract. Contract incentives using pain/gain sharing encouraged suppliers to do their best. In addition, recognized sustainability standards were used for both building (BREEAM) and civil engineering (CEQUAL) works.

A site-wide supply approach was used for some products and services to achieve sustainable outcomes in a cost-effective way, such as the procurement of low-carbon concrete on a site-wide basis. The Olympic Park used an estimated 500,000 m³ of ready-mixed concrete. Through centralized procurement with all contractors being required to use the site-wide supplier, early supply chain integration, and extensive trials and testing of various sustainable concrete mixes, the embodied carbon impact of concrete for the Olympic Park was reduced. This included the use of minimum percentages by value of recycled materials and aggregate, and took account of the emissions of transport of the materials to site as well as onsite emissions. This resulted in the use of approximately 22% of recycled and secondary aggregate, and a saving of approximately 24% in embodied carbon compared to a conventional approach (ODA 2011).

2.2.11. Norway

Laws, Regulations, and Policies

Norway is a leader among European countries in implementing GPP. Since 2001 the Norwegian Public Procurement Act has required that the state, county, and local authorities consider the impact on the environment and resources of any planned purchase. This includes consideration of life-cycle costs (Simanovska 2013). In 2007, the Norwegian government launched the Action Plan on Environmental and Social Responsibility in Public Procurement (Sustainable Public Procurement) with a three-year plan for the period 2007-2010 (Dolva 2007). However, the action plan was later rescinded as it did not reflect subsequent government policy and the content had become to some degree outdated.

In 2008, the policy for Regulation on Pay and Working Conditions in Public Contracts was created for service and construction contracts above certain thresholds. The regulation requires public contracting authorities to stipulate pay and working conditions requirements for suppliers and sub-suppliers. The contracting authority must state in the announcement or tender document that the contract will contain requirements for pay and working conditions. The contract terms must include controls to ensure that the pay and working conditions requirements are met (UNEP 2017a).

In 2010, the Public Administration and eGovernment Agency (DIFI) launched an environmental hub project that unites a number of municipalities in all Norwegian counties and provides the information and knowledge needed to integrate environmental requirements into public procurement (Simanovska 2013). According to the report Climate Cure 2020, published by the Norwegian Environment Agency in 2010, about 20% of CO₂ emissions linked to Norwegian consumption can be attributed to its public procurement.

Several policies relevant to GPP have been enacted in Norway: the Strategy for Increased Innovation through Public Procurement (2013), the Business and Human Rights National Action Plan for the Implementation of the UN Guiding Principles (2015), the Maritime Opportunities – Blue Growth for a Green Future maritime strategy (2015), and the Government Strategy for Combating Work-related Crime (2015) (UNEP 2017a).

In 2016, the Norwegian Parliament proposed a public procurement regulation advising contracting authorities to include a minimum of 30% environmental quality provisions in tenders where these provisions are relevant. The regulation took effect on May 1, 2017 (Regjeringen 2017). The aim of the regulation is to increase the share of GPP in Norway. The government allocated NOK 15 million in the 2017 budget to the national public management agency DIFI, to support the development of a scheme for improved GPP assessment (DIFI 2017a).

The Norwegian government has also used public procurement as a policy instrument to support the country's "green shift," which has the goal of making Norway a zero-emission nation by 2050 (Regjeringen 2016).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The following government agencies are responsible for or involved in GPP in Norway (UNEP 2017a):

- The Ministry of Industry has general responsibility for developing laws and regulations on public procurement.
- The Ministry of Climate and the Environment is responsible for the environmental aspects of GPP.
- The Ministry of Labor and Social Affairs is responsible for labor conditions related to GPP.
- The Ministry of Foreign Affairs is responsible for international policy on human rights and corporate social responsibility related to GPP.
- The Agency for Public Management and eGovernment (DIFI) is responsible for implementing GPP policies.

Public procurement in Norway is decentralized. DIFI is the managing authority, (<http://anskaffelser.no>) responsible for procurement policy. DIFI elaborates methodology and guidelines as well as providing training and advice to procurement specialists. DIFI is responsible for implementing the national action plan for environmentally and socially responsible procurement, which was adopted in 2007. The agency is overseen by the Ministry of Local Government and Modernisation (KMD). (Simanovska 2013).

Program Goals and Targets

In January 2016, Norway established a Government Procurement Center in charge of public contracts. The goal of the center is to implement professional, efficient, simple procurement processes in the public sector that reduce transaction costs, foster wide use of e-procurement, ensure regulatory compliance, and enable the public sector to obtain low prices for purchases. The center takes environmental issues into account when planning and carrying out purchases (UNEP 2017a). Its climate targets include reducing GHG emissions by at least 40 % by 2030 and making Norway a low-emission society by 2050 (MCE 2018).



Environmental Concerns Addressed by Policy

These environmental concerns addressed by Norway's GPP policies are (UNEP 2017a): reducing air pollution, preserving biodiversity, mitigating climate change, supporting clean technology and eco-innovation, conserving energy, reducing use of hazardous substances, protecting health, protecting local environmental, avoiding ozone depletion, protecting natural resources, promoting resource efficiency, protecting soil, minimizing waste, conserving water, and preventing water pollution.

Agencies and Institutions Targeted by/Subject to Policy

GPP is mandatory for all national, state/regional, and local public authorities (UNEP 2017a).

Products and Categories included in Program

The following products and categories are covered by Norway's GPP regulations: copying and graphic paper, cleaning products/services, office information technology, construction, transport, furniture, electricity, food and catering services, and textiles.

Product / Service Eligibility for Green Public Procurement

The Norwegian EPD Foundation (EPD Norway) ensures that EPDs for all types of products are developed in accordance with the requirements of ISO 140251, ISO 219302, and related industry (EN 158043 for building materials) and carbon footprint standards ISO/TS 140674 (Norwegian EPD Foundation 2019). More than 350 EPDs from more than 100 companies are now published and freely available at EPD-Norge. Both the underlying life-cycle assessment and the EPD itself are based upon international standards. Norwegian EPDs are an adaptation of the ISO 14025 Type III environmental declaration.

Monitoring / Measures of Program Success

DIFI measures the extent to which public entities apply sustainable and green principles in procurement. This includes measuring pilot projects to measure the climate footprint of public procurement and investigating how GPP can benefit or support the country's goal of reducing emissions in accord with the Paris climate agreement. Analysis of 10 Norwegian green procurement examples shows the emission reductions possible within different sectors (DIFI 2019):

- Three of the cases were in the buildings sector and achieved emissions reductions between 40% and 50%.
- Four of the cases were in the transport sector and reduced emissions by about 80%.
- In total, the 10 procurement examples reduced emissions by 70%, for an additional cost of just 6% compared to procurement without green provisions.

In Norway's 2017 budget, NOK 15 million was allocated to the Agency for Public Management and eGovernment to build up capacity and develop guidance on GPP at the national, county, and municipal levels (MCE 2018).

Tools to Aid Green Public Procurement

Norway's National Program for Supplier Development aims to promote innovative procurement and dialogue with suppliers generally. The program is run by the Confederation of Norwegian Enterprise, the Norwegian Association of Local and Regional Authorities, and the Agency for Public Management and eGovernment. The Government has increased allocations to the program by more NOK 9 million, from the 2015 funding level of NOK 750 000 so that the public sector's development needs can become a driver for innovation and entrepreneurship (MCE 2018).

2.3. North America

The subsections below describe the status of GPP in Canada, Mexico, and the United States.

2.3.1. Canada

Laws, Regulations, and Policies

The Canadian Policy on Green Procurement was developed in 2006 after the Commissioner of the Environment and Sustainable Development identified the following concerns: central direction on green procurement was missing; there was no federal green procurement policy or strategy; the government was not using green procurement as a tool to achieve sustainable development objectives; key federal documents did not address the responsibilities of buyers and suppliers as they related to green procurement; and there was no basis for assessing progress on green procurement (OECD 2015).

The Canadian policy requires that public procurement follow the principle of best value for money including consideration of environmental impacts of the products and services using a life-cycle approach, from acquisition through use and disposal (APEC 2013a).

Targets 8.10 and 8.11 of Canada's Federal Sustainable Development Strategy (FSDS) took effect April 1, 2011 and relate to green procurement:

- Target 8.10 – Establishing specific, measurable, achievable, relevant and time-bound (SMART) Green Procurement Targets: Each department is required to establish at least 3 SMART green procurement targets to reduce environmental impacts (APEC 2013a).
- Target 8.11 – Setting green Procurement Management Framework Targets: Each department is required to establish SMART targets for training, employee performance evaluations, and management processes and controls, as they pertain to green procurement decision making.

Guidelines are available to help public officials meet both targets (APEC 2013a).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

Development, implementation, and support of Canada's GPP policy has been led by Public Services and Procurement Canada in collaboration with Environment Canada, Natural Resources Canada, and the Treasury Board of Canada Secretariat (UNEP 2017). Within Public Works and Government Services Canada (PWGSC), policy implementation support is divided between the Office of Greening Government Operations (OGGO) and the Acquisitions Branch. OGGO leads the overall management and support of government-wide policy implementation, including inter-departmental engagement. OGGO also develops tools such as training materials and guidance and leads the development and implementation of the government-wide planning and reporting mechanism for the greening of government operations. The Acquisitions Branch supports the achievement of the policy objectives by integrating environmental performance considerations into its centrally managed federal procurement instruments, policies, procedures, and business tools, including supplier communication tools (OECD 2015).

Program Goals and Targets

Canada's federal sustainable development goals include a set of government-wide targets for greening of government operations. Government-wide targets and common performance measures were developed in the following three priority areas: buildings (specifically, energy efficiency in federal buildings), vehicle fleets, and green procurement (IISD & TERI 2007).

Greening government operations supports Canada's sustainability goals established under the Paris Agreement on climate change and the Pan-Canadian Framework on Clean Growth and Climate Change (Government of Canada Website 2018b). The Government of Canada will reduce Scope 1 and Scope 2 GHG emissions from federal government facilities and fleets by 80% below 2005 levels by 2050 (Government of Canada Website 2018b):

- On this pathway, the government will reduce Scope 1 and Scope 2 GHG emissions by 40% below 2005 levels, aiming to achieve this target by 2025 and no later than 2030.
- Both targets include the use of renewable electricity generated on site or purchased off site to reduce Scope 2 GHG emissions from electricity use.
- Clean power to reduce Scope 1 GHG emissions may also be produced or purchased off site.
- Carbon offsets are not to be used to achieve the 80% Scope 1 and Scope 2 GHG emissions reduction target.

Environmental Concerns Addressed by Policy

Canada's GPP policy addresses the following environmental concerns: reducing GHG emissions and air contaminants, improving energy and water efficiency, reducing ozone-depleting substances, reducing hazardous waste, reducing waste and supporting reuse and recycling, reducing toxic and hazardous chemicals and substances (APEC 2013b), preserving biodiversity, mitigating climate change, protecting health, and conserving energy (UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

All government departments and agencies (UN-DESA 2008), municipalities, post-secondary institutions, and others that buy for their communities across Canada are subject to the GPP policy (MCSP 2017). Deputy heads of all departments and agencies (as defined within the meaning of Section 2 of the Financial Administration Act) are required to ensure that green procurement objectives are met within their organizations (OECD 2015; UNEP 2017). The Procurement Strategy for Aboriginal Business covers only national government public authorities (UNEP 2017a).

Products and Categories included in Program

The categories and products for which environmental criteria have been established are: office buildings, printers, photocopiers, monitors and screens, personal computers and laptops, projectors, ink and toner cartridges, pencils and pens, paper, waste management services, desks / bookcases, chairs, official vehicles (lightweight cars $\leq 2,5$ Tn), hotels, food/coffee catering, and passenger transport (car rental) (APEC 2013a).

Product / Service Eligibility for Green Public Procurement

Office buildings must meet the Green Building Council's Leadership in Energy and Environmental Design (LEED - Canada) Gold level.

Canada's GPP also relies on the Canadian EcoLogo Program, sometimes referred to as "Environmental Choice," which helps consumers identify environmentally preferable products and services. EcoLogo is based on ISO standard 14024 for eco-labelling and is managed by TerraChoice. Products that display the EcoLogo have been verified by a third party to ensure their environmental claims are credible. Currently more 7,000 products are EcoLogo certified, including: paint, insulation, flooring, cleaning products, paper, tissue, electricity, printing inks, office furniture and equipment (OCA 2018).

The GPP program also relies on ENERGY STAR certification. ENERGY STAR-certified commercial and institutional buildings meet strict energy-performance standards set by Natural Resources Canada. Currently, seven building types are eligible to apply for certification: K-12 schools, commercial offices, hospitals, supermarkets and food stores, medical offices, senior care communities and residential care facilities, and ice/curling rinks. To qualify for ENERGY STAR certification, a building needs an ENERGY STAR score of at least 75 (out of 100) and meet certain other eligibility criteria. ENERGY STAR applications are verified by a licensed professional (NRCan 2018).

Monitoring / Measures of Program Success

All departments and agencies must report forecasted and actual progress on green procurement annually in publicly available parliamentary reports (the Report on Plans and Priorities [RPP] and Departmental Performance Report [DPR], respectively.) Beginning in 2008/09, the Treasury Board Secretariat Guidance provided specific instructions to all departments and agencies for reporting progress on green procurement in their annual RPPs and DPRs. An evaluation framework and government-wide performance measures were developed to monitor policy implementation and assess effectiveness after five years. Public Works and Government Services Canada is currently evaluating the policy for relevance and performance (OECD 2015).

Canada's first Federal Sustainable Development Strategy (FSDS) from October 2010 established a framework for sustainable development planning and reporting with three key elements: (1) an integrated, whole-of-government picture of actions and results to achieve environmental sustainability; (2) a link between sustainable development planning and reporting and the government's core expenditure planning and reporting system; and, (3) effective measurement, monitoring, and reporting to track and report on progress to Canadians (World Bank 2012).

