

PUBLIC PROCUREMENT OF ENERGY EFFICIENT PRODUCTS

Lessons from Around the World





ESMAP MISSION

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ACRONYMS AND ABBREVIATIONS

€	Euro (currency)	ICLEI	Local Governments for Sustainability
AMMAC	Asociación de Municipios de México (Mexico)	IFI	international financial institution
BEE	Bureau of Energy Efficiency (India)	IGPN	International Green Purchasing Network
CEC	Commission of the European Communities	ISO	International Organization for Standardization
CFL	compact fluorescent lamp	KEMCO	Korea Energy Management Corporation
CLASP	Collaborative Labeling & Appliance Standards Program	kg	kilogram
CO ₂	carbon dioxide	KliP	Kilmaschutzprogramm (Climate Protection Program, Austria)
CO ₂ e	carbon dioxide equivalent	KONEPS	Korean ON-line E-Procurement System
CPG	Commonwealth Procurement Guidelines (Australia)	KRW	Korean Won (currency)
CQC	China Quality Certification	kWh	kilowatt hour
Defra	Department of Environment, Food and Rural Affairs (UK)	LCC	lifecycle cost
DOE	Department of Energy (USA)	LED	light emitting diode
DSM	demand-side management	MKE	Ministry of Knowledge Economy (South Korea)
EC	European Commission	MOE	Ministry of Environment (Japan, South Korea, Mexico City)
EE	energy efficiency	MOF	Ministry of Finance (China)
EEP	energy efficient purchasing	Mtoe	million tonnes of oil equivalent
EEPL	Energy Efficient Products List for Government Procurement (China)	NASPO	National Association of State Procurement Officials (USA)
EMS	energy management system	NDRC	National Development and Reform Commission (China)
EPA	Environmental Protection Agency (USA)	NGO	nongovernmental organization
EPEAT	Electronic Product Environmental Assessment Tool	NPV	net present value
ESCO	energy service company	OECD	Organization for Economic Cooperation and Development
ESPC	energy savings performance contract	OMB	Office of Management and Budget (USA)
EU	European Union	PPS	Public Procurement Service (South Korea)
FAR	Federal Acquisition Regulation (USA)	R&D	research and development
FEMP	Federal Energy Management Program (USA)	RMB	Renminbi (China; currency)
FIDE	Fideicomiso para el Ahorro de Energía Eléctrica	RPN	Responsible Purchasing Network (USA)
GAO	Government Accountability Office (USA)	SEAD	Super-efficient Equipment and Appliance Deployment
GDP	gross domestic product	SEMCo	Swedish Environmental Management Council
GGAP	Green Government Action Plan (Japan)	UK	United Kingdom
GHG	greenhouse gas	USA	United States of America
GPN	Green Purchasing Network (Japan)	US\$	United States dollar (currency)
GPNI	Green Purchasing Network India	VFM	value for money
GPP	green public procurement	W	Watt
GPS	Government Procurement Service (UK)		
GSA	General Services Administration (USA)		
GWh	gigawatt hour		

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The report was written by Jas Singh (lead author), Alicia Culver (green purchasing specialist, Responsible Purchasing Network) and Melis Bitlis (analyst, consultant). The study team included Jas Singh (Task Team Leader), Feng Liu (SEGES), Alicia Culver, Jay Jangho Park, and Melis Bitlis (consultants). Peer reviewers included Ashish Bhateja (Senior Procurement Specialist, OPCPR), Ashok Sarkar (Senior Energy Specialist, SEGEN), and Roberto Aiello (Senior Energy Specialist, EASNS). The report also benefited from the feedback of Rohit Khanna (Program Manager, ESMAP), Peter Johansen (EASIN), and Ivan Jaques (SEGES).

The report is based on 10 country and city case studies, as well as numerous expert interviews. Individual case studies were authored by Caifeng Liu (China), Jay Jangho Park (Australia, India, Japan, Korea), Alicia Culver (European Union, United States, and the cities of Portland and Vancouver), and ESMAP (City of Vienna). The team would also like to acknowledge the global experts who contributed their valuable time and information to the development of this report.

EXECUTIVE SUMMARY

The public sector represents a strategically important market for energy efficient goods and services. As a big and visible consumer, actions taken by the government to improve their energy efficiency (EE) can strongly influence its citizens. The types of products purchased by governments can also influence manufacturers since between 12 and 20 percent of a country's gross domestic product (GDP) passes through its public procurement systems. Governments often purchase in large quantities and, therefore, can have a catalytic effect on local markets while offering consistent and stable demand for new and emerging technologies.

This report assesses global experiences with energy efficient purchasing (EEP) as a tool to help governments improve the efficiency of their facilities and public services. Many government jurisdictions—countries, states/provinces, and local governments—are adopting policies that require or encourage the procurement of energy efficient products by public agencies. Despite these initiatives, prevailing challenges exist including:

- A **lack of incentives** due to budgetary restrictions, split incentives and other factors;
- **Limited financial resources** needed to pay for the higher upfront cost of more energy efficient equipment or to finance purchases to amortize these costs;
- **Restrictive policies and procedures**, which make procurement, budgeting, and new approaches more difficult;
- **Behavioral inertia** of a risk-adverse public sector used to the status quo;
- **No or poor access to information and institutional knowledge** about EE opportunities, implementation options, certified energy efficient equipment, lifecycle costing; and
- **Weak governance**, which can introduce new challenges when governments pay a premium for energy efficient products.

ENERGY EFFICIENT PURCHASING

Although most EEP policies *strongly encourage* public agencies to procure energy efficient products, a smaller (but growing) number directly *mandate* it. Jurisdictions that mandate it generally see a greater and more rapid increase in the adoption of energy efficient products and market transformation effects than those that do not. There are a range of EEP approaches and policy types, from product-specific policies (e.g., energy efficient fleets), product bans (e.g., disallowing purchase of incandescent bulbs), overall EEP policies (generally covering all products with EE labels or other appropriate certifications), broader green or sustainable procurement policies where EE is almost always a core element, energy efficient and green building policies (where building equipment must meet EEP requirements), and policies that encourage or mandate the use of best value analyses when awarding tenders/contracts (which look at a product's lifecycle cost, or LCC, and favor energy efficient products).

GREEN PROCUREMENT VERSUS EEP

In many developed countries, EEP is increasingly becoming subsumed within broader green public procurement (GPP) or sustainable procurement policies, where EE is only one indicator among many others (e.g., recycled content, no toxic inputs, low carbon footprint). In most cases, such developments have been mutually beneficial, as energy savings can help to offset the high upfront costs of green products, while stronger attention to environmental issues allows for further promotion of EE. However, GPP does not yet have a universal definition or well-established parameters, which can make product comparisons, LCC analyses, certification, and results reporting significantly more complex.

KEY OBSERVATIONS OF GLOBAL EEP PROGRAMS

A review of 10 case studies and interviews with experts revealed that EEP remains a popular policy instrument being implemented or considered in many, mostly developed and middle-income, countries. Other key observations included:

- There are a **growing number of EEP programs in developing countries**. While some countries have sought to move directly to GPP programs, most countries developed EEP programs first and some are now working to transition them to broader GPP initiatives.
- There is **substantial anecdotal information on the benefits of EEP programs**, which have saved governments millions in energy costs, since many programs are based on cost-effective, best value analyses for their purchases.
- Despite a variety of efforts and approaches, **most governments do not have explicit enforcement mechanisms** to ensure that all purchases meet the policy mandates. Governments that monitor purchases generally showed less than 100 percent compliance.
- **Few programs fully account for the costs or track impacts** of such policies or programs. While many governments track the number of products purchased, almost none have detailed assessments of the total cost savings, energy/CO₂ savings, or broader impacts on the market. Without such systematic monitoring, an objective analysis of program performance is not possible.
- **There are a wide variety of existing resources** to assist developing countries in establishing such programs: EE/LCC calculators, online training materials, technical specifications, and testing protocols, labels, sample tender document language, etc. For countries getting started, such materials can greatly reduce program development costs and facilitate a quick program launch.

The study concluded that EEP policies and programs can be an effective way to promote energy efficient products by leveraging a government's purchasing power and influence. (See results in select jurisdictions in Table 1.) Countries with more advanced programs have a wealth of resources and experiences available for countries just getting started, which can dramatically lower the time and resources needed to launch such efforts. As countries improve enforcement and tracking efforts, enhanced methods will be developed and tested, providing models for adaptation and application in the developing world.

TABLE 1
EEP Results in Select Countries and Cities

CITY OR COUNTRY	PROCUREMENT POLICY	IMPACTS
Vienna, Austria	<ul style="list-style-type: none"> • Mandatory GPP policy in 1999, includes EE criteria • Guidelines cover 23 goods and services categories 	<ul style="list-style-type: none"> • Annual savings of €17 million and 30,000 tons of CO₂ emissions
China	<ul style="list-style-type: none"> • EEP policy enacted in 2004, mandated to all government levels in 2006 • Guidelines cover 28 product categories (2011) 	<ul style="list-style-type: none"> • EEP reached RMB 15.72 billion (US\$ 2.3 billion) in 2009 • Covered 70% of products in target categories
Mexico City, Mexico	<ul style="list-style-type: none"> • Mandatory GPP policy in 2011, includes EE criteria • Covers 8 product categories 	<ul style="list-style-type: none"> • Energy savings of 340 GWh/year • 6,500 tons of CO₂ emissions avoided
South Korea	<ul style="list-style-type: none"> • Voluntary GPP policy in 2004, includes EE criteria • Guidelines cover 11 product categories 	<ul style="list-style-type: none"> • GPP reached KRW 1.12 trillion (US\$ 1.0 billion) in 2009

Source | Authors.

KEY PROGRAM MODELS

The study identified several common strategies and approaches to facilitate government EEP policies, programs, and practices (i.e., how energy efficient products are actually identified, specified, or given preference in the procurement process). These included energy efficient product labeling, catalogues of technical specifications, LCC analyses, product preferences, and qualified product lists. Typically, a combination of these were used in the countries and cities studied (Table 2).

RECOMMENDATIONS

To ensure success of EEP, governments should consider using a holistic approach, from policy development and planning to tools and outreach to tracking. The adoption of a mandatory EEP policy or the development of an energy efficient label alone does not guarantee its objectives will be met without having a more comprehensive program in place. Some of the most critical elements of success relate to having established a clear policy, supporting tools to help lower transaction costs (e.g., labels, LCC calculators, qualified product lists), and creating incentives to address financial gaps and behavioral resistance. Other program components, such as strong institutional set-ups, robust testing and certification, training and outreach, strategic partnerships, and program monitoring and reporting, were also found to be crucial. Key recommendations on each of these elements are summarized in Table 3.

Ultimately, EEP policies and programs seek to alter the decision-making processes of public procurement procedures. There is emerging consensus among experts that strategies to create EEP as the default option—whereby a public agency must purchase the energy efficient product unless it can provide justification for not doing so—is most effective. This requires proper planning and reporting requirements, as well as specific guidance and supporting structures (e.g., tools, training,

TABLE 2
Key EEP Program Models

MODEL	DESCRIPTION	EXAMPLES
Labels	Requirement for products purchased to have an existing EE label, when such labels are available	Australia, China, City of Vancouver (Canada), EU, Japan, Mexico, South Korea, Cities of Portland and New York (USA)
Catalogues of Technical Specifications	Catalogue, book, or website of technical specifications/EE standards for commonly purchased products, which are then used in tender documents	City of Vienna (Austria), EU, Japan, Mexico, Sweden, UK, United States, Cities of Portland and New York (USA)
Life-Cycle Costing/Best Value Award	LCC analysis to inform purchasing decisions about which products offer best value over their useful lifetimes	Australia, City of Vancouver (Canada), EU, UK, United States, Cities of Portland and San Jose (USA)
EE Preferences	Extra points or price preferences in bid evaluation for qualifying products	Australia, China, Japan, EU, South Korea, United States, City of Portland (USA)
Qualifying Product List	Database of products that qualify with government EE specifications	City of Vienna (Austria), China, EU, City of Hannover (Germany), South Korea, UK, United States, City of San Francisco (USA)

Source | Authors.

adequate staffing and budgets, etc.) to assist procurement and technical officers to implement EEP, from market assessments, to benchmarking, to bid solicitation and evaluation.

IS THERE A NEED FOR ALTERNATIVE STRATEGIES?

Despite the collective experience with EEP programs, prevailing challenges remain. Some of these include: (i) LCC analyses are complicated to conduct; (ii) product types may change faster than EEP certification; (iii) competition requirements inhibit proprietary and new technologies; and (iv) public agencies still assume product performance risks. Some options to address these include:

- Requirement for bidders to submit bids based on LCC;
- Output-based procurement, where the lowest net present value (NPV) offered to achieve a desired output (e.g., lumen output per square meter for lighting) is selected;
- Product competitions and challenges with guaranteed government purchases;
- Product warranties that cover energy use;
- Performance-based warranties with deferred payments;
- Energy supply contracting, where key services (e.g., heating, cooling) are outsourced to the lowest bidder; and
- Energy savings performance contracts, where retrofits, capital upgrades and maintenance can be outsourced to an energy service provider (ESCO) and paid for from energy savings.

TABLE 3**Key Recommendations for a Successful EEP Program**

PROGRAM COMPONENT	RECOMMENDATION(S)
EEP Policy	<ul style="list-style-type: none"> • Develop broad EE laws and legal frameworks that provide for measures including EEP to be implemented with proper resources, institutional accountability, and targets • Consider measures for EEP to be the “default” option for public agencies (i.e., public agencies must justify opting out of the policy)
EEP Tools	<ul style="list-style-type: none"> • Create tools—such as labels or qualified product lists—to facilitate EEP implementation and keep transaction and compliance costs low
Institutional Arrangements	<ul style="list-style-type: none"> • Develop institutional arrangements to support all aspects of EEP programs, with clearly defined roles and responsibilities, and accountability • Involve procurement and technical agencies throughout
Product Testing & Certification	<ul style="list-style-type: none"> • Overall governance of product testing, certification, and labeling is critical to a successful EEP program • Ensure testing laboratories are credible and conduct routine checks to maintain program integrity • Use existing labels, local or international, to ease product certifications
Outreach & Training	<ul style="list-style-type: none"> • Conduct aggressive outreach and training programs to ensure broad understanding and buy-in
Incentives & Behavior Change	<ul style="list-style-type: none"> • Identify and understand public agency/staff motivations and behaviors to develop appropriate behavior change measures • Focus on longer term sustained changes • Create mix of obligatory procedures and voluntary measures (e.g., competitions, awards)
Partnerships	<ul style="list-style-type: none"> • Seek consultations with manufacturers, nongovernmental organizations (NGOs), other jurisdictions to greatly improve chances of EEP success
EEP Monitoring & Tracking	<ul style="list-style-type: none"> • Develop upfront compliance monitoring and results reporting plans and establish clear indicators for each • Periodically evaluate programs to assess effectiveness

Source | Authors.

ROLE OF THE WORLD BANK

Each year, the World Bank lends billions of dollars to developing countries to support economic growth and poverty reduction. Together with other international financial institutions (IFIs), investments of more than US\$ 105 billion in 2010 alone were provided to developing countries to support their economic development goals. A bulk of these funds goes towards the purchase of goods and equipment, presenting a huge opportunity for leadership in this area. Efficiency and other standards adopted by the World Bank and other IFIs can thus have a catalytic effect on global supply chains and manufacturing. Such initiatives also fit well with the new “green growth” agenda being operationalized by the World Bank, which recognizes that economic growth without attention to resource efficiency, inclusion, and resilience is not sustainable.

WHAT CAN WORLD BANK PROJECT MANAGERS DO?

World Bank and other IFI project managers can help ensure they are incorporating some simple steps into their procurement planning for energy-using equipment. These include:

- Identify key energy-using goods to be purchased under projects (e.g., water/steam pumps, office equipment, lighting, vehicles).
- Work with local counterpart agencies to develop technical specifications, which include EE performance requirements, and verify there are sufficient qualified suppliers.
- Conduct LCC analyses to assess the cost-effectiveness of various models/technologies to select the most advantageous one.
- Require equipment certifications from accredited laboratories or commission testing upon receipt of the goods to ensure compliance with the bid specifications.
- Monitor the energy savings and, if satisfied, disseminate the specifications within the country, within the World Bank, and to other IFIs.

GETTING STARTED

The following steps are suggested for countries that are initiating or developing an EEP policy or program:

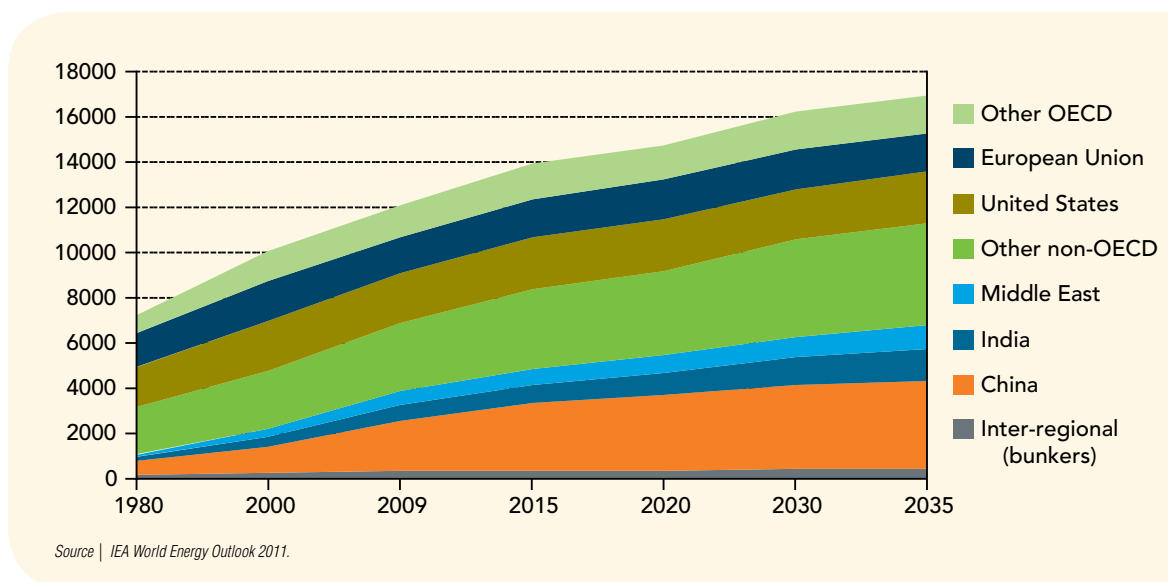
- 1 | Gain **political buy-in** on EEP concepts, focusing on key drivers, such as ensuring best value for money, leading by example, and helping to transform markets.
- 2 | Develop a **voluntary EEP policy** first to allow the mechanism to be tested, with strong components on outreach and dissemination.
- 3 | Begin with a **small set of products** in order to build a reputable EEP program. Where possible, rely on existing, credible labeling schemes.
- 4 | Develop **program infrastructure**, such as institutional set-ups and targets, as well as supporting measures (e.g., tools, training and incentives).
- 5 | Look for **strategic opportunities to partner** with other jurisdictions, bundle procurements to achieve better pricing, liaise with manufacturing associations, and involve nongovernmental organizations to broaden impacts and improve program effectiveness.
- 6 | **Track and monitor the EEP policy** to measure participation rates, track and report results, and assess broader market impacts. Disseminate results to politicians, employees throughout the jurisdiction, and the public to gain their support.
- 7 | As experience is gained, **make the EEP policy mandatory**. Appropriate enforcement mechanisms need to be established to ensure full compliance. Consider making procurement of energy efficient products the default option.
- 8 | **Update technical specifications** and introduce new products as the EEP policy matures in order to deepen impacts. Consider expanding EEP to resource-saving areas, such as water conservation, recycled content, etc.
- 9 | **Test new procurement methods** in order to further increase the impacts and improve the efficiency of EEP efforts.

INTRODUCTION AND CONTEXT

Global energy needs are increasing at a steady pace. Rapid industrial development and growing populations have led to an exponential growth in worldwide energy consumption. According to the International Energy Agency, demand for energy is projected to grow steadily from 2010 to 2035 (from 12,150 to 16,950 Mtoe), representing a 40 percent increase.¹ About 90 percent of this increase will come from developing countries. As these countries continue to urbanize, develop their industrial infrastructure, and provide universal access to basic services, strains on the existing energy infrastructure and resources will intensify. This, coupled with a substantial rise in the middle class in many of the emerging economies, most notably China and India, will also contribute to this increase in demand. This contributes to the expected rise in non-OECD (Organization of Economic Cooperation and Development) countries' share of global energy demand, from 54 percent in 2009 to 64 percent by 2035 (Figure 1.1).

This projected increase in energy demand will necessitate new solutions to help bridge the gap between supply and demand, while reducing the trillions of dollars required for new energy infrastructure investments. Increasing energy production—a necessity in the developing world—can only offer part of the solution for these energy needs. The recent spike of oil prices and volatility of fossil fuel pricing and supply has heightened concerns about energy security. These concerns will

FIGURE 1.1
World Primary Energy Demand by Region



only be exacerbated as countries try to secure these dwindling resources to power their growth, while trying to provide affordable energy services to their citizens. Further, continued reliance on traditional energy sources will have an increasingly negative impact on the environment, both local and global.

WHY IS ENERGY EFFICIENCY IMPORTANT?

Part of the energy demand problem will have to be solved by a substantial boost in global energy efficiency (EE). Energy efficiency, which is defined as a reduction in energy use to deliver the same service or output, involves decreasing the energy loss during production, supply, and consumption. Improving EE enables countries to continue to grow their economies while reducing the rate of energy demand growth. Energy efficiency measures help to minimize economic losses and operating costs, thereby decreasing the overall costs of economic growth. Such measures can also enhance a country's energy security by reducing their reliance on imported fuels, thereby making their domestic energy resources go further. It can also ease infrastructure bottlenecks while improving industrial and commercial competitiveness through reduced operating costs. Often the costs of upgrading to more efficient technologies and systems can be fully financed by the energy cost savings over a portion of the product's expected life.

It is also good for the environment. Efficiency gains can help conserve natural resources; reduce local air pollution; improve a country's ability to adapt to the potential effects of climate change (e.g., less rainfall available for hydroelectric power); reduce peak demands, which ease constraints on the power network; and shrink the carbon footprint of the energy sector. Energy efficiency is among the lowest cost measures to mitigate greenhouse gas (GHG) emissions. Without a substantial increase in EE, the energy-related infrastructure required by 2017 will exhaust all of the CO₂ emissions allowed in the 450 Scenario up to 2035, leaving no room for additional power plants, factories, and other infrastructure unless they are zero-carbon.²

WHY DOES THE PUBLIC SECTOR MATTER?

The government is often the most important factor in the energy sector, since it usually sets the policies and regulations on energy supply and is among the largest single energy user. Available data suggest that public sector energy use typically corresponds to between 2 and 5 percent of total energy consumption. It can be much higher (up to 20 to 30 percent) in countries with large heating loads and in countries with low energy access, as many in Sub-Saharan Africa.³ Thus, changes in the consumption patterns of the public sector can yield significant benefits for a country, both through reduced energy demand and lower energy expenditures by government entities.

The public sector also represents a strategically important market segment for EE. As a big and visible consumer, improvements in EE can help influence the public. New efficiency measures put in place in various public facilities across the country—such as schools and universities, public administrative offices, hospitals and clinics, orphanages, libraries, museums, and in public lighting systems—will

not only be seen by businesses and the public, it will also demonstrate good energy management practices and high-performance technologies. The types of goods and services procured by the public sector also help shape the market, as suppliers can be incentivized through large-volume contracts to serve this significant market. Preference for specific energy efficient products in public offices, for example, can stimulate manufacturers to seek the necessary certifications for their products to compete in public tenders. Moreover, the development and publicizing of tools that can facilitate public procurement of energy efficient products can be utilized by businesses and institutions to change their purchasing practices. The availability of more efficient equipment can then help increase adoption by the private sector, leading to further market shifts.

