Procurement, Innovation and Green Growth:
The story continues...

iisd International Institute for Sustainable Development / Institut international du développement durable

Partnership for Procurement and Green Growth

3GF Global Green Growth Forum

Foreword by the Hon. Ida Auken, Minister for the Environment, Denmark

Procurement, Innovation and Green Growth: The story continues...

Published by the International Institute for Sustainable Development.
ISBN: 978-1-894784-60-3

International Institute for Sustainable Development

The International Institute for Sustainable Development (IISD) contributes to sustainable development by advancing policy recommendations on international trade and investment, economic policy, climate change and energy, and management of natural and social capital, as well as the enabling role of communication technologies in these areas. We report on international negotiations and disseminate knowledge gained through collaborative projects, resulting in more rigorous research, capacity building in developing countries, better networks spanning the North and the South, and better global connections among researchers, practitioners, citizens and policy-makers.

IISD's vision is better living for all—sustainably; its mission is to champion innovation, enabling societies to live sustainably. IISD is registered as a charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Government of Canada, provided through the Canadian International Development Agency (CIDA), the International Development Research Centre (IDRC), and from the Province of Manitoba. The Institute receives project funding from numerous governments inside and outside Canada, United Nations agencies, foundations and the private sector.

Head Office
161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba, Canada R3B 0Y4
Tel: +1 (204) 958-7700 | Fax: +1 (204) 958-7710 | Website: www.iisd.org

Partnership for Procurement and Green Growth

Partnership for Procurement and Green Growth members: www.iisd.org/pgg

iisd International Institute for Sustainable Development / Institut international du développement durable

CII Confederation of Indian Industry

CII-ITC Centre of Excellence for Sustainable Development

ecos

epeat

IRF INTERNATIONAL ROAD FEDERATION FEDERATION ROUTIERE INTERNATIONALE

In partnership with:

Norad

Ministry of Foreign Affairs of Denmark

3GF Global Green Growth Forum

Foreword

Miljøministeriet
Miljøstyrelsen

We live in times of multiple crises. We are confronted not only with a financial or economic crisis, but also with the severe challenges from a climate and a natural resource crisis. Our natural resources, which we rely on for all economic activity and social and economic development, are under severe pressure, and it is clear that business as usual is not an option. Instead, our response to these crises must be one that is capable of dealing with both crises at the same time.

Long-term prosperity requires a transition to a new growth paradigm based on resource efficiency. A growth that delivers new jobs, improves social well-being and reduces vulnerability towards imports of resources, while respecting the carrying capacity of ecosystems. This growth paradigm is called green growth.

As this report shows, green public procurement possesses great and largely unharnessed potentials in catalyzing green growth. By utilizing the massive purchasing power of the public sector at all levels, green public procurement can transform the market, stimulate green industrial growth and create incentives to invest in, innovate and scale up green solutions when demand is secured and well directed.

By doing so, green public procurement can help solve multiple problems at the same time. It can trigger green innovation—innovation that creates economic value and delivers environmental benefits at the same time. And it can deliver radical change by spurring new markets and new business models while at the same time having significant spill-over effects on private household consumption through increased awareness and mainstreaming of green products.

Bold, visionary and innovative governments, businesses and cities have already realized the potential of green public procurement and lead the way. This report compiles real initiatives from all parts of the world to demonstrate the benefits of green public procurement. It shows that green public procurement can help deliver both economic and environmental results at the same time and demonstrates that the transition to green growth is attainable.

But this report also shows that many governments and stakeholders have yet to appreciate how procurement can be used to deliver on green growth. They overlook that public procurement touches a wide range of sectors, products and services and therefore can serve as a cross-cutting policy for delivering both economic and environmental value if developed and implemented with a revised mindset.

It is most fitting that the Global Green Growth Forum has made procurement and private finance initiatives a core work stream and catalysed the Partnership for Procurement and Green Growth.

I welcome the partnership and this report, and I hope it will serve as inspiration for everybody to green their procurement.

Ida Auken

Minister for the Environment, Denmark

Introduction

The world is increasingly faced with the challenges stemming from the need to sustain an expanding global population while simultaneously addressing the environmental pressures that could threaten our ability to accomplish this. Green growth has emerged as a strategy to balance the historically divergent priorities of achieving economic growth and social development without putting at risk the environmental systems and natural capital we rely so heavily upon. This approach emphasizes the environmental and economic gains achieved by reducing inefficiencies in the management of resources and the stimulation of new sources of activity through innovation and green market growth.

Within the green growth framework, public procurement serves as a key policy tool for governments to drive the agenda forward and achieve shifts in market practices by leveraging its significant purchasing power and regulatory influence. As purchasers of a diverse range of goods, services and infrastructure to meet not only their own operational needs but also to deliver on their public service mandate, governments procurement spending represents scaled-up and long-term demand across a wide number of industries. Strategically directed, this demand has the ability to act as a market supporter and catalyst, incentivizing businesses to take the risks to invest, innovate and commercialize green products and services. A key to achieving this value-added green growth will come from boosting innovation so as to overcome inefficient patterns of the past and create new markets for the future. Government procurement must be considered an essential demand-side strategy for incentivizing and incubating innovation for green growth.

This report builds on the existing body of work that supports the case for green public procurement, to further identify the linkages between procurement and green growth and discuss the enabling environment that would see public procurement serve as a trigger for green industrial innovation, expansion and growth. What follows is a brief discussion on the role of procurement within the green growth paradigm, where an introduction to key concepts is followed by feature case studies that present the varying experiences of industry and the public sector in applying procurement to achieve green growth aims. Finally, the paper concludes by offering observations on possible implications for policy and areas where further investigation is required to enable procurement to serve as a more potent trigger for green innovation and growth.

This study was initiated by and undertaken at the level of the Partnership for Procurement and Green Growth, which is coordinated by the International Institute for Sustainable Development (IISD) and supported by the Global Green Growth Forum (3GF).

Acknowledgements

CII–ITC Centre of Excellence on Sustainable Development, India
Confederation of Danish Industry
Copenhagen Cleantech Cluster
Danish Ministry of the Environment—Environmental Protection Agency
Department for Business, Innovation and Skills, United Kingdom
EPEAT
Government of Sao Paulo, Brazil
Global Energy Basel Foundation
International Road Federation
Lawrence Berkeley National Laboratory
Martin Dietrich Brauch
Oshani Perera
Philips
Rijkswaterstaat—Dutch Ministry of Infrastructure and the Environment
Samuel Colverson
Sustainable Built Environment National Research Centre, Australia
Sustainable Purchasing Council
Swedish Environmental Management Council
Tilmann Liebert
Tom Moerenhout
The Greenroads Foundation
Thomson Reuters
U.S. Department of Energy
U.S. General Services Administration
U.S. Environmental Protection Agency
United Nations Economic Commission for Europe
UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production
World Business Council for Sustainable Development
World Economic Forum

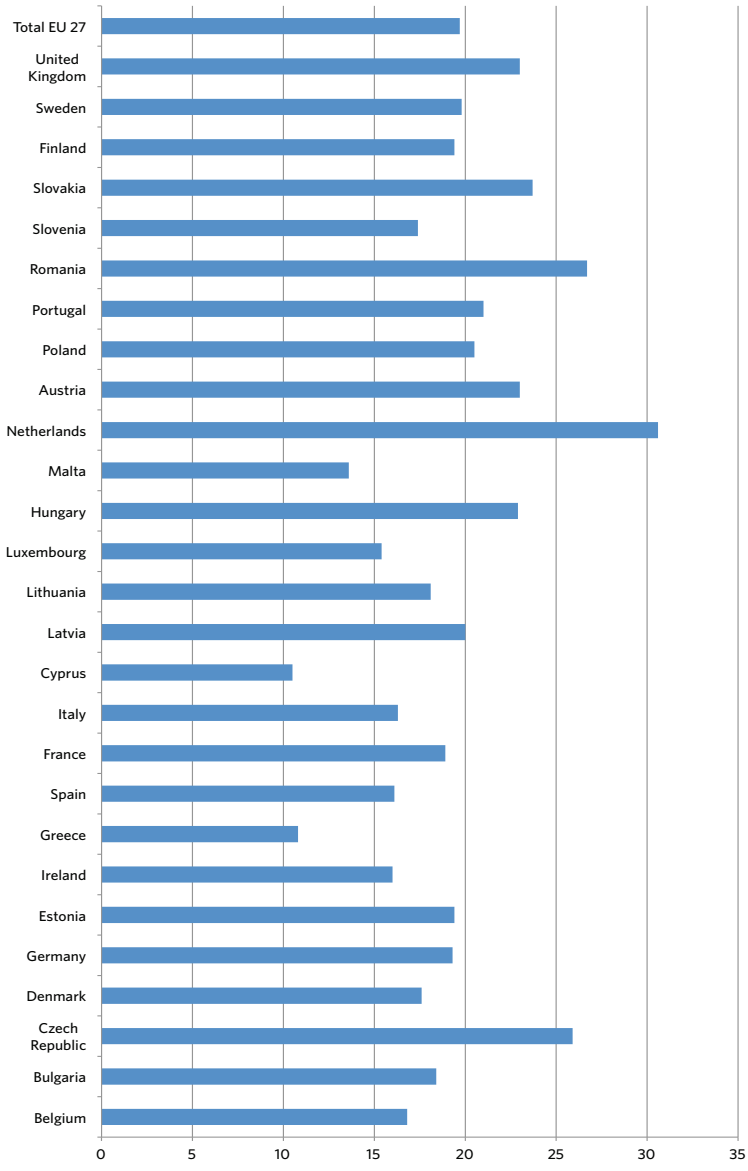
Table of Contents

Section 1: Procurement, Innovation and Green Growth

Procurement as a Green Growth Strategy

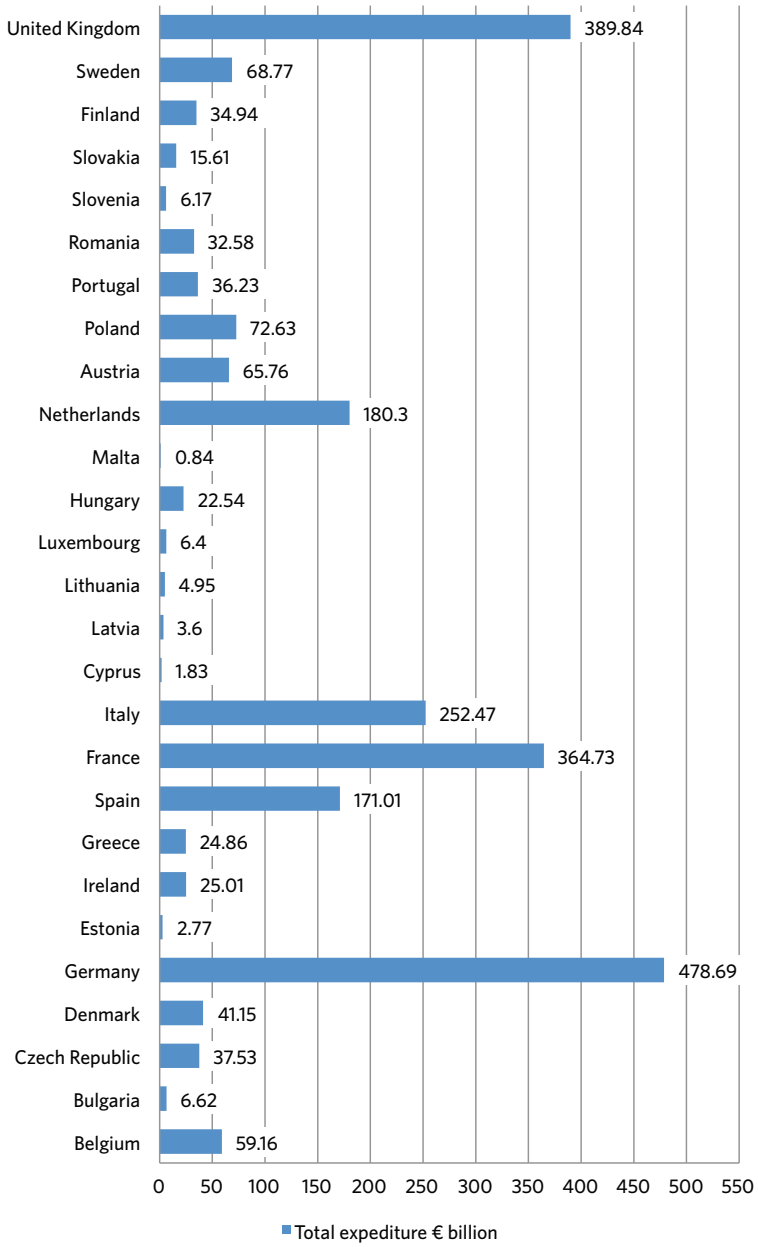
In order for government to fulfil its mandate to society, it must undertake large spending initiatives that simultaneously supply its own operation but also provide infrastructure and services for the community at large. Consequently, governments have large and diverse spending strategies on procurement ranging from routine items like stationary, computers, or furniture, to complex spending areas such as utility networks, schools, hospitals or homes. All this equates to substantial investment that can rise to as much as 45 per cent of government budgets, which is around 13 to 20 per cent of gross domestic product (GDP) in industrialized countries, and more elsewhere—35 per cent in South Africa; 43 per cent in India, 47 per cent in Brazil, 52 per cent in Ghana, 49 per cent in Mauritius and 46 per cent in Cost Rica. As such, public sector procurement is a major contributor to industry growth and stability across a wide range of sectors, providing finances and contracts that drive markets for goods and services.

TOTAL EXPENDITURE ON WORKS, GOODS AND SERVICES AS A PERCENTAGE OF GDP - 2010



Source: European Commission Public Procurement Indicators 2010 (2011)

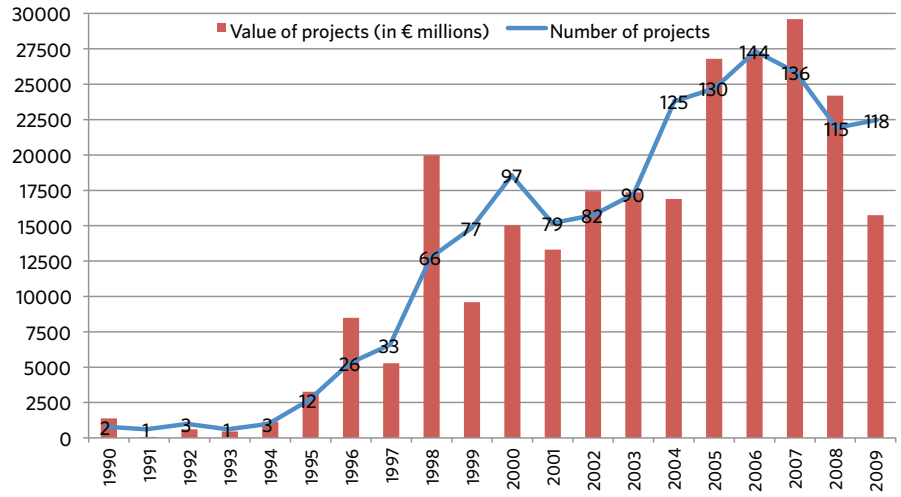
TOTAL EXPENDITURE ON WORKS, GOODS AND SERVICES BY VALUE - 2010



Source: European Commission Public Procurement Indicators 2010 (2011)

In the procurement of infrastructure and works, governments are adding private investment to their spending through public–private partnerships/private finance initiatives (PPP/PFI). This means that, in addition to the large financial flows from government procurement budgets, private sector investment is also in part being directed by government policy and priorities. In the case of the procurement of works, in the 20 years between 1990 and 2009 there have been more than 1,300 PPP contracts worth more than €5 million signed within the EU, with a combined capital value in excess of EUR250 billion. PPPs ability to provide investment in adverse climates is also demonstrated through the fact that, since 2007, some 350 new projects representing almost €70 billion have reached financial closure within the EU (Kappeler & Nemoz, 2010, p.7). Moreover, currently accounting for only 4 per cent of total public investment worldwide, figures suggest that PPP has room to grow and the potential to play an even greater role in future public infrastructure investment (EU Commission, 2009, p. 3).

EVOLUTION OF EUROPEAN PPPS PER ANNUM



Source: Kappeler & Nemoz (2010)

The Business Case for GPP/SPP

The case for a sustainable approach to government procurement is the desire to harness the massive purchasing power of public sectors to transform industry growth into green industry growth. Not only is it possible to 'green' existing industries through sustainable procurement policies, but purchasing power is large enough to also catalyse green growth, as industry and enterprises within the green sector will be willing to invest, innovate and scale up when demand is secure and well directed.

GPP's ability to stimulate industry growth can be best demonstrated through the elevation of previously niche or restricted green markets into mainstream consciousness. In North America, the domestic market for green electronics, including computers and mobile telephones, was born when the Federal Government began buying green in the early 1990s. Similarly in Europe, public procurement served as the impetus to launch markets for organic food and drink, fuel-efficient vehicles and sustainable timber products.

The influence of GPP is far reaching, as prioritizing sustainability considerations in government purchasing create positive externalities across both the domestic economy and international supplier chains: Through GPP, government can:

- Support the implementation of environmental policies on water and energy efficiency, waste management, renewable energy supply, resource efficient and cleaner production, lower greenhouse gas emissions and more.
- By ensuing scaled up and long term demand, provide an incentive for investment and innovation on sustainable products, services and works.
- Improve transparency and efficiency in procurement processes.
- Realize cost savings in the construction and operation of public assets and services
- Support the introduction of new and improved sustainable goods, services and works into the market.

Innovation for Green Growth

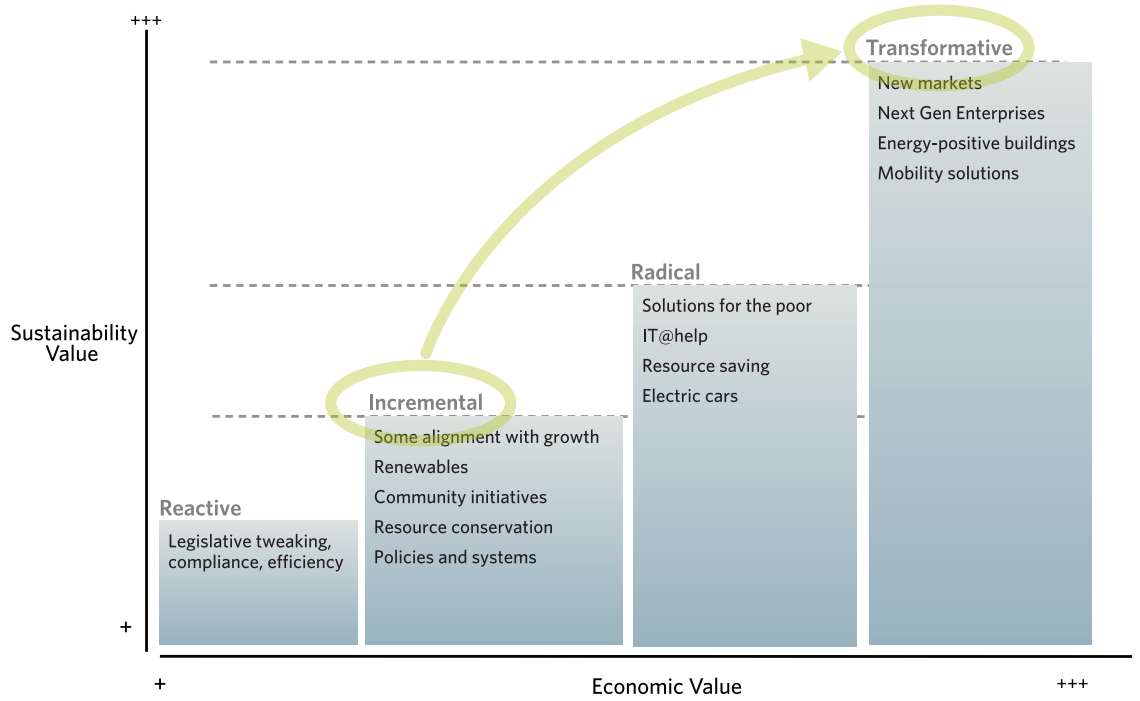
Sachin Joshi
CII–ITC Centre of Excellence for Sustainable Development

Green growth is often touted as the next solution to keep the global economy growing. It has probably found more meaning amidst a global economic crisis that shows little sign of receding. However, there are more long-term ecological and social challenges that need just as much attention if economies and societies are to be sustainable. Whatever the driver for green growth, various strategies have been promoted by governments and business. Nevertheless, there is little doubt that innovation is critical to green growth.

But what does innovation for green growth mean? Within the priorities of green growth, how does one identify and prioritise different innovations? How do governments develop innovation eco-systems? Which are the different players in the eco-systems? What resources and expertise will be required? How should business decide on the kind of innovations to invest in? What value will be created? How will the markets grow or redefine? Will they create more jobs? Should one only measure financial return on investment, or should one look at innovation in the context of creating sustainability value because it is for public good?

The Sustainable Value Creation framework helps governments and business navigate some of these important questions and develop an approach to innovation for green growth. The framework is based on the premise that innovation for green growth should create economic (or business) value and sustainability value at the same time. Sustainable value creation framework (see figure) helps governments and business develop a long-term strategic approach to transit to green economy.

SUSTAINABLE VALUE CREATION FRAMEWORK



The framework suggests four approaches to transitioning to a green economy: *reactive, incremental, radical* and *transformative*. Ideally, these are not either/or approaches, but should all be considered part of the solution. Governments and business can be found using more than one approach at the same time. However, it is typically the tendency of governments and business to follow a *reactive* or *incremental* approach to green transition.

The *reactive* approach is probably the most common and easiest approach. These are usually minor changes in legislation, improvement in compliance, and emphasis on resource-use efficiency. Due to upgrading legislation, changing consumer preferences, buyer demands, competitor moves, media attention and other factors, governments and businesses find themselves under pressure to change. This approach is important to ensure that resource efficiency and environmental performance are constantly improving, and human development indicators show positive reductions, but there is little innovation that occurs here. If government and business are first-timers or catching up, then this approach can demand significant investments, create new markets, and add jobs. But for others this is a business-as-usual approach that fails to create new jobs, and creates little value.

The *incremental* approach includes pollution prevention, improvement in public transport infrastructure and product stewardship. Incremental steps, beyond compliance actions—addressing current issues of cost, risk and footprint reduction—are important to create a better understanding of what sustainability means. These have succeeded in reducing waste, emissions and impacts, while simultaneously reducing cost risk and stakeholder resistance. Most governments and business use this approach as incremental changes to available solutions are the most cost-effective improvements. Gestation periods are also short which means improvements become commercial quickly and value is created in short time. Quick improvements over short cycles are most often seen in technology-based solutions.