Tools to Aid Green Public Procurement

Since 1998 the City of Ottawa, Canada has used SAP licensed software for resource planning to meet all financial and operational information management requirements, including those for procurement, accounts payable, and materials management. In January 2013, the Supply Branch worked with the Information Technology Department to integrate the GPP monitoring system in the existing SAP system to enable easy tracking of progress in applying the four sustainability pillars in procurement decisions. The SAP system was modified to record, for each purchase order or contract created in the system, whether client departments had considered and/or included sustainability criteria in the process (UNEP 2016). The information was to be provided in the description of the purchases requested of the Supply Branch (for purchase costs greater than CAD 10,000).

2.3.2. Mexico

Laws, Regulations, and Policies

Mexico's primary public procurement policy is found in the Industrial Policy and Foreign Trade Program (PPICE), which calls for national industries to participate in government procurement. Mexico has no overall policy on green procurement. However, green procurement efforts have been made in specific sectors. For instance, the energy-efficiency program of the government led by the National Commission for Energy Conservation (CONAE) identified procurement as a key mechanism for increasing energy efficiency (IISD and TERI 2007). The 2007-2012 National Development Plan allows for the incorporation of sustainability criteria in procurement policy. Since 2007, Mexico's procurement law has required that all wood and furniture purchased by public agencies possess a certificate demonstrating its legal origin and that paper purchased by public agencies have at least 50 percent recycled content (UNOPS 2009).

Beginning in 2009, the Government of Mexico modernized its procurement methods to eliminate obsolete regulations and build in transparency. The government also created a national on-line e-procurement platform, CompraNet, to ensure transparency and ease of access while reducing execution time.

Existing procurement regulations in Mexico contain the following provisions relevant to GPP (UNEP 2015b; UNEP 2017a):

- Regulation establishing general guidelines for environmentally sustainable aspects of public-sector acquisitions, leases, and services, 2007
- Decree establishing measures related to acquisitions, paper use, and use of the sustainably managed forest certification by the Federal Administration, 2007
- Regulation for the procurement of office paper by the Federal Administration, 2009
- Law on acquisitions, leases, and services of the Public Sector, latest revision in 2014
- Law on public works and related services, latest revision in 2016

Since 2013, GPP policy has been part of the National Strategy on Sustainable Production and Consumption and the Special Sustainable Consumption and Production Program 2014-2018, which both identify promotion of GPP as their first objective (SELA 2015; UNEP 2017a; OECD 2018).

Government Agencies and Authorities in Charge of GPP program

The lead agencies vary by policy or relevant activity. For example, the Ministry of the Environment and of Natural Resources leads the implementation of the Special Sustainable Consumption and Production Program 2014-2018. The Ministry of Finance and Public Credit oversees efficient, transparent, effective use of public resources, budgetary discipline related to public expenditures, and the modernization of the Federal Public Administration (SELA 2015; UNEP 2017a).

Program Goals and Targets

The Special Sustainable Consumption and Production Program 2014-2018 had the objective of increasing GPP and ensuring that by 2018, 6.9% of total procurement by the Federal Administration is sustainable. Furthermore, the Inter-ministerial Commission on Purchases and Works by the Federal Administration from medium and small enterprises sets annual targets on procurement expenditure benefiting these enterprises (UNEP 2017a).

Environmental Concerns Addressed by Policy

The environmental concerns prioritized in Mexico's GPP policies are: preserving biodiversity, supporting clean technology and eco-innovation, conserving energy, protecting local environmental conditions, protecting natural resources, using resources efficiently, conserving water, and avoiding water pollution (UNEP 2017a; PTB,2019).

Agencies and Institutions Targeted by/Subject to Policy

The majority of Mexico's GPP policies cover only federal government authorities, but the Special Sustainable Consumption and Production Program 2014-2018 applies to federal, state/regional, and local authorities who signed on to the Program (UNEP 2017a).

Products and Categories included in Program

The product categories included in Mexico's GPP regulations are: building materials (windows, floor coverings, wall panels, faucets, etc.), building design and construction, work contracts, furniture, cleaning products and services, office information technology (computers, screens, printers, etc.), and office paper and stationery (UNEP 2017a: PTB 2019).

Product / Service Eligibility for Green Public Procurement

The Ministry of the Environment and Natural Resources is working to implement GPP guidelines for procurers developed by the Inter-American Network on Government Procurement (INGP)³ (UNEP 2017a).

The ISO Committee ISO/ PC 277 is elaborating a procurement standard with strong participation of Latin American and Caribbean (LAC) countries including Mexico. The new ISO standard 20400 "Sustainable procurement – Guidance" will provide guidelines to assist government organizations integrating sustainability considerations into their procurement processes. Quality infrastructure (QI) bodies can support GPP by integrating environmental and social performance into technical specifications, and eco-labeling can also facilitate GPP. ISO defines eco-labels in three categories: ISO 14024 addresses the life-cycle impact of a product or service; ISO 14021 is used by manufacturers to inform consumers about the environmental characteristics of a particular component, product, or process; and ISO 14025 contains information on a product's life-cycle impact specifically on the environment (PTB 2019).

Monitoring / Measures of Program Success

Currently, the only GPP-type monitoring is of purchases from preferred companies (SMEs). The indicator calculated is the economic volume of purchases from SMEs. The information is gathered through CompraNet. Results are published in the Execution Reports of the National Development Plan 2013-2018 and in the annual contracts reports provided in CompraNet (Secretaría de Hacienda y Crédito Público 2013).

CompraNet itself is estimated to have reduced procurement execution time by as much as 95 percent, and, within three years of its adoption, SMEs increased their participation in the federal procurement system by 36 percent, and the government saved US\$1 billion (World Bank 2013).

³ INGP represents national directors of government procurement and institutions that provide institutional and financial support, such as the Organization of American States (OAS), which acts as Technical Secretariat of the network, the Inter-American Development Bank (IDB), and the International Development Research Centre (IDRC).

The Sustainable Production and Consumption project, within the framework of the Pacific Alliance, in which Mexico is a member, enables identification of the products and services most frequently purchased by the public sector and their respective sustainability impacts. This information could be used to support further definitions of GPP criteria and implementation of GPP pilot projects that could serve as models for activities that could be replicated or expanded within the federal administration (UNEP 2017a).

Tools and Organizations to Aid Green Public Procurement

The CompraNet national e-procurement platform, created by the Secretariat of Public Function, contains information on federal government requirements, dependencies, leases, acquisitions, services, and public works. This networked system has given agencies and other participants in the procurement process electronic access to the stages of the hiring/tender process. CompraNet is used by those who wish to become suppliers or contractors to the state. This includes both national and foreign individuals and corporations interested in offering goods or services to Mexican agencies or entities. CompraNet allows government agencies and companies to announce their interest in procuring goods, services, leases, and public works (Secretaría de Hacienda y Crédito Público 2013).

The North American Green Purchasing Initiative (NAGPI) is a project of the Commission for Environmental Cooperation, an inter-governmental agency for Canada, the U.S., and Mexico that facilitates collaboration and public participation to foster conservation, protection, and enhancement of the North American environment. NAGPI plays a coordinating role, compiling and maintaining GPP information to avoid duplication of effort and to create a unified voice to engage stakeholders. NAGPI also maintains a database of supporting tools and policies in North America (UNEP 2013).

2.3.3. United States of America

Laws, Regulations, and Policies

U.S. federal government procurement of green products began in 1993 with Executive Order 12873 by President Clinton. The order promoted recycling and environmental procurement. The order required agencies to align procurement policies with Section 6002 of the Resource Conservation and Recovery Act (RCRA) to use recycled products to the extent practicable and competitive. It also directed the United States Environmental Protection Agency (U.S. EPA) to establish Comprehensive Procurement Guidelines (CPGs) for recycled content in products and instructed federal agencies to adjust their procurement programs to comply with these EPA standards to the maximum extent practicable (Ganley 2013).

The Bush Administration later revoked President Clinton's Executive Orders on procurement, replacing them with other purchasing provisions. By 2007, President Bush had adopted a comprehensive policy that included GHG emissions reductions as a goal. In 2001, Executive Order 13212 required agencies to increase energy conservation. Based on this order, the Federal Energy Commission developed best practices to promote federal purchases of U.S. EPA-designated energy-efficient electronic equipment (OECD 2015).

The Bush Administration later issued Executive Order 13221 requiring federal agencies to purchase electronic products that consumed no more than one watt of standby power. Congress also expanded procurement of green products by extending federal buying preferences to include "bio-based" products. under a United States Department of Agriculture (USDA) program in the 2002 Farm Security and Rural Investment Act, and by adopting the Energy Policy Act of 2005 (EPACT). EPACT added a provision for federal procurement of energy-efficient products to the National Energy Conservation Policy Act (NECPA) (Fischer 2010).

In 2007, Executive Order 13423 articulated a comprehensive sustainability policy that remains largely in place today. Regarding procurement, the order requires agencies to purchase paper made with a minimum of 30 percent recycled content and to meet 95 percent of their electronic equipment requirements using products that have the Electronic Product Environmental Assessment Tool (EPEAT) voluntary certification. To implement this mandate, the Office of the Federal Environmental Executive (OFEE) instructed agencies to procure green products in a number of categories and required that each agency give preference in procurement and acquisition to the purchase of "environmentally friendly" products. Those are defined as products that contain recycled content, are ENERGY STAR labeled, are water-and/or energy-efficient, are "bio-based," and do not contain toxic materials or ozone-depleting substances (Ganley 2013).

in his October, 2009 Executive Order 13514, President Obama broadened the mandate to address GHG emissions in federal operations. The order laid out numerous environmental goals, from reducing use of toxic chemicals to promoting integrated energy planning. The order also contained the widest mandate to date for federal green procurement, requiring agencies to increase energy efficiency, conserve water, and reduce waste in operations and supply chains through federal procurement and building management (Fischer 2010; Ganley 2013; OECD 2015).

All sustainability mandates have also been incorporated into the Federal Acquisition Regulation (FAR) which covers all procurement requirements for federal purchases. For micro-purchases that fall below the FPDS reporting threshold, FAR coverage still mandates sustainable acquisition compliance (OECD 2015; ICLG 2019).

In the US, 55% of GHG emissions attributed to public institutions are a result of government-purchased goods and products. There is little federal, state, and local regulatory policy to address these emissions, but several voluntary national programs (e.g., Leadership in Energy and Environmental Design [LEED] and Living Building Challenge) have evolved to strengthen focus on embodied carbon. Some cities and states view procurement-based policy as a key opportunity to reduce carbon emissions. Implementation of the Buy Clean California procurement policy (see text box) may provide a model for other jurisdictions considering embodied carbon regulations (Simonen et al. 2018).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Office of Management and Budget (OMB) provides broad guidance on GPP through various policy documents, as does the Office of the Federal Environmental Executive (OFEE), which is housed at the U.S. EPA. Some procurement criteria are set by specific agencies. U.S. EPA, the General Services Administration (GSA), OFEE, and other agencies have databases that identify green products. OMB requires agencies to have green procurement plans and report annually on their GPP activities. Those reporting requirements appear to be largely qualitative, but quantitative reports are available for recycled content and alternative-fuel products (Fischer 2010). Aside from U.S. EPA, two other agencies, the U.S. Department of Energy and the U.S. Department of Agriculture, take the lead in designating products and providing purchasing recommendations and have designated environmental criteria for more than 300 product categories (OECD 2015).

Program Goals and Targets

The goals of Executive Order 13514 are (Fischer 2010, Ganley 2013, OECD 2015):

- By 2020, the federal government will reduce Scope 1 and 2 GHG emissions by 28% compared to a 2008 baseline.
- By 2020, the federal government will reduce identified Scope 3 GHG emissions by 13% compared to a 2008 baseline.
- By 2015, the federal government will reduce its energy intensity in targeted facilities by 30% compared to a 2003 baseline.
- By 2020, the federal government will reduce its potable water intensity by 26% compared to a 2007 baseline.
- By 2015, the federal government will reduce its fleet petroleum use by 20% compared to a 2005 baseline.

Section 2(h) of President Obama's 2009 Executive Order 13514 reinforces compliance with all sustainable acquisition standards and mandates that "...the head of each (federal) agency shall: ...ensure that 95 percent of new contract actions...are energy-efficient (ENERGY STAR or Federal Energy Management Program [FEMP] designated), water-efficient, bio-based, environmentally preferable (e.g., Electronic Product Environmental Assessment Tool [EPEAT] certified), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives...." (Fischer 2010, Ganley 2013, OECD 2015).

See also the Laws, Regulations, and Policies section.



Environmental Concerns Addressed by Policy

The environmental benefits targeted by GPP in the U.S. are:

- Reducing toxicity – prioritizing products using fewer toxic ingredients to minimize the hazardous health impacts on water and air and reduce damage from accidental spills and improper disposal
- Promoting energy efficiency – prioritizing products that limit energy consumption and minimize carbon footprint
- Prioritizing recycled content
- Fostering renewable energy and clean technologies – prioritizing technologies that reduce U.S. dependency on foreign petroleum, stimulate economic development for innovative technologies, reduce GHG emissions, and meet clean energy production goals (NASPO 2019).

See also the Laws, Regulations, and Policies section.

Agencies and Institutions Targeted by/Subject to Policy

U.S. GPP requirements cover all 50 states, six territories, and 87,525 local governments (Conway 2012).

Products and Categories included in Program

Currently, sustainable acquisition requirements apply to products that are supplied or used as part of services contracts and fall into the following categories: electricity, design and/or construction, operations and maintenance, janitorial products/services, office supplies, furniture, cafeteria ware/services, fleet management, hospitality (uniforms/bedding/linens, meetings and conference services), and information technology (OECD 2015).

Product / Service Eligibility for Green Public Procurement

U.S. GPP relies on ENERGY STAR ratings of products. ENERGY STAR is the government-backed symbol for energy efficiency. ENERGY STAR provides simple, credible, unbiased information to enable consumers and businesses to make informed decisions about the energy consumption of labeled products.

High-performance, green buildings (2007) - The building has an ENERGY STAR rating of 75 or higher, or Energy use is 20% below the Fiscal Year 2015 energy use baseline, or Energy use is 30% below the Fiscal Year energy use baseline, or Energy efficiency is 30% better than the current ASHRAE 90.1 standard (OECD 2015).