Proper management of government assets and minimization of operating costs also represents good governance for the public sector. This can come in the form of sound and transparent planning and budgeting, strong procurement and expenditure tracking systems, performance monitoring and productivity assessments, etc., which can help governments work more efficiently and effectively. Improving energy use within government facilities reduces energy costs, thereby creating budgetary space to invest in other socioeconomic priorities. It also can help promote good practices in facility management and operations, while lowering basic service delivery costs.

REPORT OBJECTIVES

Given the importance of EE in the public sector, this report seeks to analyze government programs around the world that have implemented policies and programs to encourage public agencies to procure energy efficient products. The analysis and recommendations are expected to assist local and national governments in developing energy efficient purchasing (EEP) policies, programs and practices suitable to their local conditions—to save energy, reduce public expenditures on energy, transform markets by increasing penetration rates of energy efficient products, contribute to the creation of green jobs, and help decarbonize their economies.

METHODOLOGY

Based on broad discussions with approximately 50 EE experts, public agency staff, and other stakeholders, numerous countries and cities that have adopted EEP policies and programs were identified. From those initial reviews, 10 in-depth case studies were developed for Australia, China, the European Union (EU), India, Japan, South Korea, United States (USA), and some local governments including Portland, Oregon (USA), Vancouver (Canada), and Vienna (Austria). For each case study interview, key questions included:

- Why did the government decide to undertake the program? Which ministries or departments took the lead in developing the policy or program?
- What were the prevailing barriers to launching the program, both internal and external for the government? Was there any opposition and how was it overcome?

- How were local manufacturers involved? Were there other stakeholders and how were they consulted or affected by the policies?
- How was the program incorporated into existing procurement guidelines? What were the main issues and how were they dealt with?
- What are the core elements of the program? Is it mandatory or voluntary? How are products identified? How are efficiency levels determined and updated? How is the program monitored? What are the enforcement or incentive mechanisms? How is the program financed?
- What are the program results to date (e.g., \$ purchased, energy saved)? Has there been an external evaluation to assess broader market impacts?
- What are lessons learned to date? What recommendations would you have for governments of developing countries wishing to undertake such initiatives?
- Do you have any experience with alternative procurement structures to allow innovative technical solutions, different technology options, extended product performance warranties, etc.? Why or why not?

STRUCTURE

This report consists of seven chapters. Chapter 2 explores typical barriers to EE in the public sector and common policy and program interventions used around the world to overcome them. Chapter 3 looks at energy efficient procurement policies and trends. Chapter 4 looks at some of the common approaches and tools related to government procurement programs for energy efficient products. Chapter 5 provides additional details on the various operational aspects of establishing a policy and/or program—institutional set-ups, product testing and certification, training and outreach, behavioral issues and incentives to overcome them, partnerships, and program tracking and reporting. Chapter 6 offers some alternative procurement strategies and options. Finally, Chapter 7 offers some conclusions and recommendations.

PUBLIC SECTOR ENERGY EFFICIENCY: BARRIERS AND PROGRAM INTERVENTIONS TO OVERCOME THEM

Despite the promising opportunities that EE offers to governments, realizing these benefits has been an enormous challenge. In this chapter, several barriers to improving EE in the public sector, in general, and barriers to energy efficient procurement, in particular, are discussed. The case studies and other research revealed common barriers, ranging from simple lack of access to information and credible product standards and certifications to more complex issues, such as the need for financing to cover the higher upfront costs of some energy efficient products and other incentives necessary to change purchasing behaviors. These barriers are further elaborated below.

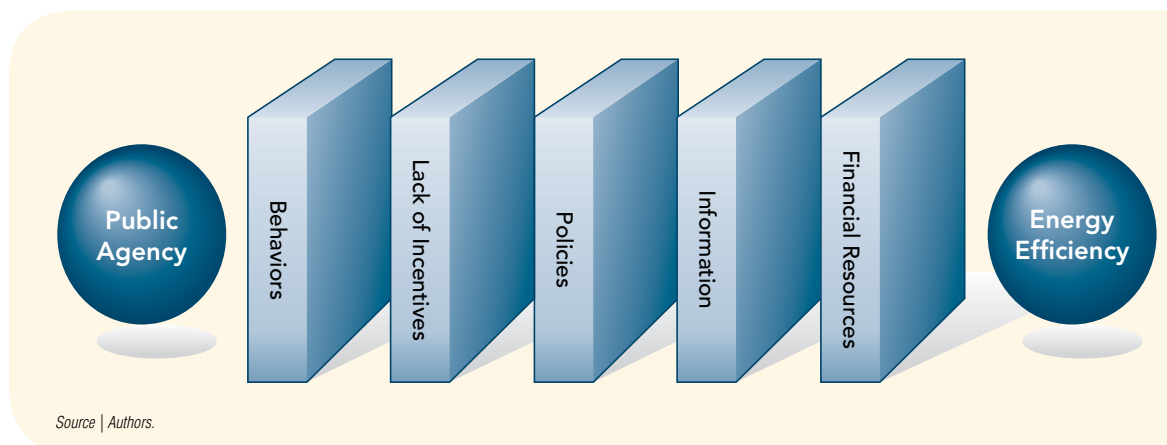
KEY BARRIERS TO IMPROVING ENERGY EFFICIENCY IN THE PUBLIC SECTOR

Even though the government has the authority to set policies and promote EE across the various economic sectors, the public sector, particularly in developing countries, often lags behind the rest of the economy in terms of efficient energy use. This is a huge missed opportunity, since the government has the visibility and opportunity to lead the economy by demonstrating good practices, testing new technologies and approaches, and using its purchasing power to help drive the market toward more energy efficient products and services. Some of the key factors contributing to this situation include:

- **Lack of incentives** | Since government agencies rely on annual budget allocations, they sometimes lack the incentive to reduce their energy use in a given year or to invest in products that will reduce their energy use in future years because they risk losing unspent funds or having their budgets cut permanently. There can also be a principal-agent or split-incentive issue, whereby a parent budgeting agency may determine capital budget needs while a subordinate agency is responsible for paying the monthly energy bills. At the personnel level, public sector staff are not always encouraged to be innovative or to assume potential risks.
- **Financial resources** | Public agencies often lack financial resources to pay for the higher upfront cost of more energy- or water-efficient technologies (including fuel-efficient vehicles), even when it can be demonstrated that the product will pay for itself within a relatively short period of time. The lack of discretionary budgets for EE upgrades or new equipment that may have a higher initial cost can often impede the procurement of energy efficient products. Furthermore, restrictions on public financing can sometime make capital upgrades difficult while typical one-year budget appropriations make it difficult to amortize the higher costs associated with more energy efficient products.

- **Policies and procedures** | Government agencies are obligated to follow rules and procedures for budgeting and procurement to ensure transparency and efficient use of public funds. Unfortunately, rigid procedures can sometimes result in less efficient operations, especially when there is a focus on purchasing products based solely on the lowest upfront cost rather than the lifecycle cost (LCC), which can consider lower operational and replacement costs of more efficient products.
- **Information** | Many public administrators are not aware of EE opportunities or lack the expertise needed to identify potential projects, estimate energy cost savings, recognize efficient products, implement and finance upgrades, maintain and operate new equipment, etc. Many developing countries lack national programs for product efficiency testing, certification, and labeling, which makes specifying and purchasing efficient equipment more difficult. In other cases, there is too much information, some of it contradictory or confusing, which can lead to agencies choosing to maintain the status quo.
- **Behavioral inertia** | One of the more vexing issues relates to behaviors. Public employees can easily become used to doing things a certain way. Therefore, investing additional time and effort in doing things differently can be unappealing. Agencies may have previously developed technical specifications, which have been tested, as well as lists of approved products and vendors with which they have significant experience. In addition, they can become used to operating certain types of equipment or have inventories of replacement products or spare parts. All of these factors can discourage them from modifying their procurement strategies. Changing these habits can be challenging, particularly if it involves an increase in workload, a strain in budgetary resources, or the introduction of new risks.

FIGURE 2.1
Barriers to Energy Efficiency in the Public Sector



Governments around the world have experience with a wide range of policies, programs, and approaches to help overcome these barriers. While some interventions are specific to a particular barrier, most address several simultaneously. For example, many governments have nodal agencies, such as EE bureaus or departments, which can provide an overall framework for government programs, advise on policies and provide information, develop model tender documents, and assist public agencies in reducing their energy use. However, there are no simple measures or universally applicable approaches. Consequently, countries and other government entities need to develop a system of measures to address their unique needs by adapting information and learning from the experiences of other countries and jurisdictions. Differences would stem from available resources, local income levels, cultural norms, supporting institutional infrastructure and other factors. A summary of approaches can be found in Table 2.1.

PUBLIC PROCUREMENT OF ENERGY EFFICIENT PRODUCTS

As noted above, one common approach to advancing EE in the public sector is the development and implementation of energy efficient product procurement or purchasing policies for the public sector. EEP policies require or encourage all public agencies to include EE requirements or preferences when they specify and/or purchase products that use energy (or otherwise influence energy use), such as lighting equipment, heating and cooling systems, pumps, motors, computers, printers, fax/copiers, vehicles, windows, etc. Some jurisdictions also include water conservation devices, solar or other renewable energy systems, recycled products, and other types of technologies in their EEP programs. Several countries go further, by specifically identifying the minimum efficiency levels public agencies must meet when they purchase energy-using products. Governments generally see such initiatives as a means to not only save energy and money, but also to transform markets by increasing penetration rates of energy efficient products, thereby encouraging manufacturers to increase their supply, which in turn helps bring down costs for the general public.

However, such programs are not without their challenges. EEP programs can suffer from the same incentive, financial, policy/procedural, informational, and behavioral barriers previously mentioned. Additional challenges faced by jurisdictions implementing EEP programs include:

- **Identifying qualifying or efficient products** | For most developed countries, national labeling schemes (e.g., ENERGY STAR) exist along with certified laboratories for equipment testing, etc. However, many developing countries lack strong testing and certification systems or have none at all, which makes identification of energy efficient equipment more difficult. Some countries have labeling programs, but the labels may lack credibility due to poor governance. Some countries have no domestic labels; they may allow imported products to display their country of origin labels, which can result in a confusing array of different labels in the market. Without proper testing and certification, a public agency may be reluctant to pay more for an efficient product, as they have no assurance that the operating cost savings will be great enough to justify any higher upfront costs.

TABLE 2.1**Barriers & Actions Taken to Improve Public Sector Energy Efficiency**

BARRIERS	INDICATIVE ACTION AND COUNTRY EXAMPLES
Lack of awareness and information about EE, including opportunities, costs, benefits, and risks	Initiate awareness campaigns and demonstrations; publish and disseminate information, such as case studies, procurement guidelines, product catalogs/specifications, etc. (Australia, Brazil, Canada, China, Czech Republic, EU, France, Germany, Japan, Mexico, South Korea, Sweden, The Netherlands, USA, Vietnam)
Lack of technical capacity for audits, project design, procurement, implementation, monitoring, trust of EE potential	Create nodal agencies to provide technical assistance (TA) for EE projects; appoint energy managers; develop training/educational programs for facility operators/energy managers/energy service companies (ESCOs), EE analytical tools, ESCO audit and procurement/contracting guidelines, prequalification of ESCOs, measurement and verification protocols (Brazil, Bulgaria, Canada, China, EU, Germany, India, Japan, Macedonia, Mexico, Philippines, South Korea, Sweden, Thailand, Turkey, USA, Ukraine, Vietnam)
Limited incentives to implement EE (potential loss of budget), try new approaches, take risks	Revise budgeting to allow retention of energy savings; issue awards for agencies/staff, include EE in management performance reviews; risk sharing/financing programs; EE targets (Brazil, Canada, China, France, India, Mexico, Russia, USA)
Lack of agency accountability for energy savings	Create public sector/agency targets with reporting/monitoring, penalties for nonperformance, energy performance labeling of buildings (Belgium, China, France, Germany, Italy, Japan, Mexico, South Korea, Sweden, Turkey, UK, USA, Ukraine)
Restrictive procurement, contracting and financing rules	Revise public policies for EE products (e.g., labeled only, life-cycle costing) and services; develop local ESCO models; create public EE funds (Armenia, Australia, Brazil, Bulgaria, Canada, China, EU, France, Germany, Italy, Japan, Poland, South Korea, Thailand, UK, USA)
Lack of funding for upfront energy audits and EE project funding	Earmark public EE budgets, create dedicated grant/subsidy programs, public revolving funds, demand-side management (DSM) surcharge or “wire charge,” free energy audits (Belgium, Brazil, Bulgaria, China, Czech Republic, Denmark, France, Germany, Japan, Mexico, Norway Sweden, South Korea, Thailand, UK, USA, Vietnam)
Small size and high transaction costs of EE projects	Bundle public EE projects; generate model documents/templates to streamline projects; develop ESCO umbrella contracts; bulk procurement of EE products through cooperative purchasing agreements (Austria, Canada, Germany, Hungary, India, Philippines, South Africa, Sweden, USA)

Source | Adapted from ESMAP 2010.

- **Less competition** | Public procurement rules and regulations generally focus on transparency, open competition, and efficiency. As such, public agencies typically need to receive at least three bids from vendors whose products meet all of the specifications for the solicitation to be considered competitive. For energy efficient equipment, there is generally less competition, since only some models and suppliers qualify. In smaller markets, this can be even more dramatic, with only one or two suppliers. Further, some efficient technologies are proprietary, which means there is only one manufacturer that can meet such technical specifications, thereby limiting competition.
- **Weak governance** | Developing countries may also suffer from government and market governance deficiencies. If public procurement systems are weak, the credibility of transparent tendering can be undermined. Thus, inviting government agencies to pay a premium for energy efficient products, particularly if such products cannot be properly certified, can create new problems. This is also true for markets. If manufacturer EE certificates or product warranties, for example, are deemed not to be credible and reliable, EEP becomes more difficult to implement effectively.

HOW COULD THE WORLD BANK HELP?

Each year, the World Bank lends billions of dollars to developing countries to support economic growth and poverty reduction. In fiscal years 2009, 2010, and 2011, total lending was US\$ 46.9, \$ 58.7, and \$ 43 billion, respectively. This financial support is achieved through a combination of loans, credits, guarantees, and technical assistance to member country governments, government agencies, or private institutions that can obtain their government's guarantee. While some of this lending comes in the form of Development Policy Support Loans or Credits, which help mitigate the costs of wide-reaching policy reforms, the majority is in the form of investment loans or credits, which provide financing for a wide range of activities aimed at creating the physical and social infrastructure necessary for poverty alleviation and sustainable development. Recipients of investment loans purchase goods, equipment, civil works, and consulting services to carry out the activities under the loan/credit.

In addition, regional development banks, along with other international financial institutions (IFIs), provide billions more in loans and credits for goods, works, and services. In 2010, total lending from all the regional development banks (Asian Development Bank, African Development Bank, European Bank for Reconstruction and Development, and the Inter-American Development Bank) totaled more than US\$ 47.8 billion.⁴

Such financing presents a huge opportunity to help push markets for more efficient products and equipment (e.g., water/steam pumps, lighting and office equipment, transformers, vehicles, etc.), which are routinely purchased under investment lending programs across all sectors. It was estimated that within the last eight years World Bank-supported programs alone have financed the purchase of some 100 million compact fluorescent lamps (CFLs).⁵ The technical specifications used by World Bank and other IFI programs can, therefore, have a potentially dramatic impact on global supplies.

BOX 2.1

Corporate Sustainability at the World Bank

The World Bank Group is seeking to reduce its environmental impact. Policies and targets have been established to ensure social and environmental considerations, including EE, are a part of every corporate procurement. The goal of the policy is for 40 percent of total purchases of electronic equipment at the World Bank to meet environmentally preferable product criteria. These criteria specify that the product meet the EE standards outlined by the ENERGY STAR program.

Many recent purchases have gone beyond the procurement goals, such as the most recent computer monitor purchases which incorporate the Electronic Product Environmental Assessment Tool (EPEAT) label in addition to ENERGY STAR. These new monitors have several green features, such as elimination of environmentally sensitive materials, end-of-life recycling or reuse, use an energy-efficient power supply, and are packaged to minimize waste. By breaking down the standard to individual components, individual criteria can be given more weight, while allowing for a larger pool of vendor proposals, since some may only qualify for individual factors but may not have the resources to gain a formal certification. The most recent purchase of energy efficient personal computers will save around US\$ 1.25 million in energy costs. Purchases also require potential vendors to answer questions regarding the management and performance of their supply chain, which signals that sustainability issues are important to the World Bank.

Source | Adam Rubinfield, Corporate Sustainable Coordinator, World Bank, personal communication, 2012.

The World Bank has also been promoting sustainable development for more than a decade and has now sought to refocus its agenda on “green growth.” This is based on the recognition that without taking care of the environment, economic growth can be constrained, limiting future growth potential. The concept of green growth not only addresses climate change, but also covers issues, such as natural resource management, deforestation, etc.⁶ “Green” procurement, which can help transform markets in developing countries, offers a clear mechanism for furthering the green growth agenda. Use of Development Policy Support Loans to foster the creation of in-country procurement policies and programs promoting green and energy efficient products thus becomes a very relevant opportunity for the World Bank to pursue. The World Bank’s Corporate Sustainability Office has also undertaken measures to help lead by example (Box 2.1).

WHAT ARE OTHERS DOING IN THIS AREA?

Several global and regional EEP programs are underway. Table 2.2 summarizes some of the main initiatives. Despite these positive efforts, the pace and scale of implementation of such policies and programs has been modest to date.

TABLE 2.2
Global Initiatives Related to EEP

NAME	FOUNDED	DESCRIPTION
CCI (Clinton Climate Initiative) Purchasing Alliance www.clintonfoundation.org	2005	A network of energy efficient technology suppliers that have signed agreements to provide building owners with preferential pricing; CCI facilitates competitive bid processes, establishes connections between building owners and technology suppliers, provides third-party oversight, and ensures suppliers meet the obligations of their agreements on pricing
CLASP (Collaborative Labeling and Appliance Standards Program) www.clasponline.org	1999	Provides technical assistance, training, and capacity building to policymakers and technical experts in targeted countries and regions on all aspects of EE standards and labeling, research, and dissemination of best practices
EcoProcura www.ecoprocura.eu	1998	Engages public authorities and businesses to participate in an annual conference to discuss sustainable public procurement policies, programs, and practices
ICLEI (Local Governments for Sustainability) Sustainable Procurement Program www.iclei.org	1990	As an international association of over 1,220 local governments, ICLEI provides technical consulting, training, and information sharing for sustainable development, including sustainable procurement
IGPN (International Green Purchasing Network) www.igpn.org	2005	Promotes green purchasing through the collection and delivery of information on global activities and best practices, purchasing guidelines, product information, research outcomes, the latest trends and international conferences and workshops. IGPN also supports green purchasing networks and has supported the creation of 10 networks in Asia
SEAD (Super-efficient Equipment and Appliance Deployment) www.superefficient.org/	2010	Engages governments and the private sector to help transform the global market for energy efficient equipment and appliances, with best practice guides for procurement, tools, public-private agreements, international partnerships, and other initiatives
Topten International www.topten.info	2000	Promotes highly energy efficient appliances through certification and information dissemination; sponsors a web-based tool to promote the top 10 most efficient models of products within several categories, highlighting health/environmental benefits, quality, etc. for consumers. It has tailored websites for different countries

Source | Authors.

The next chapter will examine the role of public procurement policies and emerging trends, followed by two chapters showing how different governments have attempted to overcome the barriers noted previously.



PUBLIC PROCUREMENT OF ENERGY EFFICIENT PRODUCTS: POLICIES AND TRENDS

Public or government procurement refers to the acquisition of goods, construction works, and services on behalf of a public authority or government agency. Given the significant share of GDP that the public sector represents, sound procurement policies and procedures by government agencies are extremely important. Thus, many governments have developed procedures and guidelines to ensure that public purchases are transparent, efficient, economic, and competitive. Many developing countries are working to improve their procurement systems, as sound public procurement policies and practices are essential to good governance. Such efforts to enhance these systems can lead to greater value for money, development of local industries, and improved administration of public services.

ROLE OF PUBLIC PROCUREMENT POLICIES

Public procurement is a significant share of economic activity within a country, and thus the public sector represents an attractive market segment for providers of goods and services. Governments in OECD-member countries spend on average 12 percent of their GDP on public procurement (excluding state-owned utilities). This, of course, varies based on the size of the state, its role in the economy, and the existence of large infrastructure projects. In 2008, the Netherlands, the Czech Republic, and Iceland spent more than 15 percent via public procurement, the United States spent 12 percent, and Mexico, Chile, and Switzerland spent less than 7 percent.⁷ In Europe, public procurement represented some €1,500 billion in 2008 (16 percent of GDP). It is estimated that between 12 and 20 percent of the GDP of developing countries pass through its public procurement systems.⁸

While the primary role of government procurement policies is to prevent corruption and ensure good value for public funds, a number of governments also rely on public purchasing to further other socioeconomic goals. Because of common ownership, governments can procure in large quantities and thus have a catalytic effect on local markets. They can also demonstrate good practices, provide for consistent and stable demand, and encourage research and development (R&D) to foster new technologies. This can range from requiring healthier or “organic” foods for public institutions (schools, hospitals), to developing strong environmentally sustainable criteria for various goods (e.g., paper that is made with recycled content and sustainably managed fiber). This way, governments can act as incubators to help create demand for “state-of-the-art” technologies, while promoting newer products and helping to lower their costs.

ENERGY EFFICIENT PURCHASING

Many countries, states/provinces, and local governments around the world are adopting policies that promote—or in some cases mandate—the procurement of energy efficient products by public agencies within their jurisdiction. Some are laws adopted by policy-making bodies (e.g., national legislatures) while others are executive orders, administrative directives or guidelines, regulations, or action plans. The types of policy drivers vary in their scope. Some are directly focused on

public agency EEP, while others encompass broader value for money, EE, climate protection, or environmental sustainability goals. These EEP provisions can be supported by the establishment of energy, resource, or GHG reduction goals in the public sector, as well as requirements for tracking and reporting of these goals. EEP policy language can also be included in EE Policies and Action Plans, Climate Change Action Plans, and National Communications.

Broadly speaking, EEP policies can be mandatory or voluntary. Most procurement policies strongly *encourage* public agencies to procure energy efficient products, but a smaller (but growing) number directly *mandate* it. Jurisdictions that mandate it generally see a larger and more rapid increase in the adoption of such products and market transformation effects than those that do not, assuming that the jurisdiction has enforcement mechanisms in place. However, many jurisdictions are reluctant to create mandatory policies due to concerns over insufficient product availability or potentially higher upfront costs of such products. Jurisdictions with mandatory EEP policies often address these concerns by allowing for reasonable exemptions, such as cases where energy efficient products are unavailable, fail to meet performance specifications, are prohibitively expensive, or conflict with another policy goal (e.g., preferences for local manufacturing, small or disadvantaged businesses, etc.).

When mandates are used, they can be prescriptive—directed at the final procurement decision with little attention to the process—or they can focus more on the procurement decision-making process. In the City of Vienna (Austria), for example, it has been obligatory for municipal agencies since 1999 to follow ecological criteria developed under its *ÖkoKauf Wien* (eco-purchasing program) when awarding public contracts for 23 categories of goods and services, covering a majority of the City's procurement activities. In China, public entities are mandated under its energy efficient procurement policy to use its “Energy Efficient Products List for Government Procurement” to purchase a wide range of product types, such as computers, printers, lighting equipment, appliances, and plumbing fixtures since 2006. Procurement officers in China are obliged to disclose the EE standards used to specify products, evaluate bids, or qualify products approved in the tendering process. The United States and European Union also have some mandatory EEP purchasing requirements (Boxes 3.1 and 3.2).

In terms of EEP policies themselves, there are a range of approaches and policy types, based on the global review. Such policies can relate to specific products (such as green information technology or fleet policies) or to the procurement of energy efficient products in general. Some countries, such as Russia, include elements of EEP within a broader EE or energy management policy that can establish other important components of an EEP program, including energy reduction targets, product and/or building efficiency and labeling requirements. Some policies cover overall green purchasing or green building practices (including the purchase of energy efficient products for green construction and renovation projects, as well as for facility operations and maintenance). Other policies promote EEP within a larger policy that addresses a “best value” or LCC analysis approach to improve government procurement (which tends to favor energy efficient products). Some of the more common policy options, along with descriptions and examples, are summarized in Table 3.1.