However, the incremental gains are generally inadequate to fundamentally change the course of transition. Demonstrating significant progress on reducing waste and emissions is crucial, yet high economic growth rates far outweigh any substantial environmental benefits. This approach may offer short-term benefits, but it quickly assumes the "business-as-usual" scenario for itself.

Something fundamental must change if a global population of nine billion is to live a decent lifestyle within the limitations of planet resources. Looking at the overall trend and the need to bring 50 per cent of the global population out of poverty, it is obvious that the incremental approach is not enough. Transport and energy systems, together with urban development, today make buildings and energy part of the problem rather than part of the solution. Recent reports suggest that the rise in global temperatures will not be limited to 2° C. Not only will natural calamities become more common, but the cost of tackling climate change will substantially increase. It is clear that access to food and water will be the next big challenge influencing geopolitics.

Incremental solutions are not enough to tackle these inevitable challenges. Incremental solutions only prepare the world for carbon and water efficiency. Moving beyond incremental improvements toward a radical and transformative solution is the only strategy to create the value necessary for truly green growth.

The *radical* approach is necessary to produce a growth trajectory that will propel economies into creating sustainable value and provide governments and businesses with the ability to make a significant positive difference in the society. It is at this stage that governments and business should ask questions like:

- How are we going to build institutions and frameworks and shift our way of thinking about social and environmental issues?
- How are we going to reach people who want and need to improve their quality of life and standard of living?
- How are we going to regenerate lost natural capital in a manner that increases economic capital as well?

Driven by the accelerating rate of technological change, radical solutions are vital in any transition to sustainable business and green economy.

Radical solutions include addressing poverty, while leveraging information and communications technology (ICT) to improve the accessibility, availability and affordability of goods and services. It creates better alternatives within existing industries without fundamentally changing them. For instance, the electric car may be a good alternate to fossil fuel-powered automobiles. Yet charging car batteries with electricity produced using fossil fuels limits the net environmental benefit. Further, it does not resolve the problems of traffic congestion, and it drains public resources to create more parking spaces and larger road networks, not to mention the impacts on social health.

When governments and companies begin to look into the future, the shift in focus is transformational. A few countries, such as South Korea, Denmark, China, India, and industries such as packaging, renewable energy, and information and communication technology are reinventing themselves. The next four decades will witness more governments and business embracing this approach. It will involve a focus on the combination of bio-mimicry, natural material regeneration, and creating new markets with next-generation solutions.

Regarding transportation, the transformative solution is to think mobility instead of cars. This change in thought process creates solutions that are transformative. For instance, a car is an energy guzzler because it is viewed as a mobility tool. It could become an energy producer if it captures solar energy, runs on it, and can be available to power other gadgets when idling.

Over a billion people in the world do not have toilets. Another billion people do not have proper flush and drainage systems. For these people, developing access to toilets with flush and drainage facilities is an absolute necessity to create healthy societies. However, it would also mean more water and energy use. This is the business-as-usual scenario and is not suitable for a sustainable world. Making use of disruptive technology, such as advanced waterless "bio-toilets," technology to make the toilets affordable and easy to install, will solve health problems, substantially reduce water and energy requirements, and also be economical to governments. Moreover, it will create new business opportunities: economies of scale will drive down the prices of these toilets, which will then replace conventional toilets globally, further reducing water and energy needs at an aggregate level.

NASA has been using complete water recycling shower cubicles in its space shuttles. Every drop of water is potentially recycled for showers. The technology is well proven, but it may be expensive for commercial use. However, improving the technology to make easy-to-install shower cubicles in bathrooms can have substantial water savings globally. Again, disruption of the traditional development curve through innovative technological advances could lead to scaled-up production that will push prices downwards to make it a household product. The scenario in 2050: nine billion people across the world take a shower everyday without wasting a single drop of water.

Some of these ideas may be premature. But it is the disruptive potential of military and space technology that has shrunk the world into a huge interconnected village. Transformational change of this nature is real. It helps decouple growth from natural capital depletion and contributes to economic growth and job creation. Business is the driver of innovation, but governments need to provide clear and stable market signals. Governments and business will need to operate in a public–private partnership mode to make this happen. Technologies are expensive, and their owners need to be compensated. Governments can make that available. Business will need to innovate to create products and improved business models for mass uptake.

Some of the necessary changes that will enable sustainable value creation through transformational change are:

- Investing in interdisciplinary innovation is critical. Only a few of the key innovations that are aimed at addressing environmental and social challenges actually come from related areas such as energy or process improvements. Innovations in fields such as biochemistry, material sciences, engineering, and business models are much more critical sources of transformative solutions.

- Green technologies need to become affordable and accessible. The success of information and communication technologies needs to be replicated in green technologies. Prices and adoption rates will improve only when green technologies are disrupted. ICT across the world has become one of the largest job creators and drivers of economic growth. Green technology has even greater potential.
- Green taxes are not enough to stimulate green innovation. Putting a price on ecological impact is very important for incremental improvements to green technology, but it is not sufficient to lead to transformative innovations. Public and private investment in interdisciplinary innovations is also needed to create long-term sustainable value.
- Radical policy change is required. Removing regulatory barriers to the growth of new markets will spur entrepreneurship and generate new business models that challenge incumbent firms. The shakeout will increase efficiency and create alternative markets leading to new jobs and competitiveness.

Conclusion

Governments and business need to be focussed on a few "mega sustainability" trends that will shape the markets of the future: the drive for renewable energy and materials, the demand for greater safety and security, and the need for increased food production. Also vital is how some of the unmet needs could be met by rethinking delivery processes and methods.

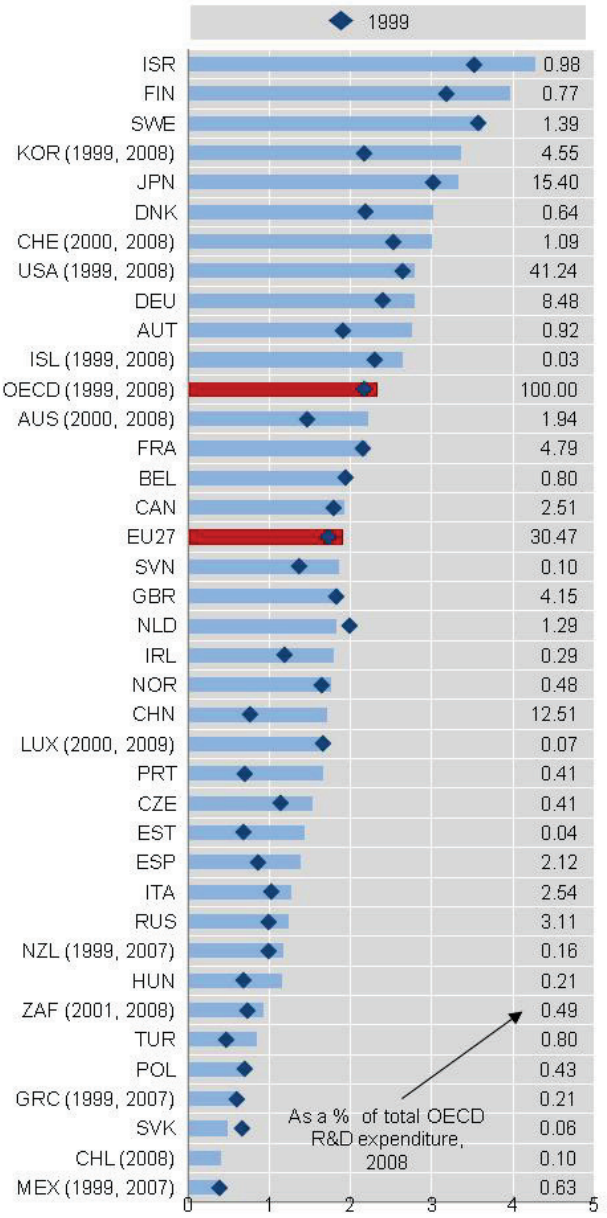
Sustainable value creation is supplemented by the "priorities" to be defined and demonstrated by governments and business. It's not about passing the buck: it is about sharing responsibility and working together.

Incremental change will not get us to a high-growth, green economy. That can be achieved only through transformative change, starting now. To play its role, business will still need to do what business does best: innovate, adapt, collaborate, execute. These activities will change along with the partnerships that are formed with other businesses, governments, academia and non-governmental organizations in order to get it right for all. And we must get it right.

Measuring Innovation

Unsurprisingly, the ability to achieve transformative innovation will be dependent on achieving the right framework conditions that includes effective policy, trade, investment, education and financial systems. While some data is available to help track the influence of framework conditions on technical innovation growth, softer changes in business models, management practices, or planning approaches are not so easily seen. The technical growth of innovation is most widely measured through expenditure on research and development (R&D), where more specifically the intensity of R&D spending as a percentage of GDP within a given economy can point towards the relative importance of generating new knowledge within that jurisdiction. As such it is more a measure of intent rather than an outcome of green growth. See figure below for a comparison of the gross domestic expenditure on R&D between 1999 and 2009 in OECD nations.

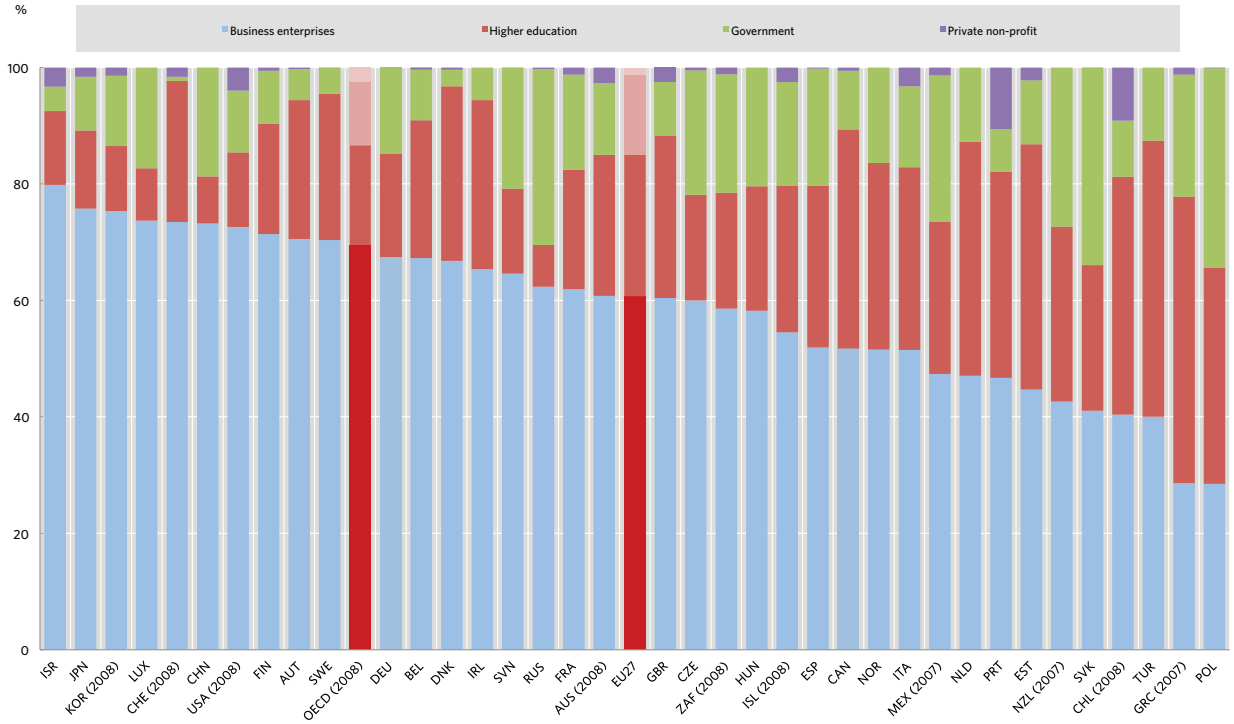
OECD GROSS DOMESTIC EXPENDITURE ON R&D: 1999 AND 2009



Source: OECD, Main Science and Technology Indicators Database

Business and industry are key to taking good ideas and emerging technology and bringing them to market, completing their transformation into economic and social worth. This participation comes across the development cycle, from generating new idea and solutions to designing and manufacturing new technologies, and distributing products into the wider market. Consequently it is the private sector that is the biggest investor in R&D across most economies, accounting for nearly 70 per cent of R&D expenditure within the OECD (see figure). If innovation is to be a catalyst for reaching green growth targets, and business is the main performer when it comes to investing in R&D for innovation, then it becomes essential for governments to support business innovation. Public procurement forms one part of a holistic strategy for stimulating and supporting innovation, where, in association with design-side policies on regulation, standards, investments or incentives, the government can feed into the business sector as a way of stimulating innovation.

OECD R&D EXPENDITURE BY PERFORMING SECTORS, 2009



Source: OECD, Main Science and Technology Indicators Database

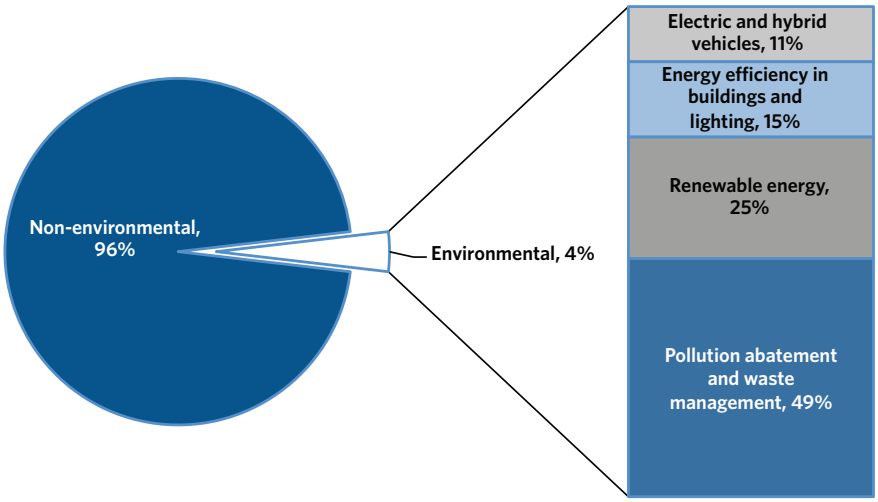
Knowing where to target the public spend and policies to best support the growth of green innovation is a question of context and priorities. But what is also clear is that different approaches are necessary over the different stages of the innovation cycle. During the development stage research and demonstration platforms are pivotal, while as technologies become technologically proven there is greater need for creating market support in the form of incentives or regulation/standards. As technology nears market competitiveness ongoing government purchasing helps to sustain growth and development and send important signals to the public on green priorities and encourage wider product adoption. Whatever the application, policies for innovation should in general focus on encouraging experimentation and ongoing development that generates new options for strengthening environmental performance at the lowest cost (OECD, 2010, p. 58).

Markets for green innovation often face additional barriers, and targeted support will, in many cases, be necessary for specific technology fields. Within Denmark this was the case for renewable energy, where feed-in tariffs were used to stimulate the wind power industry over the 1980s–1990s. High internal rates of return guaranteed by the government provided a strong incentive for investment in wind technology, and by 1990 the installed onshore wind power in Denmark amounted to 76 per cent of the total capacity in Western Europe. Thanks to a strong and stable domestic market, the Danish wind industry was able to reach technical maturity at home and then launch into the global market (Lewis & Wiser, 2007, pp. 1844–1857).

As a method of assessing the relative effect of innovation policies, tracking the structure of patent applications can provide insights into the distribution and growth of green technology and intelligence. The figure below demonstrates that environmental patents are dominated by the renewable energy sector and pollution control. The growth of environmental patents in certain fields can point to policy outcomes, where in the OECD between 1990 and 2008

the number of patented inventions in renewable energy (+24 per cent), electric and hybrid vehicles (+20 per cent), and energy efficiency in building and lighting (+11 per cent) increased more rapidly than total patents (+6 per cent) (OECD, 2010, p.52). Nevertheless, it is clear that much more can be done to spur green innovation, as the number of environmental patents is insignificant when compared to the total number of patents registered. It is worth noting that not all green innovation is a result of direct investment or R&D in environmental fields. It will often be the case that spillover from other sectors can contribute to transformative innovation within the green sector and does not necessarily suggest that investment should be concentrated on energy or the environment.

STRUCTURE OF OECD PATENTS 2006-2008:
AS A % OF APPLICATIONS FOR TOTAL PATENTS UNDER THE PATENT COOPERATION TREATY



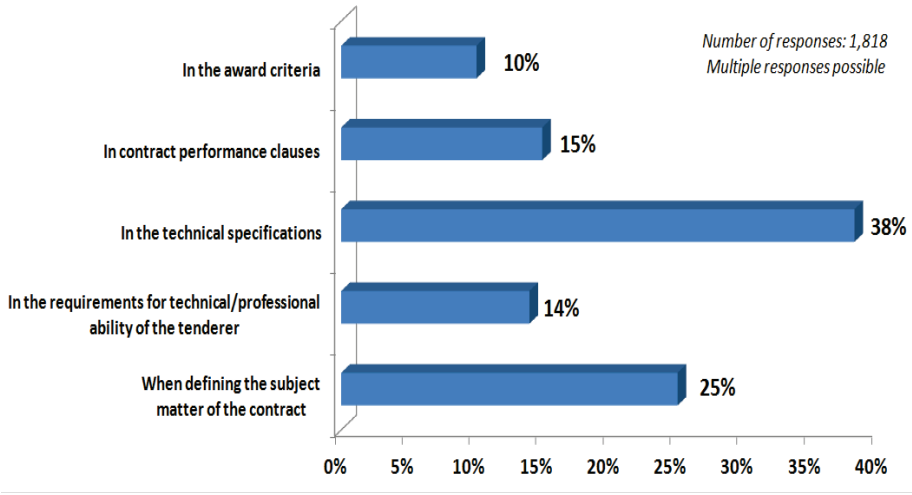
Source: OECD Patents Database (2011)

Introducing "Green" into Procurement Activities

The method and place at which green is introduced into the procurement process will have a direct influence on its success. For procurers, it becomes important to understand their market and know which criteria are best applied, how to measure and weight environmental claims and if any performance clauses are needed to achieve desired outcomes. Green can be embedded within all stages of the procurement procedure, right from the contract's subject matter and title through technical specifications, eligibility standards and award criteria.

Defining green through the contract's subject matter and technical specifications targets the environmental impacts of the goods and services being procured by examining their impact over the full life cycle. Selection eligibility criteria for the private sector based on environmental technical capacity or past performance can raise the environmental quality of services being procured. Designing award criteria to reward high environmental achievers will encourage tenderers to deliver higher levels of performance, where contract performance clauses can continue to incentivize the maintenance of high achievement. The ability and ease of introducing green into various stages of the process will depend on market context and the capacity of procurers. A recent study on GPP within the EU found that procurers most frequently introduced green criteria into the technical specifications (38 per cent) and when defining the contracts subject matter (25 per cent).

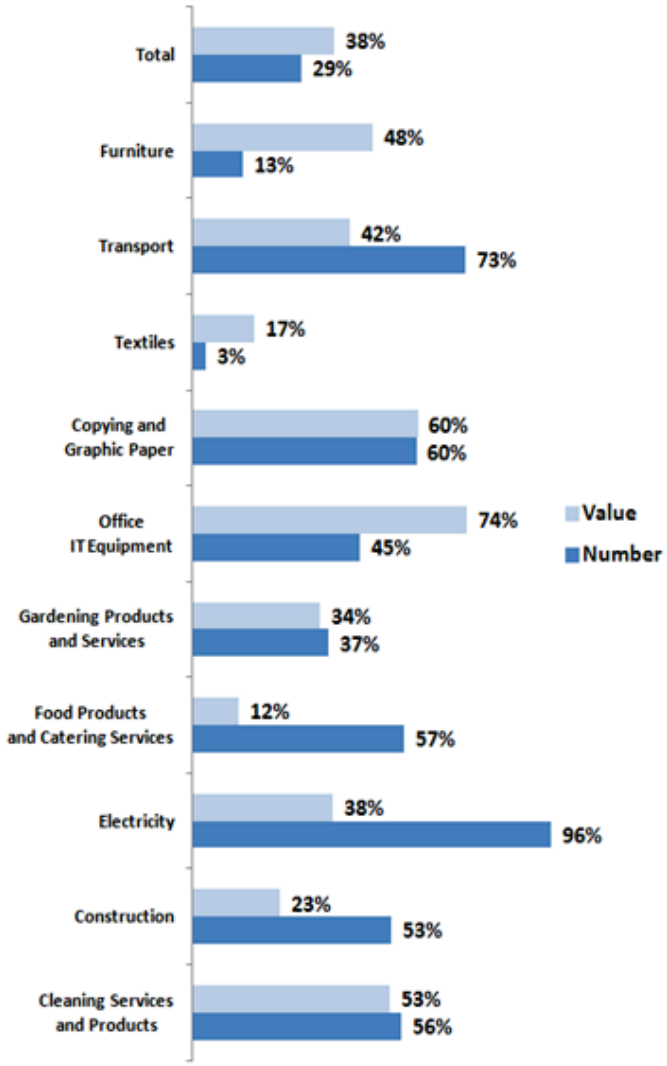
STAGE OF INCLUSION OF GREEN CRITERIA DURING PROCUREMENT PROCESS FOR ALL PRODUCT GROUPS IN THE EU 2009-2010



Source: Centre for European Policy Studies (2012)

The same study also used the inclusion of green criteria to identify the level of green procurement within specific product groups. The figure below represents three levels of green, a subjective assessment of whether procurers thought a contract was green, the inclusion of at least one EU core criteria for GPP, and, finally, where a contract has included all 10 core criteria. What can be seen is a vast difference between product categories that have historically received much of the focus, such as transport (55 per cent all core criteria) and office/IT equipment (48 per cent), with those less well known such as textiles (14 per cent) and food products (12 per cent). This difference may be attributed both to a disproportionate level of focus on certain product groups and the comparative ease with which green criteria may be introduced into some product sectors.