The U.S. Green Building Council (USGBC) manages the LEED green building rating program, which provides multi-level, point-based certifications. Since its establishment in 1993 as a single standard, LEED has evolved to become the most widely adopted and recognized green building rating system in the world. In LEED v4, USGBC introduced Building Product Disclosure and Optimization (BPDO) credits to encourage transparency and use of products that disclose and optimize whole life-cycle impacts (Carbon Leadership Forum 2018).

Three new credits were established under BPDO:

- EPD credit
- Sourcing of raw materials credit
- Material ingredients credit, as well as a low-emitting materials credit established under the indoor environmental quality rating category

The EPD credit is widely used by industry and has helped move the market toward understanding and addressing embodied carbon. LEED v4 also offers a credit for conducting a whole-building life-cycle assessment that demonstrates environmental improvements compared to a baseline building. These credits are intended to encourage manufacturers to disclose the full life-cycle environmental impacts of building products (Carbon Washington 2018).

Monitoring / Measures of Program Success

As noted above, OMB requires agencies to report annually on their GPP activities. The federal government reports to the U.S. Congress every two years on the results of its green procurement monitoring.

Tools to Aid Green Public Procurement

The U.S. federal government is developing new and improved ways to integrate green products into acquisition systems. Some agencies have found innovative ways to lead. For example, in addition to reporting per EO 13514 goals and mandates, the U.S. Department of Energy (U.S. DOE) Green Buy Program provides U.S. DOE sites around the country with recognition for reporting on purchases of 40 priority products that go beyond minimum compliance in terms of their sustainability. The priority products list represents optional stretch goals for sustainable acquisition. Sites can tailor this list to meet their specific circumstances, allowing them to select categories and products of most value for their local situations. Facilities may report additional green products and are encouraged to nominate new candidates for the list. This list also assists sites in engaging with the suppliers and informing contract language and related reviews. The recognition program rewards effective procurement programs by giving incentives to procure and report on products whose use demonstrates exceptional commitment to sustainability (OECD 2015).

U.S. EPA collaborated with the General Services Administration (GSA) to integrate U.S. EPA's Recommendations of Specifications, Standards, and Eco-labels into major federal procurement vehicles, which help federal purchasers identify credible, effective standards and eco-labels that have been established by the private sector for products and services (EPA 2017).

The Federal Procurement Data System (FPDS) continues to be refined and improved as a tool to help agencies accurately report compliance with the sustainable acquisition mandates (OECD 2015).

Architecture 2030 recently launched the Carbon Smart Materials Palette, a decision-making tool that provides designers with attribute-based guidelines for (1) designing buildings with low or zero embodied carbon, and (2) specifying construction materials with low or no embodied carbon. The tool is designed to support and complement life-cycle assessment and EPDs (Simonen et al. 2018).

CASE STUDY: Buy Clean California

California is a leader in establishing state green building regulations and standards. The 2012 amendment of the California Green Building Standards Code (CALGreen) includes an optional life-cycle assessment pathway that requires emissions reduction against a baseline along with several performance measures related to energy efficiency. This pathway is an alternative to prescriptive requirements for materials selection. Building projects can use CALGreen to pursue other sustainability initiatives such as LEED (Simonen et al. 2018).

In October 2017, California passed Assembly Bill (AB) 262, the Buy Clean California Act, a new law requiring state-funded building projects to consider the global warming potential (GWP) of certain construction materials during procurement. The bill requirements are two-pronged: manufacturers of eligible materials must submit facility-specific EPDs, and the eligible materials must demonstrate (through submitted EPDs) GWP below the product-specific compliance limits defined by the state Department of General Services (DGS), which will regulate policy implementation. The eligible materials include structural steel, carbon steel rebar, flat glass, and mineral wool insulation. An amendment (Assembly Bill 1817) to the original Buy Clean California Act

passed in June 2018, extending the timeline for compliance (USGBC website). In January 2019, state agencies were to request, from bidders, voluntary submission of facility-specific EPDs. As of January 2020, successful bidders must submit facility-specific EPDs. By January 2021 (two years later than required in the original bill), DGS will establish and publish the “maximum acceptable” GWP for each product category, which bidders must meet for eligible materials to be used for state-funded projects (USGBC Website, 2018).

Product market representatives pointed out that excluding carbon-intensive materials such as cement and concrete from the program was not congruent with state’s policy goal of cutting GHG emissions. In response, California policymakers and government implementation partners have expressed interest in integrating concrete and other materials into the law.

The USGBC-LA is also administering a Buy Clean Incentive Program to assist manufacturers from affected product markets in developing facility-specific EPDs.

StopWaste is a public agency in Alameda County, California that focuses on reducing waste in homes, at schools, and at work. StopWaste also focuses on embodied carbon in the built environment. A collaborative project of StopWaste and nearby Marin County to increase demand for low-carbon concrete through policy was recently funded by the Bay Area Air Quality Management District (BAAQMD). The project consortium will produce model code language to enable local governments to adopt low-embodied-carbon concrete specifications for residential and non-residential applications. The project will also provide technical assistance to four pilot projects to apply the specifications and will form a Bay Area Materials Working Group (StopWaste Website, 2018).

Prior to adoption of the Buy Clean California Act, the California Department of Transportation (Caltrans) had been evaluating the use of life-cycle assessment and EPDs in evaluating materials. In parallel with the Buy Clean California Act, Caltrans established the Caltrans EPD Implementation Project to begin collecting EPDs for construction materials. In addition to the materials specified in Buy Clean California Act (noted above), the Caltrans project includes materials used extensively in transportation (concrete, asphalt, and aggregate). Prior to adoption of the Buy Clean California Act, the California High-Speed Rail project had begun using EPDs as part of its procurement process. The High-Speed Rail Sustainability Report states that the construction projects will: 1) require EPDs for construction materials including steel products and concrete mix designs, and 2) require “optimized life-cycle scores for major materials” and include additional strategies to reduce impacts across the life cycle of the project (Simonen et al. 2018).

2.4. South America

The subsections below describe the status of green public procurement in the countries of Argentina and Brazil.

2.4.1. Argentina

Laws, Regulations, and Policies

The Argentine Republic places a high priority on environmental protection, securing it in Article 41 of the national constitution. Each province maintains jurisdiction over local environmental issues and natural resources. The national government is responsible for shaping the overall environmental protection framework (FIEL 2017).

Overarching national policies that affect green procurement are (UNEP 2017a):

- Decree Law n° 5340, Ordinary Regime, Buy Argentinean, 1963
- Law n° 18.875, Buy National, 1970 and its regulatory decree, Decree Law n° 2930, 1971
- Law n° 25300, Law for the Promotion of Micro, Small, and Medium Enterprises, 2000
- Decree Law 1023, Procurement Regime of the National Administration, 2001
- Decree n° 1075, Participation of Micro, Small, and Medium Enterprises in Government Procurement, amending Decree 436/2000, 2001
- Law n° 25.551, Buy Argentinian work, 2001 and its regulatory decree, Decree Law n° 1600, 2002
- Decree n° 312, Integral Protection System of Handicapped People, 2010

Decree n° 893, Regulation of the Procurement Regime of the National Public Administration, took effect in 2012 and was modified in 2015. Article 194 of the decree, titled “Mechanisms for Sustainability,” states that the National Procurement Office will develop mechanisms to promote the effective implementation of environmental, ethical, social, and economic criteria in public procurement (UNEP 2017a).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Cabinet of Ministers coordinates Argentina’s GPP policies with special support from the Secretary of Environment, the Secretary of Industry, and the Sub-Secretary of Social Responsibility. The public procurement agency leads the implementation of Decree 893/2012 and the revisions made in 2015 (UNEP 2017a).

Program Goals and Targets

The program goal is to promote, including through national targets, sustainable public procurement that could contribute to sustainable development. There is no multilaterally agreed definition of “sustainable public procurement (UN 2019), and no specific goals and targets have been specified for Argentina’s GPP program, which is still in the process of being implemented. The City of Buenos Aires, which has been the most successful government entity implementing GPP in Argentina so far, has set the following general goals for the program (GLCN on SP 2019):

- Strengthen the social impact of government procurement
- Mitigate environmental impacts
- Create a system of incentives for purchasers that promotes achievement of those goals, including training government procurers
- Develop awareness and training tools for making procurement decisions, such as guides with recommendations, check lists, supplier qualification lists, etc.
- Institute the use of monitoring and assessment tools

The City of Buenos Aires has also defined the following GPP targets:

- By 2025, 20% of the energy consumed by large users within the city's public sector will come from renewable sources.
- By 2020, 100% of purchases of electricity- or natural-gas-using devices will include sustainability criteria.

The City of Buenos Aires' budget for government procurement was AR\$ 22,000 million between July 2015 and July 2016. Currently, the City of Buenos Aires is already taking into account sustainability criteria when purchasing materials and electronic devices, paper, and computer equipment (GLCN on SP 2019).

Environmental Concerns Addressed by Policy

Argentina's GPP policies address the following environmental concerns: minimize or mitigate air pollution, preserve biodiversity, mitigate climate change, promote clean technology and eco-innovation, conserve energy, minimize use of hazardous substances, protect health, protect local environmental conditions, reduce/avoid ozone depletion, protect natural resources, use resources efficiently, protect soil, minimize waste (UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

All National Public Administrations affiliated with the e-tender portal "Argentina Buys" (Argentina Compra) are required to follow green procurement policies. However, provincial governments (such as that of Buenos Aires) may adopt GPP on a voluntary basis (UNEP 2017a).

Products and Categories included in Program

The following products and categories are covered by Argentina's GPP policies (UNEP 2017a):

1. Building equipment (water heaters, air conditioners, elevators, lighting, etc.)
2. Building materials (windows, floor coverings, wall panels, faucets, etc.)
3. Diverse chemical products (lubricant oils, paints, fire extinguishers, etc.)
4. Energy supply and energy services
5. Food and catering services
6. Furniture
7. Household appliances (TVs, refrigerators, washing machines, etc.)
8. Cleaning products and services
9. Office information technology (computers, screens, printers, etc.)
10. Office paper and stationery
11. Vehicles (passenger and light-duty vehicles, motorcycles, car-sharing services, etc.)
12. Textiles (uniforms, gloves, shoes, bed sheets, etc.)
13. Waste collection and street cleaning services

Product / Service Eligibility for Green Public Procurement

Argentina is in the process of developing GPP criteria. The country is participating in the Sustainable Public Procurement and Eco-labeling (SPPEL) project, which is financed by UN Environment and the EU (UNEP 2017a). The project aims to combine sustainable public procurement and eco-labeling to stimulate the supply of, and demand for, sustainable products in target countries and regions. It also aims to establish the foundations for the development of successful eco-labeling and SPP policies and has supported countries in the design and implementation of effective GPP and eco-labeling action plans. Argentina is one of the participating countries that implemented GPP at the national level (UN-Environment 2017).

Monitoring / Measures of Program Success

The following elements of Argentina's GPP are monitored: procurement tenders; procurement orders and/or contracts that include sustainability criteria; and sustainable products, services, or works purchased (UNEP 2017a).

Data are gathered from internal financial software and Argentina's e-procurement portal Compra. The data collected include: number of items from the catalog that incorporate sustainable criteria, number of items procured that include sustainability criteria, number of purchase orders that include sustainability criteria, number of tenders that include sustainability criteria, and economic volume procured that includes sustainability criteria. All of the data collected are expressed both in absolute terms and as percentage of the total purchased. Results are not publicized (UNEP 2017a).

Tools to Aid Green Public Procurement

In Latin America, an on-line platform, Comprasostenibles, was designed to collect GPP and eco-labeling information related to countries in the region, limit duplication of effort, and facilitate the transfer of information (UN-Environment 2017).

The Public Procurement System of the National Public Administration of Argentina, Compra, publicly disseminates all contracts made by central agencies, on the website of the National Procurement Office (ONC). The website has two consultation platforms: one providing free access to the general public and a second one that is exclusively for procurement authorities and registered suppliers (OECD 2016).

2.4.2. Brazil

Laws, Regulations, and Policies

More than 20 percent of Brazil's GDP is estimated to come from public purchases (Instituto Brasileiro de Geografia e Estatística 2014).

Although the list below of relevant legislation dates from 1985, Brazil first began to increase its emphasis on GPP in 2007 when the country joined the "Marrakech Process," which included a sustainable public procurement task force. At Rio +20, an event held 20 years after the UN Conference on Environment and Development (UNCED) and also known as the Rio Summit or ECO 92, the official documentation sent to the UN reinforced the role of the state in Brazil as a driver of sustainable development through public procurement. Brazil is also part of the International Sustainable Public Procurement Initiative (Silva 2014).

The following is a chronological list of overarching national policies that address GPP in Brazil (Da Silva et. al 2016):

- National Program for Energy Conservation, 1985
- Action Plan for Sustainable Production and Consumption (PPCS), 2011
- Action Plan for Sustainable Production and Consumption - Guidelines for implementation of 2nd cycle, 2016-2020
- Solidary Selective Collection, 2011
- Sustainable Esplanada Project, 2012
- Food Acquisition Program, 2012
- 3E Project - Energy Efficiency in Buildings, 2014
- Environmental Agenda in Public Administration (voluntary)1999 (become a program in 2002)
- Expenditure Efficiency Program, 2012

Existing regulations that include GPP provisions are divided into two categories: national and federal.

Relevant national regulations are (Da Silva et al. 2016; UNEP 2012):

- Constitution of the Federative Republic of Brazil, 1988
- Law nº 8.666 establishing norms for procurement and contracts by public administration and other measures, 1993
- Law nº 9.605 on Environmental Crimes, 1998
- Law nº 12.462 establishing the Differentiated Regime of Public Procurement, 2011

Relevant federal regulations are (UNEP 2017a):

- Normative Instruction SLTI/MP nº 02 establishing rules and guidelines for the procurement of services continuous or not, 2008 (with subsequent amendments)
- Normative Instruction nº 1 regulating environmental sustainability criteria in the procurement of goods, services, and works by the Federal Public Administration, 2010
- Administrative Rule SLTI/MP nº 02 regulating standard specifications of information technology goods within the Federal Public Administration and other measures, 2010
- Decree nº 7746 establishing criteria, practices, and guidelines for promotion of national sustainable development in contracts by the Federal Public Administration, 2012
- Normative Instruction nº 2 regulating the acquisition or lease of machinery and energy-consuming devices by the Federal Public Administration and the use of the National Energy Conservation Label in new or retrofitted federal buildings, 2014

Many Brazilian laws and policies relate specifically to GPP or to public contracts in general. In 2010, a dedicated GPP policy was established, followed by other relevant regulations (UNEP 2012; UNEP 2017a):

- Normative Instruction SLTI/MP nº 01/201032, 2010 is the main legal framework for sustainable public procurement in Brazil. It provides for the inclusion of environmental sustainability criteria in the procurement of goods, services, and works by the Federal Public Administration.