Some EEP policies prohibit the purchase of inefficient products, such as incandescent light bulbs, office equipment that does not have low standby power functions, or vehicles with a low fuel efficiency rating. Others are more process oriented, such as those which call for the implementation of an Energy (or Environmental) Management System consistent with International Organization for Standardization

BOX 3.1

Mandatory EEP in the United States Federal Government

The United States government has adopted a broad federal sustainable acquisition policy, which has been codified in its Federal Acquisition Regulation (FAR), and is mandatory with respect to the procurement of energy efficient products. The FAR states: “Federal agencies shall advance sustainable acquisition by ensuring that 95 percent of new contract acquisitions for the supply of products and for the acquisition of services (including construction) require that products are, among other things energy efficient (ENERGY STAR or Federal Energy Management Program (FEMP)-designated; water-efficient; or environmentally preferable (e.g., EPEAT registered)).” The FAR makes it clear that this requirement applies to a broad range of “contract actions” including “any oral or written action that results in the purchase, rent, or lease of supplies or equipment, services or construction using appropriated dollars, including purchases below the micro-purchase threshold.”

Source | US Federal Acquisition Regulation, Subpart 23.1, Sustainable Acquisition Policy (<https://www.acquisition.gov/far/current/html/Subpart%2023.1.html>).

BOX 3.2

The European Union's EEP and GPP Policy Directives

The European Commission (EC) has developed a set of Europe-wide EEP and GPP policy directives, regulations and action plans that include both mandatory and voluntary provisions. In 2008, the EU adopted an “Energy Star Regulation” (EC/106/2008), which “requires EU institutions and central Member State government authorities to use EE criteria no less demanding than those defined in the ENERGY STAR program when purchasing office equipment” (such as computers, copiers, etc.). In addition, in 2009, the European Union adopted a *Directive on the Promotion of Clean and Energy-efficient Road Transport Vehicles* (2009/33/EC), which obligates public authorities and service providers that are purchasing vehicles for public passenger transport services to take into account the vehicles’ operational lifetime energy and environmental impacts, including energy consumption, and emissions of CO₂ and other pollutants when making purchasing decisions. The EC is also promoting a voluntary GPP instrument based on a communication called *Public Procurement for a Better Environment*, COM 2008 400. This instrument encourages public authorities throughout the European Union to incorporate predefined environmental criteria into their purchases.

Source | Timothée Noël, Executive Agency for Competitiveness and Innovation, EC, personal communication, 2012.

(ISO) protocols. Thailand, for example, has made a commitment to follow ISO 50001, an energy management system (EMS) standard, in its public sector organizations. The Mexico City Government has made a public commitment to establish a broader environmental management system, which will establish rules within the city government on energy and water saving, responsible use of office supplies, solid waste management, and the reduction of travel trips for city employees.⁹

Additionally, some EEP policies only apply to the national level or to the government entity that adopted it, while others include obligations at multiple levels of government. The United States federal government's EEP policies apply only to federal agencies, whereas those policies adopted by China, South Korea, and Russia apply to federal agencies as well as provincial and municipal governments. The European Union has adopted policies that cover all Member States throughout Europe.

TRENDS IN PUBLIC PROCUREMENT

Over the last decade or so, several trends, which are relevant to EEP, have taken place in the public procurement area. These come in addition to the evolution and improvement that has taken place in procurement in order to manage risks and improve transparency and results. Relevant trends have included:

- a | Harmonization of public procurement policies
- b | E-procurement
- c | Sustainable or green procurement

Each of these is briefly discussed below.

Procurement Harmonization

Harmonization of public procurement policies and practices allows different countries and other jurisdictions to better coordinate and synchronize their systems, reduce regulatory burdens, improve competition, and facilitate economic activity and trade. The European Union, for example, saw the need for secondary legislation to harmonize the procurement laws of Member States in order to deal with various preferences for domestic enterprises. This work began in 1986 through Directive 88/295, which made open tendering the norm. With the various global and regional trade initiatives, focus on bringing various procurement systems in-line with one another has helped increase the amount of trade across national boundaries. In 1999, a forum for procurement harmonization among the multilateral development banks, IFIs, and other development partners was established. This has led to coordination on the principles of good procurement guidelines, dialogue on various procurement issues, and sharing of information.

Harmonization of procurement policies is highly relevant for EEP because it can help facilitate the trade of energy efficient products across national boundaries. Such policies can help clarify definitions of energy efficient and green products, testing protocols, labeling methods, and product certifications. This, in turn, can enable countries without labeling regimes to rely on those from other countries, thereby increasing competition for products, which can help bring down prices. Standardization of systems, monitoring, and other metrics can also facilitate increased inter-governmental cooperation in the area of EEP, such as exchanging of policies and program design information, bid solicitation

TABLE 3.1
Energy Efficient Purchasing Policy Types

POLICY TYPE	DESCRIPTION	SELECT EXAMPLES OF PUBLIC AUTHORITY ADOPTION
Product-Specific Procurement Policy	Focused policies requiring or encouraging the purchase of specific energy efficient products, by establishing criteria or referencing certifications. Such policies often also address product operation or maintenance needed to optimize environmental benefits (e.g., enabling energy management functions, using printer duplex settings, reducing vehicle miles driven)	<ul style="list-style-type: none"> China Notice on Centralized Procurement for Central Air Conditioners (Government Procurement Center of Central State Organs, 2004) European Union <ul style="list-style-type: none"> ENERGY STAR Regulation (for Office Equipment) (2008) Directive on the Promotion of Clean and Energy-Efficient Road Transport Vehicles (2009) United States – City of San Francisco Approved Environmentally Preferable Purchasing Requirements for Personal Computers and Servers (2009)
Energy Efficient Products Procurement Policy	Requires or encourages the procurement of energy efficient products, generally, across a broad range of product categories. Sample language: “All purchases of equipment, supplies, and appliances will require compliance with the ENERGY STAR...” This type of policy can sometimes be included in the energy or climate action plan	<ul style="list-style-type: none"> Canada – City of Vancouver Energy Efficiency Purchasing Policy (2004) China <ul style="list-style-type: none"> Government Energy-Efficient Procurement Policy (2004, Ministry of Finance, National Development and Reform Commission) Circular: Establishing a Mandatory Procurement Scheme of Energy-Saving Products (2007) Germany Procurement of Energy-Efficient Products and Services (IEKP, 2007, Federal Ministry of Economics and Technology) Spain – City of Madrid Public Purchasing Best Practices Code (2005) United States <ul style="list-style-type: none"> City of New York Local Law No. 119 to Amend the Administrative Code of the City of New York, in Relation to the Purchase of Energy Efficient Products... (2005) District of Columbia ENERGY STAR Efficiency Amendment Act (2004)
Best Value Procurement Policy	Permits or requires purchase of products based on total cost of ownership LCC assessment, or best value analysis, even if the initial cost is higher than alternative products	<ul style="list-style-type: none"> Australia Financial Management and Accountability (FMA) Act (1997) Canada Contracting Policy; Section 9: Best Value (2006) European Union EU Directive 2004/18/EC: Coordination of Procedures for the Award of Public Works Contracts, Public Supply Contracts and Public Service Contracts (2004) India Manual on Policies and Procedures for Purchase of Goods (2006) Republic of Mauritius Public Procurement Act (2006) United Kingdom – City of London Responsible Procurement Policy (2008) United States – City of Portland, Oregon 5.33.080 Portland Environmentally Preferable Procurement Code (2010)

Green or Sustainable Procurement Policy	Promotes the purchase of products that have one or more environmental attributes, such as energy or fuel efficiency, recycled content, durability, water efficiency, or the absence of hazardous substances. Many also set sustainability goals, such as energy and water reduction targets, and goals for using renewable energy to power public facilities. For example, the EU set a target that by 2010, 50 percent of all public tendering procedures should be green	<ul style="list-style-type: none"> • Brazil Decree to Consolidate and Expand Sustainable Development (2012) • Canada Policy on Green Procurement (2006) • China Government Green Procurement Policy (2006, Ministry of Finance, Department of Environmental Protection) • European Union Public Procurement for a Better Environment Communication (2008) • Japan Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services (2000) • New Zealand – City of Christchurch Sustainable Supply Chain Policy (2003) • South Korea Framework Act on Low Carbon, Green Growth (2008) • United Kingdom Greening Government Commitments: Operations and Procurement (2011) • United States <ul style="list-style-type: none"> – EO13514: Federal Leadership in Environmental, Energy and Economic Performance (2009) – City of Portland, Oregon Sustainable Procurement Policy (2009) – City of San Jose, California Environmentally Preferable Procurement Policy (EP3; 2012)
Green Building Policy for Public Facilities	Promotes the installation of energy efficient and other green products during the construction and renovation of public buildings. Some require public agencies to meet energy/water efficiency and other green standards when replacing appliances, lighting, HVAC, plumbing devices, and other equipment during routine operations and maintenance	<ul style="list-style-type: none"> • China <ul style="list-style-type: none"> – Green Building Evaluation Standard (2005) – City of Shanghai Civilian Building Energy Efficiency Standard (2008) • European Union Directive 2010/31/EU on the Energy Performance of Buildings (2010) • United States <ul style="list-style-type: none"> – City of Portland Green Building Policy (2005) – City of San Francisco Green Building Ordinance (2008)
Inefficient Product Ban	Prohibits public agencies from purchasing certain inefficient products (e.g., incandescent light bulbs, products without low standby power); these provisions are sometimes included in broad EE policies that may also ban the sale of such products economy-wide over a longer period of time (with the government being an early adopter)	<ul style="list-style-type: none"> • Russia Federal Law No. 261-FZ: On Energy Efficiency Improvement and Energy Saving (2009) • United States – City of New York Local Law No. 119 to Amend the Administrative Code of the City of New York, in Relation to the Purchase of Energy Efficient Products... (2005)
Sustainability or Climate Protection Policy	Promotes the reduction of GHG emissions and/or the attainment of other environmental goals by the jurisdiction (e.g., energy or water consumption reduction, etc.). It often calls for the development of a Sustainability or Climate Action Plan. EEP is often a central strategy for meeting the jurisdiction's sustainability goals	<ul style="list-style-type: none"> • United States <ul style="list-style-type: none"> – Maryland Greenhouse Gas Emissions Reduction Act (2009) – City of New York Local Law 22: NYC Climate Protection Act (2008) – Mexico City Mexico City Climate Action Program (MCCAP) (2008)

Source | Authors.

documents, cooperative purchasing activities, joint training programs, sharing of LCC calculators and other tools, cross-country comparisons, and collaboration in other areas. One example of this is the Government of Thailand's development of sustainable procurement criteria and labels, which are now being disseminated through the Association of Southeast Asian Nation countries. Another is the European Union's commitment to implementing GPP as a regional policy approach in order to more effectively transform the marketplace due to member states' combined purchasing power.

E-Procurement

With the prevalence of the Internet, electronic procurement (e-procurement) is becoming an increasingly common tool for improving public procurement systems. E-procurement generally offers a more efficient method of procurement by providing suppliers increased access to government markets without incurring higher marketing costs. At the same time, it gives government entities the ability to aggregate their purchases to obtain better prices from suppliers. It also promotes more transparent and visible procurement information, which can help governments negotiate better pricing and terms on their purchases. Some governments have also reported increased accuracy in purchase orders and invoicing, more consistency in order processing, faster processing times, and single points of access leading to administrative cost savings and reduced cost for bidders. E-procurement creates a platform for better tracking of purchasing activities, which governments can use to collect and analyze data on various purchases, pricing, and technical specifications.

A recent study of e-procurement systems in India and Indonesia found that, while there was not any systematic evidence of lower prices paid by the government, e-procurement led to a broader distribution of vendors, with winning bidders more likely to come from outside the region (where the *work takes place*). Further, in India, the introduction of e-procurement systems led to the selection of contractors who produced higher average quality; in Indonesia, it increased the likelihood of projects being completed on time.¹⁰

E-procurement addresses some of the issues associated with EEP. Given concerns of higher upfront costs for energy efficient products, e-procurement can facilitate inter-jurisdictional purchases, which can help lower these costs. Strong e-procurement systems can also facilitate uniform energy efficient product labeling, promote improved compliance monitoring and reporting of results, and provide better access to suppliers.

Green or Sustainable Procurement

Green public procurement is a term to define purchasing activities that take into consideration both the cost of the product, as well as the broader environmental costs and benefits. While typical procurement methods generally only compare the cost of products that meet minimum technical specifications, GPP compares the cost of products that meet both technical and environmental specifications, or at least takes environmental costs and benefits into consideration when developing specifications or evaluating bids for products or services.

Sustainable procurement typically looks more broadly at the "triple bottom line," which includes economic, environmental, and social considerations. Different governments, however, have different

ways of defining green and sustainable procurement and specifying, evaluating, and certifying products and services that meet their environmental and other sustainability standards. Generally, sustainable criteria involve the following:

- **Economic criteria** can go beyond the first cost to include LCC, promotion of new technologies, support of local manufacturers and suppliers, and other factors that ultimately provide economic benefits to the government and its citizens.
- **Environmental criteria** can include a wide range of attributes, such as energy and water efficiency, recycled and bio-based content, low carbon footprint, production using renewable energy or “organic” methods, cleanliness of manufacturing processes, longer lifespan, reduced toxic content, solid waste generation, and so on.
- **Social criteria** also look beyond the upfront economic and environmental costs of products and services to include support for products made by ethnic minorities, disabled workers, women, or minority-owned businesses. Sustainable procurement is sometimes referred to as “ethical” sourcing and includes preferences or mandates for manufacturers that adhere to acceptable labor standards (e.g., fair trade, anti-sweatshop), provide access to health care and other benefits to their employees, and have adopted other socially responsible practices.

Such practices are also sometimes undertaken by the private sector, usually under the framework of a corporate social responsibility or broader sustainability initiative. It may be pursued by businesses as a way to achieve economic and other corporate reputational advantages or to reduce operating costs.

GREEN VERSUS ENERGY EFFICIENT PROCUREMENT

In many developed countries, EEP is increasingly becoming subsumed within broader green or sustainable procurement policies and programs, where EE is only one environmental attribute among many. Some developing countries have expressed the desire to “leapfrog” policies, going straight to GPP (e.g., Czech Republic, Mexico, Thailand). This evolution has been mostly mutually beneficial, as energy savings can help offset the higher upfront costs, while stronger attention to environmental issues allows for further promotion of EE. GPP can also help strengthen technical standards, testing and certification regimes, and public awareness about such products. However, the trend towards GPP also has some potential drawbacks or complicating factors.

As noted earlier, GPP is a broader term that encompasses EE and other environmental considerations. To date, GPP does not yet have a universal definition or well-harmonized parameters. Thus, while many of the general concepts are the same—adding requirements or preferences for product testing and certification while following the jurisdiction’s procurement rules and procedures—some aspects are different, namely LCC analyses, certification, and results reporting. Shifting or leapfrogging to GPP too early can potentially undermine the entire effort if not done properly.

The main difference concerns the way LCC analyses are conducted. An LCC analysis provides an opportunity to analyze and compare lifetime costs of various products to determine which one offers the best overall value to the purchasing agency. These costs include a product’s purchase price, installation costs, operating and maintenance costs, and residual value (or waste management costs) at the end of its useful life. Both EEP and GPP incorporate LCC analyses into their purchasing

processes. The main difference is that EPP generally considers only direct financial indicators, while the other uses broader economic ones. Financial indicators, or analyses, generally look at actual project cash flows (e.g., purchase price, operations and maintenance expenses, replacement/disposal costs) which the purchaser incurs. Economic analyses, on the other hand, compare the economic and social benefits accruing to the economy as a whole, which can require establishing economic values to many environmental and social benefits that are not simple to quantify.¹¹

Energy efficient products, which often have improved designs and advanced technologies, usually have higher upfront costs than traditional equipment. This higher capital cost can be a major barrier to the procurement of such products. LCC analyses can thus be an effective method to compare efficient products with others in a transparent and more cost-reflective manner, since such products generally have a lower financial LCC compared with conventional products because the operation and maintenance costs are lower and life spans longer. Since these represent actual costs to the purchaser, it is in their financial interest to purchase the one with the lowest LCC. A good example is an energy efficient light bulb (e.g., CFL), which may cost more but has significantly reduced electricity demand and a longer rated life than a less efficient incandescent light bulb. In the example in Table 3.2, the financial LCC takes into account the upfront cost, the annual electricity costs, and the lifetime. The economic LCC assumes a price for CO₂, which gives a broader representation of the economic cost of the three options. In both cases, the lowest upfront cost technology, an incandescent bulb, has the highest annual LCC and an light emitting diode (LED) has the lowest. (Chapter 4 contains more information on LCC calculators.)

Green products, on the other hand, are categorized by their lower overall financial and economic LCCs, whereby environmental externalities and other considerations are sometimes assigned a value which may not accrue to the purchasing agency. These can include the costs for raw material extraction, a product's carbon footprint, end of product life waste management costs, creation of green jobs, etc. Thus, while the methodology can be clearly specified at the outset of a new purchase, the

TABLE 3.2
Sample LCC Analysis for Indoor Lighting in Europe

KEY VARIABLES	OPTION 1	OPTION 2	OPTION 3
Light type	Incandescent bulb	CFL	LED
Watts	60	13	6
Operating lifespan (hours)	1,200	12,000	50,000
Initial cost (€/unit)	0.30	3.50	20.00
Annual operating cost (€/year)	23.40	5.07	2.34
Annualized financial LCC (€/year)	23.76	5.56	3.52
Annual CO ₂ emissions (kg CO ₂ /unit/year)	79.51	17.23	7.95
Annualized economic LCC (€/year)	25.35	5.91	3.68

Key Assumptions | Analysis based on 10% discount rate, 260 days of operation at 10 hours/day (2,600 hours/year), electricity price of €0.15/kWh, grid emissions factor of 0.50965 kg CO₂/kWh (EU-27 average), CO₂ cost of €0.02/kg CO₂

Source | Authors.

precise values for some of the main indicators may be less clear and subject to debate, which can complicate a transparent process. However, this study found no GPP LCC calculators that actually conduct such analyses or offer clear methodologies for how such analyses could be done. The closest has been conducted by the EC in which CO₂ reductions associated with less-polluting vehicles was assigned a monetary value and incorporated into the LCC analysis used to set European Union-wide procurement guidelines for this product category.

Another key difference between EEP and GPP is certification. Whereas energy efficient products generally have simpler and more straightforward protocols for testing and certification (based largely on a single attribute of energy consumption and sometimes technical specifications designed to ensure product performance and quality), GPP decisions often consider a much wider range of environment attributes, making compliant products significantly more complex to identify, specify and procure. In some cases, this is complicated by the fact that different jurisdictions may have different definitions, specifications, or evaluation criteria for green products. Jurisdictions that want to procure green products have to weigh tradeoffs between EE and other environmental benefits of competing products. Consequently, some products with a lower EE rating may be chosen if other environmental benefits are included, or given a heavier weight, in the procurement decision-making process. It is important to note, however, that EE is often a centerpiece (and generally a mandatory) criteria when GPP decisions are made.

A third key difference, discussed more in Chapter 5, involves results reporting. In order to measure the success and impacts of a policy or program, some key performance indicators are typically identified and monitored over time. While results tracking for EEP programs is not uniform globally, the indicators—typically energy consumption and energy cost savings—are relatively straightforward. Tracking GPP, however, is typically much more complex as the range of parameters—from recycled content to reduced pollution—is more varied, methodologically complex, harder to document, and more difficult to aggregate and compare across agencies and jurisdictions. Without proper results reporting, assessing the overall effectiveness of a program can become highly subjective.

For developing countries, the introduction of GPP policies may also raise sensitivities. First, most certified green products have been designed or manufactured in developed countries, so developing countries may perceive GPP policies as favoring imported equipment over locally made products. Second, green products may have a higher upfront cost than energy efficient products, which means governments with constrained budgets are less able to defray these higher capital costs without causing some trade-offs in other critical socioeconomic investments. Third, some green criteria, such as those related to climate change, incur global benefits; many developing countries believe the costs of addressing such global problems should be borne largely by developed countries, which have produced the majority of cumulative GHGs to date. Therefore, countries considering such policies need to design them carefully to address these potential concerns.

This report focuses on policies, programs, and practices related to EEP. While many of these principles equally apply to GPP, the focus is on the former. Some examples, however, do refer to GPP as this is now becoming a widely adopted approach within developed nations. The next chapter will present some of the common approaches and tools to implementing an EEP program in the public sector, followed by a more in-depth analysis of the various components and stages of such programs.

MAIN APPROACHES AND TOOLS FOR IDENTIFYING ENERGY EFFICIENT PRODUCTS

Based on the case studies commissioned, several common strategies and approaches were identified to facilitate government EEP policies, programs, and practices. Unlike the policies themselves, which are discussed in the previous chapter, the approaches discussed in this chapter relate to EEP program implementation—that is, how energy efficient products are actually identified, specified, or given preference in the procurement process. While most of these approaches and tools are discussed individually, typically, a combination of these schemes are used in the countries and cities studied because of the variety of products purchased and gaps in existing standards and certification programs. These include:

- 1 | labeling schemes for energy efficient products;
- 2 | catalogues containing specific technical standards;
- 3 | LCC or best value analyses;
- 4 | energy efficient product preferences; and
- 5 | lists of qualified or certified energy efficient products.

The choice of procurement approach is heavily dependent upon the status of the local markets for energy efficient products, available product testing and labeling systems, technical capacity of public sector staff, overall governance of the EE and procurement agencies, and other factors. This chapter examines various approaches and tools and presents the issues associated with each. The full list of approaches, examples, and pros and cons is summarized in Table 4.1.

ENERGY EFFICIENT PRODUCT LABELING

Perhaps the most common method governments use to help their various agencies, subnational jurisdictions, and other public entities covered under any procurement policies identify energy efficient products is to rely on an existing EE label. Energy efficiency labels provide energy consumption information to consumers, so they can better understand the operating costs of the products they are considering purchasing. The efficiency levels for the labels typically are set by a government agency or an independent organization, and products are tested periodically to ensure continued compliance. In strong regimes, the label standards are updated periodically as the markets and technologies evolve.

Generally, there are two types of EE labels—endorsement labels and comparative or rating labels.