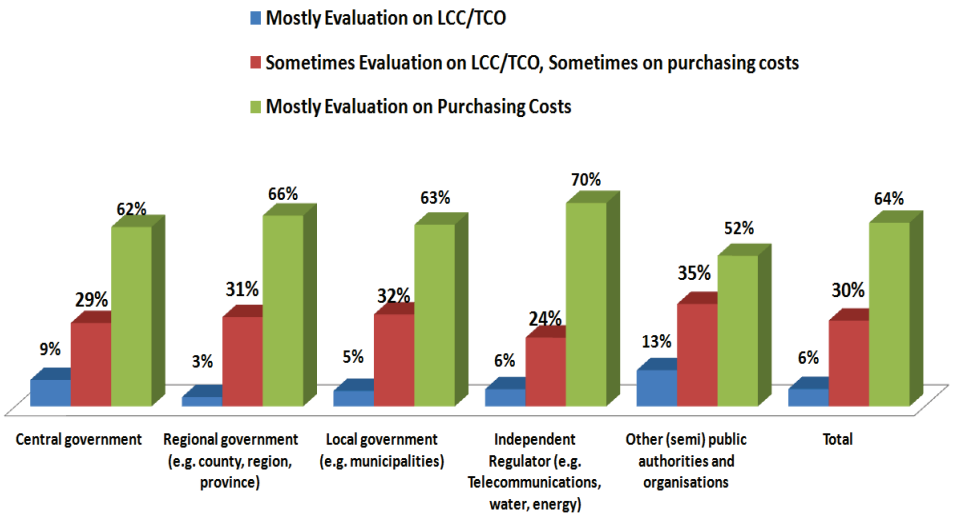
INCLUSION OF GREEN PROCUREMENT PER PRODUCT GROUP (BY NUMBER OF CONTRACTS) IN THE EU 2009-2010



Source: Centre for European Policy Studies (2012)

A further measure of the extent to which green procurement policies have made their way into practice is through looking at the application of life cycle costing (LCC). Cost is often the most influential factor at work within the award stage of the procurement procedure, where traditionally the lowest economic purchase cost has held sway. Purchase price is, however, just one of the costs involved when buying a product or service, and LCC involves evaluating the operating and end-of-life costs, often also factoring in the "hidden costs" of environmental externalities such as greenhouse gas emissions. This advanced method of price evaluation is appropriate for environmental products and services where cost and energy savings that will appear later in the contract period are not effectively represented in traditional purchase price comparison. Consequently, the use of LCC within tender evaluation can represent the commitment of purchasers to ensuring green procurement is carried out and also the level of capacity within procurement teams to understand and apply the more complicated evaluation method. The figure below demonstrates quite clearly that, despite the growing emphasis on green procurement in the last few years, purchasing price remains the dominate factor upon which tenders are evaluated. The picture does not change based on the level of government, where the use of LCC as the main evaluation tool remains low at the central, regional and local levels. Although marginally higher at the central level, the data does not tend to suggest a knowledge bottleneck, but that a lack of willingness or capacity to utilise LCC exists across the spectrum of public procurers.

USE OF LIFE CYCLE COSTING (LCC), TOTAL COST OF OWNERSHIP (TCO) AND PURCHASING COST, EU 2009-2010



Source: Centre for European Policy Studies (2012)

Section 2: Case Studies

An integral part of the investigation into procurement for green growth has been documenting and collecting case studies of procurement in practice. Collected from within industry, academia and the public sector, these case studies represent a large cross-section of the actors involved in the fields of procurement and the environment, and, as such, present a valuable opportunity for demonstrating and understanding the dynamics at play within procurement for green growth. The articles featured below are an eclectic mix of commentaries, case studies and reviews, as well as tools and mechanisms chosen for their unique perspective of the procurement/green growth paradigm.

Facilitating Local Participation Through Green Standards: Experience from the EPEAT green electronics rating system

Sarah O'Brien
EPEAT

Government Role: Supporting consensus, creating a "tipping point" market incentive

Development of the EPEAT environmental rating system for electronics was spurred by the U.S. government's need for a succinct, agreed-upon definition of "greener" products that could be trusted to reduce overall lifecycle impact. The government had instituted a voluntary program—the Federal Electronics Challenge (FEC)—to encourage all agencies and facilities to exercise responsible environmental stewardship of electronics through purchasing, use of phase management and end-of-life strategies. However, despite the existence of a few certification programs for IT and electronics, there was no purchasing specification that fully addressed the product life cycle and met the government's preference for consensus-based public standards.

The U.S. EPA was tasked with spurring development of such a specification, which it did by issuing a cooperative agreement (contract) for facilitation of a stakeholder consensus process to result in an "Electronic Product Environmental Assessment Tool," or EPEAT. A Portland, Oregon-based NGO—the Zero Waste Alliance (ZWA)—convened a broad stakeholder group, which worked over three years to develop life cycle criteria, a system for assessing products against the criteria and verifying claims, and a public standard (through the Institute of Electrical and Electronic Engineers—IEEE).

Perhaps most importantly, the federal government communicated its desire to use the standard developed if it met its needs. With a purchase volume estimated at 7 per cent of global market share for electronics at that time (2003), the government realized that it could be instrumental in providing a market incentive to design to the agreed upon "greener" specification. Once the EPEAT/IEEE 1680 standard was finalized and the product registry was operational, President Bush issued an Executive Order (13,423) requiring all federal agencies to purchase only EPEAT-registered products for all categories where an EPEAT standard existed. This Executive Order has since been superseded by a requirement built into the Federal Acquisition Regulations or FAR, and an additional, Obama-era, Executive Order (13,514, 2009).

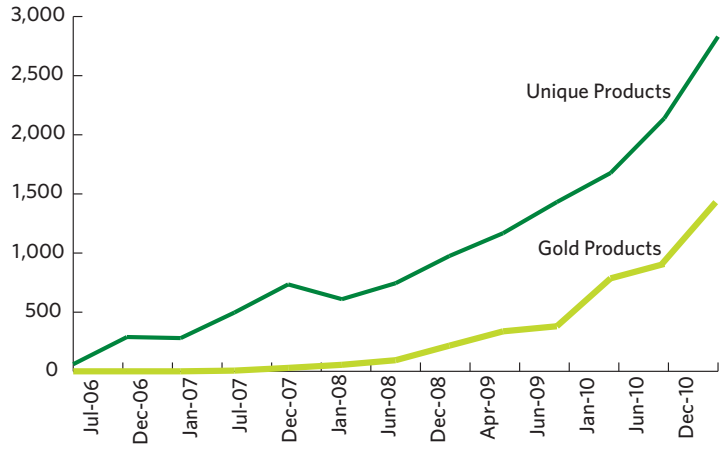
Prior to enactment of any U.S. Federal purchasing requirements, the president's Office of Management and Budget (OMB) must provide analysis of environmental purchasing initiatives' potential impact on purchasing costs and supplier competition, as well as life cycle costing benefits (or impacts) of the alternative. This advance review ensures that environmental purchase requirements are financially sound, do not restrict competition and have a positive or neutral impact on life cycle cost for the product category.

The expert analysis reassures purchasers that embrace of a particular standard is "safe." As an OMB staff member explained, "When products are spelt out in the Executive Orders and Federal Acquisition Regulations, we are essentially telling the market that they are cost-effective across the product life cycle and that they are environmentally preferable. Federal procurers can then design tenders that include these details. Their task to buy green goods and services then becomes easier" (quoted in Perera, Morton, & Perfrement, 2009, p. 13). Purchasers outside the federal government are similarly reassured that the product or service specification in question is environmentally and economically sound.

Though federal agencies struggled to enforce the purchasing requirement at first—as of 2008, 13 of 22 agencies had reached the 95 per cent mark, with most others hovering around 70–80 per cent compliance—the federal market incentive, coupled with adoption by dozens of environmentally minded U.S. states and municipalities, spurred broad manufacturer participation in EPEAT. The system's fee structure—with a single annual fee enabling as many product registrations as a manufacturer wished to make—reduced per-product cost and also encouraged rapid growth in product registrations.

EPEAT began in July 2006 with three manufacturers and 60 products registered. By December 31, 2006, the system had nine participating manufacturers registering 281 products. In 2007 that grew to 23 active manufacturers registering over 700 products, spurred on by a diversified market of hundreds of government, education, enterprise and health care purchasers. In 2012, nearly 50 manufacturers of all sizes and many nationalities participate in EPEAT, registering more than 2,800 unique products in 42 countries around the globe.

EPEAT GROWTH OF PRODUCT REGISTRATIONS



EPEAT has come to be the definitive global environmental rating for electronics over a very short time. The resulting environmental benefit and supply chain impacts occur around the globe and throughout the lifecycle of the covered products (EPEAT, 2010).

The lesson is that an explicit government commitment to a green purchasing specification can create sufficient market demand to incentivize the investment required to redesign products and services. Government purchase volumes can create an economy of scale which reduces the cost per unit of such changes. And government analysis of the environmental specification from a financial and environmental viewpoint can provide purchasers certainty about benefits that enables rapid, widespread adoption and results in market rewards to producers. This beneficial cycle results in redesigned products becoming available to a broad array of purchasers and creating environmental benefit for all.

Industry Impact: Competition spurs global innovation, creates new demand for suppliers

EPEAT is uniquely based on a combination of required criteria (23 to meet the baseline Bronze level for computer/display registration) and 28 optional criteria, which form the basis for the higher Silver or Gold ratings. From the outset, the availability of a searchable online database of all EPEAT-registered product declarations created intense competition among listing companies to be the first to meet specific optional criteria or to meet sufficient criteria to reach higher rating levels (R. St. Denis, Hewlett-Packard, personal communication, 2007).

A year after EPEAT's launch, Hewlett Packard and Dell vied for the claim of first Gold-rated product—registering a Gold laptop and Gold desktop within days of each other in June 2007. A number of manufacturers also issued announcements during 2007 about being the first to meet specific optional criteria—like the 10 per cent post-consumer recycled plastic criterion. In other words, EPEAT provided a framework within which the original equipment manufacturers (OEMs) could compete head to head on environmental grounds, just as they competed elsewhere on performance and design attributes.

As the EPEAT system became increasingly influential, its incentives began to affect the supply chain. Recycled plastic content provides one example of the system's growing impact. In 2003, the Federal Electronics Challenge Plastics Task Force identified 5 per cent of post-consumer recycled resin content (of total resin content by weight) as a challenging "stretch" goal for electronics manufacturers. Given the limited supply of clean postconsumer material available in the global market, they acknowledged that 1–2 per cent was probably as much as any manufacturer could include at the time their recommendations were issued (2003). However, in 2007–8, as they looked for additional criteria to meet to lift their products into the Gold ratings range and differentiate their EPEAT profile, OEMs began to source increasing amounts of post-consumer recycled resins.

In an interview with Green Biz, a senior engineer for Global Environmental Affairs at Lenovo said that by 2009 EPEAT had a significant impact on their manufacturing and design practices. Since the launch of EPEAT, she pointed out, the company had moved to locate sources of post-consumer plastics and had already used over 4 million net pounds of post-consumer recycled content to meet the PCR resin criteria in the standard. In 2012, 18 manufacturers of all sizes now register almost 300 products that meet the 10 per cent or higher post-consumer recycled resin content criterion, indicating a significant uptick in OEM demand, and suppliers provisioning, of PCR plastics. A senior official at MBA Polymers, one of the world's leading PCR resin suppliers, has indicated that printer manufacturers are now contacting him, in advance of the finalization of EPEAT's Imaging Equipment standard, to inquire about PCR resin supplies as they ramp up to meet the upcoming standard's requirements.

We can take away several lessons from this history:

1. Ratings tiers—and resulting competition to excel—may be crucially important to procurement standards' ability to spur ongoing environmental improvement.
2. Public visibility—the availability of head-to-head comparison—is crucial to creating competitive pressure on "green" grounds.
3. Establishing recognition for criteria that require innovation and capacity development can motivate changes with significant impact on supply chain and design.

Global Standard, Local Application: providing opportunity globally

Global Uptake

As noted above, EPEAT was originally developed for use primarily by the U.S. government and other U.S. and Canadian purchasers, with no specific prediction or planning for expanded use beyond North America. The non-profit organization selected to manage the EPEAT registry, the Green Electronics Council (GEC), promoted use of EPEAT through direct contacts, web materials and conference presentations to North American procurement professionals. But very soon after launch of EPEAT's website and searchable online registry, GEC began to field questions from private and public purchasers, manufacturers and resellers around the world interested in using EPEAT to "green" their electronics purchasing, products or sales offerings.

At first, EPEAT met global demand through a uniform registration that applied everywhere a product was sold. EPEAT's Product Verification Committee (an independent group of experts who provide judgment on conformity assessment decisions and clarifications of the system requirements) delivered a clarification early on that the IEEE 1680 standard did not specify geography, and therefore every product registered in the system must meet its declaration everywhere it was sold.

Because the IEEE 1680 criteria on which EPEAT is based include service and support attributes, however, global conformity was not a reality. Most manufacturers did not, for example, provide product takeback and responsible recycling—a required criterion—worldwide, and many could meet specific optional criteria only in limited markets. Given the varying levels of infrastructure and service development worldwide stakeholders recognized that such global conformity was almost impossible, and that purchasers' reliance on the single registry for product declaration and rating could therefore be misleading. Agreeing that a single declaration would not be sufficient to ensure conformity in all markets was the easy part—developing a system to accurately address products by geography took a long, complex and at times heated discussion among the system's stakeholder advisors.

In 2008, the decision was reached to apply EPEAT on a country-by-country basis, and to limit initial application to 40 countries. This system ensured that 1) purchasers in a given country could be sure that all declared criteria for a product were supported for their geography, 2) that EPEAT verification investigations would look at compliance on a country-specific basis, and 3) manufacturers could declare products in those areas where they could meet all required criteria, and where they felt there was a business case for applying EPEAT, and not in other areas. As of 2012, EPEAT covers 42 countries. The EPEAT website (http://www.epeat.net/learn-more/country-specific-registration) contains a list of covered countries and more specifics on country-by-country registration.

EPEAT COVERED COUNTRIES, MAY 2012

Australia	Estonia	Latvia	Portugal
Austria	**France**	Lithuania	Romania
Belgium	Finland	Liechtenstein	**Singapore**
Brazil	Germany	Luxembourg	Slovakia
Bulgaria	Greece	Malta	Slovenia
Canada	Hungary	Mexico	Spain
China	Iceland	Netherlands	Sweden
Costa Rica	Ireland	**New Zealand**	Switzerland
Cypress	Italy	Norway	Taiwan Region of PRC
Czech Republic	Japan	**Poland**	**United Kingdom**
Denmark			**United States**
Bold = some or all national government agencies use EPEAT as a purchase requirement			

Brazil

Early in 2007, EPEAT received several queries from manufacturers in Brazil about how they could qualify their products in the EPEAT system. GEC staff worked with the companies to become EPEAT Subscribers, to understand the 1680.1 criteria environmental requirements and to register conforming products in the system. Upon inquiring, staff realized that the initial interest and activity appeared to be motivated by the state government of Minas Gerais inserting an EPEAT registration requirement into their IT purchasing contracts.

Over the five years since the first Brazilian manufacturer joined the system, seven others have become EPEAT Subscribers. A number of Brazilian national government agencies now require EPEAT registration in their contracts, consistent with a legislative directive to integrate environmental criteria into government IT purchasing (A. H. F. Silveira, MPS, CIO, Ministério da Previdência Social (Ministry of Social Security), personal communication, December 7, 2011). The University of Sao Paolo uses EPEAT in its procurement, and many other purchasers are using EPEAT to identify environmentally preferable products. And when EPEAT offered conformity assessment training in Brazil in 2011, a number of independent consultants attended, to develop the skills needed to assist purchasers and manufacturers to effectively use EPEAT. One of these consultants notes that EPEAT has become "one of the key requirements of major government biddings in Brazil." (NovusTI website, n.d.).

Because the EPEAT standard requirements are the same for every country, and because the subscriber (manufacturer) fee is assessed on an annual, sliding scale basis, rather than per product, local manufacturers are able to enter the system on an equal footing with global OEMs. While it is true that ensuring compliance with EPEAT requirements—testing, establishing contract specifications with suppliers for conformant materials and components, developing service contracts for battery and product recycling—does incur costs, the actual fee basis is minimal, enabling companies with qualified products to respond to bids without incurring elevated certification costs. And conversely, global manufacturers must provide place-based local services in each country where they register—including end-of-life takeback and recycling of batteries and products and extended warranty service. The benefits of EPEAT registration thus accrue to service providers in the country of registration.

This combination of global and local criteria, necessary to address the impacts of electronic products, points the way to an effective hybrid for environmental procurement. EPEAT's geographic reach and country-specific declaration offer electronics purchasers the opportunity to use a single standard worldwide, and the assurance that product claims will be verified locally- supporting global scope but ensuring that the "seal of approval" of EPEAT registration is grounded in local compliance and support services, and vetted country by country. The standard's multi-attribute lifecycle approach supports improvements in use and end-of-life management of products where they are sold, in addition to reducing environmental impacts of production that may occur far from a country of registration.

Procurement and Green Growth: Notes on the experience of Sao Paulo, Brazil

Martin Dietrich Brauch
International Institute for Sustainable Development

Introduction

The State Government of Sao Paulo, Brazil, has realized the potential of its purchasing power to influence economic and social development and has been promoting green growth by means of its procurement policies. A combination of factors puts the government in a privileged position to do so:

1. The land area of the State of Sao Paulo compares to that of the United Kingdom; its population, to that of Argentina; its GDP, to that of Poland. Sao Paulo represents roughly one-third of the GDP and of the exports of Brazil, the 6th largest economy by nominal GDP. There is clearly a lot for the State Government to influence.
2. The State Government of Sao Paulo has an annual procurement budget of about US$12 billion for the purchase of goods, services, and construction works. This suggests that it has significant purchasing power to exert its influence.
3. Since the mid-1990s, the Government has improved procurement efficiency and has implemented procurement mechanisms aimed at promoting sustainability by means of its Sustainable Public Procurement (SPP) Program. Thus, it certainly has tools to exert its influence.

Green growth is taking place in the State of Sao Paulo. The State's Environment Secretariat studied the evolution of the number of green jobs in the State using the methodology developed by the International Labour Organization. Green jobs are defined as "decent work in economic activities that contribute significantly to reducing carbon emissions or to improve or conserve environmental quality" (Muçouçah's *Empregos Verdes no Brasil: Quantos São, Onde Estão e Como Evoluirão nos Próximos Anos*, 2009, as cited in Figueiredo, 2011, p. 38).

In Sao Paulo, between 2006 and 2010, the number of green jobs increased by 27 per cent, from 690,854 to 878,837 jobs. The Green Jobs Index—which measures the proportion of green jobs over the total number of jobs—has remained stable around 7 per cent during that period, but it is expected to reach 10 per cent by 2020 (Figueiredo, 2011, pp. 38–39).

While the data available may be insufficient to carry out econometric studies that establish a link between these results and public policy (including procurement), this piece provides an overview of the SPP Program of the State of Sao Paulo, highlighting and exemplifying its merits, and focusing on how they can trigger green growth. Finally, it briefly looks at the shortcomings and possible enhancements of the Program.

1.0 Socio-Environmental Label: Sustainability criteria in the procurement of goods and services

The Socio-Environmental Label is granted by the Sao Paulo SPP Program to signal goods, services, programs, and activities that incentivize social policies, enhance transparency in management, save water and energy, minimize waste generation, rationalize the use of raw materials, reduce pollutant emissions, adopt technologies with less environmental impact, use low toxicity products, and adopt technologies with lower greenhouse gas emissions (Decree No. 50170). The creation of the Label and its underlying socio-environmental criteria particularly affected the descriptions of goods and the technical specifications of services procured.

1.1 *Sustainability Criteria in the Descriptions of Goods*

Of the 150,000 goods in Sao Paulo State's procurement catalog, about 7,500 are "Class A": frequently purchased goods, amounting to 20 per cent of the government's total consumption. The Environment Secretariat analyzed these strategic items and granted the Label to 652 descriptions of goods that fulfill the sustainability criteria mentioned above. The Label thus indicates a differential of socio-environmental quality of certain specifications, highlighting their advantages in comparison with other catalog items, making it easier for procurers to choose green goods and services, and signalling the SPP policy to the market (D'Amico, 2010).

The government labels a specific product based mainly on an evaluation of information supplied by the producer, not on a complete technical life cycle analysis, in contrast to a significant number of SPP programs worldwide (D. Cavalcanti, Environment Secretariat, Sao Paulo State Government, personal communication, May 30, 2011). Not adopting a life cycle analysis of the goods was a deliberate while debatable decision, aimed at simplifying the Sao Paulo SPP Program (V. D'Amico, Sanitation and Water Resources Secretariat, Sao Paulo State Government, personal communication, Aug. 3, 2011). The Environment Secretariat grants the Label to the greenest goods available in the market once the Treasury Secretariat has confirmed the market's ability to supply the government's demand for those goods while ensuring competition (V. D'Amico, Sanitation and Water Resources Secretariat, Sao Paulo State Government, personal communications, May 31, 2011 & August 3, 2011).

Examples of labelled goods.

A state decree mandates that certain types of vehicles purchased by the government be ethanol-fueled, and establishes a legal preference for state entities to rent ethanol-fueled vehicles (*Decree No. 42836*). Accordingly, most vehicles fueled only by gasoline did not receive the Label, as opposed to most bi-fuel vehicles (fueled by ethanol or gasoline). This reflects the government's preference for vehicles fueled by less polluting fuels, incentivizing their purchase and giving sustainability signals to the market. In 2011, the State Government spent approximately US$ 125 million in purchases of new vehicles (Relatório da Execução Orçamentária: Materiais e Serviços, n.d.). This gives an idea of the magnitude of the government's incentive for the green vehicle industry.

In another example, the Label was granted to 41 items of sulfite paper goods requiring certification by the Forest Stewardship Council (FSC), the Brazilian Forest Certification Program (Cerflor), or the Brazilian Metrology Institute (Inmetro) (Catálogo Socioambiental, n.d.). Tenders for these goods have never been challenged (S. H. N. Nascimento, Office of the State Attorney-General and Environment Secretariat, Sao Paulo State Government, personal communication, May 30, 2011). To the contrary, in at least 20 instances, firms appealed against the qualification of their competitors whose products allegedly did not have the required certification. As it was verified that the goods did not have the required certifications, the appeals were upheld, and the competitors were disqualified (Bolsa Eletrônica de Compras website, n.d.). This example shows that the Label supports green products and firms and improves competition among suppliers.

Increase in the purchase of labelled items.

The first annual report of the Sao Paulo SPP Program, covering procurement in various organs and entities within the State in the period 2008-09, shows a significant increase in the number of purchases of items with the Label (Secretaria do Meio Ambiente do Estado de São Paulo, 2010, pp. 5, 10, 40):

- The percentage of the transactions involving labelled items over the total number of state government purchases increased from 16.03 per cent in 2008 to 24.15 per cent in 2009, considering only the 14 groups of goods evaluated for purposes of awarding the Label.
- Taking into account the total number of goods in the government catalog, the relative importance of the labelled items is much smaller: green procurement increased from 2.13 per cent in 2008 to 3.33 per cent in 2009.

The small number of labelled goods (652 now, but fewer than 400 at the time of the report) explains why the latter figures are lower. Nonetheless, the relative increases in one year indicate that the various state government agencies and entities are taking their SPP policy seriously, and instigating the market to respond with an increased supply of greener products.