- Decree nº 7.746/201233 was approved in 2012. It established criteria, practices, and guidelines for promoting sustainable development through procurement by the Federal Public Administration and created the Inter-ministerial Commission on Sustainability in the Public Administration.
- Normative Instruction SLTI/MP nº10/201234, 2012 established the rules for preparing Sustainable Logistics Management Plans that must include GPP provisions.
- Normative Instruction SLTI/MP nº1035, is the latest GPP policy approved by the Ministry of Planning, Budget, and Management.

Government Agencies and Authorities in Charge of Green Public Procurement Programs

The Ministry of Planning, Budget, and Management is responsible for formulating and promoting policies and guidelines for sustainable management of materials, products, services, and works. The Ministry of Environment supports the advancement of GPP policies by conducting studies and research. The Inter-ministerial Commission is in charge of implementing GPP with the support of the Public Procurement Agency and the Ministry of Environment (UNEP 2017a).

Program Goals and Targets

Brazil's national GPP legislation does not set goals or specific targets. Agencies included in the GPP program can voluntarily establish GPP targets and goals (UNEP 2017a).

Environmental Concerns Addressed by Policy

The following environmental concerns are addressed by Brazil's GPP policies: reducing air pollution, preserving biodiversity, mitigating climate change, fostering clean technology and eco-innovation, conserving energy, minimizing use of hazardous substances, protecting health, protecting local environmental conditions, avoiding ozone depletion, protecting natural resources, using resources efficiently, protecting soil, minimizing waste, conserving water, reducing water pollution (World Bank 2007, Da Silva et al. 2016, UNEP 2015, UNEP 2017a).

Agencies and Institutions Targeted by/Subject to Policy

Normative Instruction SLTI/MP nº 10 states that all national government agencies must develop and implement Sustainable Logistics Management Plans. Decree nº 7.746 affects all national, state/regional, and local public authorities (Da Silva et al. 2016; UNEP 2017a).

Products and Categories included in Program

The products and categories covered by Brazil's GPP regulations are: building equipment (water heaters, air conditioners, elevators, lighting, etc.), building materials (windows, floor coverings, wall panels, faucets, etc.), buildings design and construction, diverse chemical products (lubricant oils, paints, fire extinguishers, etc.), energy supply and services, food and catering services, household appliances (TVs, refrigerators, washing machines, etc.), infrastructure design and construction, cleaning products and services, office information technology (computers, screens, printers, etc.), office paper and stationery, and waste collection and street cleaning services (UNEP 2015, UNIDO 2017, UNEP 2017a).



Product / Service Eligibility for Green Public Procurement

Brazil relies in part on eco-labels to identify products eligible for GPP.

There are two Brazilian eco-labels (UNEP 2015; IISD 2015):

- The Associação Brasileira de Normas Técnicas (ABNT) (Brazilian Organization of Technical Standards) eco-label certifies products based on their life-cycle environmental performance.
- The SustentaX label is based on ISO standard 14024 and certifies that products, materials, equipment, and services are sustainable, comply with quality and safety standards, and are provided by socially and environmentally responsible suppliers.

Brazil's GPP also relies on International Organization for Standardization (ISO) eco-labels, which fall into three categories: (UNEP 2015, IISD 2015, SELA 2015).

- Type I labels (ISO 14024) are based on the life-cycle impact of a product or service. Third-party verifiers of these labels include the Forest Stewardship Council (FSC), ENERGY STAR, the Rainforest Alliance (RA), and Brazil's ABNT (Rótulo Ecológico).
- Type II labels (ISO 14021) are used by manufacturers to inform consumers about the environmental characteristics of a particular component, product or process. These labels are not subject to third-party verification.
- Type III labels (ISO 14025) contain information on a product's life-cycle impact on the environment. The labels may, for example, list chemicals used in production. These labels inform consumers but provide a weak basis for comparing the environmental impacts of products.

In Brazil, PEFC and CERTFOR labels also guide procurers as they develop sustainability criteria for timber products.

Electrobras, the national electrical utility, operates a mandatory energy-efficiency labeling system as well. PROCEL, a national energy-conservation program developed by Brazil's Ministry of Mines and Energy and Ministry of Commerce and Industry, has an energy labeling initiative for domestic and commercial appliances.

Monitoring / Measures of Program Success

Brazil's materials catalog (CATMAT) (which is a module of the Integrated General Services Administration (SIASG) of the Ministry of Planning, Budget, and Management) contains data that the government can use to evaluate the number of sustainable public procurement processes and activities in the country. This instrument is currently being updated to ensure, among other things, the reliability of information and of the cataloging methodology. Currently, the results are not reliable and therefore, there is no reliable information on the number of acquisitions including sustainability criteria (Da Silva 2016; UNEP 2017a).

At the agency level, Sustainable Logistics Management Plans (SLMPs) are supposed to be prepared and published on the websites of the respective agencies. These plans might or might not include GPP criteria. The actions proposed in these plans are supposed to be verified every six months (UNEP 2017a).

Tools to Aid Green Public Procurement

The Brazilian government's product catalog sets out mandatory technical specifications for energy efficiency based on environmental labels for commodities such as cleaning products and paper.

PROCEL is a national energy-conservation program developed by Brazil's Ministry of Mines and Energy and Ministry of Commerce and Industry. PROCEL includes initiatives focused on energy efficiency in residential, commercial, and public buildings; and energy management in municipalities as well as the appliance energy labeling project mentioned above in the section on product eligibility for GPP (World Bank 2007).

2.5. Africa and Oceania

The subsections below describe the status of GPP in South Africa and Australia.

2.5.1. South Africa

Laws, Regulations, and Policies

The Constitution of the Republic of South Africa (1996) is the principal document regulating public procurement in the country. The constitution requires that when an organ of the state contracts for goods and services, it must comply with the principles of fairness, equitability, transparency, competitiveness and cost-effectiveness (UNIDO 2017). Other important legislation includes (IISD 2014; UNIDO 2017):

- The Public Finance Management Act (PFMA) (1999): This act is the overarching framework for supply chain management in the national and provincial governments.
- Municipal Financial Management Act (MFMA) (2003): This act aims to ensure that local government finances are managed sustainably.

In 2003, recognizing the need to reform the procurement system and align it with international best practice as well as to improve financial management, the South African Cabinet approved the Supply Chain Management Policy. The Regulatory Framework for Supply Chain Management (2003) applies national and provincial departments, while the MFMA (2003) covers the supply chain management functions of local government authorities (Ambe 2016, IISD 2014).

As of 2014, several South African provinces and towns had developed their own GPP policies. The Cities of Cape Town and Johannesburg refer to green procurement in their integrated waste management policies of 2006 and 2011, respectively. The City of Cape Town also refers to green procurement in its 2013 supply chain management (SCM) policy as does the City of Thekwini. The Cities of Tshwane and Ekurhuleni refer to green procurement in their environmental policies. Ekurhuleni also refers to green procurement in its 2007 energy and climate change strategy. All of South Africa's metropolitan areas are striving to fulfill their climate change mitigation mandates by engaging in projects to reduce GHG emissions; these projects can include green procurement (Agyepong & Nhamo 2017).

The Department of Environment Affairs adopted the Preferential Procurement Policy Framework Act 2000, which focuses on internalizing energy efficiency, sustainable consumption, and local-development requirements within government procurement. This policy is essentially an instrument for targeted procurement pursuant to Act 108 of the national constitution. Act 108 focuses on the promotion of domestic industries, especially MSMEs and those owned by previously disadvantaged groups (IISD 2008).

South Africa's Western Cape Government (WCG) Provincial Cabinet mandated that the Department of Economic Development and Tourism (DEDAT) draft a sustainable procurement policy framework that considered both socio-economic and environmental impacts and incorporated national and provincial policy objectives. The WCG Department of Environmental Affairs and Development Planning worked in partnership with the Provincial Treasury and DEDAT to develop policy imperatives and strategic initiatives that would fall under such a framework. (WCG/ EADP 2015b).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

PFMA created the legislative framework for a substantial decentralization of public procurement in South Africa. In particular, PFMA states that the head of any public department, trading entity, or constitutional institution is also the accounting officer. PFMA outlines the duties of the accounting officer (in sections 38 to 43 of the legislation), which include being fully responsible and accountable for any expenditures relating to SCM within their purview (UNIDO 2017).

Program Goals and Targets

Green procurement in South Africa aims to (eThekweni 2013, Agyepong & Nhamo 2017):

- Encourage a decrease in energy and resource use
- Promote environmental best practices in terms of waste minimization and management, water and energy efficiency and conservation, pollution reduction, and socio-economic development
- Encourage suppliers to design, manufacture, and dispose of their products in a sustainable manner

Environmental Concerns Addressed by Policy

South Africa's GPP focuses on reducing GHG emissions, waste recycling, reuse and recovery, and promoting energy efficiency and renewable energy (IISD 2014, UNIDO 2017).

Agencies and Institutions Targeted by/Subject to Policy

All public entities – national, provincial, municipal, as well as state-owned enterprises (SOEs) – are required to adhere to GPP principles (IISD 2008, 2014).

Products and Categories included in Program

The products and categories covered by South Africa's GPP programs are: buses (bus bodies), textiles, clothing, leather and footwear, steel power pylons, monopole pylons, steel substation structures, power-line hardware, streetlight steel poles, steel lattice towers, canned / processed vegetables, pharmaceutical products, rail rolling stock, set-top boxes, furniture products, solar water-heater components, electrical and telecommunications cables, valve products and actuators, residential electricity meters, working vessels/boats (all types), conveyance pipes, transformers and shunt reactors, solar photovoltaic components, two-way radio terminals and associated equipment, rail signaling, wheeled bins, firefighting vehicles, steel products and components for construction, steel value-added products, and fabricated structural steel (DTI 2013, Ambe 2016).

Product / Service Eligibility for Green Public Procurement

South Africa's GPP relies on labels and certifications. South African initiatives that have established themselves as credible certifiers of environmentally friendly alternatives for particular product groups include the Honey Badger-friendly label, the Carbon Standard, and the Biodiversity and Wine Initiative (BWI). The success of such schemes is partly achieved through the support of retail chains. In 2009, a South African organics standard was developed in a stakeholder process presided over by the Department of Agriculture (DoA). Furthermore, several other sector-specific certification schemes have been initiated, such as GreenStaySA (accommodation sector), Cape Green (building products and services) and the Department of Minerals and Energy (DME) energy-efficiency rating system. South Africa has also been selected as a pilot country for UNEP's initiative to promote eco-labeling in African countries. Textiles and clothing have been chosen as the stepping stone to developing a national eco-certification label (IISD 2008).

Monitoring / Measures of Program Success

South Africa currently has 36 different government SCM systems, which are not automated and generally not well-integrated. Internal controls are not applied consistently, which contributes to high levels of non-compliance reported by the auditor general. The treasury plans to replace the numerous systems with a single integrated financial management system (IFMS). The central supplier database will fall under this system. This will make it possible to mine data on GPP and assist the government in identifying trends, accurately calculating costs, and improving planning and costing procedures for budgets of departments, municipalities, and parastatal organizations (Mail & Guardian 2015).

The government intends to centralize contracts for banking services, computers, information and communication technology services and infrastructure, consulting services, security services, air travel and accommodation, school textbooks and stationery, healthcare equipment, and leased buildings. Centralized contracting will enable government at all levels to buy goods and services from a central list of approved suppliers that have been vetted for cost and quality. The South African government has 37 central contracts covering 8,000 line items worth a total of R16 billion (Mail & Guardian 2015).

Tools to Aid Green Public Procurement

Under WCG DEDAT sustainable procurement policy framework, the Province's central supplier database was redesigned, enabling investment in green procurement at hospitals, service centers, and settlement developments (WCG/ EADP 2015b).

2.5.2. Australia

In 2011–12, the Australian Government spent more than \$41 billion on contracted goods and services (DSEWPC 2013), and in 2016–17 entered into contracts for goods and services valued at more than \$47 billion (DEE 2018). As a large procurer, the Australian Government can play a leading role, using its purchasing power to achieve environmental and social benefits throughout the supply chain and, at the same time, reduce its costs (DSEWPC 2013).

Australia's Commonwealth Procurement Guidelines (CPGs) were adopted in March 1998 with the aim of government agencies engaging in best-practice procurement, achieving value for money on the basis of life-cycle costing. Environmental and other policies were a part of the guidelines framework (APEC 2013a). Updated CPGs took effect on December 1, 2008 (Eco Buy 2009).

Meanwhile, in 2007, the Australian Procurement and Construction Council (APCC) developed the Australian and New Zealand Government Framework for Sustainable Procurement. This framework was intended to guide the national, state, and territorial governments of Australia and the government of New Zealand in integrating sustainability principles into procurement decisions (APEC 2013a; Bosse 2017).

Commonwealth Procurement Rules (CPRs) are issued by the Ministry for Finance under section 105B (1) of the Public Governance, Performance, and Accountability Act 2013 (PGPA Act). CPRs govern all Commonwealth procurement. Achieving value for money is the core principle of the CPRs. To inform a value-for-money assessment, the CPRs require that tenders be evaluated based on relevant financial and non-financial costs and benefits, which include, among other factors, environmental sustainability of the proposed goods and services. In this context, sustainability includes considerations such as energy efficiency, environmental impact, and use of recycled products (APEC 2013a; DEE 2018).