TABLE 4.1
Common Approaches for EEP

NO.	MODEL	DESCRIPTION	CASES	PROS	CONS
1	Labels	Requirement for products to have an existing EE label (endorsement or comparative) is made on tender documents, when available	Australia – CPG Canada – Vancouver China EU Japan – GGAP Mexico – AMMAC South Korea – PPS USA – GSA, Portland, New York City	Identifying qualified products is simple; avoids creation of additional testing and certification process for manufacturers; labels can be used by other countries/jurisdictions	If labels are not updated periodically, the label value is diminished; labels may only cover limited products; requires a strong label program, which some countries do not have; there can be confusion if multiple labels exist in the market; manufacturers may not have incentive to go beyond minimum label criteria
2	Catalogues of Technical Specifications	Catalogue, book, or website of technical specifications/EE standards for commonly purchased products, which are then used in tender documents	Austria – City of Vienna EU Japan – GPN Mexico – AMMAC, Mexico City Sweden – SEMCo UK – Defra USA – FEMP, Portland, New York City	Technical specifications can be easily incorporated into bidding documents; transparent, consistent and clear; e-catalogues can be updated continuously; reduces work for individual procurement officers	Updating catalogues, particularly hard copy versions, can be time-consuming and confusing due to version control issues; centralized technical specs limit flexibility; developing technical specifications for all agencies requires time and resources
3	Life-Cycle Costing/Best Value Award	Agency uses LCC calculator to assess overall lifetime product costs, including purchase price and operating costs (e.g., fuel/energy, product replacement) to make procurement decision based on best value	Australia – CPG Canada – Metro Vancouver EU UK – Defra USA – GSA, Portland, San Jose	Assures best value to tendering agency; allows for flexibility and consideration of specific applications; can be limited to requiring LCC analysis only to justify not purchasing product with energy efficient label	Transaction costs can be high (time-consuming); can require skills and data procurement agent may not have; time and hassle factor may prevent participation/compliance; procurement agent may not know how to interpret or make decisions based on LCC results
4	EE Preferences	For products deemed to be energy efficient, some provision of points or price preference is included in the evaluation process	Australia – CPG China Japan – GGAP EU – GPP criteria South Korea – PPS USA – GSA, Portland	Allows for higher efficiency products to be considered; more flexible for tendering agencies; allows tendering agencies to consider a wider range of sustainability criteria in the bid evaluation process	Creates potential for less transparency in evaluation; certification of higher efficiency may not be clear; energy efficient product may not be selected if preference is not high enough; may drive up costs of products; EE benefits may be diluted if bid evaluation considers other sustainability criteria
5	Qualifying Product Database	Nodal agency identifies products that comply with government specifications and creates database of qualified products; procurement agents use the database for their purchases	Austria – City of Vienna China – EEPL EU – Clean Vehicle Portal Germany – City of Hannover South Korea – KONEPS UK – GPS USA – ENERGY STAR/EPEAT lists, City of San Francisco (SF Approved List)	Identifying qualified products is simple; publishing lists can be used by other jurisdictions, institutions and businesses; bid evaluation can be easier	Updating can be very time consuming as there is a need to constantly add new products and remove older ones when they are no longer compliant; can be a barrier for new equipment suppliers; purchasing agents can be confused if they use outdated list

Source | Authors.

Endorsement labels, such as the one developed by the Bureau of Energy Efficiency in India (Figure 4.1), act as “seals of approval” and are awarded to models that meet technical criteria as specified by the authorized agency or organization. It greatly helps procurement officers to have a way to easily identify and specify products that meet a given EE standard. Comparative labels, on the other hand, provide greater information on the scale of performance, often with a rating of A to E (e.g., European Union) or 5 to 1 (e.g., Thailand), which enables consumers to compare products across a range of efficiency levels (see EU Energy Label, Figure 4.1).¹²

In such procurement systems, the agency can simply require products to have an endorsement label or set specifications indicating a certain minimum rating within its technical specifications with the label verifying compliance. Such an approach makes identification of energy efficient products much simpler for the procuring agency and avoids duplicate certification and testing requirements for manufacturers and other suppliers. Use of these labels by other jurisdictions within the country or by other countries becomes much easier and helps create more harmonized systems, which can have a strong influence on the market. Of course, the strength of this approach lies in the strict governance of the labeling schemes. Some labeling agencies require

FIGURE 4.1
Examples of Energy Efficiency Labels



Energy Efficiency Endorsement
Label from India's BEE



Energy Efficiency Rating Label
for TVs from the European Union

manufacturers to pay for certification of their products, which can threaten the credibility and perceived independence of the label. It may also create a barrier to entry for smaller firms with limited financial means, although some certification programs offer a sliding fee scale to address this concern. Others may not update periodically the label's standards, which can reduce the value of the label. Conversely, some labels can be so stringent that very few products qualify, making it difficult for purchasers to secure competitive bids. Another potential downside of endorsement labels is that there may be no additional incentive to go beyond the minimum EE level required to receive the label.

In many middle-income countries, energy efficient product labeling programs now exist. In less-developed economies, where there is little manufacturing, use of other internationally recognized labels (e.g., ENERGY STAR, EU Energy Label) can be adopted with modest effort. However, countries without labeling schemes but with domestic manufacturing, can meet local resistance if they adopt external labeling systems, as it can favor imported equipment. Nevertheless, with increased trade, greater harmonization, and other factors, many of these issues are likely to decrease over time.

Increasingly, labels are being developed to cover a wider array of energy, environment, and other attributes. These “eco-labels” can take into consideration EE, in addition to other environmental and performance criteria as noted in Chapter 3.¹³ Also, while governments attempt to come to consensus on how best to standardize such certification efforts, various nongovernmental organizations (NGOs) have emerged and, in some cases, developed their own labeling systems. In the long term, such a trend is logical; however, it can create the potential for confusion in the short term as consumers are faced with multiple labels at once. (See Box 4.1 for an example from the Republic of Korea.) Additional resources on labeling can be found in the Annex.

CATALOGUES OF TECHNICAL STANDARDS

Another common way for public authorities to help various branches of government procure energy efficient products is to develop catalogues of technical specifications or EE standards for energy-using products that are frequently purchased by the public sector. Catalogues are particularly common in countries without labeling regimes, or where labeling schemes do not cover certain products commonly purchased by the government, such as vehicles. They can also be used when specifications combine references to energy efficient labels with other environmental or performance standards. These catalogues can be in hard copy form (i.e., books) or online. Some catalogues can be relatively simple, while others are quite extensive, listing tools, and other resources relating to the procurement of products in that category or a justification for the recommended specification criteria.

The advantage of such an approach is that any agency wishing to purchase products that are in the catalogue is able to copy the technical specifications from the catalogue into their tender documents. They just have to select the least expensive product that meets the specifications. Often the supplier

BOX 4.1

Product Labeling in the Republic of Korea

Energy efficiency and environmental labeling in the Republic of Korea is led by the Ministries of Knowledge Economy (MKE) and Environment (MOE) and the Korea Energy Management Corporation (KEMCO). Korea's *Act on Encouragement of Purchase of Green Products* directs public agencies to purchase goods that have at least one of the energy efficient labels or eco-labels listed below (other than the stand-by warning label). Today, five national labeling systems are in place:

1. an **EE label**, which serves as a mandatory rating and information label for target products (refrigerators, air conditioners, washing machines, lighting equipment, 3-phase induction motors, and automobiles);
2. a **high efficiency appliance label**, a voluntary certification for newer, high efficiency products, such as transformers, pumps, fans & blowers, and LEDs;
3. a **voluntary e-standby label**, which certifies products that meet a low stand-by power requirement (below 1 Watt), covering office equipment and consumer electronics, such as personal computers, monitors, printers, scanners and TVs;
4. a **mandatory standby label**, a warning label for products not meeting minimum requirements for standby power, targeting TVs, computers, monitors, printers, multi-function devices, set-top boxes, and microwave ovens; and
5. an **eco-label**, developed in cooperation with the Korea Environmental Innovation and Technology Institute covering a range of energy and environmental attributes.



Source | KEMCO, 2010. For more information, see: http://www.kemco.or.kr/new_eng/pg02/pg02100200.asp.

certifies that the specifications are met, and sometimes an agency can test a few of the products to verify compliance. However, this approach is not without some drawbacks. Given the rapid state of product development and the dynamic global market, updating these specifications can become a big burden for the nodal agency. Agencies and vendors can get confused by constantly changing specifications. For hard copy catalogues, which are more common in developing countries where computerized systems are not universal among government agencies, version control can be an issue.

Having a centralized agency to develop specifications for all agencies to use can reduce flexibility, particularly when certain agencies may have unique needs.

Several countries and subnational jurisdictions have used this approach. The United States requires all energy-using products purchased by the federal government be in the top 25 percent of their product class in terms of EE. Where ENERGY STAR or other endorsement labels exist and are current, they can be used to identify qualifying products. For other common products, FEMP has developed its own online catalogue of technical specifications, covering seven categories and 53 commercial products (Figure 4.2).¹⁴ The European Union publishes an online list of voluntary “core” and comprehensive green criteria for a wide array of product and service categories. The core criteria generally cover EE performance. On June 13, 2011, Mexico City published *General Guidelines for the Procurement of Goods with Less Environmental Impact*, which are mandatory for all city agencies. Some of these guidelines call for ENERGY STAR and low standby power office equipment as well as fuel efficient and low emission light passenger vehicles.

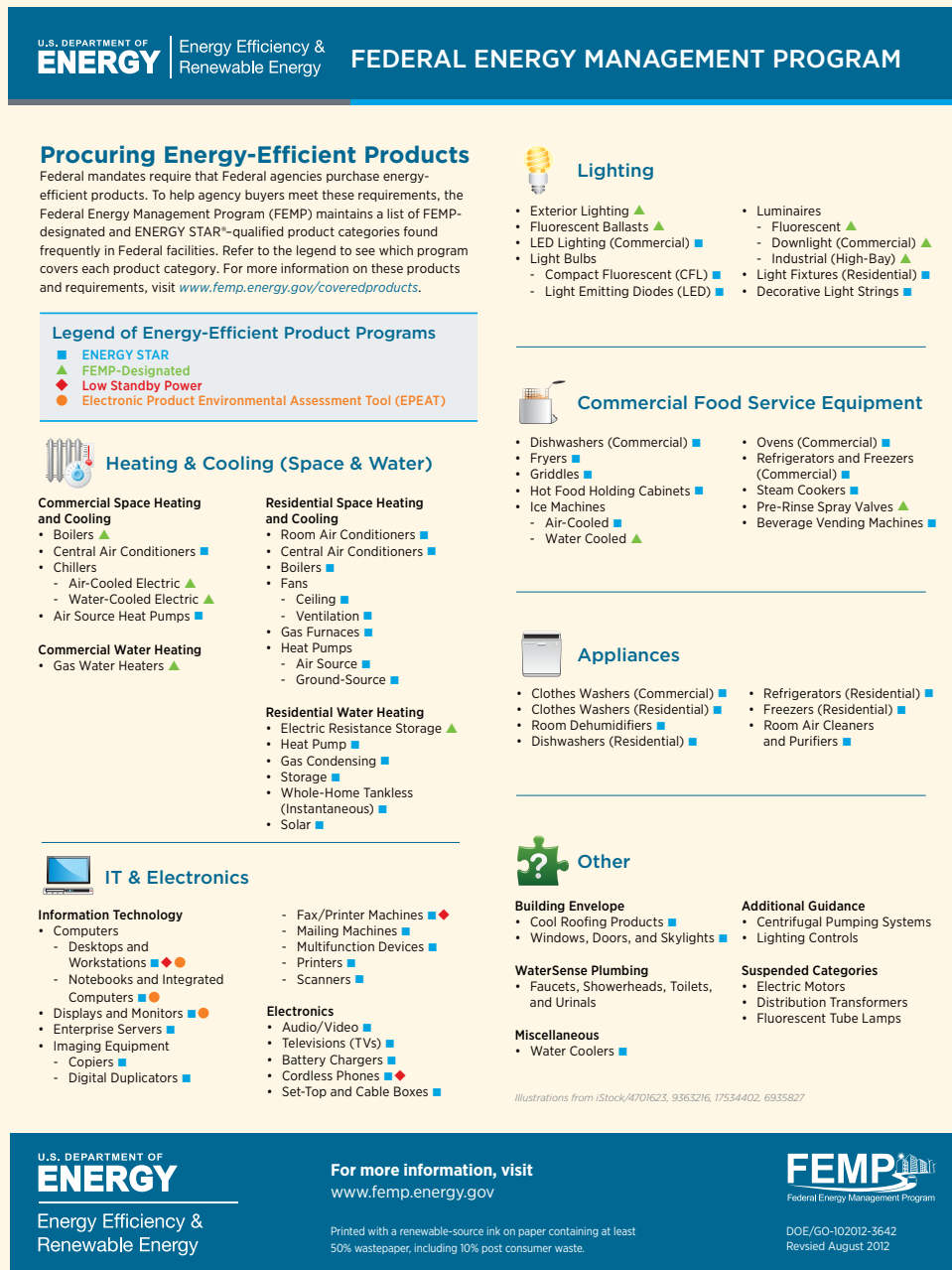
LIFECYCLE COSTING AND BEST VALUE AWARDS

In a few of the countries studied, an LCC analysis is used to determine whether or not a more efficient product, or sometimes a broader green product, is indeed a more cost-effective option based on a “best value” assessment. LCC analyses look not only at the initial purchase price of a product but also its operating costs to determine the total cost of ownership. LCC analyses can take into account the replacement costs based on the expected lifetime of the product, energy/fuel/water consumption costs, maintenance expenses, and end-of-life management (i.e., recycling or disposal) costs.

As noted in Chapter 3, some countries have expanded their LCC methodologies to include socioeconomic benefits by assigning monetary values to local and global environmental improvements, health benefits, job creation, etc. Some jurisdictions are now conducting a separate lifecycle environmental impact assessment, which typically considers other environmental externalities, such as embodied energy (that is, energy inputs for raw material extraction, production, transportation, and disposal/reuse). Although uncommon, several developed countries have indicated their desire to include such parameters in the future. In such cases, nodal agencies often provide simple spreadsheets or other calculators as tools to help procurement agents carry out such analytical work. An example from the United States’ Department of Energy’s Federal Energy Management Program (FEMP) is shown in Box 4.2.

A growing number of jurisdictions are using LCC and best value assessments to help ensure the products they are purchasing are making the best use of public budgets, or in the case of the United Kingdom, representing the highest value for money (VFM). LCC is used at various points of the standard-setting, tender development, and bid evaluation process. Some jurisdictions use LCC to establish the efficiency standards they recommend. The European Union, for instance, publishes the results of a generic product-based LCC analysis to support its voluntary GPP criteria. Furthermore, its *Directive Promoting Clean and Energy-efficient Road Transport Vehicles* encourages purchasing

FIGURE 4.2
United States ENERGY STAR and FEMP-Designated Products



Source | United States Department of Energy, FEMP Website. The complete list of product specifications can be found at: http://www1.eere.energy.gov/femp/technologies/eeep_purchasingspecs.html.

BOX 4.2

Lifecycle Costing and the US Federal Energy Management Program

The Federal Energy Management Program (FEMP) was established in 1995, under the administration of the USA Department of Energy's Office of Energy Efficiency and Renewable Energy. Its primary goal is to facilitate the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship. FEMP maintains programs to promote EE in federal buildings, energy efficient product procurement, renewable energy, water conservation, GHG reduction, efficient and alternate fuel fleets, and energy management training.

Within its purchasing program, FEMP offers energy and cost savings calculators for energy efficient products. These LCC tools allow Federal agencies to enter their own input values (e.g., utility rates, hours of use, etc.) to estimate energy and cost savings for energy-efficient products. Some are web-based tools and others are Microsoft Excel spreadsheets. For example, one tool enables users to compare commercial unitary air conditioners; it requires inputs for only six parameters (condenser type, capacity, EE ratio, annual hours of operation, energy cost, and quantity of units) and has default values for each. The tool then calculates the lifetime costs for the user's selection against a base model, the FEMP-designated (recommended) model and the best model available.

Source | FEMP Fact Sheet, July 2011, available at: http://www1.eere.energy.gov/femp/pdfs/femp_fs.pdf; FEMP website at: http://www1.eere.energy.gov/femp/technologies/ee_eccalculators.html, http://www1.eere.energy.gov/femp/technologies/eeep_unitary_ac_calc.html#output.

authorities throughout the European Union to make procurement decisions based on an LCC assessment and to consider monetizing emission reduction benefits and factoring them into the vehicle's LCC (Box 4.3). Similarly, the United States' FEMP publishes the results of LCC assessments (to determine potential energy cost savings of efficient products) based on "the product's typical usage pattern" when setting recommended and best practice EE levels for federal agencies to follow when procuring "FEMP-designated" products. The FEMP cost-effectiveness examples are accompanied by LCC templates that enable procuring agencies to conduct a cost-effectiveness assessment based on its own specific usage pattern.

Since different agencies use different types of products for different purposes, with varying operating times, loads, and energy costs, LCC analyses can ensure that the tendering agency is getting the best value for its budgetary resources by conducting a cost-effectiveness (i.e., LCC) assessment based on its specific circumstances. It also enables agencies to compare various types of products without relying on nodal agencies or adhering standardized requirements that may not be applicable to their situation. Some jurisdictions require the procurement of energy efficient products *except* in cases where a procuring agency conducts a LCC that demonstrates that the more efficient product is not cost effective.

However, the time and other transaction costs incurred to conduct LCC analyses, particularly for smaller procurements, can be prohibitively high. Further, LCC analyses generally require access to

BOX 4.3

LCC Analyses Steer Vehicle Procurement in Europe

In 2009, the European Parliament and Council adopted a *Clean Vehicles Directive* that mandates the procurement of fuel-efficient and less-polluting road transport vehicles by public authorities and service providers in the European Union. This Directive, 2009/33/EC, obligates Member States to consider operational lifetime energy and environmental impacts when purchasing road transport vehicles. These impacts include, at a minimum, energy use and emissions of CO₂ and other pollutants. Purchasers can comply with this Directive by including requirements for energy and environmental performance as minimum technical specifications or award criteria, by assigning a monetary value to (or “monetizing”) these impacts in the purchasing decision-making process or other means. The EC has advanced implementation of this Directive by developing tools such as Road Transport procurement guidelines, LCC calculator resources, and a database listing the fuel-efficiency ratings of various vehicles, which can be found on its two Clean Vehicle Portals (www.cleanvehicle.eu and http://ec.europa.eu/transport/urban/vehicles/directive/directive_en.htm). It also provides funding incentives to Member States.

Source | Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles, *Official Journal L 120*, 15/05/2009 P. 0005 – 0012; <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:120:0005:01:EN:HTML>; Report for the European Commission DG-Environment by BRE, *Green Public Procurement: Transport Technical Background Report*, 2011, http://ec.europa.eu/environment/gpp/pdf/tbr/transport_tbr.pdf.

quality data and specialized skills, particularly when broader sustainability criteria are included. LCC analyses also do not ensure that the more energy efficient product is purchased if the procurement agent enters incorrect data, lacks data, or does not know how to properly interpret the results. These problems can hinder compliance with a given procurement policy, if LCC analyses are required as part of public procurement processes.¹⁵

ENERGY EFFICIENT PRODUCT PREFERENCES

Some countries require, encourage, or allow public agencies to offer preferences for energy efficient products, or even award criteria, while not mandating their procurement outright. Such preferences can be in the form of additional technical points given for meeting certain EE levels or small allowances (i.e., price preferences) for higher costs. As with some of the other approaches, this is often used in conjunction with the other strategies, such as labeling of energy efficient products or catalogues of technical standards. In some cases, this approach is used when products exceed the minimum thresholds and the government wants to encourage further improvements by manufacturers. For example, in South Korea's Alternative Bidding System with Extra Points, contracts are awarded to the most appropriate bidder, taking into account quality, performance, and EE. Moreover, registered energy efficient products get extra points in the bid evaluation process. Such a system has collectively encouraged suppliers to raise the EE levels of their products.¹⁶ In the European Union, public authorities are encouraged to factor EE and other sustainability criteria into

the award decision, recommending environmental award criteria to account for at least 15 percent of the total points.

Allowing procurement agents to give preferences to highly energy efficient products can be an effective strategy for promoting public agency purchases of products that have a higher EE rating than a baseline level. This strategy provides greater flexibility for the public agency to justify the purchase of products with higher initial costs that can be offset by greater energy savings—rather than only specifying those products that meet the minimum standard. It can also provide further incentives for suppliers to offer higher efficiency models. Of course, LCC tools can help purchasing agents establish a framework for determining how much additional cost can be justified by the higher EE ratings of such products. It is important to note that some jurisdictions use price preferences and points as an alternative to specifying energy efficient products outright, while others use it to justify the procurement of products with an even higher EE rating or other benefits (e.g., longer rated life).

However, this approach can have limitations. Several of the countries and municipalities studied provided unclear guidelines on how the preferences should be given, which creates the potential for abuse or, at a minimum, a lack of transparency. Moreover, a number of public entities do not allow such preferences to be given at all. The World Bank, for example, has procurement guidelines for its investment operations that allow only the lowest priced product meeting a technical specification to be procured. Consequently, there is no option for additional points to be awarded. Also, when price preferences or points are offered for products exceeding the minimum specifications, additional verification of the higher efficiency levels may be needed. This can add to the transaction time, cost, and complexity, resulting in a burden to the tendering agency and potential bidders (unless this work has been standardized by a nodal agency already).

ENERGY EFFICIENT PRODUCT QUALIFYING DATABASE

Some countries and other jurisdictions have even gone further, creating databases of qualified products—with brands, makes and models—to facilitate energy efficient product purchases. Generally, a nodal agency will establish minimum criteria and manufacturers can apply to have their products included in the database. It can help provide greater comfort to the purchasing agent to know that multiple qualified products exist, while also allowing for sole sourcing of smaller contracts. In the Republic of Korea, such a database was developed by the Public Procurement Service, a centralized procurement agency. Referred to as the “Green Products Mall,” it breaks down goods by product category, by type of label or certification, etc.¹⁷ Another example is the Energy Efficient Products List for Government Procurement (EEPL) used in China (Box 4.4).

Such databases make identifying qualified products very straightforward, with the option to share it with other jurisdictions and even local businesses. Such online databases allow procurement agents in multiple jurisdictions to search through qualified products and select models for purchase. Publicizing qualified products also provides a big incentive for manufacturers to develop qualified products and

BOX 4.4

China's Energy Efficient Products List

China's Ministry of Finance (MOF) and National Development and Reform Commission (NDRC) introduced the government's energy efficient procurement policy in 2004 (Treasury [2004] 185). It requires public institutions to give priority to energy-saving products, provided they offer the same functions as the standard products. The procurement policy for energy-saving products was made mandatory in 2006.

A key element of the Chinese policy is the control and management of an Energy Efficient Products List for Government Procurement (EEPL). Both MOF and NDRC are in charge of formulating and updating the EEPL. Products are selected by MOF and NDRC from energy-saving products certified by a nationally accredited certification body, according to a product's energy-saving performance, technology, and market maturity. As of late 2011, the Chinese government has expanded or updated the EEPL nine times. The list has expanded from the initial eight product categories in 2004 to 28 product categories in 2011, including 22 energy-saving categories and 6 water-saving categories. Among them, nine categories are specified as mandatory. As a result of the government policy, EEPL and other initiatives, the national procurement amount for energy-saving and water-saving products in 2009 reached RMB 15.72 billion, which accounts for 70 percent of the total procurement value of the same product categories.

Source | Ministry of Finance, Government of China. "11th Energy Efficient Products List". December 2011 (http://www.ccgp.gov.cn/gzdt/201112/20111214_1928407.shtml); Ministry of Finance, Government of China. Treasury Notice No. 185 [2004] on Printing and Distributing Energy-saving Products for Government Procurement. (http://www.ccgp.gov.cn/zc/g/hongtouwj/201009/20100929_1321482.html); China Financial and Economic News, "Government Procurement Amounted to 741.32 Billion Yuan in 2009." August 18, 2010. (http://www.mof.gov.cn/zhengwuxinxi/caizhengxinwen/201008/20100818_333822.html). The latest product models in the EEPL can be found at: <http://www.ccgp.gov.cn/rnhbchaxun/>.

seek certifications. Such systems can also facilitate cooperative purchasing, whereby jurisdictions can aggregate their purchases and obtain bulk purchase prices while reducing their procurement workload.¹⁸ The City of San Francisco, California (USA) has developed its "SF Approved List" of products that meet their environmental and technical criteria, many of which have been performance tested by City staff. The SF Approved List includes many energy efficient products, such as lighting and computer equipment, and vehicles.¹⁹ The City of Hannover (Germany) issues, in its procurement guideline handbook, a product catalogue which lists the most environmentally friendly products on the market. Municipal agencies are obligated to consult the handbook, which helps increase the purchase of these products.²⁰

However, as databases grow in size and scope, properly updating and maintaining information becomes a challenge because it can be resource intensive.¹⁵ Government reliance on product databases may also create a barrier to new or smaller suppliers that can have trouble getting their products approved and added to these lists. This can limit their access to the public sector market, thereby reducing competition.