1.2 Sustainability Criteria in the Technical Specifications of Services

The socio-environmental criteria associated with the Label were also included in the standard technical specifications and contractual obligations of independent contractors for the procurement of the services most relevant and most frequently contracted by the government.

- Environmental sustainability criteria: Independent contractors are required to reduce water consumption, to provide energy efficiency certification, to employ vehicles that use less polluting fuels, to present appropriate waste management plans, to reduce the use of chemicals, and to identify greenhouse gas mitigation opportunities (D'Amico & Agune, 2007).
- Social sustainability criteria: independent contractors are required to provide goods, meal vouchers, and uniforms to their employees; to present proof of compliance with legal and Ministry of Labor requirements; and to insure their employees against work accidents (Cadterc Studies, n.d.; D'Amico & Agune, 2007, note 15, at 16).

These standards are contained in the 17 volumes of technical studies on different types of service, ranging from building conservation to nutrition of prisoners to fuel supply management. The latter type of service offers a valuable example of how the inclusion of sustainability criteria in the technical studies on services can spur the growth of green growth.

Fuel supply management

Ecofrotas is a Brazilian company that developed GoodCard, a magnetic card used to pay for fuel in accredited filling stations. GoodCard is connected to a fuel supply management system, which includes a registry of drivers, vehicles, and company policies (for example, the type of fuel to be used). Based on the data entered at each filling, the system generates managerial reports.

Shifting towards sustainability, Ecofrotas started to sell services of management consulting and intelligence in sustainability, through "Fleet Intelligence Reports" that include inventories of greenhouse gas emissions. These reports present emissions data (greenhouse gas emissions per kilometre), detailed by driver, vehicle, type of vehicle, filling station, and transaction. Since the company manages 320,000 vehicles, it can benchmark the performance of any given vehicle against the average performance.

Ecofrotas benefited from the technical study on fuel supply management and its socio-environmental criteria. In Sao Paulo, the company has contracts with the Military Police, the Basic Sanitation Company, the Penitentiary Administration Secretariat, the Treasury Secretariat, the Environment Secretariat, the University of Sao Paulo, among other government entities, with several positive experiences (A. Kardosh & D. Levendoschi, Ecofrotas, personal communication, May 31, 2011). Ecofrotas leads its market segment in Brazil, and expects to grow 12.5 per cent in 2012 (Ecofrotas, 2012). The scaling up of the company's operations in the country generally and in Sao Paulo in particular may be associated with the increased public spending on sustainable fuel and fleet management systems.

2.0 Timber Registry and Legal Timber Label: Sustainability criteria in the procurement of construction works

It would be difficult to apply the Socio-Environmental Label to aspects of construction works and engineering services, because there are many types of such works and services, each one of them with particular technical specifications. Thus, the Sao Paulo Government focused on adopting sustainability criteria for the consumption of timber in public construction works.

The government maintains the Timber Registry (Cadmadeira), a public registry of entities dealing in native forest products in the state, to control and promote the legal use of forest products. Accreditation in the registry is generally voluntary, but mandatory in the procurement of forest products directly and of construction works using them. The Environment Secretariat also grants the Legal Timber Label to suppliers that trade in forest products responsibly (*Decree No. 53047*).

Government purchases are estimated to account for about one-fourth of the timber negotiated in Sao Paulo (Carvalho, 2008). By conditioning the access of companies to this market to their accreditation in the Timber Registry, the government advances the greening of companies dealing in forest products. In turn, the Legal Timber Label is a government recognition that tends to stimulate public and private sector demand for the products of the labelled companies.

3.0 The Experience of Sabesp: Pre-qualification of suppliers

The Basic Sanitation Company of Sao Paulo State (Sabesp) is a private company controlled by the State Government. To ensure the quality of its purchases, Sabesp only purchases from pre-qualified suppliers. In the pre-qualification procedure, Sabesp technically assesses whether, throughout the production process, a potential supplier complies with international, domestic, and company standards, including socio-environmental criteria.

Sabesp is Brazil's largest basic sanitation company. Its contracts amounted to BRL3 billion in 2010, most of which in construction works and engineering services. Furthermore, other basic sanitation companies in Brazil often require Sabesp-issued certificates of technical compliance in their own tenders. Thus, pre-qualification by Sabesp can positively influence the greening of the basic sanitation segment in Sao Paulo and throughout Brazil.

Final Remarks

The Sao Paulo SPP Program already offers tools that can trigger green growth—but there is room for improvement and expansion:

1. Both the Environment Secretariat and the Water Resources Secretariat enacted rules on the preferential purchase of goods with the Socio-Environmental Label over nonlabelled goods capable of meeting the same need. This rule could be adopted by the State Government as a whole (V. D'Amico, Sanitation and Water Resources Secretariat, Sao Paulo State Government, personal communication, May 30–31, 2011).
2. The number of labelled items could be expanded, preferably employing life cycle analysis.
3. There should be better control of the socio-environmental responsibility of suppliers and independent contractors during contract performance, a current shortcoming of the Program. To that end, Sabesp's pre-qualification could be scaled to all State Government entities (F. L. Mota, Coordination of Decentralized Entities and Electronic Contracting, Treasury Secretariat, Sao Paulo State Government, personal communication, May 31, 2011; M. de F. A. Ferreira, Coordination of Decentralized Entities and Electronic Contracting, Treasury Secretariat, Sao Paulo State Government, personal communication, May 31, 2011).
4. The Program could be better integrated with and supported by other government policies. The Sao Paulo Development Agency offers a line of financing at reduced rates to support projects of small and medium enterprises (SMEs) to reduce greenhouse gas emissions and adjust to the State Policy on Climate Change (Linha Economia Verde, n.d.). In one year, more than BRL 4 million in loans were disbursed, but companies could benefit from receiving government support in developing appropriate business plans to allow them to access to the funds more easily (Teixeira, 2011).

This article is based upon and draws on an in-depth IISD case study prepared by the author on Sustainable Public Procurement in the Government of the State of Sao Paulo, Brazil.

The Role of Business Systems in Achieving Market Transformation

Christopher Payne
Lawrence Berkeley National Laboratories

An obvious stimulus for developing "green growth," or manufacturing capacity put to consistent use in the production of environmentally-friendly products, is demonstrating a market demand for such production capacity. Buyers with significant market power can help demonstrate this market demand, and the most obvious buyers with such power are governments. Not only do governments make purchases of many commodity products in large volumes, but they also have procurement policies that are shaped by social goals. Governments can communicate to producers that they value green products and, in doing so, they can support green growth.

The idea of public sector procurement as a market transformation mechanism is not new—in fact, many governments have had some form of sustainable acquisition policy in place for years. Unfortunately, these policies have often had limited effect. Studies in the EU and the United States have shown compliance rates with sustainable acquisition requirements below 50 per cent (Payne & Weber, *Public Sector Procurement: Issues in Program Development & Delivery*. Berkeley: Lawrence Berkeley National Laboratory, in press). How can these compliance rates be raised to make procurement policies more effective in realizing concerted demand for green products?

Most public-sector procurement programs are made up of three elements: policy, training, and tools. Each of these is undoubtedly important. Policy establishes the rationale for purchasing and some definition of what should be bought. Training communicates to buyers the policy definitions, educating buyers in how to change their buying practices. Tools provide assistance to buyers in implementing the purchase requirements sought by policy.

Recent research by Payne and Weber (*Public Sector Procurement: Issues in Program Development & Delivery*. Berkeley: Lawrence Berkeley National Laboratory, in press) suggests that there is a critical component overlooked by the standard triumvirate of policy, training, and tools. That component is business systems. The electronic systems that are used by government employees in acquisition planning, procurement, and financial tracking and reporting are often not consistent with sustainable acquisition policies. These systems provide the "default case" for programmatic activities. This default case is important for two reasons. First, and perhaps most obviously, it is easiest for an employee to take action in harmony with the system. Constantly overriding the system is time-consuming. Employees who are measured by their productivity (for example, procurement officials who are evaluated based on the number of contracts awarded) will give up on constantly overriding the system in pursuit of the broader goal of "getting the job done."

The second reason procurement system defaults are important is that the system defaults provide a constant signal to the employee of what the government values. If this signal is consistent with policy and training, the result is a reinforced message to the buyer. If the signal is in opposition to policy and training, the buyer is left to wonder how important the policies actually are.

Contrast the inclusion of sustainable acquisition into procurement systems with the typical "tools/resources" model used in sustainable acquisition programs. In the "tools/resources" model, the resources are set up *outside* the business systems. For example, an agency may offer a web site with information about efficient products to buy. Spreadsheet tools may be developed to help a buyer calculate life cycle cost savings associated with the purchase of energy-efficient products, etc. Unfortunately, to use any of these resources, the buyer has to turn aside from their existing workflow, find these external tools, glean from them the information of value, then turn back to the workflow to try to incorporate that data in the task at hand. This is inefficient at best.

In many cases, these electronic systems are sold and serviced by a small number of vendors. In the U.S., for example, the vast majority of systems used in federal contract writing are produced by only seven companies. There is a market transformation opportunity here. If sustainable acquisition policy practitioners can establish common elements that are desirable in these electronic systems and request/require those elements from the electronic system vendors, sustainable acquisition policies (and therefore green growth policies more broadly) will have a much better chance of success.

Public sector procurement can produce a strong market signal supporting green growth, but that signal originates in the standards of practice that government employees use to make purchases. Effective sustainable acquisition programs must work to change these standards of practice, and electronic business systems are a necessary element of that process of change.

Promoting Sustainability: Early experience of Dutch infrastructure PPP contracts

A.W.W. (Arno) Eversdijk
Rijkswaterstaat - Dutch Ministry of Infrastructure and Environment

Introduction

In April 2012, the Director-General of Rijkswaterstaat[1] announced that sustainability will be one of the three major criteria used during infrastructure procurement procedures. What mechanisms will Rijkswaterstaat use to achieve the Dutch sustainability goals? Which sustainability criteria will be developed for public procurement? This article highlights the Dutch approach. It explains the way Rijkswaterstaat promotes sustainability in the Netherlands and describes the first experiences with sustainability criterion within two recent PPP contracts. Before addressing any issues, we start by pointing out the goals and ambitions of the national government of the Netherlands with regards to sustainable procurement.

Dutch Ambitions of Sustainability

Sustainability begins with political ambition, an ambition that is present in the Netherlands. The government of the Netherlands, together with regional and local authorities, needs to stimulate the market for sustainable products by purchasing sustainable goods and services (Atsma, 2011). When all public authorities procure sustainably, there will naturally be a substantial boost for the market for sustainable products. The Ministry of Infrastructure and Environment is pursuing a policy of sustainable procurement as an impetus for both the public and private sectors throughout the country.

Sustainable public procurement takes environmental and social aspects into account in all phases of any procurement or tendering process (Ministry of Infrastructure and the Environment, 2011). With regard to environmental aspects, the main concern is limiting the impact on the environment by, for example, reducing energy use and waste production or using recyclable materials in manufacturing. With regard to social aspects, the concerns are the use of child labour, the promotion of fair trade practices, decent working hours, but also occupational health and safety for those involved.

On June 24, 2011 the Secretary of State for the Netherlands explained the process of sustainable procurement in infrastructure to the Lower House of the Dutch Parliament. The Ministry of Infrastructure and Environment, together with other public authorities, has developed sustainability criteria for various product groups, such as cables and pipelines, green spaces and construction works. Criteria are developed in such a way that the total costs do not increase substantially (based on life cycle costs) and that there is sufficient market supply meeting the core criteria. These criteria consist of both minimum specifications (product), selection criteria (supplier) and standard contract clauses.

Also the private sector must develop sustainability further. That is why, in June 2012, a so-called "Green Deal" was struck between the national government and a large number of private construction companies. An example of such a green deal is the goal of having Schiphol Airport be the first carbon-neutral airport in the world.

[1] Rijkswaterstaat is the executive arm of the Dutch Ministry of Infrastructure and Environment. On behalf of the Minister and State Secretary, Rijkswaterstaat is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands.

The Lower House of Parliament has requested the national Government to target a 100 per cent sustainable procurement rate by 2010. Moreover, by 2020 the emission of CO_2 is to be reduced by 20 per cent compared to 1990. At the end of 2013, the Lower House will report on the progress of these objectives. Rijkswaterstaat follows this approach. What concrete measures are Rijkswaterstaat going to put into place to prove sustainable purchasing?

Embedding Sustainability Within Rijkswaterstaat

Rijkswaterstaat already meets the criteria of the 100 per cent objective (RWS, 2012a). However, this criterion does not contribute to the objective of the CO2 reduction by 20 per cent. Although Rijkswaterstaat has already met its 100 per cent objective, the organization desires to be more ambitious in the field of sustainable purchasing. Therefore the Board of Rijkswaterstaat decided in April 2012 to designate sustainability, alongside price and quality, as one of the three EMVI[2]-criteria in procurement of construction projects.

What does this third criterion mean? State Secretary Atsma of Infrastructure and Environment wants substantial sustainability taken into account in selecting the most appropriate private party. Bidders with an energy-efficient business operation or bidders who offer environmentally friendly products can thus receive higher ratings for their offer (RWS, 2012a). For the Principal it means that the bidders should get space for innovative solutions.

In reality, there are two important instruments to assess the sustainability of offers, namely a CO_2 Performance ladder and applying the DuboCalc method as EMVI-criteria. Other measures for creating added value on sustainability are sustainable construction logistics, energy extraction and social return on investment (RWS, 2012a). However, these are still under development and therefore continue to remain excluded. The first instruments operate as follows.

The CO_2 Performance ladder is used to score the durability of the business operations of the bidder. The DuboCalc method calculates the durability of the product offered. With the CO_2 Performance ladder, Rijkswaterstaat can determine what the contractor is doing to keep CO_2 emissions during the execution of the work as low as possible (RWS, 2012b). There are five steps. The higher the step the more successful the contractor has been in limiting CO_2 emissions. A higher score on the ladder (1–5) means a larger advantage in the tendering process, in the form of a higher nominal discount on the tender price (SKAO, 2011). Compliance is assessed throughout the progression of the project.

With the DuboCalc method, the Environment Cost Indicator-value (ECI-value) of the design of a civil work will be calculated. The ECI-value is a measure of the sustainability of the work and the environmental burden (RWS, 2012a). The lower the value, the more durable the design and the lower the environmental burden. The ECI-values form part of the contract.

The introduction of the CO_2 Performance ladder and DuboCalc is taking place step by step. As of the time of writing, civil projects above €35 million (and from January 1, 2013, all civil projects up to €35 million) will be subject to these criteria (RWS, 2012b). Because of this gradual introduction, the smaller companies have the time to introduce the CO_2 Performance ladder and DuboCalc (RWS, 2012a; RWS, 2012b). What is the current state in the case of Rijkswaterstaat? In other words, to what extent is there already experience with sustainable procurement?

Dutch PPP-Experiences With Sustainability

In 2011, Rijkswaterstaat applied the CO_2 Performance ladder to the procurement of eight performance contracts and three construction projects. DuboCalc was used during the procurement of four construction projects, including two PPP-projects: the A12 Utrecht–Lunetten–Veenendaal (near the city of Utrecht) and the A15 Maasvlakte-Vaanplein (near the city of Rotterdam). The sustainability criterion for of these two projects was applied as follows.

Sustainability was part of the tendering process for the PPP-project A12 Utrecht–Lunetten–Veenendaal. The A12 had introduced sustainability as an EMVI-criterion, which was new to DBFM-contracts (RWS, 2010). The assessment of the criterion of sustainable building at the A12 took place in four parts, specifically in the plan developed for sustainability, the measures to be taken for sustainable business operations, the application of DuboCalc and the

[2] EMVI is the most economically favourable bid

measures to be taken for sustainable project implementation. Each part had a different weight in the assessment. Sustainable project implementation weighed heavier in the drill communication than sustainable business operations (RWS, 2010). The private bidders had to give a description of the sustainability objectives, of the applied environmental management system and way of reporting on sustainability performance.

The evaluation report for the A12 shows that the results of the sustainable procurement process have been mainly positive, and there is even talk of a success (RWS, 2010). It was considered a success because of the wide focus on sustainability, the freedom in sustainable solutions, the value assigned to sustainability consistent with public goals and the weighting of the sustainability aspects was good. Despite this success there exist both within Rijkswaterstaat, as in the market, need for more targeted guidance in the field of sustainability per project (RWS, 2010: 4). The evaluation of project A12 shows the following points for improvement:

- More thematic prioritization from Rijkswaterstaat. Here arises a dilemma: on the one hand, the freedom given to bidders to design innovative sustainable solutions is a positive. On the other hand, however, this hampers comparison of the offers and makes the evaluation process for procurers more difficult (RWS, 2010).
- Introduce sustainability earlier in the tendering process (RWS, 2010: 10). The requirements for sustainability were introduced only between Plan-of-Approach-phase and the Consultation phase of the dialogue. If included too late, the introduction of the risk that the sustainability-related design decisions infer have already been taken by bidders (RWS, 2010: 11). Incorporating sustainability considerations earlier in the process leads to a different mindset to bidders about sustainability.
- More explicit attention to sustainability in the dialogue talks (RWS, 2010). The Principal should further develop knowledge and expertise on sustainability within their organization.

Sustainability was also given attention in the procurement procedure of PPP-project A15 Maasvlakte–Vaanplein. However, for the A12 the scope of the quotation at this point was wider (Eversdijk et al, 2011). Specifically, for the A15, the public attention for sustainability was considered to be too narrow (RWS, 2012), mainly limited to filling in DuboCalc, whereas sustainability in the case of the A12 was quoted more like a total vision (RWS, 2010).

Moreover, it is apparent from the interviews with private parties of both the A15 and A12 that they found the demands for sustainability only slightly distinctive when considering the calculation results from DuboCalc (Eversdijk et al, 2011). As shown in the procurement of the A12 and A15, bidders could achieve a high score in DuboCalc without additional sustainability measures (Eversdijk et al, 2011). This therefore constitutes a point of improvement for the future to increase the incentive for improved sustainability performance.

In addition to a difference in level of ambition between the two PPP-projects, another difference was found with regard to sustainability between the two projects. This concerns the way in which compliance is monitored during the realization phase of the DBFM-contract. In other words, there is a difference in the monitoring of the sustainability performance of the contractors. This happens with the A12 by systematically checking the quality system and risk assessment of the contractor during the term by the Principal. In the case of the A15, this happens only once—after completion of the work (RWS, 2010).

Apparently, in practice at the individual project level, space has been given to meet the sustainability criterion. It is therefore recommended for more structural monitoring of the way sustainability goals of Rijkswaterstaat are translated into DBFM-contracts. This will also improve, in practice, the extent to which sustainability performance will be achieved with DBFM-contracts.

Discussion and Conclusions

The A12 was the first PPP project that drew attention to sustainability during the tendering process (from January 2009 to September 2010). To realize wider sustainable purchasing, Rijkswaterstaat used two instruments whereby private bidders can receive a nominal discount on their tender price. Besides this, Rijkswaterstaat also strives to give bidders as much space as possible to enhance sustainable solutions.

However, at the individual project level it means balancing between public steering and private innovation. Too much guidance by government can suppress rather than stimulate private innovation. Each project should also be considered to determine whether there is sufficient design freedom for private parties to be distinctive with respect to sustainability (RWS, 2012a). For example, if the lowest ECI-value is expected to be nearly equivalent to the highest ECI-value, then there is apparently little or no profit in taking sustainability into account.

The sustainability policy has been launched. The initial findings are positive and, with the recent decision of Rijkswaterstaat, sustainability is now also one of three criteria under which private offers will be reviewed. Therefore, we may propose that Rijkswaterstaat is very driven with sustainability as a government organization which contributes positively to the viability of the Netherlands, now and in the future.

.

Product Lists: The GPP pathway in China

Samuel Colverson
International Institute for Sustainable Development

Background

Public procurement continues to play an important role in the ongoing development of China's public policy and market development. Although still immense, the declining dominance of state-owned enterprises and the continued strengthening of a genuine private sector within ongoing market liberalization requires a more nuanced approach to market regulation. When considering environmental issues, Green Public Procurement (GPP) is a mechanism through which the market can be guided towards stated policy objectives, not only driving environmentally conscious business practices but also raising public awareness more generally.

The Chinese GPP approach has developed over the last 10-year period and is integrated into an already well established and functioning public procurement apparatus that can be described as hierarchical in nature, with a centralized multi-level system that is characterized by its top-down structure.

The general procurement framework operates from a national level starting point, where the National Development and Reform Commission, the Ministry of Commerce, and the Ministry of Finance are responsible for the formulation of the policy framework, including directives, laws and guidelines. From there, it is the sub-central government's role to customize the regulations and specifications according to local context, administer budget allocations for public procurement, along with training of procurement officers. Depending on the size of the locality, these functions may be broken up into two separate offices, where a procurement bureau will develop local regulations and represent local interests at the administrative level between government bodies, while public procurement centres are tasked with implementing the actual procurement process.

GPP Approach

To administer GPP, the Chinese government employs a hybrid-framework approach (thus identified and named by Phillips (forthcoming)) that matches their specific bureaucratic characteristics, combining a certain degree of control through top-down methodology in coordination with freedoms to local bureaucrats at subsystem levels.

The main foundation for GPP in China comes from Article 9 of the Government Procurement Law (2002), which stipulates that procurement should be conducted in such a manner as to achieve State goals for economic and social development "... including but not limited to environmental protection, assistance to underdeveloped or ethnic minority areas, and promotion of the growth of small and medium sized enterprises" (People's Republic of China, 2002). In this sense, Article 9's (and the remainder of procurement legal frameworks) primary function is to provide a basis for GPP upon which the sub-government level structure must define and administer its GPP activities.

The national government has set in place two main policy tools to support Article 9 and assist sub-central bureaucrats by specifying environmentally and energy efficient products through two centrally controlled lists. The Energy Saving Products list was first released in 2004 and is updated biannually, now covering over 30,000 products in 28 categories manufactured by 600 enterprises. Only 8 of the 28 categories are compulsory for procurement agents: the remaining are voluntary. Similarly, the Environmental Labelling Products list is completely voluntary; first issued in 2006, it now covers 24 product categories.

As largely voluntary directives, the implementation of these product lists depends heavily on local structures and institutional conditions, the political and economical environment and staff capacity within procurement centres. The result is an unpredictable and highly contextual application of GPP across jurisdictions (Philipps, Espert & Eichhorst, 2011). Nevertheless, the targeted assistance at local-level GPP provided by the product lists is a good starting point for introducing and implementing GPP in China, and with increased capacity at the local level, the system can be improved in terms of broader coverage, flexibility and inclusiveness (in particular concerning small- and medium-enterprises). A national dialogue, backed up with a national questionnaire on this issue is ongoing. All in all, tapping into local potential is a promising way forward, as figures show that local governments are the key public spenders, in 2008 spending over 90 per cent of the total government expenditure on procurement (World Trade Organization, 2010, p. 40).