Sustainable procurement is a strategy under Australia's National Waste Policy, in which the government has committed itself to embodying and promoting improved resource management within its own operations. Under the National Waste Policy Implementation Plan of July 2010, the government also committed to supporting implementation and reporting on the uptake of sustainable procurement principles and practices (DSEWPC 2013).

Government Agencies and Authorities in Charge of Green Public Procurement Programs

Australian states have direct responsibility for executing sustainable procurement and are at varying stages of developing green procurement policies, institutionalizing sustainable procurement objectives, and implementing strategies to meet these objectives. Each state has environmental procurement policies and guidelines as well as web tools to increase awareness and expertise on low-impact options. State procurement boards have been engaged in various capacities, including advising procuring authorities on the environmental attributes of products and integrating performance targets for water, materials, and energy efficiency into procurement decision making. Several states have included environmental standards in supplier pre-qualification schemes and listings. Integral to the states' efforts is the Good Environmental Choice eco-label (IISD & TERI 2007).

Program Goals and Targets

GPP supports Australia's contribution to meeting the UN's Sustainable Development Goals, notably Goal 12—Responsible Consumption and Production.

Environmental Concerns Addressed by Policy

The environmental concerns addressed in the Australian Government Environmental Purchasing Guide include: reducing energy and water consumption, improving resource use efficiency, reducing waste, reducing environmental health impacts of products and services, reducing pollution, providing markets for new environmentally preferable products, closing the loop on recycling, improving the viability of recycling, and encouraging industry to adopt clean technologies and produce products with low environmental impacts (ECO Buy 2009).

Agencies and Institutions Targeted by/Subject to Policy

The Australian state, territory and local governments are subject to Green Public Procurement/ Sustainable Public Procurement (DSEWPC 2013).

Products and Categories included in Program

The categories and products for which environmental criteria are established and that are included in GPP in Australia are: construction, maintenance, and renovation of public buildings (water, cooling and heating systems, energy); energy-efficient office products (printers, photocopiers, monitors and screens, light bulbs/ light tubes, personal computers and laptops, refrigerators); office supplies (ink and toner cartridges, paper); and office cleaning and waste management services (APEC 2013a).

Product / Service Eligibility for Green Public Procurement

ECO-Buy was born in 2001 as a result of the alliance of 24 local governments in Australia to buy recycled products. ECO-Buy enabled local organizations to increase their expenditures on green products from around AUD \$5 million in 2001 to AUD \$70 million in 2008. Reporting of local GPP performance as well as activities such as the ECO-Buy awards have encouraged institutions to increase their adoption of green purchasing criteria.

ECO-Buy developed the ECO-Find database of products that are environmentally preferable to comparable or competing products or services based on life-cycle assessment. In general, green products included in the database have one or more of the following attributes: recycled content, water savings, energy savings, low toxicity, sustainably sourced materials (APEC 2013b).

Products already certified by recognized independent eco-labeling schemes are incorporated into the ECO-Find database. The eco-labels included are: the Good Environmental Choice Label (Australia), Equivalent international eco-label (certification body member of Global Eco-labeling Network - GEN), and Green Tag.

Sustainable Choice is a free program that supports local government purchasing for sustainability, funded by the NSW Office of Environment and Heritage. The Sustainable Choice program began in December 2006, and evolved out of a Local Government Buy Recycled Alliance (2003-2006) that emphasized the use of recycled products (Local Government NSW 2013). Recommended environmental certifications include: AAA rating, ENERGY STAR rating, Energy all-stars, Good Environmental Choice Australia (GECA), Forest Stewardship Council (FSC), and Fair Trade (Zeppel 2014).

Monitoring / Measures of Program Success

The ECO-Buy Local Government program is working to improve tracking and reporting of green product expenditures. As a result of the ECO-Buy program, local authorities report improvement in buying green. In 2008, 49% of members had a tracking system in place and, in 2009-2010, 65 percent of ECO-Buy members were informed about green purchasing. Despite the improvements in reporting, results also showed the difficulties of monitoring the procurement of green products. The results of green procurement are widely disseminated, and certificates are delivered to members commemorating improvements in green purchasing performance (ECO-Buy 2009/2010; APEC 2013b).

Over the history of the ECO-Buy Local program, the main results have been (APEC 2013b, ECO-Buy 2010, 2011):

- The expenditures by all reporting ECO-Buy local government members increased from AUD \$5 million (hereafter "\$") in 2000–2001 to \$71.5 million in 2007–2008 with a slight drop to \$67.4 million in 2009-2010.
- The number of green products purchased by members has grown from 80 in 2000-2001 to more than 430 in 2009-2010.
- More than 37,500 tons of CO₂ were avoided, and 9.9 billion liters of water and 84 hectares of land were saved as a result of green products purchased in 2009-2010.
- Recycled product spending increased by \$3.3 million from 2008-2009 to 2009-2010, in part because of an increase in recycled fleet management products.
- In 2009-2010, 77 percent of members were making good progress in developing GPP policies and strategies.

Australian Government agencies are required by the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) to include in their annual reports information about their performance in following ecologically sustainable development (ESD) principles. Incorporation of environmental purchasing practices is a common step that agencies take to protect the environment (APEC 2013a).

Tools to Aid Green Public Procurement

The Eco-Buy program, described above, provides the following support services and tools:

- Database of environmental products: ECO-FIND
- Trainings and events
- Consultancy services: research on green product alternatives, best practices, project development, etc.
- Organization of trade fairs
- The ECO-Buy Sustainable Procurement Assessment Tool to measure sustainable procurement performance

The Eco-FIND directory lists green products and suppliers independently assessed by Eco-Buy as having at least one of the following key attributes: recycled content, energy or water savings, low toxicity, or reduced impact on biodiversity and human health. Eco-Find's online directory lists 18 key product categories, including: vehicle fleets, waste management, lighting, recycled content, office goods, buildings, parks and gardens, and events. Other green product databases listed by Eco-Buy include Good Environmental Choice Australia, Ecospecifier, EcoDirectory, Social Enterprise Finder, and Sustainable Choice (NSW) (Zeppel 2014).



2.6. Multilateral development banks and United Nations

The subsections below describe green procurement practices at the World Bank, Asian Development Bank, and UN.

2.6.1. World Bank Green Procurement Practices

The World Bank has two guidance documents related to green procurement: “Environmental, Social, Health & Safety [ESHS] in Procurement” (2018) and “Sustainable Procurement” (2016). These documents are meant to assist borrowers and bank staff in integrating ESHS and sustainability requirements into the procurement process but do not specify targets. Instead, goals and targets are set project by project.

The ESHS guidance recommends that borrowers lay out their own ESHS performance expectations for the entities from whom they aim to procure funding. This document also recommends that the bank assess national procurement procedures in the borrowing country and decide whether to adopt those national policies, amend or strengthen them, or adapt a World Bank procurement guideline for use in the national policy.

The sustainability guidance document states that “sustainability priorities may arise from a variety of sources,” including the borrower’s policies, community needs, and naturally arising environmental risks. The borrower is asked conduct a sustainable procurement risk assessment; identify sustainability impacts at each stage in the life cycle of procured products; and “inquire with a wide range of manufacturers, vendors, industry experts, and end-users about new and innovative approaches.” The sustainability guidance gives specific examples of CO₂ reduction as a sustainability need in a World Bank project (World Bank 2016).

The guidance documents apply to borrowers. The World Bank defines as a borrower as a recipient of investment project financing (IPF), including any entity of the borrower that is involved in the implementation of a project receiving IPF. This may include relevant entities such as an employer or client (World Bank 2018). The World Bank also requires that any entities that submit bids to fulfill procurement needs also submit an ESHS declaration.

The sustainability guidance lays out three general pillars of sustainability: economic, environmental, and social. It provides example criteria, including CO₂ emissions reduction in connection with the environmental pillar. The borrower ultimately sets these criteria, including whether they are mandatory or optional. The borrower can require external labels or certifications as criteria.

The ESHS guidance requires regular progress reports on the ESHS metrics selected for the project: the “Contract Manager will review and discuss with the contractor the monthly progress reports, and as necessary give instructions to the contractor for any remedial actions to ensure compliance with the ESHS requirements” (World Bank 2018).

The sustainability document recommends that the World Bank and the borrower share the lessons learned with each other after the contract has ended.

The ESHS document does not require capacity-building activities, but does require borrowers to assess the capacity of their market to manage ESHS risks. The ESHS guidance lays out the steps that borrowers need to take to follow the guidance.

The sustainability document describes a “supply positioning model” to help analyze sustainability needs. It also links to a number of public life-cycle tools for assessing cost or sustainability criteria of products.

2.6.2. Asian Development Bank Green Procurement Practices

The Asian Development Bank (ADB) has a policy that applies to procurement of goods, works, and consulting and non-consulting services. The policy does not have specific green procurement targets. Goals and targets are set project by project. The ADB procurement policy lays out six procurement principles to be applied in implementation of a project: economy, efficiency, fairness, transparency, quality, and value for money. This last principle, value for money, “may include life-cycle costs and socioeconomic and environmental development objectives of the borrower” (ADB 2017).

The ADB procurement policy was updated in 2017 and applies to all ADB borrowers for projects with concept notes approved on or after July 1, 2017. The prior procurement policy applies to projects approved before that date.

No specific environmental concerns or criteria are mentioned. The borrower must make a “Procurement Plan,” which includes any specific environmental and/or social objectives of the project.

2.6.3. United Nations’ Green Procurement Practices

The United Nations (UN) has several green procurement policies among its different subdivisions. These policies are meant to guide the UN’s roughly \$15 billion annual spending (as of 2010). The UN started exploring sustainable procurement in 2007 with a statement on “moving towards a climate-neutral United Nations.” After that, the Sustainable UN (SUN) unit was established, an inter-agency group began working on low-carbon procurement, and sustainable procurement policies took effect in 2009.

The UN’s overall system is supposed to follow Sustainable Development Goal 12, to “ensure sustainable consumption and production patterns” across policy, operational, and administrative areas. Goal 12 specifically refers to the need to “promote public procurement practices that are sustainable, in accordance with national policies and priorities” (UNGM 2019). The UN also issued specific guidance in 2011 called “Buying for a Better World: A Guide on Sustainable Procurement for the UN System” (UN 2011). Some UN agencies, such as the United Nations Development Programme (UNDP) and the United Nations Population Fund, have their own procurement policies. These agencies have to harmonize their goals with overall UN procurement requirements.

Green procurement spans several UN agencies and initiatives, including the United Nations Environment Programme, the UN Office for Project Services, the International Labour Organization, and the SUN facility.

In addition to the Sustainable Development Goal for procurement, the UN Buying for a Better World policy refers to “quality factors” related to social and environmental performance, as well as the requirement that suppliers comply with national legislation and UN conventions (such as the Montreal Protocol).

All goods and services procured by the UN are covered. Some recent examples of UN procurement of goods that contain carbon-intensive materials include vehicles for the United Nations Office for Project Services, solar panels for the United Nations Interim Force in Lebanon, building renovations for an office in Vienna including a climate-neutral floor of the building (UN 2011). Several UN agencies have also committed to purchasing 100% renewable energy (Greening the Blue 2019).

Green procurement targets are generally set project by project. An example is carbon emissions ratings for purchase of motor vehicles. Potential sustainable procurement priorities include GHG emissions reduction and natural resource use optimization. The procurement policy notes that “In general, climate change and reduction of GHG emissions will be among the most important issues for UN organizations. These are areas that can be influenced through procurement by placing an increased focus on energy efficiency and logistics” (UN 2011).

The UNDP Procurement Strategy lists the “social costs of carbon emission” as one of its key purchasing criteria. It also states: “Through the reorientation of its procurement strategy, UNDP will make a significant investment in renewable energy solutions and energy-efficient technologies such as solar cooking stoves and hybrid vehicles” (UNDP 2015).

The UN Population Fund set four environmental sustainability focus areas for its Green Procurement Strategy, one of which is minimizing CO₂ emissions through five goals: controlling energy consumption, managing waste, recycling, optimizing transportation, and managing materials/resources (UNFPA 2013). The strategy proposes several measurements, including grams of emitted CO₂e per unit and a life-cycle assessment of results.

The UN tasked itself to work with suppliers to come up with and implement a Sustainable Procurement Action Plan and measure performance. The UNDP Procurement Strategy says it “will develop monitoring mechanisms, including assessments and spot checks, to promote vendor compliance.” It also calls for benchmarking UNDP’s procurement policies compared to those of other organizations. UNDP “will continue to regularly measure progress in sustainable procurement and report its findings to the Annual Statistical Report on United Nations Procurement” (UNDP 2015). The UN Population Fund claims that, two years after launching its Green Procurement Strategy in 2013, it had reduced CO₂ emissions by 7,700 tons (UNFPA 2019).

The “Greening the Blue” campaign launched through the SUN facility aims to engage staff throughout the organization on how to green the UN, including through sustainable procurement. UNDP is also developing external training and certification programs for corporate training to educate UNDP and procurement professionals.

The Resource Efficient and Cleaner Production program was created by the UN International Development Organization and UN Environment Programme in 2009 to help enterprises and other organizations improve their resource productivity and environmental performance. (<http://www.recpnet.org>).

The UN Global Compact is an initiative to help companies meet voluntary commitments and the UN goals. It can help companies achieve green procurement targets, among other capacity-building functions. (<https://www.unglobalcompact.org>)

The UNDP publishes data on more than 10,000 projects worth more than \$5.8 billion on <https://open.undp.org/>.

Although GPP is considered an effective policy instrument to reduce environmental harm, countries face many obstacles in implementing GPP policies (Renda et al. 2012; Van der Zwan 2018). These barriers range from lack of products on the market that meet the environmental criteria defined by GPP programs to lack of information about GPP and its financial and environmental benefits, and from lack of human or financial resources to implement GPP programs to lack of criteria for establishing what products or services are eligible for green procurement.

This section briefly describes GPP barriers documented in four countries/regions—South Korea, Canada, China, and the EU—to illustrate the range and nature of the barriers encountered.