EMERGING APPROACHES

As governments gain more experience and expertise in energy efficient purchasing, more complex and broader goals are being incorporated. For example, a number of United States cities have added buildings and building components (e.g., green roofs) to their procurement guidelines. The City of Portland has even established guidelines for product procurement for contractors hired by the City. Many jurisdictions are now looking at the carbon footprint of products, as well as embodied energy and broader resource efficiency criteria (e.g., through the use of lifecycle environmental impact assessments and environmental product declarations), as their programs evolve. Many certification and labeling agencies and testing laboratories are doing the same. Therefore, while many developing countries may be just getting started, developed countries are continuing to expand and revise their programs, which will offer a broad menu of approaches and experiences for developing countries to tap into in the years ahead.

In the next chapter, some specific mechanisms used to help promote and facilitate EEP policies programs and practices will be explored.

ENERGY EFFICIENT PURCHASING PROGRAM COMPONENTS

A | INSTITUTIONAL SET-UPS

It is important for public authorities to establish institutional systems to support their EEP policies and programs in order to facilitate high compliance or participation rates. For the purposes of this section, institutional arrangements are meant to describe how the core functions of EEP programs—e.g., policy formulation, standards setting, development of training and tools—are organized, rather than procurement decisions or the level of decentralization of public procurement. The study found that there are a wide range of approaches taken in various counties, but there are also a number of similarities and common functions. It should be noted that, regardless of structure, EEP necessitates close cooperation and coordination among a variety of government entities in order to be effective. Typically, these involve ministries or departments of energy, environment, science, and technology, as well as agencies for standards, procurement, and general services. In a few instances, the ministries of finance and economy were also involved (Table 5.1).

TABLE 5.1
Institutional Set-Ups for EEP

NAME	DESCRIPTION	EXAMPLES
Centralized (nodal) Agency	Centralized agency that sets standards, develops program plans, training, tools, and other materials	Denmark (DEA), Finland (MEE), Japan (MOE), Sweden (SEA), United Kingdom (Defra)
Shared Management, or Steering Group	Standards and program implementation developed through a cooperation of different departments	Australia (DFD, DSEWPC), China (MOF, NDRC), European Union (DG ENV, IFE), Germany (MoET, MOENCNS, AEE), Korea (MKE, KEMCO, PPS), City of Portland (USA), United States (DOE, EPA, GSA, OMB), City of Vienna (Austria), Mexico City (MOE, Chief Clerk)
Local Government Association	Associations provide information on EEP/GPP to their members, along with training, tools, etc.; some facilitate cooperative purchasing activities among multiple jurisdictions	Mexico (AMMAC), United States (NASPO/WSCA, NACo, United States Communities, Municipal Solid State Street Lighting Consortium)
NGO	Nonprofit entities share information and training, tools, etc. on EEP/GPP	Canada (MCSP), European Union (ICLEI), India (GPNI), Japan (GPN), United States (RPN)

Source | Authors.

Additional Acronyms: Agency for Energy Efficiency (AEE), Danish Energy Authority (DEA), Department of Finance and Deregulation (DFD), Department of Sustainability, Environment, Water, Population and Communities (DSEWPC), Directorate General Environment (DG ENV), Institute for Energy (IFE), Ministry of Economics and Technology (MoET), Ministry of Employment and the Economy (MEE), Municipal Collaboration for Sustainable Procurement (MCSP), National Association of Counties (NACo), Nature Conservation and Nuclear Safety (MOENCNS), Swedish Energy Agency (SEA), Western States Contracting Alliance (WSCA)

In general, the core functions associated with EEP policies and programs include:

- Setting policies and updating them
- Establishing staff roles and responsibilities
- Developing EEP program plans and targets
- Determining which products should be covered under the EEP program
- Setting technical specifications and testing protocols for target products (including updating)
- Generating outreach and training materials for public sector staff
- Administering awards, incentives, and competitions, etc.
- Developing tools, such as LCC calculators and product lists
- Program tracking, monitoring, and reporting

The study found that, in some cases, there was a centralized management structure, usually with the ministry of energy (for EEP) and environment (for GPP). Despite the need for consultations with other agencies, one ministry was appointed to have overall responsibility for the EEP program. In more countries, joint responsibility was used to manage the EEP programs. In these cases, other agencies were involved, such as ministries of finance (Australia, China) and knowledge (Korea). Such programs often did not act in isolation. Several also had active participation by government associations, NGOs (Box 5.1), and other entities.

BOX 5.1

Japan's Green Purchasing Network

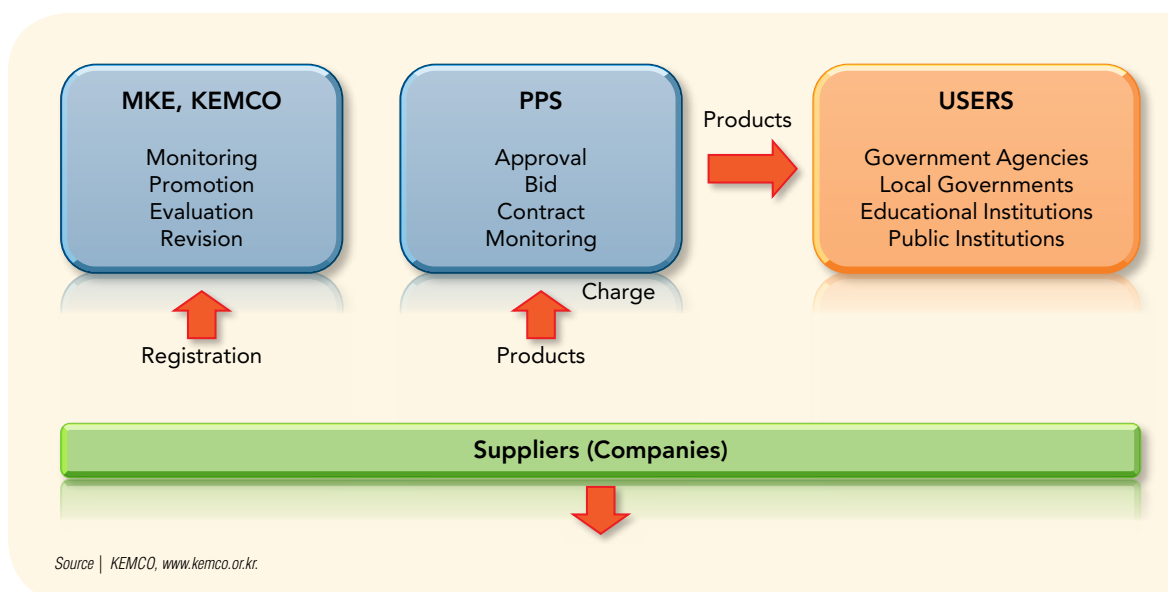
Japan's Green Purchasing Network (GPN) was established in 1996 by government, businesses, and nonprofit organizations as a non-state entity to promote green purchasing to consumers, companies and governmental organizations. It has played a critical role in advancing green purchasing in Japan by promoting the ideas and practices of green purchasing, drawing up purchasing guidelines, and publishing environmental data books for several types of products, which are updated four times a year. GPN provides strong support for exchange of experiences, enhancing collaboration among business, municipal governments, the Environmental Agency, and NGOs with an interest in green purchasing. Among its activities, GPN draws up purchasing guidelines for various products, maintains an extensive product database, holds seminars as well as study meetings, and awards commendations to organizations that develop and implement innovative green purchasing programs. As of April 20, 2011, GPN has 2,749 members, including 229 local authorities, 2,265 private companies, consumer groups, environmental NGOs, and cooperative associations.

Source | Green Purchasing Network website. See: <http://www.gpn.jp/organization/index.html>.

Despite the varied approaches, there were no remarkable differences among the reported performance of the EEP policies and programs, although since many lack detailed reporting, it was not possible to analyze whether results actually varied with the institutional arrangements. However, based on the case studies reviewed, there did not appear to be major differences in functions or effectiveness. Jointly managed EEP programs, which require significant cooperation and coordination, did not suffer from a lack of accountability and, in fact, were among the high performers. Some experts also suggested that programs emanating from environment ministries may have less political support than those directly supported from ministries of energy or finance, although no evidence of this was found.

It was noted that several EEP programs work very closely with central public administration and procurement agencies. Involving procurement agencies early and on an ongoing basis in the program does appear to have a positive effect on overall program success. The European Union, the Republic of Korea, and the United States have all made significant strides to work within the procurement systems and partner with them to advance EEP implementation, which has proved to be extremely important. For example, three government agencies in the Republic of Korea collaborate to make its EEP program work. The Ministry of Knowledge Economy (MKE) establishes the framework for the program, approving energy efficient standards and testing criteria; the Korea Energy Management Corporation (KEMCO) is responsible for EEP program implementation and monitoring; and the Public Procurement Service (PPS), the country's central purchasing agency, negotiates contracts for energy efficient and other green products and services on behalf of local governments and other public organizations (Figure 5.1).

FIGURE 5.1
EEP Institutional Arrangements in the Republic of Korea



It is important to note that institutional arrangements continue to evolve. For example, while many EEP programs may have been founded within energy ministries and agencies, these programs are now being subsumed in broader GPP programs, which require much greater input from ministries of environment. For example, the EEP program in the United States began several decades ago as a voluntary encouragement initiative based largely on the ENERGY STAR Program and FEMP. Today, General Services Administration (GSA; USA), the central procurement agency for the (non-military) federal government, has a significant role in making energy efficient and other environmentally preferable products available to federal agencies on central contracts. GSA works closely with Department of Energy (DOE) and the Environmental Protection Agency (EPA) to label compliant products so they are easily identifiable on the GSA Advantage website. In most of the case studies reviewed, however, GPP policies are still voluntary with emerging guidelines; consequently, institutional arrangements are often not clearly defined.

B | PRODUCT TESTING AND CERTIFICATION

A critical component of an effective EEP program is a system for setting EE standards, including testing and certifying that products meet the minimum standards established by the jurisdiction. These functions are often performed by a nodal agency or another public entity that conducts market analyses of available products within specific categories to determine what is “best in class” from an EE perspective and ensure that the most efficient products also meet the form and function of procuring agencies. Often, the standards for energy efficient products also include other technical requirements (e.g., performance, lifetime) and, increasingly, include other environmental criteria as well.

Generally, before standards are set, the list of equipment or product categories to be included in an EEP program have to be determined. This list is dependent upon a variety of factors, including volume of product category purchases by public agencies, LCC or VFM determinations, energy savings potential, adequate qualifying products, availability of existing certifications and labeling schemes covering products, and potential for market transformation. Generally, simpler product categories are selected first (e.g., lighting), followed by other high-volume purchases (e.g., office equipment, vehicles).

How the energy consumption of a product category is measured—and how efficiency standards are ultimately set—varies greatly by country and product category. The efficacy of lighting equipment, for example, is typically measured as lumens (i.e., light output) per watt, while vehicle efficiency is measured in distance traveled per unit of fuel (e.g., miles per gallon, kilometers per liter). Electronic equipment energy efficient standards typically set a maximum electricity consumption level per product type and may require specific energy-saving features such as low standby power or automatic shutdown when the equipment is sitting idle.

Product efficiency verification typically involves manufacturers submitting data from approved laboratories to accredited certification bodies. The certification body (or the EE nodal agency itself) may perform its own quality assurance testing on products—either routinely on samples provided by the product manufacturer or randomly from items on store shelves. They may also perform site audits to evaluate quality control measures that are in place when the product is being manufactured.

In many countries that have EEP policies and programs in place, the national government is responsible for setting the efficiency standards that procurement agents are encouraged or required to follow. In a few countries, such as Japan through its Green Purchasing Network (GPN), EE and other green product standards or guidelines are developed by independent, third-party entities, such as non-profit eco-labeling and certification organizations.

EEPL in the People's Republic of China

Perhaps the most carefully controlled energy efficient product certification, testing, and approval program in the world has been developed in the People's Republic of China. In 2004, the Ministry of Finance (MOF) and the National Development and Reform Commission (NDRC) introduced an EEP policy which required public agencies to give preferences for energy efficient products. This was followed up in 2006 with a public procurement policy for energy-saving products, which made EEP mandatory for selected products.

In support of the EEP policy, MOF and NDRC are responsible for overseeing the system that ensures products added to its List of Energy Efficient Products for Government Procurement (EEPL) meet strict efficiency and quality standards. They are chosen from among products that are approved by China's sole certification body, the China Quality Certification Center (CQC), following a stringent procedure.

After manufacturers submit their applications, the CQC Center either rejects their application or schedules a site audit. Suppliers that pass the laboratory test review and manufacturing plant audit are issued either an Energy or Water Conservation Certificate (Figure 5.2) along with a notification of approved products that is posted on the CQC Center's website for a short public consultation period (usually one week). The CQC Center is empowered to revoke a manufacturer's certificate if a product no longer complies with the national EE and/or quality standards or that is unable to guarantee an adequate supply of compliant products.

Once a supplier receives a certificate, they have been approved to enter into a contract agreement with the Chinese government to offer products on the EEPL. Public employees at all levels of government in China are required to purchase products on the EEPL if they are in categories covered by the list.²² Moreover, public authorities are expressly prohibited from purchasing products from suppliers that have had their certificates revoked.

FIGURE 5.2
China's Energy and Water Conservation Certifications



ENERGY STAR in the United States

The ENERGY STAR Program in the United States has a similar, but less centrally controlled, system for EEP product standard setting, certification, and testing. The ENERGY STAR Program was first launched as a voluntary energy efficient product endorsement labeling program in 1992 by the United States EPA and became jointly run by DOE in 1996. It currently has standards and lists of qualified products in many categories that are commonly used by government agencies, institutions (such as schools), and businesses. According to the EPA, “ENERGY STAR products typically represent the top 25 percent of the most efficient products available.”²³ A number of other countries (e.g., Australia, Canada, Mexico) as well as the European Union also use the label to specify energy efficient products in their EEP programs.

Products can earn the ENERGY STAR label by meeting the EE requirements set forth in its product specifications. EPA and DOE establish these specifications based on the following set of key guiding principles: (i) product categories must contribute significant energy savings nationwide; (ii) qualified products must deliver the features and performance demanded by consumers, in addition to increased EE; (iii) if the qualified product costs more than a conventional, less-efficient counterpart, purchasers will recover their investment in increased EE through utility bill savings, within a reasonable period of time; (iv) EE can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer; (v) product energy consumption and performance can be measured and verified with testing; and (vi) labeling would effectively differentiate products and be visible for purchasers.²⁴

For each product category, the Program adopts EE standards and other relevant technical specifications, which typically delineate the test methods that must be followed for achieving a certification. While the product specifications are set directly by EPA or DOE, public comments on each proposed specification are allowed. The Program revises its specifications periodically to ensure that its requirements continue to raise the bar on EE, thereby facilitating market transformation.

For most of its history, the Program relied on self-declaration by manufacturers for determining which products meet its efficiency and performance standards. Manufacturers that signed up for the program were able to test their products in their own laboratories and submit information to EPA or DOE on products they wished to receive the label. It should be noted that, while this system was widely supported by industry, there have been some credibility concerns as well as complaints from manufacturers that their competitors were not testing products as prescribed.

In 2008, the EPA's Office of the Inspector General released an audit report that found the Program's claims on energy savings were unreliable and unverifiable.²⁵ The report noted that there were insufficient review mechanisms in place to ensure the accuracy and validity of data collected. In 2010, a second report was issued by the US Government Accountability Office (GAO), which found further faults in the conformity assessment and review process for ENERGY STAR-qualified products, concluding that the Program was highly vulnerable to fraud.²⁶

As a result, the Program was overhauled by eliminating manufacturer self-declaration and instead requiring third-party certification of all products. EPA set up programs to qualify ENERGY STAR-accredited laboratories and certification bodies to perform the testing and conformity assessment work on its behalf.²⁷ The Program submits qualified products to be tested; those that fail are listed as “disqualified” on the ENERGY STAR website. Today, there are more than 200 ENERGY STAR-accredited Certification Bodies and Laboratories across the globe, with concentrations in the United States, China, Taiwan, and Europe.²⁸

A recent enhancement to the Program involved labeling of the most efficient equipment, responding to some concerns that the pass-fail endorsement label does not enable purchasers to easily differentiate the most efficient products. The ENERGY STAR-Most Efficient Initiative now identifies the leading-edge products in each category, similar to Topten International that is active in the United States, the European Union, China, and elsewhere.

Europe

In the European Union, under its 2008 ENERGY STAR regulation, each Member State is responsible for establishing a surveillance mechanism to ensure conformity of the self-certified office equipment. In cases of non-compliance, Member States shall take “effective, proportional, and dissuasive sanctions” and communicate these to the Commission. Under the EU Directive on energy labels, it is the responsibility of the manufacturers to declare their energy label and make available the technical documentation for inspection purposes. This technical documentation must be available for a period of five years for any government review or inspection; it is also the role of Member States to ensure that all suppliers and dealers established in their territory fulfill their obligations. In practice, almost all European Union Member States control the correct provision of labels through direct visits in shops, although in several countries shop inspections are not necessarily carried out on an annual basis. The European Union’s GPP criteria include voluntary guidelines on how procurement staff can prepare tenders for 19 product categories. Guidelines provide the minimum criteria, which correspond for EE to the best EU energy labels.

C | TRAINING AND OUTREACH

Because effective EEP programs require the participation of a variety of agencies across a given jurisdiction, including both purchasing and technical staff as well as key product end-users, building the capabilities of public employees—particularly those who are making centralized purchasing decisions—is essential. In the United States, for example, there are more than 500,000 staff that can make purchasing decisions on behalf of the federal government, which points to the need for comprehensive and effective training and outreach programs.²⁹ Four topics that are commonly covered in an EEP training program include:

- 1 | why EEP (or green) purchasing is important from an economic and environmental perspective;
- 2 | an overview of the jurisdiction’s EEP policies and programs;

- 3 | a review of the jurisdiction's EEP procedures and practices, including methods to identify qualifying energy efficient products; and
- 4 | a list of available information, tools (e.g., LCC calculators), and resources.

In practice, most of these topics are covered in the same course.

It is important for employees to understand why the jurisdiction has decided to purchase energy efficient products because it can help motivate them to participate or comply. Such training should point out why EEP is good for the government, can help agencies save money, and promote exemplary environmental stewardship. Relevant public sector staff must also clearly understand what EEP policies are in place as well as their roles and responsibilities under those policies. It is essential for them to understand legislative requirements and stay up-to-date on the most recent policies and regulations. Even if the jurisdiction has adopted a voluntary policy, or has only a promotional program without a policy, staff should understand the jurisdiction's objectives and how they can help achieve them. Similarly, practical information related to how to implement EEP—including an overview of model documents and procurement language, tools and other resources that have been developed to assist them—can greatly increase compliance rates, in the case of a mandatory policy, or participation rates, if voluntary.

Education and outreach (including hands-on technical assistance) on EEP and GPP is not always provided by the government. Some government agencies hire technical consultants to conduct educational seminars. Others require selected vendors to provide training or to promote their products to potential end-users under their contracts. Often, manufacturers (or trade associations representing manufacturing sectors) will promote EEP and GPP through expos and conferences. While product manufacturers can provide helpful technical support, public agencies should closely evaluate the information provided by manufacturers and trade associations to ensure that their efficiency standards meet government requirements. In the United States, European Union, India, Japan, and elsewhere, EEP/GPP outreach and education can also be offered by NGOs, such as the Green Purchasing Networks in Asia, the Responsible Purchasing Network (RPN) in the United States, and Local Governments for Sustainability (ICLEI) and EcoProcura in Europe. These organizations also generally offer information on best practices, success stories, innovative technologies, new tools, etc., often through websites and sponsoring conferences and workshops, both regional and global.³⁰

The decision about who receives training varies by jurisdiction. Often, public agency procurement managers, who are responsible for purchasing decisions that impact many agencies, are targeted first. Generally, other employees who are responsible for purchasing decisions under the jurisdiction's policy as well as technical officers are then targeted. In countries and other jurisdictions where administrative functions are more decentralized, such as in India, training has been more important because purchasing agents have considerably more autonomy in their budgeting and procurement decisions.³¹ However, education in a decentralized system is more difficult because there may be less standardization of procurement systems, training materials must be adapted to each jurisdiction or public institution, and there may be many more people to educate.

Some jurisdictions require certain staff (notably central agency procurement officers) to become trained on their EPP/GPP policies and procedures. The City of Portland, Oregon (USA) goes one step further by detailing the responsibilities of specific staff to conduct training and encouraging employees within their departments to attend employee trainings related to its Sustainable Procurement Policy. The City's policy requires city bureaus to be responsible for:

- building awareness of the policy and sustainable procurement standards through information dissemination and incorporation into routine employee trainings;
- encouraging employee attendance at internal and external trainings related to sustainability; and
- encouraging the use of environmentally preferable/sustainable products and services through information dissemination, development of internal procedures, pilot testing, and leading by example.

In cases where budgetary resources for training are limited or purchasing staff is not centrally located, online courses can be an efficient way to conduct primary or supplementary training, with specially designed “webinars” that include time for technical staff to address participant questions and discuss specific cases. For example, the Swedish Environmental Management Council (SEMC), which “strives to increase the knowledge and sustainability criteria in public procurement,” has developed two web-based courses on GPP: *Introduction to Green Public Procurement* and *Introduction to Climate-Efficient Procurement*. These online courses offer examples of cases where green and climate-efficiency have been incorporated into procurement and explain how to conduct an LCC analysis of products.³² Another example of online training in the United States is summarized in Box 5.2.

Some jurisdictions incorporate training about EEP/GPP into their overall procurement training for employees, while others offer it as a separate event. Training can be conducted either face-to-face or online, as a

BOX 5.2

EEP Training in the United States

The USA's FEMP provides training for public procurement officials on a variety of EEP topics. FEMP trains federal agency managers on the availability and cost effectiveness of products that are highly energy- or water-efficient or powered by renewable energy. It also offers courses on sustainable buildings, the latest energy regulations, budgeting and financing for EEP, tools, and more. Trainings are conducted both online (either live or on-demand) and face-to-face. The FEMP website provides detailed information on each course, the schedule for upcoming courses, and presentations, and other documents from past trainings. Staff interested in participating in such training programs can register online.

FEMP's EEP training provides an easy-to-access opportunity for staff to learn about federal policies and best practices for EEP. Even though FEMP targets its courses to federal agency managers, all federal employees, as well as public employees at other levels of government, businesses, and ordinary citizens interested in learning about EEP, can access presentations and course materials online.

Source | FEMP website. For more information, see: <http://apps1.eere.energy.gov/femp/training>.

self-paced course. As with all trainings, EEP courses should give trainees opportunities to interact with the trainers, see real life case studies, discuss issues with trainers and other participants, ask questions, and provide feedback at the end of each course. The content of the EEP course should be up-to-date (by incorporating changes in regulations) and should highlight “best” practices or innovations.³³ It should also be customized, where appropriate, for target agencies and staff, and incorporate previous participant feedback.

In many jurisdictions, in addition to training, nodal agencies also offer an array of resources to help purchasing agents implement EEP, since many are unfamiliar with energy efficient products and how to identify and specify them. These informational resources typically include tools (e.g., LCC calculators), as well as model procurement documents (e.g., sample bid specifications and contract language), EE product standards and testing protocols, energy efficient product certifications and labeling, lists of approved products, etc. The dissemination of these resources through training workshops, websites, and other outreach efforts can reduce confusion, make EEP easier, and save time and money—thus, helping to lower the transaction costs. For example, the EC has developed a web-based GPP Toolkit that includes a handbook designed to help Member States and other public authorities plan and implement EEP and GPP initiatives.³⁴ The City of Portland, Oregon (USA), posts sample bid specifications on its website along with case studies showing actual examples of how EEP has been carried out, environmental and economic benefits, and lessons learned.³⁵ Proper outreach efforts are needed to ensure that the target audience is aware of the EEP training courses, procurement tools, and other resources offered.

D | INSTITUTIONAL INCENTIVES TO EFFECT BEHAVIOR CHANGE AMONG STAFF

In addition to initiating EEP policies and programs, governments often need to do much more to incentivize public agencies and their staff to participate in such programs. This can be important, particularly since enforcement of such requirements can often be difficult to do in practice. As noted in Chapter 2, there are inherent barriers to improving EE and practicing EEP. Many countries, especially those in the developing world, have public agencies with tremendous budget constraints that are constantly struggling to fulfill their mandates with diminishing resources. This can make the higher upfront costs of energy efficient products difficult to justify, despite their lower LCC.