Following the pattern of implementation, the outcomes of GPP in China are variable and difficult to quantify. In the case of a government's resource and carbon footprint, some limited direct effects can be identified. Unfortunately, more important indirect effects in terms of market stimulation and increased consumer awareness are difficult to assess. For the case of the EU-funded SuPP-Urb project on GPP in China, direct savings within PPCs in the three project cities amounted to reductions of 105,749 tonnes of CO2. This is the equivalent of the annual CO2 emissions of 17,335 Chinese people in 2009, when the annual per capita emissions were 6.1 tonnes (Philipps, Marsille, Schröder, & Haberland, 2011, p. 17). Indirect effects within this project could only be estimated qualitatively via interviews with suppliers and stakeholders, where, at least for the most advanced city of Tianjin, relative impact can be assumed (Philipps, forthcoming).

Review

The use of product lists allows the central government to both guide the direction of the GPP process while also bridging the capacity and implementation gaps at regional level. Local procurers designing tender specifications do not have the burden of research and evaluation in a rapidly changing market, where new products are appearing every day and where energy efficiency or environmental advantages are not as easy to identify as purchase price criterion. In this way, the lists deal with both the lack of ability to evaluate green products, as well as the capacity constraints on time and personnel to conduct the necessary product evaluations at the local level.

Central lists have the ability to provide a degree of consistency and security within the market, as companies working across regions can be sure that the same minimum product specifications are in force, although the degree to which environmental criteria are incorporated and weighted within tender evaluation still remains variable. In this way, the central government can also direct the national market, enforcing a policy on energy consumption or recycling practices and signalling a market shift through the choice of products and categories, or the minimum requirements for entry onto lists.

One concern is that centrally controlled lists can infer a loss of flexibility and contextual relevance at the local level, as the decision-making process is removed from the on-the-ground practitioners and lists may not reflect local market maturity. Central authorities are also faced with a high workload in accurately evaluating products and maintaining comprehensive lists, with the risk that the most recent product or technology advancements are slow to enter the wider market as a result of evaluation backlogs. Similarly, small- and medium-enterprises that are innovating new products may struggle to get to market through the inability to fulfil and maintain the administrative requirements for inclusion in the lists. The same could be said for many potentially advantageous foreign products. Consequently, lists do not always reflect the true nature and potential of markets for environmental products, which has a flow on effect into the projects and services commissioned by procurers at the local level.

GPP seeks to implement policy through influencing the supply and demand side of certain product markets. Within this equation, product lists can only be partially successful because they tend to target procurers rather than the market. While they provide a ready-made recipe for procurers wishing to learn GPP and bridge capacity gaps, they do little to drive private sector innovation. Companies are not incentivized to design and innovate past the minimum requirements for inclusion in the lists, and, once on the list, there is little to encourage a product's further development. Stimulating technological and product development therefore relies heavily on the continued updating of list minimum requirements, an administrative burden that suggests in reality that updates occur less frequently than is necessary.

Concluding Thoughts

Product lists can be seen as a potential stepping stone for governments seeking to transition to GPP, offering the ability to overcome the capacity and knowledge gaps within the public sector to enable practical GPP implementation, whilst also educating and guiding the market on the design of environmentally sensitive products. To be successful however, lists and the entry requirements must be regularly and comprehensively updated to ensure correct market representation and to support innovation in product technology and design. As a stepping stone, it is important that more developed GPP practices are integrated into the list approach, including a move towards more robust price evaluation mechanisms such as life cycle costing, and capacity building across the bureaucratic levels in order to spread administrative burdens and encourage GPP take up at local levels.

This case study was written with the support of Sebastian Philipps of the UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production, and is based on three detailed papers produced by the Centre on GPP in China.

Sustainable Road Infrastructure Procurement in Australia

Adriana Sanchez and Keith Hampson
Sustainable Built Environment National Research Centre (SBEnrc)

Introduction

According to Tan et al. (2011), the establishment of a clear sustainability policy in the construction industry is paramount, if only as a statement of the commitment of the top management to protecting the environment and enhancing social responsibility. The resulting policies should then translate into proactive strategies and action plans that improve the sustainability performance of contractors and provide a competitive advantage by integrating "long-run profitability" with sustainable development efforts. The strategies should also take into account climatic protection issues through greenhouse gas emissions (GHGe) monitoring and reduction initiatives (Stocker & Luptacik, 2009).

Government procurement often represents a significant share of national GDP, accounting for up to 20 per cent for some countries (Garcia-Alonso & Levine, 2008) and approximately AUD100 billion in Australia (APCC, 2007). Therefore, in industry sectors where government entities constitute the largest client, such as in the Australian road construction sector, procurement practices can be used both as a strategic tool to promote certain behaviour and as an environmental policy instrument to further the environmental performance of products and services (Faith-Ell, 2005).

Road authorities have the opportunity to use green public procurement as a tool to promote positive environmental changes during the procurement process through green preferences and environmental selection criteria for bid evaluation. However, green procurement is also the aspirational target concerning environmental objectives that might help contractors achieve additional advantages in winning a contract (Uttam, Faith-Ell, & Balfors, 2012). Systems that encourage contractors to "go the extra mile" should therefore be employed.

According to the Australian Procurement and Construction Council (APCC) (2007), Australian Government entities such as the road authorities should encourage suppliers to adopt design and construction processes that reduce the use of resources and the overall GHGe generated by their services.

The Australian Sustainable Built Environment National Research Centre (SBEnrc) endeavours to build a more in-depth understanding of the complexities involved in construction of major roads in order to assist road authorities in their GHGe management efforts. Project 1.8 (Sustainable Infrastructure Procurement) focuses on the overall procurement processes, while also investigating ways to reduce the environmental impact of micro-construction processes such as mass-haul.

The main objective of the project is to provide the industry with a tool that can be used as a proactive mechanism to plan, monitor and review the GHGe from earthworks during major road infrastructure construction projects. This tool should support the development of green procurement methodologies to achieve Australia's GHGe reduction targets by optimizing mass-haul.

National GHGe Reduction Initiatives in Australia as They Pertain to the Built Environment

In May 2006, the APCC established a working group to develop an Australian and New Zealand Government Framework for Sustainable Procurement. This framework was released to the public in September 2007 (APCC, 2007).

During the same year, the Australian Government introduced the National Greenhouse and Energy Reporting Scheme (NGERS) (Aijun, 2007) under which all companies with annual emissions above 125 kilotonnes (kt) CO_{2eq} (for the fiscal year 2008–09) and 50 kt CO_{2eq} (as of 2010) or energy consumption over 500 terrajoules (TJ) (for the fiscal year 2008–09) and 200 TJ (as of 2010) must register and report their GHGe and energy consumption (Australian Government. CommLaw, 2009). This scheme forces many large corporations to at least monitor and understand their GHGe sources to avoid civil penalties.

The Australian Federal Government's ratification of the Kyoto Protocol came into force in March 2008, following the government announcement in December 2007 of a 60 per cent reduction target of the national GHGe by 2050 (refer to 2000 standard) (Aijun, 2007).

The Australian Green Infrastructure Council (AGIC)[3] was also formed in 2008 as a member-based association which, in 2012, made public the AGIC IS rating scheme. This scheme is Australia's only comprehensive national system for evaluating sustainability across the design, construction and operation of infrastructure (AGIC, 2012).

In 2011, the Transport Agencies Greenhouse Group (TAGG)[4] issued a GHGe assessment workbook for Road Projects aimed at providing the means to estimate GHGe from road construction works (Dilger, Riley, Young, Bengtsson, & Kneppers, 2011).

The Australian Parliament passed the Carbon Tax Bill in November 2011, with the tax coming into effect in mid-2012, thereby establishing a fixed carbon price regime of 23 AUD/tonne of CO2eq (Sydney Morning Herald, 2011) to affect all companies with GHGe above 25,000 tonnes of CO2eq (Crook, 2011). However, most road construction contractor emissions are under this threshold, and therefore will not be affected directly by the scheme.

Although there have been several national initiatives aiming to provide tools to the sector to encourage greener practices, there has been a lack of conviction in carrying out the action plans to materially affect practices in the road construction sector. Currently, the only national initiative which provides some level of accountability for GHGe in this sector is the NGERS. Nevertheless, there are neither mandatory reduction targets nor economic incentives to encourage attempts at reaching them.

[3] The predecessor organization for the SBEnrc, the CRC for Construction Innovation, was a founding partner of AGIC

[4] Members: New Zealand Transport Agency (NZTA), New South Wales Roads and Maritime Services (NSW RMS), VicRoads, Government of South Australia Department of Transport, Energy and Infrastructure (SA DTEI), Tasmania Department of Infrastructure, Energy & Resources (DIER), and Main Roads of Western Australia (MRWA).

Current Australian procurement practices

Lehtiranta, Hampson and Kenley (2012) mapped Australia's current GHGe reduction initiatives in the public road construction procurement sector based on the nation's five largest road authorities. These agencies are responsible for 96 per cent of the total AUD13 billion of annual national public road construction and maintenance expenditure.

Major gaps found in Australia's green procurement practices were found (Lehtiranta, Hampson, & Kenley, 2012):

1. A lack of established best practices, standardized procedures and guidelines for GHGe assessment and reduction.
2. A lack of integration between GHGe assessment and management mechanisms including platforms for interdisciplinary collaboration.
3. Scarcity of environmental criteria in designer and contractor selection.
4. Scarcity of incentives for GHGe reduction in contracts.
5. Incomplete monitoring, control, and review methods.
6. Lack of focus on mass-haul optimization as an environmental management tool.

The SBEnrc research team has continued to build on the work of Lehtiranta et al. (2012), helping to find a solution to the fact that most road authorities do not have systems in place to ensure the translation of such goals to proactive mechanisms applicable to road construction projects, despite having developed policies, strategies and action plans integrating GHGe reduction components to different degrees. However, it was found that many road authorities who are core partners to the SBEnrc are currently developing sustainable procurement guidelines and tendering requirements that will have an impact on GHGe from construction operations.

The SBEnrc research team is in close contact with influential agencies at both national and local levels, such as the Australian Green Infrastructure Council (AGIC), the Transport Authorities Greenhouse Group (TAGG), Austroads (Australian and New Zealand road transport and traffic authority association), Main Roads Western Australia, Queensland Transport and Main Roads, New South Wales Roads and Maritime Services, and Roads Corporation, Victoria (VicRoads) with an aim to maximize the relevance and impact of the research outcomes.

Green Procurement Incentive Tools

Broome p.112 (2002) states that "intelligent use of incentives relates to designing a multi-incentive plan so that the contractor, in pursuing its business objectives, is indirectly placing the same emphasis or weighting on each of the client's project objectives as the client does." There are numerous incentive mechanisms that can be built into the procurement process in order to translate policies and strategies into proactive initiatives that ensure achievement of the overall goals and objectives. Some of the possible incentive mechanisms are explained in the following sub-sections.

1.1 Pre-qualification

Lam, Ng, Hu, and Skitmore (2000) define contractor pre-qualification as a process to evaluate the ability of candidate contractors to complete a contract satisfactorily before they are admitted into the bidding process. Austroads developed the National Pre-Qualification System for Civil (Road and Bridge) Construction Contracts, applied nationwide. However, while this system requires a certified EMS, it does not include sustainability or GHGe management (Casey & Kelley, 2010). These concepts could be included as a criterion in the EMS.

1.2 Multi-Factor Tender Evaluation

Multi-factor or multi-criteria tender evaluation is a way to achieve best value for money instead of simply the lowest price. This approach to tender evaluation has been growing in the contractor selection process over the last decade and can be carried out on a project by project basis or through a standard set of criteria (Wong, Holt, & Cooper, 2000).

To this end, numerous advanced models (such as Multiple Kernel Learning [Lam & Yu, 2011], Stochastic Decision Models [Russell, et al., 1990], etc.) and non-financial criteria have been created to compare different bids. They could be applied based on the road-building techniques and materials proposed by the contractors during tender (e.g., GHGe calculations [Zammataro, 2010], Environmental Cost Assessment [Curkovica & Sroufe, 2007], CO2 Performance Ladder and DuboCalc [Rijkswaterstaat, 2010], etc.).

1.3 Performance Selection Incentive

Kenley, et al. (2000) described a performance incentive scheme based on voluntary assessments, which could work as a reward scheme by assigning tender price reductions depending on the rating attained by the bidding contractors. This system could be used in the road construction industry through the adoption of sustainability rating tools (e.g. INVEST [Murphy, 2011b], AGIC IS [AGIC, 2012], CEEQUAL International [CEEQUAL Ltd., 2012a], etc.).

1.4 Tax Incentives

Tax incentives can motivate stakeholders to perform more sustainably in the construction industry (Feige, Wallbaum, & Krank, 2011). An example of such taxes is the carbon tax, an excise tax imposed according to the carbon content of fossil fuels (Zhanga & Baranzinic, 2004). The Australian Parliament passed the Carbon Tax Bill in November 2011, with the tax coming into effect in mid-2012 and thereby establishing a carbon price regime of AUD23/tonne of CO2 (Sydney Morning Herald, 2011). Such a tax could be an incentive to reduce fuel consumption during road works and therefore improve contractor GHGe performance.

1.5 Incentive Contracts

Contract clauses can be used for sustainability purposes to address issues that pertain to the execution of the contract. Performance-based incentives can be used through the establishment of minimum levels of performance at project completion ("gatepost" incentives) or at milestones ("graduate" incentives) (Broome, 2002, Ch. 5). Conditional and banked awards, as well as value enhancement incentives can also be integrated into the contract to promote higher performance (Broome, 2002). GHGe calculators such as Carbon Gauge designed by VicRoads (Murphy, Sustainable Procurement Practices, 2011a) and CHANGER designed by the International Road Federation (IRF, 2010) could be used to such an end.

1.6 Delivery Models

There are many delivery models available to the road construction industry, and the project will excel only if the right delivery model is chosen for the appropriate context (Song, Mohamed, & AbouRizk, 2009). The delivery method selection is therefore one of the most critical steps in ensuring project success (CEIID, 2010).

In the construction industry, traditional design–bid–build approaches have historically created adversaries among project team members, whose individual profitability frequently is only attainable at the expense of another party to the contract (Hauck, Walker, Hampson, & Peters, 2004). Currently, there is a trend in Australia towards Alliance and PPP contracts for delivering some of Australia's most complex and significant public sector infrastructure projects (CEIID, 2010). However, PPP is not as common as Alliance in the Australian road construction industry.

Because Alliance contracts are based on best value primacy (Walker & Hampson, 2003), this model has the potential for promoting innovation and achievement of positive outcomes in relation to GHGe and other sustainability issues (Gollagher & Young, 2009).

Conclusions & Recommendations

In a world concerned about climate change, government procurement can be a very powerful tool to create incentives for industry to adopt less GHGe-intensive practices and technologies.

To this end, there are several incentive mechanisms for performance improvement that could be applied to the road construction industry. These are been currently studied by SBEnrc in order to find the most suitable option. These incentives vary depending on the project phase where they are considered; road authorities, for example, can employ project management incentives, which can include access to contracts through pre-qualification requirements, performance-rating-based tender evaluation, contract specific incentives and early contractor involvement delivery methods.

In the opinion of the authors, the steps towards achieving the GHGe reduction goals that Australia has committed to on behalf of all government entities by signing the Kyoto Protocol should include the implementation of a combination of project specific and cross-project incentives by road authorities.

Based on the research conducted for the present study, it has been concluded that incentives are most effective when applied at the earliest project phases. Furthermore, a benchmarking system of project emissions and GHGe reduction initiatives would facilitate the objective comparison of bids, including their impact on the GHGe reduction goals. To achieve this, such a system should allow the implementation of pre-qualification requirements based on maximum GHGe per kilometre of road work, on environmental cost of carbon pollution, or on a combination of both into the cost/benefit analysis of the tender evaluation.

For incentives to be effective, systems for accurate and objective monitoring and reporting of contractor performance must be instituted. The above strategies should therefore be combined with the use of specific key performance indicators (e.g., on-site fuel monitoring device requirements) that ensure accurate and objective performance monitoring to ensure these contract incentives are as effective as possible.

The delivery method can have considerable influence on achieving the project GHGe goals. By including the contractor at an earlier stage and with the use of proper incentives (e.g. conditional contract renewal), Alliance, Early Contractor Involvement and Public/Private Partnership models could allow for the utilisation of technologies and techniques that, while not necessarily representing the lowest cost, have preferable GHGe impact levels. Furthermore, incentives such as extra-cost sharing for carbon offsetting or 'greener' technologies can be used as an alternative solution.

The Australian Sustainable Built Environment National Research Centre (SBEnrc) will continue to work with the various road authorities and influential groups to develop a set of tailored solutions for the Australian road construction context.

Clusters as Catalysts for Developing "Smart Cities" Through Intelligent Public Demand

Marianna Lubanski & Michael Johansen
Copenhagen Cleantech Cluster

Background

With the ambition to become carbon neutral in 2025, the City of Copenhagen has embarked on a journey to become a "smart city," where, among other things, energy is used intelligently, transportation flows smoothly, and waste is utilized as a resource in order to increase the quality of life for its citizens. A broad variety of initiatives need to be developed and implemented to realize this goal, and the City Hall plays an important role, not only as a policy developer, but also as a procurer of new infrastructure, technologies and services. However, cities and other

public procurers do not always know what is possible and what is not when it comes to the procurement of new and complex technological solutions. The outcome is often less innovative solutions.

As a result, Copenhagen Cleantech Cluster and the City of Copenhagen have entered a strategic partnership to explore new methods in using public procurement as a driver for innovation that supports Copenhagen's green transition in becoming a "smart city."

An innovation platform has been established facilitated by Copenhagen Cleantech Cluster as a new method to engage experts and entrepreneurs across sectors in a creative process to generate ideas on how to develop a digital infrastructure for the smart city. The method and the obtained lessons until now hold great potential for using public procurement to drive innovation.

The Smart City

"Smart cities" has emerged as a global megatrend in response to the challenge of increasing living standards and quality of life while tackling booming urbanization and escalating greenhouse gas emissions, congestion and pollution. The concept of the smart city comprises many technologies such as smart waste, smart water, smart transportation, smart grid and smart buildings. Most of the required technologies already exist, but it turns out that realization of a smart city is not just a technological fix that can be solved through public procurement.

City administrations have the city planning authority and act as procurer, but development of innovative ideas and solutions require stakeholder involvement and citizen engagement. Current EU legislation limits the city authorities' ability to interact with the private and the civil sector to ensure transparent procurement processes and free and open competition in the bidding process. As a result, cities have to look for new ways to ensure innovation as a pre-process to the actual procurement process.

Clusters and Triple Helix Cooperation

Clusters as geographic centres of interconnected economic and innovative activities are increasingly seen as drivers of growth, and the cluster concept is being adopted by industries and policy makers, who want to support and even create "Silicon Valleys" of their own. As a consequence, cluster organizations are emerging all over the world as a new type of cross-sector platform to facilitate interaction between public authorities, private sector and research institutions in the so-called triple helix model.

Traditionally, these three institutional spheres have operated within their own logical systems. The realization that capitalizing on knowledge and innovation capacity at a regional level requires strong relations and collaboration across sectors has, however, led to the establishment of many hybrid units. Examples are tech transfer offices at universities, government research labs and lobby departments in larger companies. This way, institutional spheres are increasingly overlapping, and the formation of cluster organizations takes this overlap to the next level.

Copenhagen Cleantech Cluster

Copenhagen Cleantech Cluster is one of the world's leading cluster organizations, sponsored by two regional authorities (Capital Region of Denmark and Region Zealand) and the European Union with a total budget of €20 million. The cluster initiative has a partner base representing the entire value chain of Danish Cleantech, and 11 organizations drive activities on behalf of the cluster in a decentralized organizational setup.

The initiative is now halfway through the five-year project period, and can document concrete results on job creation, inward investments, gap funding, international cooperation projects etc. More importantly, the formation of a coherent cluster organisation with buy-in from all relevant Cleantech stakeholders in the region, paves the way for even more innovation.

To develop the cluster even further and establish a sustainable cluster organization, Copenhagen Cleantech Cluster has been established as a non-profit association that launches new initiatives to foster innovation and green growth.

The Cluster Organization as Driver for Green Procurement

Over the last year, the cluster organization in Copenhagen has become a strong alliance partner for the city authorities in testing out new ways of driving green growth and the "smart city" agenda. The administration logic, focus and practices of the City do not include open innovation and the facilitation of complex stakeholder relations to find new ways of doing things, and here the alliance with the cluster organization comes in handy. The City benefits from the operational and hands-on approach of the cluster, and the cluster benefits from a visionary City Hall and a City that is ready to implement (and procure) new solutions as well as play host to test and demonstration projects.

Innovation Platform

The City of Copenhagen and Copenhagen Cleantech Cluster have established an innovation platform to involve stakeholders in the development of the smart city. The innovation platform method is based on experiences with public–private innovation from the U.S., the Netherlands and Finland, where intelligent public demand has been tested as a tool to solving some of modern society's grand challenges that call for radical innovation and very active participation from the public sector.

The process can be divided into four phases:

Identifying and prioritizing challenges

The process starts with the identification and prioritization of important challenges by the public authorities. In this phase, it is crucial that the public authority is committed to invest time and resources in developing the solutions to the challenge.

In this case, Copenhagen's ambition to become a smart city was set out as the grand challenge.

From grand challenge to specific problems

The next step is to collect knowledge about the challenge and ideas about how the challenge can be solved. Concrete solutions are not explored in this phase, which instead addresses in which strategic direction the solution could be found. It is important to be open to many ideas and explore alternatives.

In the case of the "smart city" platform, experts, entrepreneurs and other stakeholders were invited to help understand the grand challenge in more detail, and break it down into more specific problem areas. The first finding was that citizen engagement and data availability are the most important issues, and, based on this finding, the focus of the platform became more specific: to *identify how existing and new data can be made available through a digital infrastructure.*

This challenge was discussed at a series of meetings between the city and the cluster, where city representatives presented obstacles and opportunities for a solution. Based on these discussions, it became clear that it would be of great benefit to explore further how a digital infrastructure could be established, and it was decided to move to the next phase.

Innovation teams

Partners and stakeholders with the competencies to contribute to solving this more specific challenge are identified, and possible solutions and barriers are explored in more detail. It is important that the public sector is actively engaged throughout the process, since they are ultimately procuring a solution.