Korea

Asia Pacific Economic Cooperation (APEC) has identified key barriers to development of GPP policies in the Republic of Korea as (APEC Annex D 2013b):

- Lack of products on the market that meet the defined GPP environmental criteria
- Lack of information/knowledge about financial benefits of GPP
- Lack of information /knowledge about environmental benefits of GPP

Korea's Public Procurement Service (PPS) set challenging green procurement targets, aiming to double its 2009 green public market to US\$5.4 billion by 2013. To stimulate public purchasing of green products, PPS expanded incentives and annually updated minimum environmental standards for products.

Canada

According to APEC (Annex D 2013b), GPP barriers encountered in Canada were associated with early adoption of stewardship criteria. Industry was reluctant to manufacture green products because of concerns that consumers would prioritize price, features, or aesthetics of products over environmental responsibility attributes. An increase in environmental awareness helped to overcome those barriers.

Implementation of green procurement in Canada has focused on integrating environmental considerations into centralized procurement instruments and developing tools and guidance for purchasing within the federal government.

APEC recommended that efforts to increase awareness and engagement with GP should continue and that increased attention could be placed on decentralized federal purchasing

China

Five key barriers to GPP in China have been identified (Qiao & Wang 2011):

- Lack of education and information about GPP
- Problems with program management and approach
- Lack of uniform definitions of green procurement criteria and eligible products
- Insufficient resources
- Lack of mandatory requirements / enforcement power

Lack of education and information about GPP

China's GPP program has suffered from lack of publicity and media attention. At the time of Qiao and Wang's 2011 study, little effort had been made to promote the importance and goals of green procurement, and government procurement personnel had little knowledge about environment protection.

Problems with program management and approach

China's public procurement procedure is to select the lowest bid. The concept of weighing environmental impacts in determining which bid is most advantageous has been difficult to introduce.

In addition, China does not have a single designated agency that is charged with managing green procurement. Several agencies and ministries are involved, including the Environment Protection Ministry, the Finance Ministry, the National Development and the Reform Committee as well as various provincial and local procurement centers, but there is little coordination among these entities. They issue regulations either jointly or on their own, resulting in policy overlaps, management duplication, and even conflicts. In addition, because there is no single designated green procurement agency, GPP is performed by procurement centers whose authority does not align with their responsibility in some cases. In addition, these centers do not consistently apply their own regulations to guide green procurements. As noted below, there is no national mandatory policy or enforcement to address this inconsistency.

Lack of uniform definitions of green procurement criteria and eligible products

A key to successful implementation of GPP is having a robust standard for evaluating green products. Currently, China's green procurement policy is not based on a robust scientific standard.

Insufficient resources

Implementing public green procurement requires human, financial, and information resources. China's current procurement system suffers insufficient funding and inadequate information infrastructure (the latter noted under barrier #1 above).

Lack of mandatory requirements / enforcement power

China implements GPP through administrative orders and regulations within specific functions, administrative levels, and jurisdictional areas. Although administrative orders are a simple means by which to create requirements, they lack legal enforcement power, so cooperation is effectively voluntary. Affected agencies have the options to implement administrative orders, not to implement the orders, or to compromise the implementation.



European Union

A number of key challenges to the implementation of GPP in the EU have been identified in the RELIEF project and European Commission survey on Green Public Procurement in Europe 2006 (EC 2016):

- Lack of political support
- Perception that green products cost more
- Lack of legal expertise in applying environmental criteria
- Lack of practical tools and information
- Lack of training
- Lack of co-operation among authorities
- Limited established environmental criteria for products/services

Lack of political support

In some countries, public authorities cited lack of management support as a barrier to broad implementation of GPP. This suggests that senior officials within the public sector are not aware of the importance of the GPP agenda or do not make this importance explicit to their purchasing staff.

Perception that green products cost more

A key challenge identified by many public-sector organizations in the EU is the need to change perceptions and decision-making criteria within purchasing departments. In particular, using purchase price alone to decide among offers, rather than using the full life-cycle cost of the product or service, can adversely affect the likelihood that green products and services will be selected. Applying environmental criteria to procurement can sometimes result in higher initial purchasing costs, but overall costs often decrease because the higher purchase prices of green goods and services are balanced by lower operating, maintenance, or disposal costs.

Lack of legal expertise in applying environmental criteria

Many purchasers within public authorities do not know, and should not be expected to know, all the environmental and social impacts of purchasing particular products or services. In some cases, purchasers might struggle to define what an environmentally and/or socially preferable product or service is and how to include appropriate relevant criteria in tendering. The ability to accurately assess and verify information submitted by tenderers in response to environmental criteria is also a challenge.

Lack of practical tools and information

In some countries, public authorities cited lack of practical tools and information and the need for systematic implementation and integration of GPP into management systems. Decentralized organizations require effective management systems to ensure consistent application of environmental and social initiatives such as GPP. Joint procurement is one possible approach to overcome this kind of obstacle.

Lack of training

Procurers need training regarding legal and technical aspects of GPP implementation as well as the concept of LCA and life-cycle costing to evaluate a product or service.

Lack of co-operation among authorities

There is little systematic implementation of GPP across Europe, with the majority of public authorities acting alone, often on their own initiative. Both informal and formal cooperation are needed to enhance GPP in the EU. The lack of coordinated exchange of best practices and lack of networking among authorities have been identified as obstacles to wide implementation of GPP.

Limited established environmental criteria for products/services

For many product and service groups, public authorities do not have access to clear and verifiable criteria that allow them to incorporate environmental considerations into their tendering while complying with the requirements of procurement directives and other sources of procurement regulation.

The subsections below summarize the key points described in the body of this report and list policy and other recommendations for global GPP.

Summary

Because public entities exercise large-scale purchasing power in contracts for goods, services, and construction of infrastructure, policies prioritizing environmentally and socially responsible purchases can drive markets in the direction of sustainability. Significant GHG emissions are attributable to products and services that are commonly procured by governments, for example, large infrastructure such as roads, buildings and railways; public transport; and energy.

A wide range of countries around the world practice some form of GPP to promote environmental and social good. This report looks at 30 of those programs, 22 of which are countries in Asia, Europe, North and South America, Africa, and Oceania, and five case-studies at the city and regional level, as well as GPP programs of three multi-lateral banks and the UN to promote sustainability. Fifteen of the countries we review are among the top 20 GHG-emitting nations. The GPP programs included in this study are at country-, state-, region-, or city- level.

Although GPP programs vary in the numbers of types of products and services covered, most aim to address a range environmental concerns from mitigating climate change, reducing GHG emissions, and promoting energy efficiency to protecting soil, water, biodiversity and health. Some GPP programs include social criteria, such as giving preference to small businesses in a percentage of contracts awarded.

A large number of GPP programs rely on in-country, international, or independent eco-labels or other certification schemes such as EPDs to establish the products and services that are eligible to be procured under GPP policies. A popular method of assessing the sustainability of products and services is life-cycle analysis, which examines the environmental impact of a product over its entire lifetime from production through transport, use, and disposal. Training in evaluating life-cycle cost offers procurers a means of weighing environmental benefits in lieu of using the traditional approach of simply awarding public contracts to the lowest bidder.

Many countries that monitor and quantify GPP program impacts report that implementation of the programs is followed by significant decreases in CO₂ emissions and increases in numbers of green products procured and contracts awarded to small enterprises where the latter is part of the GPP criteria.

Recommendations

The foremost recommendation for using the power of public purchasing to foster sustainability is that all countries that do not currently have a GPP program should develop one. Countries that already have GPP programs can apply international best practices to improve their programs.

Given the pressing nature of the climate change crisis, we recommend that countries explicitly address energy-efficiency and embodied GHG emissions reductions in their GPP criteria, especially for products such as steel, cement, concrete, glass, and construction materials that have a significant GHG footprint.

To promote ongoing progress in addressing climate change crisis and environmental degradation, countries should continually revise their GPP by periodically review their GPP criteria versus market condition and make criteria more stringent to raise the bar for cleaner products.

Eco-labeling is an effective tool that is frequently used by governments implementing GPP programs. The EPDs are also another effective tool that are used in some countries and regions. Relying on a respected existing international or in-country eco-label can simplify the process of establishing purchasing criteria for governments newly developing GPP programs.

Life-cycle analysis is a useful tool that procurers can be trained to apply in order to shift from the model of routinely awarding procurement contracts to lowest bids to the model of accounting for the full life-cycle benefits/impacts and cost of a product or service and thereby recognizing that there may be overall cost savings if the maintenance, disposal, or other life-cycle cost of an environmental product is lower even if the first cost is higher.

Multilateral development banks and other lenders that provide significant funds to infrastructure projects around the world could incentivize green and low-carbon products and services in their programs in order to enhance the contribution that their funds make to environmental protection.

References

- Act amending the Energy Efficiency Act 1338 2016. Finland Energy Efficiency Act of 2016
- Agence de l'environnement et de la maîtrise de l'énergie (ADEME) 2014. FRA26 Sustainable public procurement.
- Agency for Public Management and eGovernment (Difi) 2019. Sustainable Public Procurement– on the move.
http://www.procuraplus.org/fileadmin/user_upload/Activities_files/Events/Oslo_2018/Procurement_Seminar_Oslo_2018_-_Difi.pdf
- Agyepong AO. & Nhamo G. 2017. Green procurement in South Africa: perspectives on legislative provisions in metropolitan municipalities
- Ambe, IM. 2016. Public procurement trends and developments in South Africa
- Andrea Renda et al. 2012. The uptake of Green Public Procurement in the EU 27, Centre for European Policy Studies and College of Europe.
- Annual Greening Government Commitments:
<https://www.gov.uk/government/collections/greening-government-commitments>
- Asia Development Bank (ADB) 2017. Procurement Policy.
(<https://www.adb.org/sites/default/files/adb-procurement-policy.pdf>)
- Asia Pacific Roundtable on Sustainable Consumption & Production (APRSCP) 2014. Report on Eco-labelling and Sustainable Public Procurement in the ASEAN+3 Region: Development of a Feasibility Study for Regional Ecolabelling Cooperation
- Asia-Pacific Economic Cooperation (APEC) Annex B 2013a. Factsheets of GPP Policies in 18 APEC Member Economies
- Asia-Pacific Economic Cooperation (APEC) Annex D 2013b. Best Practices on Green Public Procurement Factsheet
- Asia-Pacific Economic Cooperation (APEC) 2013. Green Public Procurement in the Asia Pacific Region: Challenges and Opportunities for Green Growth and Trade
- Australian Centre for Sustainable Business and Development (ACSBD) 2014. Green Procurement by Local Government: A Review of Sustainability Criteria
- Austrian Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) 2013. Sustainable Public Procurement in Austria
- BAX & Company. 2019. Green procurement: the pathway to reduce emissions.
<https://baxcompany.com/insights/green-procurement-the-pathway-to-reduce-emissions/>
- Betiol, L.S. 2013. Contratações públicas como indutoras de sustentabilidade: a perspectiva do consumo sustentável. Avanços e desafios no cenário jurídico brasileiro
- Bosse, J. 2017. The WTO and Green Public Procurement in Australia
- Burja, A. 2009. Using Green Public Procurement (GPP) for sustainable consumption and production. Journal for European Environmental & Planning Law, 6(3), 319-338.
- Buy Clean 2019. Spending California Taxpayer Money in a way that helps cut the pollution that causes climate change. <https://buyclean.org/buy-clean-california/>
- Carbon Leadership Forum 2018. Buy Clean Washington.
<http://www.carbonleadershipforum.org/resources/buy-clean-washington/>
- Carbon Washington 2018. Moving Washington State toward zero carbon emissions

Centre of Excellence for Sustainable Development (CII-ITC0) 2008. Green Procurement and Purchasing Guidelines

City of Copenhagen 2010. Sustainability in Construction and Civil Works 2010

City of Vienna 2019. ÖkoKauf Wien - programme for sustainable public procurement. Available at <https://www.wien.gv.at/english/environment/protection/oekokauf/>

CO₂ Performance Ladder: https://www.skao.nl/home_en

Coggburn, J. D. 2004. Achieving managerial values through green procurement: Public Performance & Management Review 28(2) 236-258.

Confederation of Indian Industry (CII) 2012. Green Public Procurement Guidelines in India

Conway, D. 2012. Sustainable Procurement Policies and Practices at the State and Local Government Level

Copenhagen Capacity (CopCap) 2013. Green and Smart Buildings in Denmark

Da Silva et al 2016. Sustainable public procurement: the Federal Public Institution's shared system

Danish Technological Institute Website.
<https://www.dti.dk/specialists/green-lab-for-energy-efficient-buildings-gleeb/introduction/33855>

Department for Environment, Food & Rural Affairs (DEFRA) 2007. "Securing the Future" UK Government Sustainable Procurement Action Plan: Incorporating the Government response to the report of the Sustainable Procurement Task Force.

Department for Environment, Food & Rural Affairs (DEFRA) 2010. An Action Plan for driving sustainable operations and procurement across government.

Department for Environment, Food & Rural Affairs (DEFRA) 2012. Sustainable procurement: the Government Buying Standards (GBS)

Department for Environment, Food & Rural Affairs (DEFRA) 2013. London 2012 legacy: Sustainable procurement for construction projects Available at <https://www.gov.uk/government/publications/london-2012-legacy-sustainable-procurement-for-construction-projects>

Department for Environment, Food & Rural Affairs (DEFRA) 2014. Guidance on Sustainable Procurement Tools

Department for Environment, Food & Rural Affairs (DEFRA) 2016. Collection of Greening Government Commitments.

Department for Environment, Food & Rural Affairs (DEFRA) 2018. Guidance on Upholding environmental standards if there's no Brexit deal.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) 2013. Sustainable Procurement in the Australian Government Report 2013

Department of the Environment and Energy (DEE) 2018. Sustainable Procurement Guide

Department of Trade and Industry (DTI). 2013, Industrial Policy Action Plan, http://www.thedti.gov.za/news2013/ipap_2013-2016.pdf

Difi 2017a. Grønne offentlige anskaffelser – hva er det og hvorfor er det viktig?. Retrieved from <https://www.Difi.no/blogg/2017/08/gronne-offentlige-anskaffelser-hva-er-detog-hvorfor-er-det-viktig>

Dolva CL. 2007. Green Public Procurement. How widespread is Green Public Procurement in Norway, and what factors are seen as drivers and barrier to a greener procurement practice? <https://www.stockholmresilience.org/download/18.aeea46911a31274279800078675/MHF+2007+Thesis+Dolva.pdf>

DubaCalc: <https://www.dubocalc.nl/en/>

Dutch Ministry of Infrastructure and Environment (DMIE) 2010. Monitor Duurzaam Inkopen 201. Resultaten monitoringonderzoek duurzaam inkopen 2010.