Even if governments are successful in obtaining buy-in from the key public agencies under their jurisdiction, getting public sector staff—from budget managers to procurement officers to technical staff to agency end-users—to change the way they conduct their business is still a monumental challenge. Staff may not be well informed about applicable regulatory requirements, how to implement EEP, how other agencies have successfully overcome barriers, and what tools exist to help them. Public sector staff may also, in general, prefer to do things the way they have been doing them in the past and can be resistant to change. EEP often entails asking staff to take on additional tasks, such as conducting LCC analyses when purchasing goods, identifying EE standards and certifications to incorporate into their bid specifications, evaluating products offered by suppliers to determine if they meet jurisdiction standards, and fulfilling its monitoring and reporting requirements. These all place additional obligations on staff. If the policies require more complex systems to be put in place, it can also introduce new risks into the procurement process. Ignoring such issues can undermine EEP goals and the program's effectiveness. In addition, subnational government staff may resent new mandates from central authorities.

As noted in the previous section, training can go a long way to help purchasing agencies and other staff understand regulatory requirements and their obligations as well as increase their motivation to participate in the jurisdiction's EEP/GPP program. It can also share tools and other resources to assist in the implementation of EEP. However, it may not be enough. This section examines experiences from various countries in dealing with behavioral issues and the role that various incentives can play in facilitating EEP implementation.

Are incentives necessary? One approach to addressing behavioral issues is incentives. In the global review, incentives were found to fit into two broad categories: institutional and individual (Table 5.2). These can also be categorized as either compulsory or voluntary. Institutional incentives are those that target the agency-level decision-making process and seek to overcome potential gaps between its needs and those of the government as a whole. For example, many governments do not allow public agencies to retain energy cost savings accrued from measures taken to become more energy efficient. Without such policy change, it can be financially difficult for agencies to reduce their energy costs, especially when the upfront cost of purchasing a more efficient product is higher. Regulations that allow for energy cost savings retention, at least until the agency has recouped its investment, can overcome this barrier. Similarly, programs that provide upfront financing to pay for any incremental, higher cost of a more efficient product can also solve this problem. This is sometimes accomplished through the use of a revolving loan fund that can be replenished with the agency's energy cost savings. Efforts to provide agencies with EE targets and offer recognition to those that exceed them have also been used in a number of the countries studied to further counteract this institutional incentive gap. A majority of the incentives used today are institutional ones—offering awards to agencies that exceed EE or energy reduction targets.

The second category of behavioral issues involves individual agency staff, such as technical and procurement officers. These issues are generally more complex. In the private sector, incentivizing staff with bonuses is commonplace and can be effective; however, this is often not practical, legal, or even desirable in the public sector. One approach, which appeared to have had some success, is offering staff recognition and positive performance reviews, since these can have a considerable impact on staff motivation. Similarly, competitions among agencies and units can also have a positive effect on staff behaviors.

Voluntary incentives can be offered in a variety of ways. Some of the most common voluntary measures that emerged from the case studies are summarized below.

TABLE 5.2
Institutional and Individual Incentives for EEP

INCENTIVE TYPE	INSTITUTIONAL	INDIVIDUAL
Voluntary	Budget retention for energy savings	
	Financial incentives (grants, loans)	Performance bonus, time off
	Agency recognition and awards; publicizing success stories	Recognition and awards for staff
	Regional/Institutional cooperation	Departmental competitions
	Agency performance reviews	Performance reviews, job advancement
Mandatory	Laws and regulations	
	Reporting requirements	
	Agency EE targets	Departmental and unit targets

Source | Authors.

- **Budgeting** | A range of budgeting disincentives can prevent the purchase of energy efficient products. For some agencies, unused energy budgets, which can occur when energy costs are reduced, can be lost or “clawed back” by parent budget agencies. Allowing units to retain a portion of any energy cost savings can help address this issue. Mixed institutional incentives can also arise, when one department is responsible for operating costs, including energy, while another is responsible for capital upgrades and equipment procurement. Agencies have little motivation to pay a premium for energy efficient equipment when the financial savings goes to another department. Further decentralization efforts can help create more autonomous and accountable agencies, thus giving them full responsibilities for their facilities. Line item budgeting, in which operating costs are accounted for separately from capital costs, can also make it difficult for agencies to derive the full benefits from EEP. In such cases, adjustments to budget codes or adopting of “lifecycle budgeting” have been used to address such barriers.
- **Financial incentives** | In some developed countries, financial incentives are available to help public agencies with their EEP programs. These can be in the form of small grants, revolving loans or concessional (below market rate) financing, to help defray the higher upfront costs.³⁶ In Los Angeles (USA), the City purchased LED street lights for a total investment cost of US\$ 56.9 million, and received a utility rebate of about US\$ 13.2 million.³⁷ Recently, some governments that provided economic stimuli during the recent global financial crisis channeled budgetary funds towards EE retrofits and EEP, recognizing that such investments can help create jobs in the short term and operating cost reductions in the medium term. The United Kingdom established a loan fund and other financial instruments to enable its government agencies to purchase energy efficient equipment and fuel-efficient vehicles. Similarly, Norway has offered “grants to EE measures in public buildings” since 2009. This is one of the strategies included in the European Union’s National Energy Efficiency Action Plan and Sustainable Procurement Action Plan.³⁸
- **Price negotiation** | There are strategies public agencies have used to secure lower upfront prices for energy efficient products, such as aggregating demand within jurisdictions and purchasing cooperatively among jurisdictions. Eliminating competing low-efficiency products from umbrella contracts for certain types of products (e.g., lighting, office equipment, etc.) and adding energy efficient products to the “core” or “market basket” list of items around which the contract is negotiated are two additional strategies that can help jurisdictions receive higher discounts from vendors.³⁹ Some jurisdictions have decided to finance large-volume purchases of energy efficient products by negotiating contracts with ESCOs, which pay the upfront cost of products, such as energy-saving lamps or water conservation devices, and are repaid from the energy cost savings.
- **Performance reviews and bonuses** | Performance reviews and bonuses can be another way to help motivate staff. Incorporating some responsibilities and goals related to EE into staff job descriptions, and then measuring their achievements against the annual goals during performance reviews, can help motivate employees to integrate EE into their operations. In some cases, modest bonuses, raises, or additional vacation time can also be offered to staff that exceed certain goals or achieve particularly high energy cost savings as a result of their actions. China has specific EE targets for various provinces, districts, and municipalities and uses achievement of targets in its annual performance reviews of public managers and officials.
- **Agency and staff recognition** | Where financial awards and bonuses are not allowed or are beyond the resources of the program, simply recognizing high and low performers (“fame and shame”) can go

a long way toward motivating the public sector. This can be done by publicizing the highest and lowest performers, presenting plaques and other types of awards, holding award ceremonies, and publishing success stories in newsletters, on the Internet and elsewhere, both at the institutional and individual levels. In the United States, GreenGov awards are issued each year to federal agencies and individual staff in categories, such as: (i) the *Sustainability Hero Award* for agency sustainability champions; (ii) the *Green Innovation Award* for transformational ideas on energy and environmental performance; and (iii) the *Lean, Clean and Green Award*, which recognizes outstanding agency achievement in building or fleet EE or renewable energy.⁴⁰ The City of Lviv (Ukraine) simply requires its municipal buildings to post an energy label on the front of their buildings. Agencies that receive high ratings are praised; low performers generally receive pressure to improve.⁴¹ The Department for Environment, Food and Rural Affairs (Defra, UK) recommends providing individual incentives to staff to promote sustainable development, such as staff acknowledgements from senior management or providing access to career opportunities to successful procurement staff.⁴²

- **Institutional cooperation** | Regional or institutional cooperation mechanisms can foster a community among public agencies and staff to share their experiences, problems, ideas, and useful resources (e.g., LCC calculators, specifications, and bid evaluation methods). These exchanges can create a collaborative environment that can be critical to changing staff culture and behavior. The City Council of Portland (USA) adopted a resolution that created a *Sustainable City Partnership* in December 2006 to facilitate the gathering of officials and foster changes in culture and practices to help the City meet its overall sustainability goals. Aggregated or pooled purchases, where jurisdictions combine forces to purchase certain products can be another way to cooperate. This is discussed in greater detail in the Partnerships section.
- **Competitions** | Organizing competitions among agencies has also been used to incentivize staff to change their way of doing business. Usually, these can be done at a relatively low cost, as the prize may be less important than the glory of winning. Typically, such events require agencies to compete to reduce their energy consumption, or to meet another simple sustainability criterion, over a fixed period. Agencies can then develop their own strategies and plans to maximize their ability to prevail over the other agencies. In some cases, these competitions can lead to long-term operational changes that can become institutionalized. In other cases, however, measures implemented can be short lived and may not be sustainable beyond the competition period, so these need to be taken into account. (See Box 5.3 for an example from the Czech Republic.)
- **Mandatory requirements** can also be used to achieve changes in behavior among public agencies and their staff. However, efficient and effective enforcement mechanisms may be needed to ensure these requirements are adequately followed as envisaged.
- **Laws and regulations** | As noted in Chapter 3, many EEP programs are developed around specific laws, regulations, decrees, and executive orders relating to EE, EEP, and other sustainability practices. These mandates generally provide an overall framework for a national EE program and provide for specific measures, including EEP, to be implemented. Often, EEP is enacted through secondary legislation or regulation, which lays out which agencies are responsible for implementing an EEP policy or program. In China, for example, it is obligatory for government procurement documents (e.g., requests for expressions of interest, requests for proposals, draft contracts) to set forth product energy-saving requirements, conditions for qualified products, and preferential procurement assessment criteria for energy-saving products.⁴³ In

Japan, the *Law on Promoting Green Purchasing* requires the government to select energy efficient products and to help ensure participation by the various public sector institutions.⁴⁴

- **Reporting requirements** | In addition to overall legislation, many countries include requirements for public agencies, municipalities, and other entities to develop Energy Efficiency (or Climate) Action Plans and report on their progress. If an EEP policy is in place, there may be reporting obligations for this as well. Although such requirements are often not prescriptive in nature, they do obligate public agencies to develop a plan and report on their progress. Such a measure does not always ensure that public agencies are doing all they can, but it at least tends to identify proactive agencies for potential recognition and those agencies doing the least. If such measures are combined with voluntary public disclosure of reporting, it can further help stimulate action due to concerns over agency reputational risks. The Republic of Korea has a comprehensive reporting requirement for their green purchasing program, combined with allocations of monetary incentives (Box 5.4).
- **Energy reduction targets** | Some countries also establish energy (as well as water and GHG emissions) reduction targets within their legislation. This helps to create accountability within the public sector. Like reporting, reaching energy reduction targets is typically not prescriptive, but requires some overall outcomes to be achieved. Reaching energy reduction targets can be done by national governments as well as subnational governments (e.g., states/provinces, municipalities), ministries, etc. and usually includes dates by when the targets should be met. The Russian government, for example, has set an ambitious target of reducing its energy intensity by 40 percent between 2010 and 2020, with annual targets of about 3 percent per year for municipalities. Australia also created annual targets for its public agencies (Box 5.5).

E | PARTNERSHIPS

Government entities across the globe have formed partnerships—both formal and informal—to advance their EEP (and broader green) initiatives. Such partnerships are important in order to enhance

BOX 5.3

Green Procurement Competition in the Czech Republic

In the Czech Republic, the region of Hradec Králové launched a competition in 2008 to promote GPP among public institutions. The competition focused on creating environmentally friendly offices and organizations, based on pre-set criteria, particularly in the areas of bulk procurement of energy efficient office equipment, household appliances, and lighting products as well as green vehicles. Approximately 350 persons from among towns, municipalities, and institutions were invited to take part in the competition. Participants had a chance to complete a questionnaire about launching environmentally friendly operations within their organization. The questionnaires, which were completed by more than 60 institutions, were evaluated and a physical on-site inspection took place in the best 20 institutions to verify the data provided. In the end, six institutions obtained a certificate and financial support.

Source | Buy Smart: Green Public Procurement for Smart Purchasing, Procurement and Climate Protection, D6.2: Draft Policy Recommendations -- Czech Republic, July 31, 2011 (see: http://www.buy-smart.info/media/file/1512.D6_2_policy_CZ.pdf).

BOX 5.4

Public Agency Reporting and Incentives in the Republic of Korea

The South Korean Ministry of Environment (MOE) operates a GPP reporting system and offers incentives based on results. Under this system, public institutions are required to compile records of their purchases of green products within three months following the end of each fiscal year and report them to MOE. Each city, county, and province must submit its purchasing records to the head of its office; the city mayors and provincial governors then collect and aggregate these reports and submit them to MOE. Based on the results of the reports, MOE can provide grant support or environment-related subsidies to local governments that have demonstrated a superior green product purchasing record.

Source | Ministry of Environment, Government of Korea. "Act on Encouragement of Purchase of Green Products." 2011.

cooperation and coordination among the various stakeholders, create a collaborative environment, and build upon the experiences of one another. The types of partnerships are varied, but they largely fall into three categories: working with other jurisdictions on EEP, cooperation with manufacturers and suppliers, and partnering with NGOs or nonprofit organizations. The nature of the partnerships can be as simple as information sharing, joint training, or sharing of tools. These relationships can also be more complex such as those that form to support aggregated purchases. This section includes summaries and examples of these three types of partnerships, including the typical roles they play in helping make EEP by public agencies easier and more effective.

BOX 5.5

Government Energy Efficiency Targets in Australia

While Australia lacks a comprehensive, national EEP program covering federal, state/territory, and local governments, in 1998 the central government did establish a target of reducing energy use to 10,000 MJ per person per year for tenant's light and power use in government office buildings by 2002 under the *Measures for Improving Energy Efficiency in Commonwealth Operations*. In 2006, the target was updated under its *Energy Efficiency in Government Operations Directive*. The most recent two targets to be met by July 2011 were:

- 7500 MJ/person/year for public offices—Tenant Light and Power
- 400 MJ/m²/year for public office—Central Services

As of 2008-09 (report issued in 2011), the government had achieved an average of 8,031 MJ/person/year, with 38 percent of the agencies already meeting the 2011 target. For central services, the average energy use was 485 MJ/m²/year, with 42 percent already meeting the 2011 target. Projections indicated that if trends continued, the average target would likely be met, but there was a risk that some agencies may not comply. Since 1999, the government has reduced its energy use by 32.6 percent.

Source | Department of Climate Change and Energy Efficiency. "Energy Use in the Australian Government's Operations 2008-09." Commonwealth of Australia, 2011 (available at: <http://www.climatechange.gov.au/~media/publications/energy-efficiency/energy-use-aus-gov-operations-2008-09-PDF.pdf>.)

Inter-Governmental Partnerships

Government entities at all levels have formed partnerships with each other to share information, harmonize standards and, in some cases, aggregate demand through cooperative purchasing (also called “pooled procurement”) activities. Some of these public sector partnerships are forged through policy requirements. For example, in the European Union, there are regional EE, EEP, and green procurement policy directives that apply to all Member States. This has created an incentive for each of these countries to collaborate and harmonize their implementation strategies and specifications in order to make the procurement process both easier and more impactful by sending a uniform message to suppliers about how they should design their products to reduce climate and other environmental impacts.

Governmental partnerships can involve public entities at all levels as well as governmental associations, public universities (academia), and schools; they can be program or product specific. The National Association of State Procurement Officials (NASPO) in the United States, for example, has established a Green Purchasing Committee that disseminates information about successful GPP policies and best practices among states, including a Green Purchasing Guide, information on cooperative purchasing, and other tools and resources to support GPP policies, programs, and practices.⁴⁵

Another important way in which government agencies work together is to purchase cooperatively. Cooperative purchasing lowers costs by aggregating purchases. Unit costs and overall transaction costs decrease because the agency usually secures deeply discounted prices and it saves jurisdictions money if they do not have to issue a tender on their own. It also helps promote uniform standards across different agencies. Cooperative purchasing is particularly useful for municipal governments since many lack resources to issue contracts on their own, or only purchase in relatively smaller quantities.

In the United States, every state operates a cooperative purchasing program that allows local governments, school districts, and other public agencies within their jurisdiction to order products under their existing supply contracts. The Commonwealth of Massachusetts does a particularly good job at promoting the energy efficient and other green products available on their contracts. It publishes (and regularly updates) a *Guide to Recycled and Environmentally Preferable Products on Massachusetts Contracts*, which lists discounted CFLs, LED exit signs, high-efficiency motors, water conservation devices, and more. Another example is *United States Communities*, a government purchasing cooperative that is affiliated with the National Association of Counties. Lead public agencies competitively solicit contracts, which *United States Communities* makes available to various entities with limited technical capacity—such as cities, special districts, public schools, other public agencies, and nonprofits nationwide. Users can access a list of solicitations and view green products available on existing contracts.⁴⁶ By aggregating demand through cooperative contracts, two important barriers to EEP can be at least partially addressed: (i) the time and expertise it takes to procure energy efficient products; and (ii) their higher upfront costs. Other countries are increasingly following this trend. In the Republic of Korea and Japan, subnational governments are allowed to utilize the national government's contracts, which are guided by EEP requirements. In addition, several European countries are involved with cooperative purchasing entities, some of which are focused on increasing procurement of energy efficient and other green products.⁴⁷

Partnerships with Businesses

Businesses—manufacturers, trade associations, distributors, private certifiers, utilities, and technical consultants—can be important allies, or opponents, of government EEP and GPP initiatives. Therefore,

it is common for governments to consult with them early on in the development of EEP efforts to solicit their support, to gain valuable technical information about the jurisdiction's proposed EEP guidelines and standards, to encourage their participation in properly labeling compliant products, and to respond to any potential concerns. When the City of Vienna (Austria) developed its GPP program, the business community's involvement was actively sought. Consequently, the business sector responded very positively to the ecological requirements for products and services, and, over time, adjusted its production conditions, product qualities, and service performance—helping to ensure the program's success. China, the United States, and other countries solicit or allow comments from manufacturers or other businesses when their standards are being set.

Some manufacturers or industry trade associations, particularly those that represent businesses that offer energy efficient products, can be very willing and eager to partner with government agencies in order to promote newer technologies and provide information about the environmental and economic benefits of their products. In some developing countries, such manufacturers can even actively lobby governments to introduce EEP efforts where none exist. Governments can take advantage of such opportunities by working with them on EEP outreach efforts, cosponsoring conferences where innovative technologies are showcased, and hosting seminars and periodic presentations on recent innovations as well as other discussion forums to address technical and other issues. Some jurisdictions even allow, encourage, or require approved vendors of energy efficient products to promote these items to their end-using departments.

More recently, several private eco-labeling organizations have emerged. One example is UL Environment, which recently acquired EcoLogo, a Canadian certification organization that developed standards for many energy- and water-using product categories such as printers, copiers, insulation, water heaters, showerheads, and toilets. Such developments can be helpful by creating certifications not offered by government programs (such as for high efficiency or green products). However, these efforts can also be duplicative or cause confusion among the public if not properly coordinated.

Product manufacturers and distributors can take actions to make EEP easier for government entities, such as:

- getting their products certified, which makes product identification easier and verifies EE claims;
- labeling their products in their catalogs, websites, and other marketing materials (and making it easy to find them in e-procurement systems during online searches); and
- providing EE or “green spend reports” to government agencies that purchase their products.⁴⁸

Another type of business, utilities, can also be a strategic partner. Utilities can:

- offer rebates or other incentives (e.g., on-bill financing) when public facilities purchase energy efficient products, which can help offset their higher upfront costs;
- identify even higher (top tier) energy- and water-efficiency standards for public agencies, develop model specifications, and offer other resources (e.g., information/awareness campaigns) to promote EEP;
- conduct LCC assessments for public facilities or develop LCC calculators that are specific to a given jurisdiction;
- purchase and disseminate energy efficient products such as CFLs to public facilities;

- carry out energy and water audits to help the facility identify their energy and water conservation opportunities; and
- pilot and demonstrate innovative technologies and disseminate case studies on energy efficient and other green products.

However, gaining utility support may require the jurisdiction to undertake certain EE regulatory actions (e.g., DSM, standard offers, white certificates); otherwise, it can be seen as conflicting with their energy supply business.

Government entities need to be careful, however, when partnering with manufacturers, trade associations, and distributors to avoid perceived or actual conflicts of interest. Nodal agencies also need to protect EEP certification and EEP efforts from “greenwashing,” false, or unsubstantiated environmental product claims, which have become more common as awareness about environmental issues increasingly influences consumers’ purchasing practices.

Nonprofit Partnerships

Governments can also partner with (nonprofit) NGOs, which can typically conduct outreach, develop additional educational resources and tools, and in some cases, provide hands-on technical support during the standard-setting or procurement process. For example, in the United States, the RPN, a national nonprofit network of mostly public agency purchasing agents, develops and disseminates resources on best practices on EEP and other green purchasing policies, programs and practices. One tool it provides for its members is a Model Reporting Template. Japan established GPN in 1996 to promote green purchasing in both the public and private sectors, and has now evolved into the International Green Purchasing Network (IGPN). India and nine other Asian countries created green purchasing networks, with mentoring from IGPN.

In countries that lack strong government-based certification programs for energy efficient or green products, NGOs sometimes step in to fill the gap. NGOs can provide an important watchdog function by advocating for and monitoring EEP and green purchasing policy and program implementation. In countries with limited resources for enforcement, random testing, and monitoring of government purchases such a function can help the government more effectively enforce its EEP policies. However, NGOs should not be viewed as potential substitutes for government functions; governments should have credible programs capable of being implemented on their own.

F | PROGRAM MONITORING AND REPORTING

Regular monitoring of EEP program activities, as well as reporting of results, helps ensure that such policies and programs are meeting their intended objectives. It can also provide valuable information to program staff, policymakers, other public entities and jurisdictions, and the general public about a program’s activities and its impacts. Reporting can help keep public agencies accountable and provide enhanced transparency about government purchases. Unfortunately, this program function was consistently deficient across the case studies reviewed. This not only makes it difficult to justify a program’s success, but can also make it more difficult to assess compliance, which is a critical element of a mandatory EEP policy. Without such mechanisms, it becomes difficult to determine if there are components of a policy or program that need to be improved.

Why is tracking not routinely done? There are a number of reasons proper monitoring, tracking and reporting is inconsistently done. Some of the more common reasons include:

- **Costs vs. benefits** | Tracking energy and energy cost savings associated with EEP can be time-consuming, and therefore, costly. In some cases, there also is no entity assigned to collect or analyze the data. Some countries and other jurisdictions argue that the logic of EEP is sound, since it is often based on LCC analyses; therefore, devoting the requisite resources to conduct elaborate tracking may not yield significant benefits to the government to justify the costs. Despite the fact that several EE and environmental calculators exist, often they only determine impacts of individual purchases.
- **Unclear baselines** | While agencies may track what they purchase, determining what they would have purchased in the absence of an EEP policy or program is much more difficult. Without having clear methods for establishing such baselines, assessing how much energy was saved due to an EEP policy or program (or even an individual procurement action) can become quite subjective.
- **Bundled contracts** | Often, product procurement is bundled—either with other products or services—making tracking more difficult. Agencies are rarely able to track individual product purchases unless everything on the contract complies with the EEP policy.
- **Decentralized systems** | Since many countries have fairly autonomous agencies that can make purchasing decisions on their own, aggregating purchases across them, particularly before e-procurement systems, was very difficult. Tracking the purchasing activities and impacts of jurisdictions at multiple levels of government introduces additional complications.
- **EEP vs. GPP** | As noted earlier, many developed countries have expanded their EEP policies to address broader green or sustainability issues, which are more difficult to track, since there are many more parameters.

Despite these challenges, there now appears to be increasing attention in this area. This study revealed that there are two main types of EEP tracking and monitoring activities that are taking place: (i) *Compliance Monitoring*, designed to document the extent to which public agencies are practicing EEP; and (ii) *Impact Reporting*, designed to document the impacts (typically energy savings, cost savings, and resulting environmental benefits such as GHG reductions) of a jurisdiction's EEP activities and procurement decisions. While there remain gaps in both, more government entities are tracking compliance with EEP and GPP policies than are reporting achieved results and impacts. Further, despite the potential of EEP policies to transform markets, very little effort appears to have gone into substantiating these claims—that is, assessing to what extent the introduction of an EEP policy or program actually helped shift the market beyond the government's purchases.