In this case, the more specific challenge of establishing a digital infrastructure was explored in more than 20 meetings, six workshops and a digital workshop with more than 200 experts involved. Topics addressed included data availability, open vs. closed standards, business models for establishing a digital infrastructure, waste management, water management, transportation, energy consumption etc. Over a period of six months, these interactive elements provided substantial knowledge and input for how to establish a digital infrastructure for a smart city.

An important conclusion was that a central issue is to find a proper business model, where private sector players can build the digital infrastructure on market terms, and at the same time have open standards and secure the sharing and availability of both public and private data. Establishing the right business model for the digital infrastructure will be a focal point going forward.

Procurement and Implementation

Based on knowledge and input, the next step is to put out a tender for a new solution. The identity of the procurer is not given; it might be a public authority, but it could also be an association with public sector backing.

In the Copenhagen case, a test case has been developed in the area of traffic. The City wishes to reduce CO_2 emissions from traffic looking for available parking spots. The Copenhagen Cleantech Cluster has facilitated a three-month process to develop different scenarios to solve this challenge. The scenarios will be handed over to the City of Copenhagen, which can use them for inspiration to develop the final procurement material/criteria.

This way, the City will be a very qualified buyer, which has received the best possible input from leading researchers, companies, entrepreneurs and citizens before defining what they wish to buy.

Lessons Learned

In this case, the City authorities are not only policymaker, city planner and procurer, but an active participant in the innovation process as well as upgrading the internal knowledge about possible solutions to the city's challenges. City authorities can benefit from using the cluster organization as a neutral meeting place and a competent facilitator that drives this process.

The cluster plays the role of arms-length innovation agent and is a driver of innovation and concrete action in close collaboration with the City. The cluster's role is not to be compared with a consultancy, as the cluster is a non-profit member-based organization. The cluster has the necessary partnerships with stakeholders across the triple helix to ensure the cluster remains a driver of innovation, providing business opportunities to cluster companies.

The Case for Accelerating Innovative Public Procurement in Outdoor Lighting

Jan-Willem Scheijgrond
Philips

Cities consume 70 per cent of the world's energy supply, a figure that will only increase over time. Going forward, how will these cities manage to meet growing energy demand while keeping costs under control and reducing their carbon footprint?

Lighting accounts for 19 per cent of the world's electricity consumption. Significant savings are possible—on average 40 per cent—simply by switching to energy-efficient lighting technologies such as LED (light-emitting diodes). On a global level, these savings amount to €128 billion in reduced electricity costs, 670 million tons of CO2, or the equivalent of 642 power plants.

LEDs are revolutionizing the energy efficiency of lighting. They slash energy bills, are infinitely scalable, extremely reliable and have a much longer lifetime than almost all other types of lighting. But like any new technology, they face barriers to adoption from a market unfamiliar with their benefits.

In 2009, The Climate Group established "LightSavers," a global program to accelerate the market adoption of outdoor LED lighting and smart lighting controls. Twelve cities participated in this program, including Kolkata, London, New York and Sydney, to independently verify the performance of LED lamps. The Climate Group published the findings in "Lighting the Clean Revolution" in June 2012. The report demonstrates that LEDs are ready to be brought to scale in outdoor applications. The independent and verifi-able results from the program demonstrate that outdoor LED products offer high quality light, durability and significant electricity savings in the range of 50 to 70 per cent.

However, despite these obvious benefits, rapid adoption of LED outdoor lighting remains hindered by two barriers:

- **Upfront cost.** LEDs are already economically attractive in many settings, such as outdoor environments where energy or maintenance costs are high. This is particularly the case when based on a Total Cost of Ownership calculation. But they face a particular economic disadvantage in their high upfront costs. At a time of serious financial constraints, this can limit LED sales even in settings where the long-term economic, environmental and social benefits clearly outweigh the costs.
- **Lack of awareness.** Major governments and corporations are important drivers for the early LED market, but there is great variation between lighting managers' levels of awareness: from recognizing energy saving as an issue, being alert to the current state of LED technology and to understanding how to proceed in procuring well-designed LED solutions. With LED technology changing so rapidly, keeping up to date can be challenging.

SOCIAL BENEFITS OF LED LIGHTING IN TORONTO

Like many cities, Toronto traditionally overlights parking areas and garages to increase the public's sense of safety. But lighting public spaces 24/7 regardless of their occupancy leads to high electricity bills and unnecessary carbon emissions. In Toronto's Ellesmere and Victoria Park housing garages, a new LED smart control system has used dynamic lighting to cut energy use by as much as 80 per cent, while delivering significant improvements in public safety.

Smart controls allow the level of light produced by the LEDs to be kept to the minimum permitted by standards, and then ramped up by simple occupancy sensors when the area is occupied by moving people or vehicles. Opinion surveys in these parking garages show this lighting strategy increases public safety, as people using the parking garage become more aware of others present in the parking area when light levels change.

(From "**Lighting the Clean Revolution**," June 2012)

1. Define the problem, consult the market, and procure the solution.

Developments in outdoor LED are moving quickly. Especially in the absence of sufficient knowledge about lighting within cities, it makes sense to consult market players about the problems you face with lighting the city as part of the procurement process. Market players can inform cities about solutions and developments, possibly with the support of an independent party to validate claims. Once you understand what solutions are out there, specify the tender, referring to international lighting standards where possible to allow for a level playing field amongst companies.

2. Procurement on the Basis of Total Cost of Ownership

The most effective way to compare the value of LED products with their conventional counterparts is to conduct a total cost of ownership analysis to assess the total cost of ownership of each technology option. Then the potential LED adopter can compare technology alternatives on an even economic playing field, rather than solely on the basis of upfront cost and simple payback. The key data inputs for such an analysis would include:

- Number of street light luminaires to be replaced.
- Cost of installing the new luminaires, including required roadway closures.
- Maintenance cost of replacing luminaire components when they burn out or fail, including cost of roadway closures to accommodate crews.
- Energy costs estimated during the lifetime of the luminaires.

- Useful lifespan of the existing and the LED luminaires.
- An appropriate discount rate.
- Possible benefits for public safety and aesthetics.

3. Invite innovation and "green" in the procurement process. Too often, bid documents state they invite innovative and green ideas, but evaluation is done on simple lowest initial cost criteria. It is important to ensure the awarding criteria, the length of the contract, and the related maintenance provisions clearly reward innovation and green too. For example, you may need to increase the length of contract for LED, as savings are ongoing for a longer time than conventional lighting. Furthermore, you may want to build in a profit share option and flexibility for suppliers that can green the solution during the contract as technology evolves and new ways are found to reduce maintenance or energy costs. For example, Philips won a tender in Spain some years ago, although the finance was not made available until years later. In cooperation with the city, we were allowed to change the specifications of the solutions to take into account the latest technologies, allowing the city to achieve better light at lower cost.

4. Small is beautiful. Some cities are too ambitious, wanting to replace all lighting in the city with one procurement process. It is advisable to go for smaller steps: e.g., a district, or only main roads, pedestrian area. This makes negotiations simpler, speeds up the implementation, and reduces the risks. It also allows more and local/small players to participate in the procurement process as the risk of the project becomes bearable to them as well.

5. Explore innovative financing solutions. Our experience is that there are many innovative ways to overcome the barrier of high upfront costs by exploring various finance options such as leasing, performance contracting, public–private partnerships (PPP), private finance initiatives (PFI) and carbon financing under the Clean Development Mechanism (CDM). The various financing forms are able to rebalance the capital expenditure and operating expense thus adapting to the financial constraints of practically any city. Again, it is important to go out to the market and investigate which financing options suit you best. Philips has worked with many cities to find suitable financing solutions, including providing our own financing.

Mayors, city planners, and lighting managers have a great opportunity to tap into the wealth of experience available around the world to help them shape innovative procurement practices for LED outdoor lighting. Financing propositions are also increasingly flexible to meet anyone's needs. The only challenge remaining is the courage to show leadership and join the LED revolution.

Trends revealed in recent changes to Brazilian public procurement legislation

Valéria D'Amico
State Government of Sao Paulo, Brazil

The process of continuous improvement and modernization of public administration in Brazil, especially in the area of public procurement, has provided a very favourable environment for adopting sustainable public procurement policies. Such policies are, since 2005, in a process of progressive dissemination, initially championed by the federal states and later by the federal government. Currently, it can be said that solid initiatives to implement sustainable procurement policies are taking place at the regional and local level across the country.

For these developments, we must consider the contribution of the UN Conference on Sustainable Development, Rio+20, held in June 2012, which strengthened the sustainable development agenda. One of the two central themes of the conference, *green economy in the context of sustainable development and poverty eradication*, encompasses sustainable procurement policies, thereby renewing government commitments in this area.

As the United Nations Environment Programme (UNEP) report *Towards a Green Economy—Pathways to Sustainable Development and Poverty Eradication* (2011) makes clear, the transition to a green economy is already under way. The publication argues that this path will be up to the governments, through, among other measures, green public procurement.

Sustainable Public Procurement in Legislation

Under the encouragement of the Rio+20 Conference, Brazil established Decree No. 7.746/2012 which consolidates and extends the Sustainable Procurement Program, regulated by the federal Tendering and Contract Law No. 8.666/963, to establish criteria, practices and guidelines to promote sustainable national development through contracts undertaken by the federal government, and establishing the Interministerial Commission on Sustainability in Public Administration (CISAP).

As a result, federal agencies must observe sustainability guidelines in acquisition processes involving environmental, social and economic issues, valuing the pursuit of minimizing the impact on nature, encouraging regional development, employment generation as well as efficiency and innovation.

The decree lists the following guidelines: low impact on natural resources such as flora, fauna, air, soil and water; preference for materials, technologies and raw materials from local sources; more efficient use of natural resources like water and energy; higher generation of jobs, preferably with local labour; longer life and lower maintenance cost of products and works; use of innovations that reduce the pressure on natural resources; and environmentally sound sourcing of natural resources used in goods, services and public works.

A Shift Toward Provisions Favouring Local Content

Building on its experience with SPP, Brazil has begun to focus on local content rules as it seeks to utilize procurement in support of national development. Noteworthy, because it affects the entire Administration, is the recent change in Law No. 8.666/1993—General Procurement Law. Considering that the scope of the Law concerns the Union, the States, the Federal District and the Municipalities, it has a huge impact. The change was made by Law No. 12,349 on December 15, 2010 and is based on an appreciation of the role of the state in promoting economic development and strengthening the productive chains of domestic goods and services.

Law 12,349/2010 imposes several significant changes in the federal Tendering and Contracts Law (No. 8,666/963), especially the inclusion of Article 3 on the "promotion of sustainable national development" as a new objective of tenders.

It was the relevance of this legislative mechanism that introduced the conditions necessary to establish a degree of preference for manufactured goods and on services that meet Brazilian technical standards, taking into account:

- The generation of employment and income
- The effect on the fiscal incomes of federal, state and local governments
- Development and technological innovation carried out in the country
- Cost of additional products and services
- Review and retrospective analysis of results

According to the Explanatory Memorandum for Provisional Measure 495/2010 converted into the above-mentioned Law, other countries also guide the purchasing power of the State to encourage domestic production of goods and services, and have also established a preference for domestically manufactured products, such as the United States and China. In Latin America, Colombia and Argentina in particular have also established regulations that give preference to domestic products.

Brazilian law establishes that the bidding process can award a certain preference to products and services that meet national Brazilian standards and methods and for goods and services resulting from the development and technological innovation performed in the country. Defined by the federal executive branch, the preference margins for domestic products and services will be up to a maximum of 25 per cent of the price for foreign manufactured goods and services.

It is important to note that the list of companies favoured by the application of Law 12.349/2010 is issued online, indicating the preference level allocated to each as they are applied in the bidding modality auction, (as dealt with in Law No. 10,52/2002), recognizing the importance of economic efficiency and transparency.

In the context of global governance, it is essential to recognize the role of transparency and integrity in public administration in generating the trust needed to establish stronger relationships with businesses, civil society and other governments. Here, cooperation between relevant actors and the leverage of high investments flows occurs in a political environment free from misappropriation of resources and mismanagement. As regards the application of preference margins and compensation measures through commercial, industrial, or technological means or through access to favourable financing conditions, this role is carried out by federal public administration regulations in Law 12,349/2010. The regulation also creates an Interministerial Commission for Public Procurement which will be responsible for defining the margins of preferences that will apply to federal procurement, such as those already applied to the purchase of clothing, footwear and accessories, bulldozers and backhoes, and for drugs and medicines. It appears that the States, the Federal District, the Municipalities and the other powers of the Union may follow suit and adopt the margins of preferences provided by the Federal Executive.[5]

According to the Ministry of Health, medicines were the first items to be defined with the additional preference margins. As disclosed by the Ministry, "The purchases of medicines and vaccines corresponded in 2011 to BRL 4 billion (of the total BRL 12 billion spent on drugs) and account for about 20 per cent of the external deficit of the sector. With the application of margins, we estimate the impact on the national market [to be] BRL 2 billion and generate 5,000 jobs, [and] additional revenue beyond BRL 50 million."[6]

This process is part of the federal government plan that prioritizes the State action, through government procurement with funds announced around BRL 8.4 billion.[7]

Harnessing Large Government Infrastructure Spending

One of the most important strategies in the transition towards a green economy and sustainable development is to mobilize the purchasing power of government to promote changes in current production and consumption patterns.

In this context, Brazil recognized the opportunities to promote market development presented by the significant amount of investments due to the organization of the 2014 World Cup and the 2016 Olympics, and the ensuing demand generated directly by the government through development projects and constructions conditioned by the mega-events' timing. This led to the establishment of specific legislation targeting procurement from these events. Law No. 12,462/2011, which established The Differential Public Procurement Regime (RDC), applies only to tenders and contracts necessary for the 2016 Olympic and Paralympic Games, the FIFA Confederations Cup 2013 and FIFA 2014 World Cup, involving infrastructure construction and contracting services for airports near the capital of the host cities. Later on, in July 2012, the legislation included actions of the Growth Acceleration Program (PAC), a strategic investment program that combines management initiatives and public works, focussing on investments in the areas of logistics, energy and social development.

The RDC does not change Federal law on procurement tenders, contracts or procedures, but rather establishes innovation provisions for sustainable development and speeds up public contracting, aiming to reduce excessive formalities, valuing competition and prioritizing the use of electronic means of procurement. It is expected that the RDC will influence future revisions of the procurement legislation, inserting sustainability criteria clearly and objectively into federal law.

Final Thoughts

This article has sought to present Brazil's approach in using public procurement to achieve national development and growth goals. In doing so, it has highlighted a focus on growing local markets, and outlined the steps taken in procurement legislation to support domestic goods and services through local content provisions. It is too early to determine the outcomes from these initiatives, but it is clear that Brazil will continue to integrate sustainable considerations and seek to use public procurement to spur the growth of national and local markets.

[5] For more information, see www.desenvolvimento.gov.br/sitio/interna/noticia.php?area=2&noticia=11607) (in Portuguese).
[6] For more information, see portalsaude.saude.gov.br/portalsaude/noticia/5846/162/sus-dara-preferencia-a-equipamentos-nacionais.html (in Portuguese). Translation by IISD.
[7] For more information, see www.brasilmaior.mdic.gov.br/noticia/index/institucional/id/1543 (in Portuguese).

Sustainable Infrastructure Within Public Procurement: The GEB Grading Tool and Sustainable Infrastructure Financing

Katharina Schneider-Roos and Daniel Wiener
Global Energy Basel

Preface

"Infrastructure has particular challenges in public procurement, because it is highly complex and customized and often requires economic, political and social considerations from a long time horizon" (Estache, Iimi, & Ruzzier, 2009, p. 33). More than that, the procurement of infrastructure is not an isolated action, but one that moves beyond construction to entail a host of supporting services integrated within the infrastructures operation, such as energy, waste treatment, transport and mobility. In acknowledgment of this complexity, the Global Energy Basel (GEB) Grading Tool provides a self-evaluation for sustainable infrastructure projects according to the three pillars of sustainability (economic, social and environmental) which helps to identify a project's strengths and weaknesses in the starting phase of procurement and to improve its quality through self-assessment. Project providers can thereby align their projects with sustainability criteria before presenting them to investors.

Five Core Challenges in a Changing World

Sustainable infrastructure chiefly addresses a series of interconnected challenges that will determine the quality of life in the 21st century. These challenges will set the tone for investment in sustainable infrastructural development:

- Population growth and urbanization
- Economic development and poverty alleviation
- Climate change mitigation and adaptation
- Resource scarcity and security
- A safe environment and preservation of biodiversity

GEB identified these five core challenges as critical issues worldwide, for which investors, pension funds, insurance reserves, and sovereign wealth funds will have to make investment policy and strategic asset allocation decisions that will impact the entire infrastructure value chain. The world's largest infrastructure developers will also be operating in this changing investment environment.

In order to sustain human living conditions we need to keep global warming below 2°C, reduce CO2 emissions by at least 80 per cent in OECD countries by 2050 and develop low-carbon growth strategies in all other countries. These efforts will trigger a major redesign of urban infrastructure. According to the World Bank (2011), annual investments of US$140–175 billion are projected for the next 20 years and another US$ 30–100 billion per annum for climate change adaptation.

Investment to provide resilient infrastructure is a fundamental need to support a balanced and sustainable development pathway that addresses social, ecological, and economic concerns. Adequate infrastructure combined with a forward-looking mindset empowers people to make the right choices for addressing the five core challenges that impede sustainable development.

Whether at the societal, community, or individual level, it is the provision of integrated infrastructure that frees people to make sound long-term choices. How can households conserve energy if the insulation in their house is insufficient? Poor public transportation systems remove incentives for families to abandon a mobility model based on multiple cars per household. Subsidies for redundant, inefficient energy systems undermine investors' faith in the potential for renewable sources of power.

The GEB Grading Tool

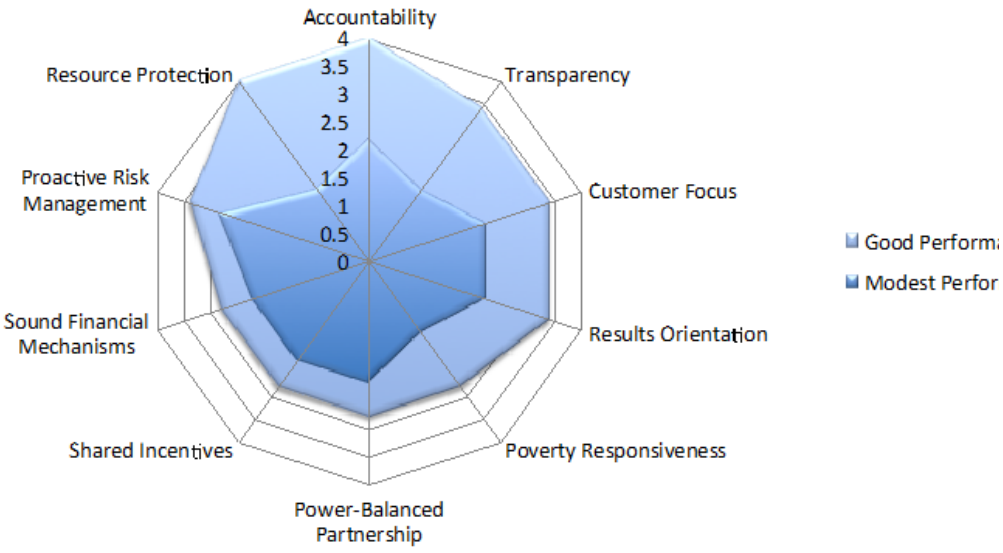
The GEB Grading Tool and Public Procurement

The GEB Grading Tool has been developed in response to the needs of complex infrastructure projects for assessment that recognizes and accounts for sustainability as part of the investment and finance stage of project development. With the GEB Grading Tool it is possible to distinguish infrastructure projects that address the full range of sustainability criteria from general infrastructure projects that do not. This step is indispensable for attracting investors who are present on the GEB platform and interested in investing in sustainable infrastructure projects.

Through Capacity Building Workshops, GEB has trained city officials through the use of the GEB Grading Tool. GEB's Capacity Building Platform offers workshops not only on the usage of the self-evaluation tool but also on the concept of "sustainable infrastructure" itself. It empowers cities and other project owners to improve the structure as well as the presentation of their projects in order to make them more attractive to mainstream, forward-looking investors

The GEB Grading Tool covers questions of sustainable public procurement by means of its 10 topics: Accountability, Transparency, Customer Focus and Results Orientation, Poverty Responsiveness, Power Balanced Partnerships, Shared Incentives, Sound Financing Mechanisms, Proactive Risk Management and Resource Protection. The themes of Accountability, Transparency and Resource Management are particularly relevant to public procurement.

GRADING TOOL EXAMPLE



The Underlying Initiative

The Grading Tool is based on a toolkit for developing public-private partnerships (PPPs) for water services. This initial project aimed at improving partnership governance in water services through PPPs. The goal of this initiative was effective water governance for all water users.

The toolkit was originally designed by The Swiss Agency for Development and Cooperation (SDC), the Swiss State Secretariat for Economic Affairs (SECO) and Swiss Re Centre for Global Dialogue through a rigorous multistakeholder process. Their common objective in this initiative was to enable optimal use of PPPs as one option that contributes to the overall performance improvements of water supply and sanitation services. While Swiss Re contributed its risk expertise in this partnership, SDC and SECO placed additional emphasis on improving the sustainability and poverty focus of PPPs.

Although the original focus of the Tool was on the involvement of the private sector in water supply services, much of the content is also applicable for systems managed by public utilities.

How the 10 Themes Were Shaped

Over 300 stakeholder representatives have helped to develop these tools, including representatives from national, regional and local governments, UN and multilateral organisations, local authorities, public utilities, civil society organisations, private companies, business organisations, labour unions, international financial institutions and development agencies, as well as water expert groups.

Several drafts of a policy-level document, "Policy Principles," were produced and discussed in an open consultation process. The operational guidance document, "Implementation Guidelines," was developed in collaboration with renowned experts in the field and subjected to a review process. To ensure and verify the applicability in various contexts, regional multi-stakeholder discussions and applications were held before producing the first official version of the instruments.

From Water to Sustainable Infrastructure

Given the involvement of members of Global Energy Basel in the development of this initial tool, it was clear that any effort to design its own Grading Tool would be based on this first, extremely thorough and comprehensive effort. Water systems, as presented in this initial toolkit, are also sustainable infrastructure projects, and hence serve very well as a test case for determining the crucial qualities for sustainable infrastructure projects in general.

In this effort, Global Energy Basel has used this extensive work to develop a new toolkit: the grading system that can be applied to any sustainable infrastructure project. What recommends this approach and this toolkit is that it is based on extensive research into existing projects and the development of policies for best cases. This assures that the Grading Tool is a comprehensive and highly applicable approach for sustainable infrastructure.