Eco Buy 2009. Green Purchasing in Australia

ECO-Buy 2010. Local Government Annual Report 2009-10

Eco-Buy 2011. The State of Victorian Local Government Green Purchasing 2010-11.

Ecofys 2013. Ex post beleidsevaluatie duurzaam inkopen – Eindrapport

Ecological Union 2016. Russia sets sustainability goals and implements green procurement

Environmental Protection Agency (EPA) 2017. Sustainable Marketplace: Greener Products and Services

EThekweni 2013. EThekweni municipality: Supply chain management policy

European Commission (EC) 2008. Green Public Procurement and the European Ecolabel

European Commission (EC) 2010. Public procurement – Study on administrative capacity in the EU

European Commission (EC) 2013. GPP in Practice. Using LCA and CO₂ performance to assess bidders.

European Commission (EC) 2016. Green and Sustainable Public Procurement. Available at http://ec.europa.eu/environment/gpp/versus_en.htm

European Commission (EC) 2016. Strategic use of public procurement in promoting green, social and innovation policies: The Netherlands In-Depth Country Report

European Commission (EC) 2016a. GPP in Practice. Issue no. 64 - September 2016. Strategy and approach to SPP in the Municipality of Copenhagen

European Commission (EC) 2016b. Public procurement – a study on administrative capacity in the EU

European Commission (EC) 2016c. Strategic use of public procurement in promoting green, social and innovation policies: Austria In-Depth Country Report

European Commission (EC) 2016c. Strategic use of public procurement in promoting green, social and innovation policies: The Germany In-Depth Country Report

European Commission (EC) 2017a. National Action Plans

European Commission (EC) 2017b. The EU Environmental Implementation Review: Common Challenges and How to Combine Efforts to Deliver Better Results

European Commission 2009. Collection of statistical information on Green Public Procurement in the EU

European Commission 2011. Buying Green! A Handbook on Green Public Procurement

European Court of Auditors 2014. How do the EU institutions and bodies calculate, reduce and offset their greenhouse gas emissions?

European Sustainable Procurement Network 2007. A Guide to Cost-Effective Sustainable Public Procurement

European Union (EU) 2016. Green Public Procurement Criteria for Road Design, Construction and Maintenance

European University Association (EUA) 2018. A comparative analysis of public procurement frameworks and practices in universities in Portugal and selected EU member states

Federal Agency for Technical Regulation and Metrology 2012, GOST R 54964-2012. Conformity Assessment. Environmental requirements for real estate objects

Federal Public Service Health/Food Chain Safety and Environment (FPSH/FCSE) 2019. EPD database. Available at <https://www.health.belgium.be/en/database-environmental-product-declarations-epd>

Federal Ministry of Environment and nature Conservation (FMENC). 2019. The German Government's Climate Action Program. Available at <https://www.bmu.de/en/topics/climate-energy/climate/national-climate-policy/climate-action-programme/>

FIDO 2012. Handleiding voor de toepassing van de levenscycluskost (LCC) bij duurzame overheidsopdrachten. Available at <http://gidsvoorduurzameaankopen.be/nl/goede-praktijken-2015/levenscycluskost-2012> & <http://www.smart-spp.eu/index.php?id=7633>

Fischer, E. 2010. Green Procurement: Overview and Issues for Congress

Ganley, S. 2013. Federal Green Product Procurement Policy in the United States

Gaz-Group 2015. Olympic Sochi Buses

Global Lead City Network on Sustainable Development (GLCN on SP) 2019. Buenos Aires Targets. <http://glcn-on-sp.org/cities/buenos-aires/>

Government of Canada Website 2018a. Policy on Green Procurement

Government of Canada Website 2018b. Greening Government Strategy

Government of Canada Website 2018c. Departmental Sustainable Development Strategy - Results Report for the 2017 to 2018 Fiscal Year

GPP 2020 2016. Procurement for a low-carbon economy. Available at <http://www.gpp2020.eu/home/>

GPP criteria: <https://www.mvicriteria.nl/en>

Green Building Council Finland (GBC-Finland) 2014. Calculation Guide: Life-Cycle Cost – the long-term cost efficiency indicator. Electronic version available at <http://figbc.fi/en/building-performance-indicators/calculationguide/life-cycle-cost-guide/>

Green Building Council Finland (GBC-Finland) 2015. Calculation Guide: Life-cycle Carbon Footprint. Electronic version available at <http://figbc.fi/en/building-performance-indicators/calculation-guide/life-cycle-carbonfootprint-guide/>.

Greening the Blue 2019. Best Practice. <http://www.greeningtheblue.org/resources/procurement/bestpractice>

Günther, E., & Scheibe, L. 2006. The hurdle analysis. A self-evaluation tool for municipalities to identify, analyze and overcome hurdles to green procurement. *Corporate Social Responsibility and Environmental Management*, 13(2), 61-77.

Hu, B. & Yi, S. 2014. Status Report of China's Green Government Procurement.

Huttunen, Riku 2017. Government report on the National Energy and Climate Strategy for 2030. Helsinki: Ministry of Economic Affairs and Employment 2017

IBO 2019. Oekoindex OI3. The instrument for environmental building optimization. Available at <https://www.ibo.at/en/building-material-ecology/lifecycle-assessments/oekoindex-oi3/>

Instituto Brasileiro de Geografia e Estatística 2014. Séries estatísticas

International Comparative Legal Guides (ICLG) 2019. USA: Public Procurement 2019

International Initiative for a Sustainable Built Environment (IISBE) 2008. Sustainable building in France: a progress report

International Institute for Sustainable Development (IISD) and the Energy and Resources Institute (TERI) 2007. State of Play in Sustainable Public Procurement

International Institute for Sustainable Development (IISD) 2008. Sustainable Public Procurement in South Africa

International Institute for Sustainable Development (IISD) 2012. Procurement, Innovation and Green Growth: The story continues...

International Institute for Sustainable Development (IISD) 2012. Sustainable Public Procurement in the Sao Paulo State Government

International Institute for Sustainable Development (IISD) 2014. Implementing Sustainable Public Procurement in South Africa: Where to start

International Institute for Sustainable Development (IISD) 2015. Implementing Sustainable Public Procurement in Latin America and the Caribbean

International Institute for Sustainable Development (IISD) 2015a. Green Public Procurement in China: Quantifying the Benefits

International Institute for Sustainable Development (IISD) 2015b. How Green Public Procurement Contributes to Sustainable Development in China

International Organization for Standardization (ISO) 2019. (www.iso.org/standard/63026.html)

Interreg Europe 2018. Role of Green Public Procurement in improving resource efficiency.

Københavns Kommune 2012.
https://kk.sites.itera.dk/apps/kk_pub2/index.asp?mode=detalje&id=1018

Kumar C. 2014. Green Public Procurement in India

Kumar S. 2018. Sustainable Procurement Task Force: India is in the Game

Kyu Woong Ko, and KEITI 2015. Korea's Green Public Procurement & Lessons Learned

Local Government Association 2014. National Procurement Strategy for Local Government in England.

Local Government NSW 2013. Sustainable Choice.
<http://www.lgnsw.org.au/member-services/sustainable-choice>

Mail & Guardian. 2015, Government supplier database: A blow to corruption

Marque NF 2019. <http://marque-nf.com/en/>

Martinet Y. 2010. Government finally adopts Grenelle Environment Project

Ministry for Environment, Land and Sea Protection (Italy MoE) 2019a. Minimum Environment Criteria (CAM). <http://www.minambiente.it/pagina/gpp-acquisti-verdi>

Ministry for Environment, Land and Sea Protection (Italy MoE) 2019b. GPP in local authorities <https://www.minambiente.it/pagina/il-gpp-negli-enti-locali>

Ministry for Environment, Land and Sea Protection (Italy MoE) 2003. Action plan for the environmental sustainability of consumption in the public administration section.

Ministry of Climate and Environment 2018. Better growth, lower emissions.
<https://www.regjeringen.no/contentassets/4a98ed15ec264d0e938863448ebf7ba8/t-1562e.pdf>

Ministry of Economic Affairs and Employment (MEAE) 2013. Government decision-in-principle on the promotion of environmental and energy solutions (cleantech solutions) in public procurement.

Ministry of Environment (MOE) and KEITI 2015. Policy Handbook for Sustainable Consumption and Production of Korea. 1st Edition

Ministry of Finance (MoF) 2018. Office Memorandum. Task Force in Sustainable Public Procurement

Ministry of the Environment (Japan MOE) 2016. Introduction to Green Purchasing Legislation in Japan

Ministry of the Environment (MOE) 2017. Programme to Promote Sustainable Consumption and Production

Ministry of the Environment (MOE) 2018. Procurement Criteria for Low Carbon Building

Modak P. 2016. Green Public Procurement – A Potential Game Changer for India?

More information on a widely used environmental assessment tool for construction projects:
<https://www.breeam.com/>

MOTIVA Online Services 2019a. http://www.motivanhankintapalvelu.fi/in_english

MOTIVA Online Services 2019b. www.motivanhankintapalvelu.fi/tietopankki

Municipal Collaboration for Sustainable Procurement (MCSP) 2017. The Annual Report on the State of Sustainable Public Procurement in Canada

Municipal Department MA 22 / ConPlusUltra 2014. Green Public Procurement in the City of Vienna. Impact Analysis

National Association of State Procurement Officials (NASPO) 2019. NASPO Green Purchasing Guide

Natural Resources Canada (NRCan) 2018. ENERGY STAR certification for commercial and institutional buildings in Canada.
<https://www.nrcan.gc.ca/energy/efficiency/buildings/energy-benchmarking/building/20258>

Norwegian EPD Foundation. 2019. The Norwegian EPD Program.

Office of Consumer Affairs (OCA) 2018. Common Environmental Labels and Claims in Canada

Office of Consumer Affairs (OCA) 2018. Environmental Labelling Programs - Ecolabels.
<http://www.ic.gc.ca/eic/site/oca-bc.nsf/eng/ca02742.html>

OkoKauf Wien 2019. baubook green procurement. Available at
<https://www.baubook.info/oea/?SW=16&oegpk=1&lng=2>

Olympic Delivery Authority (ODA). 2011. Learning legacy: Lessons learned from the London 2012 Games construction project. Available at
https://www.apm.org.uk/sites/default/files/open/open/learning-legacy_lr.pdf

One Click LCA 2019. EPD tool for the French industry.
<https://www.oneclicklca.com/easy-to-use-concrete-epd-france/>

Open House 2012. <https://www.openhouse.dk>

Organization for Economic Co-operation and Development (OECD) 2015. Going green: best practices for green procurement.
https://www.oecd.org/gov/ethics/Going_Green_Best_Practices_for_Sustainable_Procurement.pdf

Organization for Economic Co-operation and Development (OECD) 2016. Towards e-procurement in the Russia Federation

Organization for Economic Co-operation and Development (OECD) 2016. Argentina Compra - Public procurement website of the Argentinian National Public Administration

Organization for Economic Cooperation and Development (OECD) 2014. Going green: best practices for green procurement – Austria. Vienna ÖkoKauf program

Organization for Economic Cooperation and Development (OECD) 2015. Smart procurement. Going green: best practices for green procurement.
<http://www.oecd.org/gov/ethics/gpp-procurement-Sweden.pdf>

OVAM 2019. Veranderingsgericht en gezond bouwen. Available at
<https://www.ovam.be/veranderingsgerichtbouwen>

Overheid Vlaanderen 2019. Productgroepen. Available at
<https://overheid.vlaanderen.be/overheidsopdrachten-en-raamcontracten/duurzame-en-innovatieve-overheidsopdrachten/productgroepen>

Partnership Agreement 2014 for France, in accordance with Articles 14 and 15 of Regulation (EU) N.1303/2013 of the European Parliament and of the Council of 17th December 2013

Partnership for Green Public Procurements (Partnerskab for offentlige grønne indkøb) 2013: Partnerskab for offentlige grønne indkøb – indkøbsmål. Available online in Danish only at:
http://www.gronneindkob.dk/files/10406056_09%20Indkbsml%20samlet%20288%202013.pdf 2013

Physikalisch-Technische Bundesanstalt (PTB) 2019. Latin America and the Caribbean Promoting Innovation in the Green Economy by including Quality Infrastructure

PIANOo 2019. Sustainable Public Procurement. Available at
<https://www.pianoo.nl/en/public-procurement-in-the-netherlands/sustainable-public-procurement-spp>

PIANOo:
<https://www.pianoo.nl/en/public-procurement-in-the-netherlands/sustainable-public-procurement-spp> (Dutch public procurement expertise center – sustainable public procurement)

Porteous, E. & Naudé, F. 2012. Public sector procurement: The new rules

Prime Minister's Office Finland (PMO) 2017. Government Report on the implementation of the 2030 Agenda for Sustainable Development

Procura Plus 2019. <http://www.procuraplus.org/public-authorities/copenhagen/>

Procurement in India: Why and How Government of India (GOI), Ministry of Corporate Affairs 2011. Annual Report

Procurement training provided by the National Sustainable Public Procurement Program (NSPPP): <http://sd.defra.gov.uk/advice/public/nsppp/>

Public Procurement Service (PPS) of Korea 2009. Annual Report 2009.

Public Procurement Service (PPS) of Korea 2010. Annual Report. Section 5, Green Procurement.