Compliance Monitoring

EEP compliance monitoring can be performed either on the macro level, by assessing the number of jurisdictions within a country or region that have adopted an EEP policy or that report they have implemented an EEP program, or within a jurisdiction, by tracking the number of departments that are participating in the program. There may be specific indicators the jurisdiction is using to monitor compliance with the jurisdiction's policy, such as adoption of EEP administrative procedures, development of an EEP action plan, or establishment of an EE or green team to implement the EE policy. Compliance monitoring is sometimes performed through surveys, although this method can yield inconsistent results unless concrete indicators are identified and documentation is provided by each of the entities that is being surveyed.

More detailed compliance monitoring is less common but sometimes done, as well. Tracking of energy efficient product contract actions, for example, is one way to monitor at the purchasing level. Typically, it involves tracking the inclusion of EE specifications, preferences, or requirements in the bid solicitation for targeted product categories, such as computers, appliances, lighting equipment, or vehicles. Another type of contract action that can be monitored is the use of LCC analyses to make a procurement decision. Some jurisdictions have gone further by monitoring the dollar amount—or, more importantly, the percentage of contracts (by number or total amount spent) that are for energy-, water- or fuel-efficient products over a specific time period, generally one year. In some cases, these purchases are compared to an amount or percentage from a prior baseline year or to a goal the jurisdiction has set for itself. And, as noted earlier, purchasing contracts can require vendors to provide the jurisdiction with periodic “green spend reports.”

Some examples of compliance monitoring and reporting are provided below:

- **China** has reported that its mandatory government EEP policy, which was first implemented at the national (central government) level in 2005, was quickly implemented by government entities at all levels by 2007. It further reported that national procurement of energy-saving products has increased at a rate of 20 percent since 2006. The amount of energy- and water-saving products procured by government entities in China in 2008 reached RMB 13.19 billion (US\$ 1.9 billion), accounting for 64 percent of the products in the categories that were tracked. In 2009, the national procurement amount reached RMB 15.72 billion (US\$ 2.3 billion), or 70 percent.⁴⁹
- The **European Commission** is monitoring uptake and implementation progress expressed in numbers and values of voluntary GPP procedures by European Union Member States. In 2008, the Commission of the European Communities (CEC) issued a “Public Procurement for a Better Environment” Communication that set a target of 50 percent of all tendering procedures for specific product categories, including at least those for which the Commission had established European Union-wide voluntary “Core” Green Criteria, which often includes EE. A 2011 CEC-commissioned study of 230,000 contracts (valued at €117.5 billion) that were negotiated during 2009/2010 found that only 26 percent (by number) and 38 percent (by value) included all core GPP criteria, although 55 percent included at least one core GPP criterion. This demonstrated that GPP implementation was well below its target. The study also showed varied levels of GPP uptake among Member States; top-performing countries include Belgium, Denmark, the Netherlands, and Sweden.⁵⁰
- In **Japan**, the *Law Concerning the Promotion of Eco-Friendly Goods and Services by the State and Other Entities* requires federal agencies, as well as local governments and prefectures, to adopt a procurement policy, establish a system for promoting GPP, and establish GPP targets on an annual basis. The government tracks (via surveys) GPP activities, including the adoption of a policy and the use of its centrally developed environmental evaluation criteria. According to a recent report, “In 2007, all [of Japan’s] national government ministries, 47 prefecture governments, 12 designated cities, and 68 percent of 700 local governments undertook green purchasing, and, collectively, 95 percent of the purchased products in the designated categories were green products.”⁵¹
- In the **Republic of Korea**, the government’s *Act on Encouragement of Purchasing of Green Products* (2004) requires the Ministry of the Environment to ensure that public agencies report annually on their GPP action plan implementation, procurement practices, and results. Analysis shows that the purchasing volumes have been steadily increasing since 2005, from about KRW 40 billion (US\$ 39 million) in 2005 to about KRW 1,120 billion (US\$ 1.0 billion) in 2009.⁵²

- **Thailand** is setting up an electronic monitoring system to publicly track and report the number of government agencies that are participating in implementing a National Green Procurement Plan, which was adopted by resolution in 2008. Since it was initiated, the number of government agencies participating in the plan has increased from 25 percent in 2008 to 78 percent in 2010. Green purchases have also increased from about 50 percent in 2008 to about 60 percent in 2009.⁵³
- The **United States** federal government has established a sustainable acquisition monitoring system to document compliance with a federal executive order requiring 95 percent of new contract actions to be for products and services that are energy and water efficient, or otherwise environmentally preferable (EPEAT-certified).⁵⁴ In addition, every federal agency is required to develop, implement, and annually update a sustainability plan with officers that are accountable to the Office of Management and Budget (OMB); meet individual performance goals for reducing their agency's consumption of energy and water; and report publicly on their activities and progress. OMB then issues a Sustainability and Energy Scorecard for each agency and posts it on a federal website.⁵⁵ In fiscal year 2010, several federal agencies reported purchasing desktop computers, laptops, and monitors that are EPEAT-rated for virtually 100 percent of their acquisitions in this product category. This reporting innovation ensures accountability and encourages agencies to work toward continuous improvement.

Results Reporting

Results reporting is significantly more complex than compliance monitoring, as it requires that common indicators be developed for each purchase and aggregated across agencies and jurisdictions. While this is much less common, typical indicators for EEP programs include energy savings and cost savings. For GPP programs, this is significantly more varied given the different parameters used in the criteria. GPP indicators can include energy savings, cost reductions (often based on economic LCC analyses), renewable energy purchased/generated/installed, GHG emissions avoided, and other environmental factors. Unfortunately, such reporting is rare. The study identified only two programs that had done an exemplary job reporting quantified results: the City of Vienna (Box 5.6) and Mexico City (Box 5.7).

Some countries (e.g., Australia, Thailand, USA) and municipalities (e.g., Mexico City, New York City, Portland) are now starting to document the energy and water consumption of their public facilities (often per square meter or foot). This is often reported as a baseline assessment in Energy Efficiency, Climate Protection, or Sustainability Action Plans, which typically set goals for reducing the quantity of these environmental indicators.

In addition to results reporting, many experts recommend periodic evaluations of programs, perhaps every five years. Such evaluations can be very helpful in assessing overall progress toward meeting EEP objectives, identifying areas of weakness, documenting success stories, gauging broader market transformation effects, and other possible outcomes.

BOX 5.6

Environmental Reporting from the City of Vienna

The City of Vienna (Austria) has been an environmental leader within Europe for many years. In 1998, the City developed its first Climate Protection Program (*Klimaschutzprogramm*, or KliP), which quickly became one of the most ambitious and comprehensive programs in the world. Among other things, KliP sought to reduce CO₂ emissions by 2.6 million tons over 12 years while helping to create green jobs and improve the quality of life. KliP provided the framework that allowed the City's Eco-purchasing Program (*ÖkoKauf Wien*) to be developed and launched in 1999.

To date, *ÖkoKauf* has developed ecological procurement criteria in 23 categories of goods and services. Using various technical working groups, *ÖkoKauf* has produced more than 100 separate guidelines for procurement in product categories, such as lighting, cleaning agents and disinfectants, stationary and office supplies, electrical appliances, fleets, buildings, events, and waste disposal.

ÖkoKauf has also done an exemplary job at tracking and reporting its impacts. Total cost savings have been calculated at about €17 million annually, or about 3 percent of its total procurement amount. The City also reports CO₂ emission reductions of about 30,000 tons per year. Other more anecdotal impacts include the mainstreaming of water flow controls in public buildings and the “greening” of supply chains, which have resulted from local businesses complying with the City's stringent procurement criteria.

Source | ESMAP, 2011. “Municipal Eco-Purchasing in Vienna, Austria.” ESMAP Energy Efficient Cities Initiative Good Practices in City Energy Efficiency, October 2011. (See: <http://www.esmap.org/esmap/node/1315>).

BOX 5.7

Municipal Energy Efficient Purchasing in Mexico

Mexico City is one of the first large municipalities in the world to track and report the energy savings and resulting GHG emission reduction benefits of its purchasing activities. First, it set energy, water, and GHG reduction goals in its Mexico City Climate Action Program. Through implementation of an EMS, Mexico City conducted a baseline audit of energy use and identified priority EE procurement opportunities in its facilities. On June 14, 2011, the City published its *General Guidelines for the Procurement of Goods with Less Environmental Impact*, which are mandatory for all city dependences (i.e., departments). This catalogue includes EE specifications for eight product categories, such as ENERGY STAR-rated computers and copiers, Fideicomiso para el Ahorro de Energía Eléctrica- (FIDE) certified fluorescent lamps and electronic ballasts, and light passenger vehicles with a fuel-efficiency of at least 13 kilometers/liter.

In order to help meet its environmental commitments, Mexico City also negotiates centralized contracts for products, such as energy efficient copiers, and requires agencies to report twice annually on the types and amounts invested in the purchase of sustainable products. Through its EMS, it is working to design a more effective GPP reporting system. It is also purchasing more efficient water pumps and switching from “hot” to “warm” asphalt paving mixes to reduce fuel consumption. For each project, the City documents annual energy and GHG reductions as well as cost savings. Through its various sustainability programs and procurement initiatives, the City has saved about 340 GWh and 6,500 metric tons of CO₂ emissions annually.

Sources | Written communication from Jorge Lara, Environmental Secretariat, Mexico City Government, June 2012.



ALTERNATIVE PROCUREMENT STRATEGIES

In all cases, government programs studied limited their programs to conventional product procurement systems, that is, developing clear technical specifications and lowest cost. As noted earlier, however, some jurisdictions have given preferences to products with high efficiency levels. Given some of the other prevailing barriers presented, such as proprietary technologies, such an approach has not always led to the best outcomes.

This section explores some alternative procurement strategies, which can help ensure that public agencies are able to get the best value for their funds. Some of the options presented are simply natural additions to existing practices that have been used elsewhere, while others are new strategies. These are offered to help stimulate debate on where such procurement policies and programs can go in the future and is not intended to present only “tried and tested” approaches.

WHY DO EXISTING PROCUREMENT STRATEGIES FALL SHORT?

In general, current procurement systems often represent the best option to ensure that government purchasing is done in a transparent manner at the lowest cost. These systems have been developed over decades and are continually refined as global good practices evolve. However, in terms of EEP, there are a number of remaining gaps in addition to those discussed in Chapter 2. These include:

- **LCC analyses prior to bidding are complex and not always accurate** | While LCC analyses can be a transparent method for assessing which technology offers the best value to the government, it is complicated and not always completely accurate at predicting the costs that bidders will ultimately offer on their products. Usually, procurement or technical officers conduct an LCC analysis prior to bidding to determine which technology offers the best value, so that those specifications can be used in the bidding documents. However, since the actual price of the product is not known until bidding has been done, the costs only represent estimates. This can create a situation where the lowest cost option is not selected. This is particularly true for emerging technologies, such as LEDs, where the costs are declining but not fully cost competitive for certain applications.
- **Product types are constantly changing** | With the rise of the dynamic global market, products are in a constant state of evolution. Technical analyses and specifications developed today may not be the best in the future. However, governments tend to rely on similar specifications repeatedly and are not always able to update each specification for each tender, creating a situation where the government is actually chasing rather than leading the market.
- **Some suppliers offer proprietary products** | As new technologies are developed, early suppliers usually hope to recover their R&D costs by getting a jump on the market by being the only ones that offer a given product. Unfortunately, for the public sector, this can present a problem since governments generally require competitive bids in order to make a selection. While most procurement regimes have options for waivers from competitive tenders, or for designing a solicitation that does

not single out a specific technology, undertaking such options take additional time and justifications, which potentially increase the transaction costs and risks for procurement officers.

- **Product performance is still a risk** | Energy savings are still, of course, based on how the equipment is ultimately selected, installed, operated, and maintained. Suboptimal application of technologies, over- or under-sizing of product capacities, incorrect operation, etc. can all erode the energy cost savings that are expected from purchasing energy efficient equipment.

WHAT OPTIONS EXIST TO ADDRESS THESE ISSUES?

Several options exist, or are emerging, to address some of these more vexing shortfalls. In some cases, these are actually tried and tested schemes, while others are still at a more conceptual level. Continued debate and dialogue, as well as some testing and pilots, could help to further shed light on how such programs should continue to evolve.

- A | LCC analysis by bidders.** For products of a similar technology but with variable efficiency levels, such as refrigerators or air conditioners, bidding documents could specify technology but not efficiency level. In terms of cost, the bidding documents could include a simple spreadsheet for each supplier to calculate the LCC based on the best efficiency levels offered, with the lowest LCC declared the winner. This then allows suppliers to offer the best model they have and not only the cheapest model meeting the bid specifications. In such cases, some additional testing or certification may be required upon receipt to ensure the products function at the promised levels.
- B | Output-based procurement.** For many applications, the product or technology (e.g., metal halide, fluorescent tubes, high-pressure sodium, LED, induction for street lighting) is less important than the service the product provides (i.e., lumen output per square meter). It is thus possible to call for lighting solutions, where the technical specifications do not specify technology but simply the desired output, and then select the lowest LCC or highest net present value (NPV) from the bids received. This would also allow suppliers with proprietary technologies to participate in a competitive tender. As with Option A, proper testing and certification upon receipt will be needed.
- C | Product competitions and challenges.** In order to stimulate R&D for higher efficiency products, governments can also issue competitions and challenges to the industry. The prize could be a guaranteed bulk purchase by the government. Several governments have discussed such an option for LEDs, where they would commit to a purchase if the price can come down to an agreed level. This allows the government to truly lead the market, purchase proprietary technologies, etc. while helping to bring down costs.⁵⁶
- D | Energy-use product warranties.** Most product warranties cover only basic operational parameters, such as functionality or equipment life. However, governments can include an energy-use warranty requirement in their bid specifications, whereby suppliers are required to indicate the energy use of a product under given operating conditions. While such information is typically within a product's specifications, it is not usually covered by a warranty. This could provide additional assurances to a public agency.

- E | Performance-based warranties.** Although similar to Option D, this option would allow for some greater financial recourse to a public agency for poor equipment performance. This could be achieved by holding a portion of the final payment for 6 to 12 months (this is similarly done under a defects and liability period), creating an escrow account where the supplier places a portion of the contract amount (e.g., 10 percent) for a period to guarantee product performance, requiring a performance bond from the supplier, allowing the public agency to pay over time from the continued energy savings of the equipment. These could also be structured as equipment leases, where the lease payments are based on the estimated energy savings.
- F | Energy supply contracting.** An energy service model used in France for over 60 years, also known as *chauffage* contracts, involves outsourcing operations and maintenance of a technical energy system (such as heating or cooling) to a contractor and selling the output (e.g., steam, heating/cooling, lighting) at an agreed price (joules, cooling per square meter, lighting per meter per hour). While this is a service and not a product contract, it does represent another option for lowering energy costs in a more flexible manner, while allowing a private supplier to take over performance risk of the system.⁵⁷
- G | Energy savings performance contracting.** An energy savings performance contract (ESPC) can offer a range of services (from design through commissioning) to the implementation of energy efficient projects, technologies, and equipment to a client. The services provided may also include the financing of the EE upgrades so that the host facility has to put up little or no capital. The compensation for the services is paid by the host facility from the monetary savings resulting from the reduced energy consumption. In many cases, the compensation is contingent upon demonstrated performance in terms of energy cost savings or other performance measures, thereby creating a system where the services and equipment can be paid for from the actual energy cost savings. As with Option F, this is a service contract, but offers a viable alternative to a public agency simply purchasing more efficient equipment on its own.⁵⁸

A summary of these options, and the challenges they can help address, are presented in Table 6.1.

TABLE 6.1
Mapping of Alternative Procurement Options with Remaining Gaps

BARRIERS	INACCURATE LCC	CHANGING PRODUCTS	PROPRIETARY TECHNOLOGIES	PERFORMANCE RISK
LCC Analysis by Bidders	✓	✓	✓	
Output-Based Procurement	✓	✓	✓	
Product Competition		✓	✓	
Energy-Use Warranties				✓
Performance-Based Warranties				✓
Energy Supply Contracting	✓	✓	✓	✓
ESPCs	✓	✓	✓	✓

Source | Authors.



CONCLUSIONS AND RECOMMENDATIONS

Because public procurement can be a significant share of the economic activity within a country, its ability to lead and help shift markets is substantial. Therefore, the methods used by the governments to purchase goods and services, the specifications they use, and the types of products they request can have a ripple effect through the markets. This creates a unique opportunity for EEP programs to not only save the public money but also promote EE throughout the economy.

Based on the global review, a number of observations were noted. These included:

- There are a **growing number of EEP programs in developing countries**. While some countries (e.g., Czech Republic, Mexico, Thailand) have sought to leapfrog directly to GPP programs, most countries (e.g., China, EU, USA) developed EEP programs first and some are now working to transition them to broader GPP initiatives.
- There is **substantial anecdotal information on the benefits of EEP programs**. Clearly, many have saved governments a good deal of money since most are based on some cost-effective, best value analysis for their purchases.
- Despite a variety of efforts and approaches, **most governments do not have explicit enforcement mechanisms** to ensure that all eligible purchases meet the policy mandates. Some governments have reporting requirements, some are encouraged to refer to agreed upon technical specifications or labels, etc., but almost none had systematic ways to ensure full compliance. Governments that monitored purchases generally showed less than 100 percent compliance.
- **Few governments fully account for the costs and impacts** of their policies or programs. While program coordination costs are usually accounted for, the systematic aggregation of the incremental costs for individual purchases, additional staff time, staff training, etc. have not been tracked or reported. While some governments track the number of products purchased, almost none have detailed assessments of the total cost savings, energy/CO₂ reductions, or broader impacts on the market. Without such systematic monitoring, an objective assessment of program performance is not possible.
- **There are a wide variety of existing resources** to help developing countries in establishing such programs: EE/LCC calculators, online training materials, technical specifications and testing protocols, energy and eco-labels, sample tender document language, catalogues of energy efficient products, etc. (See Annex.) For countries getting started, such materials can greatly reduce program development costs and facilitate a quick program launch.

The conclusion of the study is that EEP policies and programs appear to be an effective way to promote energy efficient products by leveraging a government's purchasing power and influence. Much of the basic policy and program architecture, from technical standards to tools, has been developed and in use for more than a decade. This provides a wealth of resources and experience for countries considering such initiatives, which can dramatically lower the time and effort to get started. As countries with more mature programs enhance enforcement and tracking efforts, improved methods will be developed and tested, providing models for adaptation and application in the developing world.

RECOMMENDATIONS

To ensure success of EEP, governments should consider adopting a holistic approach—adopting policies, setting goals, developing tools, and tracking/reporting activities and impacts. The adoption of a mandatory EEP policy or the development of an energy efficient label alone does not guarantee its objectives will be met without having a more comprehensive program in place. Some of the most critical elements of success include having established a clear policy, supporting procedures and tools to help lower transaction costs, and creating incentives to address financial gaps and behavioral resistance. Other program components, such as strong institutional set-ups, robust testing and certification, training and outreach, strategic partnerships and program monitoring and reporting, were also found to be crucial. Recommendations on each of these elements are summarized in Table 7.1.

Ultimately, EEP policies and programs seek to alter the decision-making process of public procurement procedures. There is emerging consensus among experts that strategies to create EEP as the default option—whereby a public agency must purchase the energy efficient product unless it can provide justification for not doing so—is most effective in ensuring high compliance rates. This requires proper planning and reporting requirements, as well as specific guidance and supporting structures (e.g., tools, training, adequate staffing and budgets, etc.) to assist procurement and technical officers to implement EEP from market assessments to benchmarking to bid solicitation and evaluation. The City of Portland, has mandated sustainable procurement, thus making it the default option. In this case, purchasing agents must follow sustainability guidelines unless they can demonstrate that the default product does not offer the lowest cost or overall best value to the City.

WHAT CAN WORLD BANK PROJECT MANAGERS DO?

Until systematic procedures are put in place, World Bank and other IFI project managers can work to ensure they are incorporating some simple steps into the development of their procurement plans for energy-using equipment. These include:

- Identify key energy-using goods to be purchased under the project (e.g., water/steam pumps, office equipment, lighting, vehicles).
- Work with local counterpart agencies to develop technical specifications, which include EE performance requirements, and verify there are sufficient qualified suppliers to ensure competitive bids.
- Where multiple technological options exist, conduct LCC analyses to assess the cost-effectiveness of various models to select the most advantageous one.
- Require equipment certifications from accredited laboratories, or commission testing, upon receipt of the goods to ensure compliance with the bid specifications.
- Monitor the energy savings and, if the outcomes are satisfactory, share the specifications within the ministries, utilities, or other counterpart agencies to mainstream them as well as within the World Bank and across other IFIs.