Promoting Public Procurement and Green Growth through Sustainable Infrastructure Financing

Infrastructure projects are ever more exposed to risks due to failure to meet sustainability criteria such as unforeseen negative impacts on the environment, lack of integration of stakeholders, and lack of common agreement on incentives and goals between the stakeholders. The use of the Grading Tool helps stakeholders understand and detect such risks, which, if not addressed in a timely manner, can generate extra costs and delays for a project. In short, the Grading Tool allows risks to be addressed much earlier and thus more efficiently.

Investors in sustainable infrastructure projects are in need of an independent evaluation tool that allows them to compare projects according to sustainability criteria. Making these comparisons becomes part of investors' due diligence and sets a new focus. On the other hand, governments searching for private investments in their sustainable infrastructure projects see the benefit of applying a self-evaluation tool up front to encourage efficient adherence to sustainability criteria. If an infrastructure project is designed to be sustainable from the start, then its procurement will naturally follow suit.

Procuring for Innovation: Lessons from GPP in Denmark

Samuel Colverson
International Institute for Sustainable Development

The European Commission indicators for public procurement show that, in 2010, Denmark had an estimated total expenditure on works, goods and services to the value of more than €41 billion, having risen steadily over the previous five years from an estimated €33.6 billion in 2006 (European Commission [EC], 2010). The purchasing power of public procurement within Denmark to both promote and support the production and sale of green products has been well established over the past 15 years, where a green procurement agenda has shaped both procurement frameworks and private sector behaviour.

The result is that Denmark ranks highly within the European Union in terms of green procurement practices, where at least one of the EU green core criteria was featured in 73 per cent of contracts by Danish authorities, and 44 per cent of the contracts featured all the relevant green core criteria. Similarly, 87 per cent of the Danish authorities involved in the same study, prepared by the Centre for European Policy Studies, reported that their organization includes an environmental component within its procurement policy. In this and the other key analysis criteria, Denmark was consistently above the EU average, and, when assessing the monetary value of contracts including all core criteria, is ranked third in the EU27 with 79 per cent (Centre for European Policy Studies, 2012, pp. 90–92).

An emerging priority for green public procurement (GPP) in Denmark moving forward is the desire to drive innovation within its industry and markets. While the data demonstrate that it has been relatively successful at implementing GPP in a number of areas, the link to innovation is less well established. This case study gives an overview of the current tools and approaches used by Denmark in its GPP implementation and looks at early results for innovation.

Part 1: Description of Key Tools and Approaches

The following section builds a foundation for understanding GPP in Denmark by taking several of the key features and briefly describing their purpose.

Government

For the Environmental Protection Agency (EPA) within the Ministry of Environment, the approach is to develop a complete procurement tool kit in conjunction with partnerships across key strategic areas to accelerate available knowledge and take-up of sustainable procurement. This has meant a focus on key sectors for growth, currently the transport, construction and food sectors, along with sustained effort on procurement at the municipality level, where two-thirds of public procurement actually happens. In addition, priority areas of activity include collaboration with the private sector to encourage development of practices that support sustainable procurement, and the need to disseminate knowledge on available tools and the benefits of sustainable procurement.

The key tools and approaches are identified below:

Tools for sustainable procurement

Manuals for Green Procurement: Guidelines for public purchasers on a range of 46 different goods and services, from simple paper supplies to complex transportation services. Manuals identify the specific environmental issues relating to each product category, educate on the advantages and benefits of procuring green technology, and provide advice for procurers on the kinds of questions and specifications to be looking for when designing tenders or negotiating with suppliers. Includes links to endorsed product lists and criteria associated with eco-labels, certifications or mandatory standards. Although not mandatory, some 69 per cent of all public purchasers use these manuals to inform the design and administration of environmental requirements in their procurement activities (EPA website, n.d.).

Eco-Labels: Although it is prohibited within the EU to use labels as a precondition for qualification within the tender process, it is possible to design technical specifications in accordance with criteria from the appropriate label and indicate that products that have received that label are deemed to satisfy the technical specifications. The EU eco-label "the Flower" and the Nordic Council of Ministers' eco-label "the Swan" are the only two officially recognized eco-labels in Denmark. "Eco-labeling Denmark" is an independent administrator within the Danish Standards Foundation, and is responsible for the processing and award of eco-labelling, but also provides support and information material for companies and purchasers.

Knowledge sharing: Numerous documents and resources have been compiled to provide information and training on relevant topics relating to green procurement, such as life cycle costing and cradle-to-cradle procurement, and which are stored and made freely available on the Ministry website. Similarly, the website also provides links to additional tools and support hosted by other Ministries or centres for excellence, for example in food, transport and energy consumption. Conversations undertaken within the course of research suggest that these resources are not well known and underutilized.

Partnership for GPP

Municipalities in Denmark are responsible for approximately two-thirds of government procurement, and as the authorities are closer to the general public, a partnership between municipalities on GPP is seen as the best way to lead the debate forward. Membership is voluntary, but jointly agreed objectives become mandatory. The partnership is intent on developing concrete methods for incorporating environmental requirements into procurement and is an important forum for sharing knowledge and procurement solutions. So far, the three largest municipalities of Copenhagen, Aarhus and Odense have joined with the Ministry of Environment and three other municipalities to form the partnership.

Forum on Sustainable Procurement

Established since 2010, and building on the experience of the earlier Panel for Professional Environmentally Conscious Procurement operating from 2003–2009, the Forum on Sustainable Procurement is aimed at promoting environmentally responsible procurement among professional procurers in both the public and private sectors. Membership is made up from both sectors, such as the Confederation of Danish Industry, Copenhagen University, Association of Public Procurers in Denmark, Local Government Denmark and the EPA, and comes together within themed working groups to act as a platform for capacity building, knowledge sharing and lobby activities to both advance sustainable procurement and break down barriers.

Regional Collaboration

Green 7: Along with England, the Netherlands, Sweden, Austria, Finland and Germany, Denmark forms part of an informal advisory group dubbed the "Green 7." Representing the frontrunners of GPP within the EU, the Green 7 cooperation is focused towards assisting the Commission to achieve its GPP goals, as a platform for proactive and constructive interaction with the Commission.

Norden: This is the official cooperation platform in the Nordic region that includes the Nordic Council and the Nordic Council of Ministers, along with a number of other organizations and initiatives. The opportunity to combine regional action on identified issues multiplies the ability to find and implement solutions and extends the Nordic leadership on green and sustainable procurement. An example is the development of the Nordic eco-label.

Private Sector

Business also has an important part to play in supporting the development of green procurement practices, and engaging with the private sector is crucial to creating the right mix.

Confederation of Danish Industry (DI): Green procurement website and blog

This serves as a web portal for enterprises doing business with the government to be updated on both the green procurement policy landscape and trends in the development of green public procurement specifications. The website (www.di.dk) also refers to ongoing efforts to help municipalities increase the use of green criteria in procurement specifications. Moreover, the portal highlights the early debate on the value of "standardized green specifications" in providing more certainty to suppliers, as well as serving as a more cohesive policy signal for scaling and green innovation across supply chains in Denmark. In commenting on government procurement frameworks and procedures, the private sector can help drive and inform reform through knowledge sharing, but also by giving the government clear signals on business priorities and areas of opportunity. The DI recommendations for a strategy on Intelligent Public Procurement would be an example of this.

Clean Enterprises of the 21st Century (Cle-En 21)

The project, a partnership between DI and the EPA, aims to enable Danish enterprises and small- and medium-enterprises (SMEs) to expand their voluntary environmental efforts in accordance with the European Sustainable Development Strategy and the EU Integrated Product Policy. The deliverables of the project will include several digital tools, capacity building for technical assistance providers, a cross–sectoral coordination group for integrated product policy (IPP) efforts in industry, and pilot projects in selected companies.

Copenhagen Cleantech Cluster

Comprised of partners from within research institutions, industry, government and NGO's, the Cleantech Cluster is mandated to facilitate partnerships, host events or conduct analysis that supports the development of conditions that aid growth in the cleantech sector. One direct example of added value comes from Innovation Platforms, where public purchasers can sit at the table with stakeholders and present their needs, whereby the cluster model can provide targeted research and feedback that informs procurers as to the market or technology conditions and enable it to shape its specifications and tenders appropriately.

Procurement in Practice

Life cycle costing (LCC) as part of GPP allows for a more comprehensive assessment of a product's real cost beyond the initial purchase price. LCC is a tool regularly used by procurers in Denmark, where 45 per cent of purchasers identify LCC as being one of the evaluation criteria in proposal assessment, although 45 per cent still mainly rely on purchase cost as an evaluation criteria, and LCC was considered the main evaluation criteria by only 10 per cent of respondents (Centre for European Policy Studies, 2012, p. 91).

A PricewaterhouseCoopers analysis of GPP within the "Green 7" nations highlights the link between environmental awareness and knowledge in procurers and the use of environmental criteria in Denmark. Assessing what influences purchasers to include green criteria as minimum technical specification or award criteria it was found to be that the environmental impact of the purchase and familiarity with green alternatives are the biggest drivers. This is especially true for Denmark, where its procurers were among the highest respondents to these motivators. The availability of green alternatives is an essential link in the GPP chain, but here purchasers in Denmark only considered it of relative importance following the other two knowledge-driven motivators (PricewaterhouseCoopers, 2009, p. 81).

Although pushed heavily by government and well supported by partnerships and guidance materials, GPP remains largely voluntary within Denmark. A National Action Plan has been in place since 1994 (updated in 2008) and the target of 50 per cent green procurement referred to in the European Commission's communication on GPP has also been adopted as an indicative political target. However, environmental requirements are mandatory only for central government, implemented across 20 product groups, and rely upon voluntary initiatives at regional level, such as those identified above where action becomes mandatory only after voluntary membership.

Within the stages of the procurement process, green criteria are integrated into the technical specifications and award phases, signifying both compulsory and preferential elements within tender proposals, but do not feature as a contract performance clause (Centre for European Policy Studies, 2012, p. 44).

Private Sector Perspective:

Interviews with the Confederation of Danish Industry present the private sector perspective as one that very much appreciates the new green thinking coming from government and the opportunities for business growth that comes along with it, but also underline the importance of consistency in messaging and regulatory requirements in supporting the growth of green markets.

- Clear and consistent public sector demand according to green procurement best practice is something to strive for within Denmark. However, there is a concern that if requirements are not transparent and uniform across the EU as a whole, then Danish companies may be exposed to unequal competition and may suffer.
- An organizational hurdle at the municipal level is that larger procurement contracts are often separated across government departments, where the procurement process itself is administered by one department while the operation is placed with another. This can raise challenges for implementation of green technology and practices if the level of buy in and understanding is not equal across departments. Additionally, the value chain associated with green technology, where higher purchase costs are offset by cheaper operation and disposal costs over the life of the product, is disrupted, as one department bears the costs and another the benefits. This may affect the willingness and incentives for departments to procure green.
- Suppliers of goods to the public sector are experiencing a growing demand for green products. For suppliers, resources are needed to comply with the extra demands that accompany green procurement, but this need is exacerbated by a lack of standardized green criteria between municipalities. One third of the municipalities, particularly the large municipalities, formulate their own higher requirements for green procurement, while the other municipalities are using standard requirements. The extra administrative burden is felt most by SMEs, with the potential to curb their ability to expand across sectors and jurisdictions.
- Furthermore, there is a desire for purchasers to upgrade their knowledge of green procurement and to streamline procedures in a bid to eliminate the complexity of the demands on which the companies are asked to act.
- A disconnect between political rhetoric and actual requirements generates private sector uncertainty and does not provide a stable platform for investment in R&D.
- There is often insufficient and inconsistent demand through tendering to motivate companies to undertake the administrative burden of registering as a green enterprise.
- There is an internal conflict between the development of environmentally friendly products and a retained emphasis on pricing and budgetary constraints within tender evaluation.

Part 2: The Innovation Angle

Historically, it is the cost, energy and environmental savings associated with GPP that have attracted the attention and been the focus of governments procurement and research activities. However, as a policy tool, GPP also has the ability to give important incentives and stability to the private sector and industry, encouraging innovation in "green" technologies and products. The present need across Europe and North America to spur more growth has seen a renewed focus on the environmental conditions best suited to fostering innovation and has signalled an evolution in the GPP debate. This is also true for Denmark, where emerging challenges presented by decreasing competitiveness and productivity and a need to lift technology exports have added fuel to the innovation agenda and are pushing the development of GPP-related solutions.

GPP has proven effective in helping to support best products and bring them into the common market, playing an important role in the "chain of innovation." The new emphasis is on discovering ways to use GPP as an initiator and incubator earlier in the development cycle, thereby multiplying the innovation effect on products, markets and the economy more widely.

A Good Practice Example

The use of output-based specification on environmental matters leads to a culture of innovation, not laziness, where there is an incentive to create more effective and efficient solutions that are currently available in the open market. Rather than stipulate technology to meet a desired need, the authority instead identifies a problem or need to be met, or minimum evaluation targets, and allows the private sector to design and present the best solution.

This approach was one of the key success points in the modification of the wastewater treatment systems throughout Denmark, where process-focused, rather than technology-focused, legislation combined with clear environmental objectives from the Water Act of 1974, to facilitate the use of output-based and contextually appropriate methodologies in the Action Plans that implemented the public policy. In this way, new and innovative technologies made significant contributions to reducing the pollution caused by wastewater by between 80–90 per cent.

One of the companies involved in the wastewater system modification was Krüger A/S, who, in 1988, along with the Danish Technical University, developed the biological BioDenitro/BioDenipho process for the removal of nitrogen and phosphorous. These theories and technologies were world leading at the time and have formed the foundation of many modern wastewater treatment practices, establishing a leading industry for Denmark. Despite a small market for suppliers and consultants in this area, companies such as Krüger, Grundfos and Danfoss together with a total of around 100 Danish companies, have built a market on wastewater technology and have exports of about €1 billion each year (Danish Ministry of the Environment, 2008).

Some Eco-Innovation Success

According to the Eco-Innovation Observatory, Denmark is one of the eco-innovation leaders of the EU, ranking second across Europe in 2010. Benefiting from high performance in R&D investment, and as one of the leading exporters of environmental solutions and technology, eco-industry in Denmark made up 4.4 per cent of GDP in 2004 (again, second in Europe). This result stems largely from eco-innovation in air, water, waste and energy, where 4 per cent of the national workforce are employed in technology fields from these sectors. Notably, the market share of eco-innovation products has been growing faster than the total export of regular products in recent years, and in 2010 represented 16 per cent of total exports, equivalent to €15.5 million (Eco-Innovation Observatory, 2011).

The wide range of public Institutions and ministries involved in supporting eco-innovation in Denmark may be one of the reasons for its comparative success. Although active across policy-making and the setting of standards, the use of direct funding schemes to co-finance the development and demonstration of new products and technologies has been a particular focus of the EPA in recent years. A study in 2006 revealed that stronger regulation in itself does not necessarily increase innovation activities: it must also be supported by investment flows to bridge the initial gap between reality and policy goals. The Danish EPA Eco-Innovation, the Danish Advanced Technology Foundation, the Business Innovation Fund, and National Innovation System are some of the funding schemes that have been identified as important within this equation (Eco-Innovation Observatory, 2011).

Conclusion

Denmark is considered to be one of the leading GPP countries within the EU, employing a range of approaches and tools to meet its green procurement targets. While there are tools and regulations that create minimum standards for green procurement, voluntary action and collaboration at the municipality level and between sectors can be considered the main vehicles through which higher performance is achieved. Such an approach drives forward the GPP agenda but also contributes to inconsistent messaging across the market, where the private sector must respond to varying requirements and uneven demand. For procurement to support innovation and the scaling up of new technologies into the market, it must be consistent both in terms of its requirements and its level of demand, incentivizing business to invest in R&D and support product development. This is especially true in bridging the investment gap within innovation, where new models of procurement, such as forward commitment contracts, should be utilized in conjuncture with other funding schemes and strategies.

This case study was written with the support of Rasmus Boldsen and Mikkel Stenbæk Hansen of the Danish Ministry of the Environment-Environmental Protection Agency, and benefited from insights contributed by the Confederation of Danish Industry.

Leadership and Prioritization in Procurement

Jason Pearson
Sustainable Purchasing Council

"*Managers are people who do things right. Leaders are people who do the right thing.*"

—Benning and Nanus, 1985

Are We Doing the Right Thing?

Green or sustainable procurement only has meaning if it actually makes a significant contribution to the long-term prosperity and sustainability of society and the planet. When governments and other large institutions seek to exercise leadership by implementing green or sustainable procurement policies, we should reasonably expect that their policies will achieve statistically meaningful reductions in the life cycle impacts of purchased goods and services, including in upstream industry supply chains and in the post-use phase of physical products. Otherwise, these policies amount to little more than a cosmetic mask for business as usual, and certainly do not demonstrate leadership.

Unfortunately, it is often difficult to ascertain to what extent apparently robust sustainable procurement policies achieve meaningful environmental and social impact reductions. As a result, governments and large institutions who implement such policies encounter difficulties in measuring their effectiveness for achieving institutional goals and in communicating the results to key internal and external stakeholders. Additionally, the proliferation of standards, claims, and labels in the green product marketplace has produced increasing confusion and frustration among procurement officers, who often lack the time or technical expertise to differentiate genuine leadership standards from glorified greenwashing.

To address these issues, a group of organizations came together several years ago with facilitation by The Keystone Center to form the Green Products Roundtable (GPR) as a multistakeholder initiative with a goal of bringing clarity to the landscape of green standards and claims by: 1) developing appropriate criteria for assessing the credibility of existing standards, certifications, and labels; and 2) identifying those standards, claims, and labels that meet these criteria. The membership of the GPR includes leaders from government, the private sector, and civil society, and this diverse group collaborated over several years to develop a Framework to support large institutional purchasers in developing, implementing, measuring, and communicating sustainable procurement policies.

A Prioritization Framework for Leadership

Prioritization is the key to the success of this Framework. For too long, we have comforted ourselves with the idea that "every decision (of green procurement) matters." That is, that "buying green" is inherently good, regardless of how significant (or insignificant) the differences are between "green" and conventional versions of a given product, or how significant (or insignificant) the impacts associated with different types of products. A prioritization-based approach rejects this philosophy in favour of an insistence that some decisions matter more than others.

We know, for instance, that some procurement categories generate more impacts per dollar than others in their production, distribution, use, or disposal. Logically, then, if we want to exercise leadership, we should prioritize

the most impactful categories, and we should assess them with those standards, certifications, labels, and other methods of differentiation that meaningfully address the unique types of impacts that they generate. For example, we know that food production is one of the most significant contributors to freshwater pollution, and that the international textile industry is more likely than many other industries to employ underage workers. As a result, each dollar that we spend on food is far more likely to cause significant water pollution than each dollar that we spend on, say, office furniture. And each dollar that we spend on imported uniforms is far more likely to violate our supply chain labour standards than each dollar spent on, say, electricity.

Therefore, before embarking on the development of specific sustainable procurement policies, a government or large institution should ideally undertake a strategic prioritization, informed by the best available science and on-the-ground knowledge, to understand which of its major purchasing categories generate the most significant upstream (and potential downstream) environmental and social impacts, and then to understand the types of impacts and where they occur in the supply chain. With this information in hand, a purchasing organization could then assess which existing standards, certifications, and labels are most likely to address the most significant impacts in the life cycles of its priority purchasing categories.

The Framework developed by the Green Products Roundtable is intended to support exactly such a strategic prioritization. The Framework lays out a methodology for using the best available science and knowledge to identify those purchasing categories that generate the most significant life cycle impacts across the spending profile of an institutional purchaser (e.g., a national government or university) or an entire sector (e.g., health care or hospitality). The Framework then proposes a method for connecting these priorities with existing methods for evaluating goods and services within these purchasing categories, in order to identify those methods most likely to achieve meaningful impact reductions.

A New Organization to Support and Recognize Leadership

In early 2013, the Green Products Roundtable proposes to launch a new organization, the Sustainable Purchasing Council,[8] which will offer a recognition program for institutional purchasers based on the above Framework. The mission of the new Council will be to support and recognize leadership in strategic institutional purchasing that shifts industry supply chains toward a prosperous and sustainable future. The Council will help institutional purchasers to:

- **Prioritize** opportunities to influence the life cycle impacts of purchased goods and services
- **Identify** existing leadership standards and approaches that address these priorities
- **Benchmark** progress toward goals
- **Receive** recognition for advancement.

The Council will also work to reduce marketplace confusion by identifying preferred attributes, standards, labels, and assessment methods that address key areas of concern in priority purchasing categories.

The Council plans to undertake the following core activities:

Enable Prioritization and Decision-Making

The primary function of the Council will be to develop resources that help institutional purchasers to optimize purchasing influence to achieve leadership goals. Using a Framework developed by the Green Products Roundtable,[9] the Council will enable purchasers to evaluate which purchased products and services have the most significant negative environmental and social life cycle impacts, and then determine which existing attributes, standards and approaches most effectively address these impacts.

[8] For more information, see www.purchasingcouncil.org.
[9] The Green Products Roundtable is a stakeholder group including manufacturers, retailers, purchasers, distributers, certifiers, and other experts and thought leaders. For more information, see http://bit.ly/greenproductsroundtable.

Define and Recognize Leadership

The Council will develop and deliver a recognition program that defines and rewards institutional purchasing leadership, modelled on parallel programs that recognize leadership in other areas of institutional activity, such as the USGBC's LEED program or AASHE STARS, with the expectation that some components of the new program will be integrated into these existing programs. Government agencies and other large institutions who participate in the program by prioritizing their activities and making use of the most robust assessment methods to address their priority impact categories will be eligible for recognition. The recognition program will provides an institutional framework, creating incentives for purchasers to change existing decision-making practices and deploy their purchasing power to maximum benefit for the future.

Build Science-Based Consensus

The governance and operation of the Council will be structured to ensure that it can be trusted to apply the best available science and knowledge to credibly define leadership for institutional purchasing. The Council will initially focus on environmental issues, with plans to later expand to address the full range of factors relevant to the broader goal of a prosperous and sustainable future.

A Snapshot of the Framework

The Council will provide authoritative guidance on which procurement activities merit prioritization, and on which standards and labels designate products that can meaningfully address these priorities, expanding on work initiated by the Green Products Roundtable to refine its Framework into a structured guideline for sustainable procurement, as follows:

Step 1. Calculation. Using Economic Input-Output Life Cycle Assessment data, literature reviews, and expert input, the Council will provide a method for estimating the relative contribution of each major purchasing category to the overall life cycle impacts of an institution's procurement activities.