Public Procurement Service (PPS) of Korea 2010. Korean Government's Guidance on Promoting Green Procurement Practice

Public Procurement Service (PPS) of Korea 2011. Annual Report 2011

Qiao, Y. & Wang C. 2011. Issues and Challenges in Implementing China's Green Public Procurement Program.
https://www.researchgate.net/publication/266468918_Issues_and_Challenges_in_Implementing_China's_Green_Public_Procurement_Program

Regeringen Government 2013. Strategi for intelligent offentlig indkøb (Strategy for smart procurement)

Regjeringen 2016. Nye regler for å kjøpe grønt. Retrieved from
<https://www.regjeringen.no/no/aktuelt/nye-regler-for-a-kojope-gront/id2471894/>

Regjeringen 2017. Vil ha fleire grøne innkjøp. Retrieved from
<https://www.regjeringen.no/no/aktuelt/vil-ha-fleire-grone-innkjop/id2550261/>

Renda, A., Pelkmans, J., Egenhofer, C., Schrefler, L., Luchetta, G., Selçuki, C., & Zirnhelt, A.C. 2012. The uptake of green public procurement in the EU27. Brussels, Centre for European Studies (CEPS), College of Europe, 51

Rijkswaterstaat 2019. DubCalc Portal. Available at <https://www.dubocalc.nl/en/>

Romodina, I., & Silin, M. 2016a. Perspectives of Introduction Sustainable Procurement in Public Procurement in Russia

Romodina, I., & Silin, M. 2016b. Ecological Aspects of Sustainable Public Procurement in Russia

Russian Green Building Council 2012. Implementing 'Green' Building Standards 5th Report

Russian Green Building Council 2013. Implementing 'Green' Building Standards 6th Report

Russian-German Environmental Information Bureau 2013. Sustainable Development in Russia

Scottish Procurement and Commercial Directorate (SPCD) 2018. Construction Procurement Handbook.

Sebi C. & Schleich J. 2018. France: The road to a low-carbon building sector by 2050 will be a long one

Secretaría de Hacienda y Crédito Público 2013. Primer Informe de Ejecución Del Plan Nacional de Desarrollo 2013-2018

Shelehov, A. M. 2002. The Main Provisions of the Strategy of Sustainable Development of Russia.

Silva, R.C, (2014). Compras compartilhadas sustentáveis

Simonen, K., Huang, T., Huang, M., 2018. Draft Buy Clean Washington Study

Simanovska J. 2013. Green public procurement in Norway.
https://lpmc.lv/uploads/media/Green_public_procurement_in_Norway.pdf

Sistema Economico Latinoamericano y Del Caribe (SELA) 2015. Public procurement as a tool for development in Latin America and the Caribbean

SKAO 2019. Sustainability with the CO₂ performance ladder. Available at
https://www.skao.nl/home_en

SPP Regions 2015. Best Practices in regional SPP/PPI network: Partnership on Green Public Procurement, Denmark

StopWaste 2018. Local Government Climate Planning.
<http://www.stopwaste.org/preventing-waste/business/built-environment/climate/local-government>

Sustainable Procurement Task Force (SPTF) 2006. “Procuring the Future” Sustainable Procurement National Action Plan: Recommendations from the Sustainable Procurement Task Force.

SYKE Finnish Environment Institute 2019a.
https://www.syke.fi/en-US/Research__Development/Consumption_and_production/Calculators/Juhilas

SYKE Finnish Environment Institute 2019b. https://www.syke.fi/en-US/Research__Development/Consumption_and_production/Calculators/Synergy

SYMBI and FUNDECYT 2017. Guidelines on how to capitalize green procurement as an enabler of industrial symbiosis.

Temmerman L. & Habets A. 2013. Green Public Procurement

TenderNED 2017. Dataset Tendernet 2017.

The Climate Group et al. 2008. Smart2020. Enabling the low carbon economy in the information age

The Energy and Resources Institute (TERI) 2007. Sustainable Public Procurement: Towards a low carbon economy

The Energy and Resources Institute (TERI) 2013. Engagement with Sustainability Concerns in Public

The United Nations Office for Project Services (UNOPS) 2009. 2008 Annual Statistical Report on United Nations Procurement

United Nations Centre for Regional Development (UNCRD) 2015. Sustainable Urbanization in Japan Aiming towards a Low Carbon City

United Nations Department of Economic and Social Affairs (UN-DES), 1992. Agenda 21. Division for sustainable development

United Nations Department of Economic and Social Affairs (UN-DESA) 2008. Public Procurement as a tool for promoting more Sustainable Consumption and Production patterns

United Nations Environment (UN-Environment) 2017. Sustainable Public Procurement and Ecolabelling (SPPEL).
<http://www.oneplanetnetwork.org/initiative/sustainable-public-procurement-and-ecolabelling-sppel>

United Nations Environment Program (UNEP) 2012. The Impacts of Sustainable Procurement

United Nations Environment Program (UNEP) 2015. Sustainable procurement & major events

United Nations Environment Program (UNEP) 2015a. Implementation of Green Public Procurement and Ecolabelling in Asia-Pacific Countries

United Nations Environment Program (UNEP) 2015b. Regional Strategy on Sustainable Consumption and Production (SCP) for the 10YFP implementation in Latin-America and the Caribbean

United Nations Environment Program (UNEP) 2017a. Factsheets on Sustainable Public Procurement in National Governments.
<http://www.oneplanetnetwork.org/sites/default/files/factsheets2017.pdf>

United Nations Environment Program (UNEP) 2017b. Comparative Analysis of Green Public Procurement and Ecolabelling Programmes in China, Japan, Thailand and the Republic of Korea: Lessons Learned and Common Success Factors

United Nations Environment Programme (UNEP) & Global Alliance for Buildings and Construction (GBC) 2017. Towards a zero-emission, efficient, and resilient buildings and construction sector

United Nations Environment Programme (UNEP) 2013. Sustainable Public Procurement: A Global Review. Final Report.
<https://globalecolabelling.net/assets/Documents/unep-spp-report.pdf>

United Nations Environment Programme (UNEP) 2016. Monitoring Sustainable Public Procurement Implementation

United Nations Global Marketplace 2019. “Sustainable Procurement Tools”.
https://www.ungm.org/Shared/KnowledgeCenter/Pages/PT_SUST

United Nations Industrial Development Organization (UNIDO) 2017. The Role of Public Procurement Policy in Driving Industrial Development

United Nations 2011. Buying for a Better World: A Guide on Sustainable Procurement for the UN System. http://www.greeningtheblue.org/sites/default/files/BFABW_Final_web_1.pdf

US Green Building Council 2018. Buy Clean California.
<https://usgbc-la.org/programs/buy-clean-california/>

Van der Zwan Judith 2018. Green Public Procurement as environmental policy tool: A theoretical framework.
http://www.a-id.org/wp-content/uploads/2018/05/Green_rpcurement_May_2018.pdf

Vlaamse Overheid 2017. Materialen voor de herinrichting van gebouwen - algemene fiche. Available at <https://overheid.vlaanderen.be/Materialen-herinrichting-gebouwen>

Vlaamse Overheid 2018. Totem: een nieuwe tool om de milieuprestaties van gebouwen te verbeteren (vroeger “MMG”) <http://www.ovam.be/materiaalprestatie-gebouwen> & <https://www.totem-building.be/>

Vonortas et al. 2011. Public Procurement and Innovation in United States

Western Cape Government Environmental Affairs and Development Planning 2015a. Sustainable Public Procurement Policy Update: An overview to inform implementation in Western Cape Government

Western Cape Government Environmental Affairs and Development Planning 2015b

World Bank in Mexico 2013. Mexico Moves to Results-based Procurement System

World Bank 2012. Green Procurement in Selected Environmental Policy Frameworks

World Bank 2016. Sustainability Guidance.
<http://pubdocs.worldbank.org/en/788731479395390605/Sustainable-Procurement-Guidance-FINAL.pdf>

World Bank 2018. ESHS Guidance.
<http://pubdocs.worldbank.org/en/449581537214904626/Procurement-Guidance-ESHS-in-Procurement.pdf>

Zeppel H. 2014. Green Procurement by Local Government: A review of Sustainability Criteria

Zhu Q., Geng Y. & Sarkis J. 2013. Motivating green public procurement in China: An individual level perspective

List of Acronyms

ABNT	Associação Brasileira de Normas Técnicas
ACSBD	Australian Centre for Sustainable Business and Development
ADB	Asia Development Bank
ADEME	Agence de l'environnement et de la maîtrise de l'énergie
ANAC	National Anti-Corruption Authority
APCC	Australian Procurement and Construction Council
APEC	Asia-Pacific Economic Cooperation
APRSCP	Asia Pacific Roundtable on Sustainable Consumption & Production
ARPAs	Regional Environmental Protection Agencies
BAAQMD	Bay Area Air Quality Management District
BHEL	Bharat Heavy Electricals Limited
BL	Bidding Law
BREEAM	Building Research Establishment Environmental Assessment Method
BWI	Biodiversity and Wine Initiative
CASBEE	Comprehensive Assessment System for Built Environment Efficiency
CATMAT	Materials Catalogue
CCS	Crown Commercial Service
CEC	China Environmental United Certification Centre
CEUCC	China Environmental United Certification Center
CII	Confederation of Indian Industry
CO ₂	Carbon Dioxide
CONAE	National Commission for Energy Conservation
CopCap	Copenhagen Capacity
CP	Centralized Purchasing
CPGs	Commonwealth Procurement Guidelines
CPRs	Commonwealth Procurement Rules
CPSUs	Central Public Sector Undertakings
CQC	China Quality Certification Centre
CSC	China Standard Certification Centre
DEDAT	Department of Economic Development and Tourism
DEE	Department of the Environment and Energy
DEFRA	Department for Environment, Food & Rural Affairs
DME	Department of Minerals and Energy's
DoA	Department of Agriculture
DPR	Departmental Performance Report
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
DTI	Department of Trade and Industry

EC	European Commission
ECI	Environmental Cost Indicator Value
ECL	Energy Conservation List
ECPs	Energy Conservation Products
EDC	Environmental Development Centre
EEV	Enhanced Environmentally Friendly Vehicles
ELP	Environmental Labelling Product
EPA	Environmental Protection Agency
EPACT	Energy Policy Act
EPD	Environmental Product Declaration
EPEAT	Electronic Product Environmental Assessment Tool
ESD	Ecologically Sustainable Development
ESHS	Environmental, Social, Health & Safety in Procurement
EU	European Union
EUA	European University Association
FAR	Federal Acquisition Regulation
FPDS	Federal Procurement Data System
FSC	Forest Stewardship Council
FSDS	Federal Sustainable Development Strategy
GBC	Green Building Council
GBS	Government Buying Standards
GDP	Gross Domestic Product
GECA	Good Environmental Choice Australia
GEM-DD	Groupe (Permanent) d'Etude des Marchés Développement Durable, Environnement
GFR	General Financial Rules
GHG	Greenhouse Gas
GPCs	Government Procurement Centers
GPIS	Green Products Information System
GPL	Government Procurement Law
GNP	Green Purchasing Network
GPP	Green Public Procurement
GPP NAP	National Action Plan on Green Public Procurement
GSA	General Services Administration
G-SEED	Green Standard for Energy and Environmental Design
ICL	Incandescent Lamps
ICLG	International Comparative Legal Guides
ICT	Information Communication Technology
IDB	Inter-American Development Bank
IDRC	International Development Research Centre
IFMS	Integrated Financial Management System

IISD	International Institute for Sustainable Development
INGP	Inter-American Network on Government Procurement
IOC	International Olympic Committee
IPF	Investment Project Financing
ISO	International Organization for Standardization
ISPRA	Italian National Institute for Environmental Protection and Research
JAS	Japanese Agricultural Organic Standard
JEA	Japan Environment Association
KEITI	Korea Environmental Industry and Technology Institute
KONEPS	Korea on-line E-Procurement System
LAC	Latin America and Caribbean
LCA	Life Cycle Analysis
LCC	Life Cycle Costing
LEED	Leadership in Energy and Environmental Design
MCSP	Municipal Collaboration for Sustainable Procurement
MEAE	Ministry of Economic Affairs and Employment
MEAT	Most Economically Advantageous Tender
MEP	Ministry of Environmental Protection
MFMA	Municipal Financial Management Act
MNCs	Multi-National Corporations
MOE	Ministry of the Environment
MOF	Ministry of Finance
MoR	Ministry of Railways
MSE	Micro and Small Enterprises
MSME	Ministry of Micro, Small and Medium Enterprises
NAGPI	North American Green Purchasing Initiative
NDRC	National Development and Reform Commission
NECPA	National Energy Conservation Policy Act
NHS	National Health Services
NRCan	Natural Resources Canada
NSPPP	National Sustainable Public Procurement Program
NTPC	National Thermal Power Corporation
nZEB	Nearly Zero Energy Building
OAS	Organization of American States
OCA	Office of Consumer Affairs
OECD	Organization for Economic Cooperation and Development
OFEE	Office of the Federal Environmental Executive
OGGO	Office of Greening Government Operations
OMB	Office of Management and Budget
PFMA	Public Finance Management Act
PMO	Prime Minister's Office

PPA	Public Procurement Agency
PPCs	Plan for Sustainable Production and Consumption
PPS	Public Procurement Services
PSU	Public Sector Unit
PTB	Physikalisch-Technische Bundesanstalt
PWGSC	Public Works and Government Services Canada
QI	Quality Infrastructure
RCRA	Resource Conservation and Recovery Act
RECP	Resource Efficient and Cleaner Production
RPP	Report on Plans and Priorities
SCP	Sustainable Consumption and Production
SDG	Sustainable Development Goal
SELA	Sistema Económico Latino americano y Del Caribe
SLMP	Sustainable Logistics Management Plans
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SOEs	State-Owned Enterprises
SPCD	Scottish Procurement and Commercial Directorate
SPTF	Sustainable Procurement Task Force
TCO	Total Cost of Ownership
TERI	The Energy and Resources Initiative
ToR	Terms of Reference
UES	Unified Information System
UN	United Nations
UNCRD	United Nations Centre for Regional Development
UN-DES	United Nations Department of Economic and Social Affairs
UN-DESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Program
UNIDO	United Nations Industrial Development Organization
UNOPS	United Nations Office for Project Services
UNPFA	United Nations Population Fund
USGBC	US Green Building Council
WB	World Bank
WCG	Western Cape Government
ZNC	Zero Net Carbon