TABLE 7.1

Recommendations on EEP Program Components

PROGRAM COMPONENT	RECOMMENDATION(S)
EEP Policy	<ul style="list-style-type: none"> • Develop broad EE laws and legal frameworks that provide for various functions to be carried out by government and targets to help ensure accountability; undertake periodic planning functions to update targets based on agency reporting, technology innovations, and other factors • Develop a clear policy on EEP and disseminate it widely to relevant public sector staff, so they know their roles and obligations; mandatory measures are most appropriate if they can be systematically enforced, otherwise voluntary measures with incentives may be more practical • Consider measures for EEP to be the “default” option for public agencies, i.e., public agencies must justify opting out of the policy
EEP Tools	<ul style="list-style-type: none"> • Create tools—such as labels, catalogues of technical specifications, qualified product lists, LCC calculators, preferential bid scoring templates—to facilitate EEP implementation and disseminate widely • Tools should be designed to keep transaction and compliance costs as low as possible to boost compliance/participation; solicit feedback from users to improve them • Nodal agencies need to ensure that tools requiring constant updating (catalogues, product databases) need to have adequate resources to ensure relevance over time
Institutional Arrangements	<ul style="list-style-type: none"> • Develop institutional arrangements to support all aspects of EEP programs, with clearly defined roles and responsibilities, and accountability • Involve procurement agencies early and keep them as an integral part of the program • Involve EE, sustainability and other agencies to provide technical support to procurement agencies • Gain buy-in from policymakers and high-level agency staff to ensure adequate program support and resources to effectively operate
Product Testing and Certification	<ul style="list-style-type: none"> • Overall governance of product testing, certification, and labeling is critical to a successful EEP program • Ensure that testing laboratories are accredited and credible; when relying on manufacturer testing, conduct periodic inspections to maintain program integrity • Use existing labels, local or international, to ease product certifications • Start with most common products first (e.g., lighting, office equipment), and expand as experience is gained
Outreach and Training	<ul style="list-style-type: none"> • Conduct aggressive outreach and training programs to ensure relevant public sector staff understand policy requirements and how to apply them, policymakers maintain their support, and the general public understands the impacts • Establish clear guidelines on who is responsible for providing and receiving training, including training of potential bidders so they understand and comply with the policies • A combination of on-line and face-to-face courses, with case studies, are common, effective approaches, with required periodic training for procurement managers/officers • Flexible courses, with feedback from participants, help ensure improvements over time
Incentives and Behavior Change	<ul style="list-style-type: none"> • Identify and understand public agency and staff motivations and behaviors to developing appropriate behavior change measures • Focus on longer term, sustained changes • Create obligatory purchasing procedures, reporting requirements, and targets to help ensure agency compliance/participation • Voluntary measures, such as cooperation, financial incentives, competition, and recognition, can help agencies exceed minimum requirements
Partnerships	<ul style="list-style-type: none"> • Collaborate and consult with manufacturers, NGOs, civil society, and other jurisdictions to greatly improve chances of EEP success • Work with other jurisdictions on information sharing, cooperative purchasing, etc. to help lower transaction costs and product prices and build motivation in EEP programs • When resources are limited, partner with businesses and NGOs to help with information dissemination, but ensure information is unbiased and avoid conflicts of interest
EEP Monitoring and Tracking	<ul style="list-style-type: none"> • Develop upfront compliance monitoring and results reporting plans and establish clear indicators for each • Use e-procurement systems to help identify EE products on contract and track EEP procurement results; encourage/require vendors to report product quantities sold to specific jurisdictions • Consider periodic program evaluations to assess effectiveness, broader market impacts
Innovative EEP Options	<ul style="list-style-type: none"> • Consider innovative schemes for purchasing energy efficient products (e.g., output-based procurement) when existing practices are insufficient to meet government needs

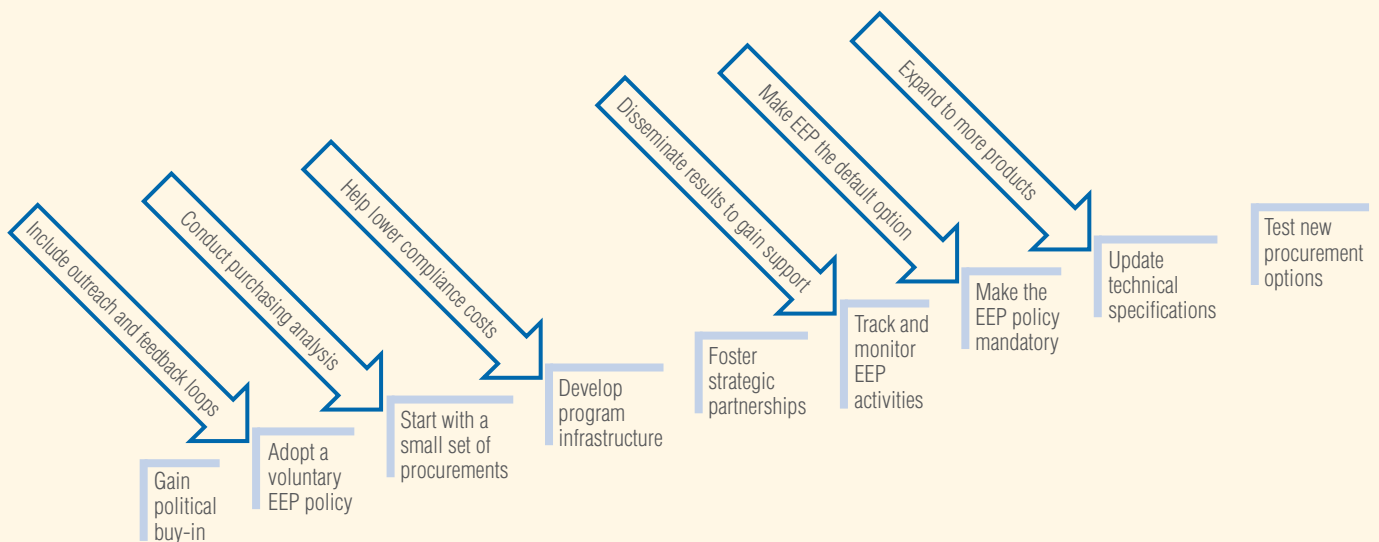
Source | Authors.

GETTING STARTED

For countries that are initiating or developing an EEP policy or program, the following steps (Figure 7.1) are recommended:

- 1 | Gain political buy-in on EEP concepts, focusing on key drivers, such as ensuring best value for money, leading by example, and helping to transform product markets.
- 2 | Develop and adopt a voluntary EEP policy first to allow the mechanism to be tested, with strong outreach and educational components, including feedback loops to hear what barriers exist and challenges public procurement officers face with implementation.
- 3 | Assess government purchasing history, collect baseline information about current product use, etc. Begin with a small set of products (e.g., lighting, office equipment) in order to build credibility with the EEP program. Where possible, rely on existing, credible labeling schemes for easy identification of qualifying energy efficient products.
- 4 | Develop the program infrastructure, such as institutional set-ups, roles and responsibilities, priorities and targets, as well as components to facilitate implementation—e.g., tools, training materials and incentives—that address the barriers and feedback identified in Step 2. The goal of these resources should be to make compliance easier and, therefore, less costly.

FIGURE 7.1
Getting Started With EEP



Source | Authors.

- 5 | Look for strategic opportunities to partner with other jurisdictions, bundle procurements to achieve better pricing, liaise with manufacturing associations, and involve NGOs to broaden impacts, ease implementation, and improve effectiveness.
- 6 | Track the EEP policy to measure participation rates, document success stories, report results, and benefits, assess broader market impacts, and identify opportunities for further improvement. Disseminate results to policymakers, employees throughout the jurisdiction, and the public to gain their support and help lead by example. Recognize and reward agencies and staff who exceeded targets.
- 7 | As experience is gained and capacity built, make the EEP policy mandatory. Appropriate enforcement mechanisms need to be established to ensure full compliance. Consider making procurement of energy efficient products the default option, especially in cases where there is a readily available supply of products that present the best value based on an LCC analysis.
- 8 | Update technical specifications and introduce new products as the EEP policy matures in order to deepen impacts. Consider expanding EEP efforts to other resource-savings areas, such as water conservation, recycled content, etc.
- 9 | Test new procurement methods in order to further expand the scope, increase the impacts, and improve the efficiency of the EEP program.

ANNEX | RESOURCES FOR EEP AND GPP

1 | EXAMPLES OF EE AND LCC CALCULATORS

Buy Smart, Europe | http://www.buy-smart.info/media/file/983.BuySmart_LCC_calculation_tool.xls

Clean Vehicle Europe | <http://www.cleanvehicle.eu/startseite/>

EU ENERGY STAR for PCs and imaging equipment | <http://www.eu-energystar.org/en/calculator.shtml>

India BEE calculator | <http://220.156.189.26:8080/lcca/LCCA-debug/LCCA.html>

SEAD Street Lighting Evaluation Tool |

<http://superefficient.org/Activities/Procurement/Download%20SEAD%20Street%20Lighting%20Evaluation%20Tool.aspx>

SEMCo LCC tool | http://www.msr.se/en/green_procurement/LCC/

US DOE building calculator | http://www1.eere.energy.gov/femp/information/download_blcc.html

US DOE FEMP calculator | http://www1.eere.energy.gov/femp/technologies/eeep_eccalculators.html

2 | EXAMPLES OF BROADER GREEN AND ENVIRONMENTAL CALCULATORS

Environmental Paper Network paper calculator | <http://calculator.environmentalpaper.org/home>

ICLEI's SMART SPP LCC-CO2 tool | <http://www.smart-spp.eu/index.php?id=7633>

Responsible Purchasing Network collection of green calculators |

http://www.responsiblepurchasing.org/purchasing_guides/all/calculator/

Smart SPP Europe | <http://www.smart-spp.eu/index.php?id=7633>

University of California Carbon Footprint Calculator | <http://coolclimate.berkeley.edu/tools>

University of Tennessee electronics environmental benefits calculator for EPEAT |

<http://isse.utk.edu/ccp/projects/benefitscalculator/elecbenecalc.html>

3 | EXAMPLES OF EEP AND GPP TRAINING PROGRAMS

EU Green Procurement | http://ec.europa.eu/environment/gpp/toolkit_en.htm

EU Pro-EE Pilot training | <http://www.pro-ee.eu/training.html>

ICLEI training | <http://www.iclei.org/index.php?id=834>

Responsible Purchasing Network Webinars | <http://www.responsiblepurchasing.org/webinars/>

Swedish Environmental Management Council (SEMCo), Seminars and E-Learning |

http://www.msr.se/en/green_procurement/Education/

United Nations Environment Programme (UNEP) Training | <http://www.unep.fr/scp/procurement/docsres/>

US ENERGY STAR Training | http://www.energystar.gov/index.cfm?c=business.bus_internet_presentations

US EPA Green Procurement Training |

http://www.fedcenter.gov/Documents/index.cfm?id=14261&pge_prg_id=26960

US FEMP Training | http://apps1.eere.energy.gov/femp/training/course_detail_live.cfm/CourseDateId=243

4 | EXAMPLES OF TECHNICAL SPECIFICATION CATALOGUES

Canada G.I.P.P.E.R.'s Guide to Green Purchasing |

http://www.pmac.ca/images/stories/tools_resources_pdf/gipper.pdf

Consortium for EE Specifications | <http://www.cee1.org/resrc/specs-main.php3>

ENERGY STAR Product Specifications | http://www.energystar.gov/index.cfm?c=product_specs.pt_product_specs

EU GPP criteria catalogue | http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

Global Ecolabelling Network Criteria by Country |

http://www.globalecolabelling.net/categories_7_criteria/list_by_program/

Japan Green Purchasing Network Green Purchasing Guidelines | <http://www.gpn.jp/English/guideline.html>

The City of Los Angeles Bureau of Street Lighting LED Street Lights Specifications | <http://bsl.lacity.org/>

Metro Vancouver's Sustainable Procurement and Green Procurement Procedures, April 2011 |

<http://www.metrovancouver.org/bids/Bidding%20Documents/MetroVancouverSustainableGreenProcurementInformationPackage.pdf>

Mexico City General Guidelines for the Procurement of Goods with Less Environmental Impact (in Spanish) |

<http://www.sma.df.gob.mx/saa/images/descargas/eventos/curso2011/lineamientos-cv-2011.pdf>

Mexico National Energy Efficiency Standards (in Spanish) |

http://www.conuee.gob.mx/wb/CONAE/CONA_1002_nom_publicadas_vigen

The Netherlands National Government Criteria |

<http://www.senternovem.nl/sustainableprocurement/criteria/index.asp>

New York City Environmentally Preferable Purchasing Minimum Standards for Goods, Updated June 2012 |

http://www.nyc.gov/html/mocs/downloads/pdf/epp/nycepp_goods.pdf

City of Portland Buying Green Example Specifications |

<http://www.portlandonline.com/omf/index.cfm?c=53454&>

Procura* Criteria | <http://www.procuraplus.org/en/about-procura/procura-manual/>

Responsible Purchasing Network's Responsible Purchasing Guides |

https://www.responsiblepurchasing.org/purchasing_guides/all/

SEMCo Procurement Criteria | http://www.msr.se/en/green_procurement/criteria/

Spain Basque region GPP Criteria (in Spanish) |

<http://www.ihobe.net/Publicaciones/Ficha.aspx?IdMenu=750e0714-11a4-40da-840c-0590b91bc032&Cod=ec7547c6-9d23-43b6-ad78-537ab4480513&Tipo>

UNEP Procurement Criteria | <http://www.unep.fr/scp/sun/facility/reduce/procurement/guidelines.htm>

US FEMP Criteria | http://www1.eere.energy.gov/femp/technologies/eep_purchasingspecs.html

5 | EXAMPLES OF ENERGY EFFICIENT OR GREEN PRODUCT LISTS

China EE Product List (in Chinese) | <http://www.ccgp.gov.cn/jnhbchaxun/>

China Supply Agreement List (in Chinese) | <http://www.zycg.gov.cn/home/xygh>

Consortium for EE (USA) Qualifying Product Lists | <http://www.cee1.org/resrc/qualprod-main.php3>

EcoLogo's EcoBuyer Green Products Database | <http://www.ecologo.org/en/certifiedgreenproducts/>

Electronic Products Environmental Assessment Tool (EPEAT) Product Registry |
<http://www2.epeat.net/searchoptions.aspx>

EU ENERGY STAR Products Database | <http://www.eu-energystar.org/en/database.shtml>

Japan Green Product Lists (in Japanese) | <http://www.gpn.jp/econet/>

Korea Green Marketplace (in Korean) | <http://shop.greenproduct.go.kr/>

Korea KONEPS System (in Korean) | <http://shopping.g2b.go.kr/>

City of San Francisco (USA) Approved Product List | <http://www.sfapproved.org/>

UK Greenticks list | <http://www.buyingsolutions.gov.uk/aboutus/sustainability/sustainable-solutions/quickwins/>

US ENERGY STAR Product List | http://www.energystar.gov/index.cfm?c=products.pr_find_es_products

US General Services Administration (GSA) Green Products Compilation | <http://www.sftool.gov/greenprocurement>

6 | ADDITIONAL RESOURCES ON ENERGY LABELS

Asia-Pacific Energy Cooperation Countries Energy Standards Information System | <http://www.apec-esis.org/>

CLASP Standards and Labeling Guidebook |

<http://www.clasponline.org/en/ResourcesTools/Resources/StandardsLabelsGuidebook>

EU Energy Label | http://ec.europa.eu/energy/efficiency/labelling/labelling_en.htm

US ENERGY STAR | http://www.energystar.gov/index.cfm?c=products.pr_how_earn

ENDNOTES

- ¹ International Energy Agency. 2011. "World Energy Outlook 2011." IEA/OECD.
- ² IEA, 2011.
- ³ Singh, Limaye, Henderson, Shi. 2010. "Public Procurement of Energy Efficiency Services: Lessons from International Experience." Washington, D.C.: World Bank 2010.
- ⁴ ADB, AfDB, EBRD, IADB Annual Reports, 2010.
- ⁵ ESMAP, 2009. "Large-Scale Residential Energy Efficiency Programs Based on CFLs." ESMAP CFL Toolkit, 2009. (See: <http://www.esmap.org/esmap/CFLToolkit>.)
- ⁶ For more information on the World Bank's Green Growth work, please see "Inclusive Green Growth: The Pathway to Sustainable Development." World Bank, 2012. (Full report available at: http://siteresources.worldbank.org/EXTSDNET/Resources/Inclusive_Green_Growth_May_2012.pdf)
- ⁷ OECD, 2011. "Government at a Glance, Chapter IX on Public Procurement." OECD, 2011. (Available at: <http://www.oecd-ilibrary.org/docserver/download/fulltext/4211011ec046.pdf?expires=1331640930&id=id&accname=guest&checksum=4C7AED92F1AB1E6A6C3AB0ECE9059171>).
- ⁸ OECD DAC report, 2005. "Harmonising Donor Practices for Effective Delivery: Strengthening Procurement Capacities in Developing Countries." OECD, Paris, 2005.
- ⁹ Written communication from Jorge Lara, Environmental Secretariat, Mexico City Government, for the World Bank Public Procurement of Energy Efficient Products Practitioners Workshop, Washington, DC, June 7-8, 2012.
- ¹⁰ Olken, B. 2012. "Can the Use of Electronic Procurement Improve Infrastructure Provision?" Massachusetts Institute of Technology (MIT), presentation to World Bank, May 22, 2012.
- ¹¹ It should be noted, however, that many existing EE LCC calculators actually only consider reduced energy costs, for simplicity, and do not typically account for lower maintenance costs, a longer life span, and disposal/recycling costs.
- ¹² For more examples of labeling schemes, please see: EU Energy Label: www.energy.eu/#energy-focus; US ENERGY STAR: www.energystar.gov; India BEE Star Rating: www.beeindia.in; Australia Energy Rating Label: <http://www.energyrating.gov.au/programs/e3-program/energy-rating-labelling/about/>; U.K. Energy Saving Trust: <http://www.energysavingtrust.org.uk/In-your-home/Energy-Saving-Trust-Recommended-products>. For more information on EE labeling in general, see the Collaborative Labeling & Appliance Standards Program (CLASP) website at: www.clasponline.org.
- ¹³ Examples of such labels include: Japan Eco Mark: <http://www.ecomark.jp/english/nintei.html>; India Eco Mark: <http://www.bis.org.in/cert/prooth.htm>; Canada EcoLogo: <http://www.ecologo.org/en/>; US Electronic Products Environmental Assessment Tool (EPEAT) eco-labels: <http://www.epeat.net/>; EU Eco-label: <http://ec.europa.eu/environment/ecolabel/>; Nordic Eco-label: <http://www.nordic-ecolabel.org/>.
- ¹⁴ Unlike ENERGY STAR, FEMP does not identify qualifying products, only specifications. Federal agencies utilize the FEMP standards by incorporating them into their bid specifications and relying on suppliers to demonstrate that their products meet the FEMP standards. It is worth noting that the FEMP website has been used less frequently than that of ENERGY STAR largely because there is an extra burden on purchasing agents to identify compliant products.
- ¹⁵ There are several websites that provide free access to LCC calculators where users can compare products based on initial cost, energy consumption and other operating/maintenance/ disposal costs over its anticipated lifetime. Recently, a new group of tools have been developed that also enable users to calculate a product's carbon footprint and other environmental impacts. See Annex for more information.
- ¹⁶ The six target items for this procurement method include pumps, chillers, air compressors, fans and blowers, elevators, escalators.
- ¹⁷ For more information on the Korean ON-line E-Procurement System, or KONEPS, please see: <http://shopping.g2b.go.kr/> and Green Marketplace Korea: <http://shop.greenproduct.go.kr/>.
- ¹⁸ See, for example, China's Supply Agreement List at: <http://www.zycg.gov.cn/home/xygh>

¹⁹ For more information, see www.sfapproved.org.

²⁰ European Commission SAVE Program, 2003. "Harnessing the Power of the Public Purse." (See http://www.eceee.org/EEES/public_sector/PROST_fullreport.pdf.)

²¹ Some public authorities, such as the General Services Administration (USA), are working to overcome this problem by collaborating with certification and other eco-labeling organizations such as ENERGY STAR and EPEAT (the Electronic Product Environmental Assessment Tool). EPEAT maintains a list of computer equipment that meets minimum EE and other environmental criteria. These organizations periodically provide GSA with an electronic list of qualified products, which it uses to label products offered on federal contracts.

²² Approved products on the EEPL, include a wide variety of products such as air conditioners, refrigerators and other appliances, lighting equipment, water heaters, computers and imaging equipment, transformers and power supplies, water pumps, doors and windows, insulation, vehicles, and water-saving toilets and faucets.

²³ While the 25 percent figure is indeed part of the program, some interviewed note that for some product categories where specification updating has been delayed, a very high percentage of the market has been able to achieve the ENERGY STAR certification.

²⁴ For more information on ENERGY STAR, see: www.energystar.gov.

²⁵ US EPA Office of Inspector General, Report 09-P-0061, *Improvements Needed to Validate Reported ENERGY STAR Benefits*, December 17, 2008.

²⁶ Government Accountability Office Report, GAO-10-470, *Covert Testing Shows the Energy Star Program Certification Process Is Vulnerable to Fraud and Abuse*, March 2010.

²⁷ http://www.energystar.gov/index.cfm?c=third_party_certification.tpc_index, Accessed April 30, 2012

²⁸ US Environmental Protection Agency, *EPA Recognized Certification Bodies (CBs) and Laboratories*, accessed on April 28, 2012; http://www.energystar.gov/index.cfm?fuseaction=recognized_bodies_list.show_RCB_search_results.

²⁹ Payne, C. Weber, A. 2012. "Public Sector Procurement: Issues in Program Development and Delivery." Lawrence Berkeley National Laboratory, SEAD Public Procurement Working Group.

³⁰ For example, the EcoProcura conference series is a Europe-wide forum to promote exchange of information on "practical solutions on sustainable public procurement." Its September 2012 annual conference in Malmo, Sweden "will focus on what the proposed and latest legislation, strategies, guidance and practical solutions mean to public authorities implementing SPP..." See <http://www.ecoprocura.eu/malmo2012>.

³¹ Ministry of Finance, Government of India. "General Financial Rules 2005." (http://finmin.nic.in/the_ministry/dept_expenditure/GFRS/GFR2005.pdf)

³² Swedish Environmental Management Council (SEMCo), Seminars and E-Learning (see: http://www.msr.se/en/green_procurement/Education/)

³³ For more examples on training, see Annex.

³⁴ The EU's *Green Public Procurement Toolkit* can be accessed at: http://ec.europa.eu/environment/gpp/toolkit_en.htm.

³⁵ City of Portland, Oregon, Buying Green Example Specifications and Case Studies, Sustainable Procurement at the City of Portland, <http://www.portlandonline.com/omf/index.cfm?&c=37732>.

³⁶ See, for example, the Municipal Energy Efficiency Fund in Ann Arbor, Michigan (USA) at: <http://www.esmap.org/esmap/sites/esmap.org/files/Ann%20Arbor%20EE%20Fund%20final.pdf>.

³⁷ ESMAP, 2011. "Los Angeles LED Street Lighting Retrofit." ESMAP Energy Efficient Cities Initiative Case Study, October 2011. (See: <http://www.esmap.org/esmap/node/1314>.)

³⁸ European Commission, 2010. *Energy Efficiency in Public Procurement – Member States' experience, barriers/ drivers and recommendations*. http://ec.europa.eu/energy/efficiency/studies/doc/2010_05_jrc_ee_public_procurement.pdf

³⁹ A market basket is a preferred list of high-volume purchases that governments can use to evaluate supplier

pricing when a wide variety of products are being purchased on a contract.

⁴⁰ For more information on GreenGov Awards, see: <http://www.whitehouse.gov/greengov/presidential-awards>.

⁴¹ ESMAP, 2011. "Energy Management Systems in Public Buildings in Lviv, Ukraine." ESMAP Energy Efficient Cities Initiative Case Study, April 2011. (See: <http://www.esmap.org/esmap/node/1246>.)

⁴² Defra, 2010. "Sustainable Procurement in Government: Guidance to the Flexible Framework." (See: <http://sd.defra.gov.uk/documents/flexible-framework-guidance.pdf>.)

⁴³ China State Council. "Notice on Establishing Mandatory Procurement Policy for Energy Efficient Products." July 30, 2007. (http://www.ccgp.gov.cn/jnhp/zcfg/201009/t20100928_1066288.shtml)

⁴⁴ Ministry of the Environment, Government of Japan. "Basic Policy on Promoting Green Purchasing February 2012." (<http://www.env.go.jp/en/laws/policy/green/2.pdf>)

⁴⁵ For more information, see: http://www.naspo.org/content.cfm/id/Green_Guide.

⁴⁶ For more information, see: <http://www.uscommunities.org/>

⁴⁷ See http://www.eceee.org/EEES/public_sector/PROSTChapter03.pdf

⁴⁸ A green spend report is a report generated by a product supplier (which can be required in a purchase contract) that documents the amount of energy efficient (or environmentally preferable) products that a public entity purchased over a specific time period (usually a year) from that vendor. In some cases, they can be quite detailed, for example indicating the amount of products that have specific environmental attributes such as having specific eco-labels (EPEAT, ENERGY STAR) and can even provide information broken down by individual department or purchaser.

⁴⁹ 12th Five-Year Energy Conservation Plan for Public Institutions, Issued by Government Office Administration of the State Council, 2011.

⁵⁰ European Commission, 2012. "Monitoring the Uptake of GPP in the EU." See: http://ec.europa.eu/environment/gpp/studies_en.htm.

⁵¹ International Green Purchasing Network (IGPN), *Green Purchasing: The New Growth Frontier: Policies and Programmes to Enhance Green Business Growth in Asia, Europe and the United States*, October 13, 2010, http://www.igpn.org/DL/Green_Purchasing_The_New_Growth_Frontier.pdf.

⁵² Korea e-National Indicators (http://www.index.go.kr/egams/stts/jsp/potal/stts/PO_STTS_idxMain.jsp?idx_cd=1376&bbs=INDX_001).

⁵³ IGPN, 2010.

⁵⁴ Federal Acquisition Regulations, Subpart 52.2: Text of Provisions and Clauses, Section 52.223-15: Energy Efficiency in Energy-Consuming Products, <http://www.farsmarterbids.com/regs/fars/sectionphp?sectionID=01520223-15>.

⁵⁵ For more information on OMB's Sustainability and Energy Scorecard, see: <http://sustainability.performance.gov/>.

⁵⁶ See, for example, the Super-Efficient Refrigerator Program (SERP) in the United States in 1993, where the government along with 25 utilities offered a US\$ 30 million prize to manufacturers that surpassed DOE's energy efficient standards by 25-50 percent at: <http://www.homeenergy.org/show/article/id/931>.

⁵⁷ This model also widely used in Germany, Austria and elsewhere in Europe.

⁵⁸ ESPCs are also widely used around the world for public sector EE. See Singh, et. al., 2010 for more information.





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