Step 2. Prioritize. Based on the calculated results, the Council will offer a method for identifying those categories of goods and services that are estimated to cause the most significant damage, either at the scale of a single institution or across a category of purchasers (e.g., universities, hospitals, government agencies). These "priority categories" will be the focus of leadership action.

Step 3. Correlate. Drawing upon the expertise of technical advisors and expert stakeholders, the Council will then identify those evaluation methods (e.g., labels, certifications, attributes) that meaningfully address the key "hotspots" of impact for priority categories.

Step 4. Define/Implement. Having identified the most appropriate evaluation methods for priority categories, the Council will create draft language for integration into individual institution's policies.

The Framework is unique for enabling large institutions to ensure that they achieve maximum potential benefits from their green purchasing and procurement activities.

Aligning Incentives to Reward Leadership

The Sustainable Purchasing Council has been conceived and developed as a collaborative effort, and it will continue to grow through constructive partnership and coordination with existing initiatives, linking their work with opportunities to harness the potential of institutional purchasing to significantly transform the market toward a more sustainable economy. We envision that it will align incentives among stakeholders, as follows:

Institutional and commercial purchasers

The Council will lower the cost of and increase the effectiveness of purchasing leadership by offering fair, balanced and expert advice to help purchasers to achieve sustainability goals. The recognition program will offer an opportunity to benchmark, communicate, and receive recognition for their leadership activities.

Government Agencies

The Council will offer evaluation criteria that are sufficiently robust to differentiate standards and labels according to the Federal guidelines. This greater clarity will enable Federal, state and local government purchasers to demonstrate conformance with new guidelines and expectations.

Retailers

Retailers need help in identifying which attributes, labels, and standards signify credible environmental benefits, so that they can satisfy customers and reach corporate sustainability goals. The resources provided by the Council will enable retailers to clearly communicate and demonstrate leadership to their customers.

Standards Developers

The Council's explicit endorsement of high quality standards and assessment programs for specific product categories will reward leadership and build market share for developers and managers of standards programs.

Brand Owners and Manufacturers

Businesses need no longer seek multiples certifications, but can focus on those whose endorsement by the Council will ensure greater market share. Additionally, the resources created by the Council will help manufacturers and brand owners to credibly differentiate their products and services for key customers.

Prioritization Pilot Project for Universities

In advance of launching the Council, the Green Products Roundtable is undertaking a pilot project in collaboration with the Association for Advancement of Sustainability in Higher Education (AASHE) to test the viability of this concept among institutions of higher education. A diverse group of colleges and universities will act as a Program Advisory Committee for a four-month process that will result in a draft version of the recognition program. The draft will be used as the basis for an anticipated multistakeholder process to create a full operating version of the recognition program for release in 2014. The pilot will also explore making the full operating program a reference standard for AASHE's Sustainability Tracking Assessment and Reporting System (STARS), possibly replacing or augmenting existing credits related to procurement.

The pilot project, in the short term, and the Council, in the long term, pose the following questions as both a strategic framework for action and as an invitation to discussion and engagement:

- Are data and methodologies for quantifying the life cycle impacts of goods and services sufficiently accurate and robust to allow for large institutions to confidently prioritize their sustainable purchasing and procurement activities?
- Can non-quantitative intelligence about the life cycle impacts of goods and services be effectively integrated into prioritization analyses?
- Do certain categories of purchasing (e.g., energy, food, fuel, chemicals) consistently generate the most significant life cycle impacts, regardless of institution-specific purchasing patterns?
- Are some purchasing-related impacts better addressed by non-purchasing, non-procurement actions (e.g., research, customer/vendor education, policy advocacy, etc.)?
- What are the social barriers to adoption of sustainable procurement by large institutions?
- How should sustainability be defined for sustainable purchasing: 1) in terms of "three pillars" of economy, ecology, equity; or 2) in terms of those externalized costs which matter to society but are not embedded in market prices?
- Can the Council's commitment to leadership as a core value of its recognition program adequately address reputational risks associated with the solicitation of revenue from the private sector?

- Is the value provided by the Council to the private sector sufficient to cover its costs in the form of sponsorships and earned income?

These questions—and many more—will define the exploration to be undertaken in the coming months and years.

Developing GPP in India Through Public–Private Partnership

Sachin Joshi
CII–ITC Centre of Excellence for Sustainable Development

India is currently developing its green public procurement (GPP) policy, driven by national plans for sustainable development and voluntary commitments on climate change. GPP will be important to create aggregate demand for environmentally friendly goods and services, trigger private sector demand, improve supply chain processes and create opportunities to innovate.

The importance of GPP was emphasized at one of the early meetings of the Prime Minister's Council on Climate Change. The Ministry of Environment and Forests (MoEF) was mandated to develop the policy. What followed is a unique example of a public-private partnership in the development of GPP. The CII–ITC Centre of Excellence for Sustainable Development (hereafter the Centre) was entrusted with developing the policy.

The Centre is a think tank and active arm of the Confederation of Indian Industry, India's largest business association with more than 9,000 members. The Centre provides technical assistance to governments and business in various areas of sustainable development. Over 20 years, it has worked with the private and public sectors to improve environmental policy in India. It was also felt that GPP required development of product specifications, which was best done with input from producers. It was, therefore, not surprising that MoEF requested that the Centre work on GPP. This probably makes it a unique case in GPP development in the world.

There was already a market for green products in India, which had gradually developed despite the absence of GPP, mainly because of private sector moves to become environmentally friendly. It made good business sense: high standards in global supply chains, and in energy and natural resource use require efficiency and optimization of consumption. The 5-Star Energy Label of the Bureau of Energy Efficiency (BEE) at the Ministry of Power had become recent success. Many parts of the government were already procuring labelled appliances. Green buildings were also an increasing trend within new government offices.

There was little doubt that greener products and services were available in the country. Effort was required to review various product specifications, develop commonly acceptable specifications, and consolidate everything into GPP. The Centre had both the technical expertise as well as the ability to convene large groups under its auspices.

The Centre was mandated to:

1. Develop product specifications
2. Develop the GPP management framework
3. Provide recommendations for possible GPP legislation

It was particularly important that a GPP policy be designed in a manner so as to be able to deliver outcomes that were most relevant to the Indian context. A flexible methodology, responsive to the needs of the country, was required.

Product Selection and Specification Development

From an exhaustive list of products that the Government of India procures, a set of six product categories were identified for which to develop specifications. The six product categories are: public works (bricks, steel & cement), electric appliances, IT equipment (computers & peripherals, photocopier, telecoms), pharmaceuticals (bulk drugs), paper, office furniture and lighting. These products are mainly characterized by their environmental impact (in production, use or disposal), volumes in use, and significant share of public spending. These were selected on the basis of the following:

- Products which are low-hanging fruit (starting with products that are easier to green, requires minimal investment, etc.)
- High-purchase product categories within government procurement (in terms of volume or value)
- Product categories where greening initiatives have already been undertaken

There were many challenges to define product specifications. Few products have specifications for "green" indicators. The project had aspired to introduce green specifications on a life cycle analysis basis. However, data across the life cycle isn't available, and even the infrastructure for manufacturers to satisfy life cycle requirements is lacking in India. To resolve these challenges, the project considered the most resource-intensive stage in the life cycle of a product and developed green specifications for that stage. The criteria for manufacturing processes were air and water pollution, energy intensity and raw material usage. For appliances and IT equipment, specifications were developed on in-use energy efficiency and recycle or reuse. Specifications were based on domestic energy labelling and e-waste regulations. In certain cases, conflict arose between green and quality specifications. This conflict could be resolved through improvements in technology or production process.

The project has suggested higher than prevailing green specifications and a gestation period for manufacturers to upgrade to those specifications without compromising on quality specifications. In that period, manufacturers should migrate to improved technology or processes.

Established standards and labels were also used to define criteria so as to ensure greater credibility for the whole process. For instance, energy efficiency criteria were drawn from the already existing Star Rating program of the Bureau of Energy Efficiency. In certain instances, conflict arose between environmental criteria and existing regulations and norms. Such issues had to be resolved by consulting various stakeholder groups and arriving at a consensus.

Public–Private Partnership

The three success factors of GPP development in India are: government leadership and commitment, a close working relation between public and private sectors, and the multistakeholder nature of the process.

India's public authorities, including its federal government, are major consumers and procurers of goods and services. A recent estimate by the Planning Commission puts the scale of public procurement between 15 and 20 per cent of GDP, or US$215–270 billion per annum. By using their purchasing power to choose environmentally friendly products and services, they can make an important contribution to creating green markets. It was important to make the connection between the country's national priorities and objectives in relation to the economy, and the environment in particular.

The GPP policy was suggested at the highest levels of the Indian government. One of the early meetings of the Prime Minister's Council on Climate Change stressed the importance of green public procurement if India was to succeed in its low-carbon growth plan. The Ministry of Environment and Forests was mandated to initiate the work. After discussions with many stakeholders, the CII–ITC Centre of Excellence for Sustainable Development was asked to help the Ministry develop a GPP policy.

Through the project, the Ministry has worked closely with the Centre. There have been occasions when the Ministry would follow up on the progress of certain issues. Within the government, the Ministry would periodically report to the Prime Minister's Office.

One of the significant features of India's GPP development is the role of the private sector. The fact that the Ministry entrusted the work to the Confederation of Indian Industry by itself was symbolic of private sector engagement. Over 20 years, the Centre has worked with business and government, particularly the MoEF, to improve the environmental performance of industries and also improve the environment policies. It has assumed recognition for being progressive about better environmental norms and proper implementation in the country. At the same time, it builds the capacity of business to reduce its environmental footprint.

The Indian market for "greener" products and services is already increasing. The success of BEE's Energy Star label in both retail and institutional markets, increasing green building space, as well as the fact that the automotive industry is improving the fuel efficiency of vehicles are some of the indicators that the green market is developing. Information and communication technology companies are pressing for "green" criteria in a range of infrastructure projects. The private sector has been more than willing to participate in the development of GPP, for they have seen the increase in the size of the market for greener products. For global companies with operations in India, it has meant the beginning of migration of Indian standards to global standards sometime in the future.

The products are manufactured by the private sector which has the knowledge of product specifications. For each product category, the Centre and the MoEF appointed a sectoral business association that would be responsible to help with product specifications. In cases where a suitable sectoral association was not available, a group of companies was formed. Product specifications received were referred to the Bureau of Indian Standards and the Central Pollution Control Board. Product specifications were finalized after each specification went through a few rounds of discussion.

Multistakeholder Process

Involving multiple stakeholder groups adds legitimacy to the development of any program or policy. Multistakeholder inputs were seen as being valuable in appreciating the complexities involved not just in approaches such as life cycle analysis (LCA), but also in GPP and implementing strategies and systems to meet prevailing procurement patterns. In addition, the perspectives of private stakeholders who have been working on improving environmental and social performance in supply chains was of interest.

With this understanding in mind, The Centre worked towards developing the GPP guidelines in a consultative manner. Bringing different ministries to the table in a manner that was progressive for the project was identified as a challenge right at the start of the project. The Centre worked with the Planning Commission of India to be able to convene different stakeholders. A "Core Group" of different stakeholders was constituted that would act as a sounding board as well as contribute to developing product specifications. It brought to table different ministries, standard-setting organizations such as the Bureau of Indian Standards, regulators such as the Central Pollution Control Board, institutions such as the BEE, and sector associations to represent the private sector. These stakeholders were very proactive and willing to contribute towards the development of technical specifications for designated procurement products. This strategy worked well, and helped evolve consensus on some of the challenges, allowing the project to remain on schedule.

The Promise of GPP

GPP has a key role to play in India's efforts to transition to a green economy. It can help stimulate a critical mass of demand for more sustainable goods and services which otherwise would be difficult to get onto the market. GPP is therefore a strong stimulus for eco-innovation.

Promoting green procurement gives important incentives for industry to develop "green" technologies and products and promote them in the market place. In particular, small- and medium-sized companies may profit from environmental procurement, as it offers an opportunity to find markets for their innovative solutions and products.

Introducing "green" tendering criteria can influence the marketplace and result in new entrants in the field of environmental technologies and products—potentially resulting in increased competition and reduced prices.

Utilizing the knowledge and experience of the private sector in developing GPP is a practical way to ensure a robust and effective program. The role of the CII–ITC Centre of Excellence for Sustainable Development in developing specifications and recommendations for legislation in India is a positive example of how government and the private sector can partner in designing and establishing GPP.

Encouraging Green Procurement in the Road Industry

Sam Seskin and Steve Muench
Greenroads Foundation

There are over 100 million kilometres of roads in the world today. Where they exist, these roads provide access and mobility and are a major force in driving the global economy. They represent a significant direct investment (about 1–5 per cent of world GDP is spent on roads every year) with even farther reaching contributory effects. But they also present significant problems through natural resource expenditures and environmental impacts, as well as the social disruptions due to traffic accidents, habitat fragmentation, loss of community, and pollution.

The good news is that today's road owners, designers and contractors are fully capable of building and maintaining high-quality roads that connect communities, drive economic engines, improve the environment and provide meaningful work. We now need to change our current practices so that these capabilities can be used to build better, more sustainable roads today.

The Greenroads Rating System

At the Greenroads Foundation, we believe that one of the most effective tools in accelerating the pace of creating better, more sustainable roads is a voluntary rating system. While the building industry has done this effectively for over 10 years, roads are relatively new to the game. Greenroads® (www.greenroads.org) is the first, and currently only, independent third-party rating system for roadways in operation worldwide. It is a set of 48 sustainable ideas, called "credits," for roadway design and construction. Road projects can obtain points for achieving credits and the entire project can then be certified based on the total number of points earned. In general, rating systems can be used to (1) define what sustainable roadway design/construction is; (2) benchmark sustainability in roads; (3) manage and improve roadway sustainability; (4) reward superior performance; and (5) communicate sustainability in a meaningful way amongst road professionals, political decision-makers and the general public. Greenroads itself is working with dozens of agencies in several nations, on projects whose construction value is in the billions of U.S. dollars.

Challenges to Sustainable Roadway Procurement

There are both challenges and opportunities associated with a roadway industry that is beginning to move towards sustainable procurement. There appear to be four major challenges to more sustainable roadway procurement:

Economic hardship. The current worldwide recession and related revenue loss have hit road owning agencies hard. Most have experienced substantial budget cuts that are not likely to be reversed in the foreseeable future. This can create a minimalist approach to roadwork where only the most basic road features are funded. Unfortunately, sustainability is still often viewed as an expensive add-on feature that can be eliminated rather than a fundamental infrastructure quality that must be addressed. Further, economic hardship can create situations in which road owners are forced to focus on low initial capital costs. While lower life cycle costs may be more desirable, owners may be unable to fund higher initial costs in order to achieve those lower life cycle costs.

Reliance on proven technologies and methods. Road owners generally own constructed roads and bear the associated risks (e.g., performance, failure, legal, etc.) for decades, if not generations. Thus, owners usually have a low tolerance for risk associated with new technologies and methods associated with sustainable practices. The industry is largely driven by existing regulations, standard practices, and specifications. Since these items are necessarily developed based on past experience, they often inadvertently preclude the use of innovative new technologies and practices. For instance, many local stormwater regulations effectively prevent the use of proven low-impact development drainage strategies that are more able to closely mimic pre-development hydrological conditions than current methods.

Narrow scope. Sustainability is a system characteristic; it involves considering what happens within smaller subsystems and how those subsystems interact to affect larger systems. Institutional boundaries often compartmentalize our thinking so that we optimize smaller subsystems (e.g., the road network) at the expense of larger systems (e.g., the environment). For instance, in the U.S. Pacific Northwest, where salmon are a vital component of the ecosystem, upgrading a roadway culvert to make it fish passable may be viewed entirely as an expense for the road network: it provides no roadway mobility or accessibility improvements. However, viewed in terms of the larger ecosystem, it may be viewed as a small expense that achieves great benefit by restoring miles of upstream waters as viable salmon spawning grounds.

Multiple rating systems. Several different rating systems and sets of guidelines are being developed that apply to the road industry, and it is still unclear which, if any, will dominate. Thus, road owners can be hesitant to commit to a system, preferring to take a wait-and-see approach.

In order to be successful, then, sustainable roadway procurement must (1) save money, (2) use systems thinking, (3) work with flexible regulations/standards, and (4) have clearly communicated goals and reasoning for its adoption. While this may seem a tall order, numerous road owners in a number of countries are moving forward with sustainable procurement. The Greenroads Foundation has been involved in the U.S., Canada, Ireland, South Africa, the Middle East, and Europe in helping develop rating systems, starting chapter organizations, and conducting research.

Sustainable Roadway Procurement Approaches

Based on our observations, sustainable roadway procurement is usually done via one of two broad approaches.

Bottom-up voluntary approach. Sustainable procurement is voluntary and is done because of a local political mandate (such as a charter, resolution or executive order), a strong commitment to sustainability (e.g., the Greenroads Council of South Africa involves consultant, contractor, and government stakeholders working to adapt the Greenroads Rating System to the specific socioeconomic conditions of South Africa), or quantifiable life cycle cost savings (e.g., the City of San Jose, California saved US$400,000 on a US$2.4 million project by using cold-in-place recycling).

Top-down mandatory approach. Sustainable procurement is mandated at some level of government. For example, the City of Bothell, Washington Resolution 1222 requires the city to develop a carbon reduction and energy independence plan, which includes green infrastructure.

In the U.S., sustainable roadway procurement has been most aggressively pursued by smaller road owning agencies (e.g., cities and counties) who often do not have large bureaucratic processes to overcome and can more quickly adapt their practices. So far, most registered U.S. Greenroads projects come from local cities.

What Works

From our work in the United States, Canada, Europe, South Africa, and the Middle East, we can identify several key elements that are most likely to define success in sustainable roadway procurement.

Public opinion can drive sustainable procurement. The values and opinions of citizens clearly affect public actions, programs and policies. At present, citizen interest in sustainable transportation is focussing on mode of travel, rather than on facility design, construction and operation. In transportation, this makes policy sense since the vast majority of carbon associated with road infrastructure comes not from construction but from use by motor vehicles. Nevertheless, over time, as the public's knowledge deepens, roadway design and construction methods will adapt as well.

Sustainability must be an owner priority. Sustainable procurement ultimately relies on the road owner. While this may seem obvious, no amount of advocacy from any other group can substitute for a committed owner. Making sustainability a priority with top management support ensures that resources are available, a plan exists and that plan is implemented. Once this is in place, road owners have the proper context within which they can evaluate the use of sustainability rating systems as a helpful tool in achieving their goals.

Straightforward communication about sustainability is essential. Communicating sustainability goals and objectives can be difficult because there are so many facets to sustainability. A straightforward and generally recognized rating system can be a valuable sustainability communications tool: it can define, benchmark, quantify, reward, and communicate sustainability in a meaningful way amongst professionals, politicians, and the public. More complicated or piecemeal approaches (e.g., developing one-off systems/metrics that are not well-known, claiming existing policy/actions are already sustainable) tend to confuse or obfuscate the message.

Competitive procurements can drive sustainable outcomes. It is important to align construction industry motivation with owner agency sustainability desires. Typically, this is done through standards, specifications and contracts. Therefore, standards, specifications, and contracts should specify sustainable outcomes. Rather than basing procurement on least capital cost, owners that base a competitive procurement on sustainable outcomes (even with a fixed capital cost) will provide clear incentives to bidders, who, in turn, will provide markets for suppliers of the new technologies that policy makers desire. The procurement process for the Sea to Sky Highway in British Columbia, Canada is an example of a successful design-build-operate-maintain (DBOM) procurement process that incorporated a number of sustainability metrics in fixed price procurement. Of course sustainability metrics can be embedded in a price-competitive procurement as well.

What's Next?

A straightforward and generally recognized sustainability rating system can provide an easy way to further sustainable procurement. This is common practice in the building industry (e.g., LEED®) but has yet to catch on in the road industry. For competitive roadway procurements in the current economic climate, advancing green procurement for roadways may best be done through a model like that of British Columbia, in which contract price is fixed and roadway performance metrics form the basis of contractor (and in this case, operator) selection. For this to be successful, the public owner must develop or use a set of roadway sustainability standards.

In the coming decade, we expect such standards to evolve in many nations. The foundation for this evolution already exists. Advancing green procurement likely will be linked to the adoption of performance standards, by both owners and/or various industry groups, for the many technologies and processes that constitute the road industry. However, if the public is to understand and support green procurement, and owners manage it, the many elements of sustainability need to be integrated into a useful package. Working together, the public and private sectors can achieve sustainability outcomes by taking advantage of the work already underway today.

Public Procurement and Green Investment in Vietnam

Tom Moerenhout
International Institute for Sustainable Development

Public procurement is an important driver of economic activity in many rapidly growing economies. In Vietnam, government spending has consistently accounted for more than 25 per cent of economic activity in the last decade. The part of GDP owed to state spending more than tripled, from VND170,000 billion in 2000 to VND583,000 billion in 2009 (General Statistics Office of Vietnam, 2011). Like other rapidly industrializing nations, Vietnam may soon witness a decline in Official Development Aid when it reaches the GDP status of a lower middle-income country. This has important implications for the objectives of public procurement.

From one side, procurement policies play a primary role in ensuring an efficient economy. For example, in Vietnam and other South East Asian countries, infrastructure constraints prevent optimal growth. The Vietnamese government increased its spending on infrastructure from VND6.795 billion in 2005 to VND14.679 billion in 2009. With FDI adding another VND1.816 billion in 2010, the share of infrastructure procurement in Vietnam has been consistently between 8 per cent and 10 per cent of GDP. In spite of these efforts, investors still list poor infrastructure as one of the main hindrances for operations in Vietnam (Nguyen Xuan Thanh, 2009).

Procurement to Encourage Green Industrial Growth

In addition to ensuring an efficient economy, procurement can also guide economies to invest in efficient sectors. There is a consensus that Vietnam's growth is in large part attributable to its successes in the manufacturing sector. However, in its Vietnam Industrial Investment report, UNIDO righteously warns that, to maintain sustainable growth, industrial policy needs to refocus on transformation in strategic sectors that can yield future results from technological change, innovation and learning (UNIDO, 2012). Such a pattern is not Vietnam-specific, but reflects the growth pains transitional economies often encounter after a period of manufacturing-driven growth.

To escape what is often referred to as the "middle income trap," Vietnam needs to create new competitive advantages. This effectively means it needs to target sectors in which it can add value by innovation and technological advancement. Green industrial growth is commonly known as a path that creates significant added value. Both sustainable sectors—for example renewable energy and healthcare—as sustainability performance in conventional corporate sectors move companies to invest in longer-term value creation as opposed to shorter-term profit generation. When done properly, this eventually delivers stable competitive advantages (Eccles, Ioannou & Serafeim, 2011). Research on the 2006–2010 period indicates that companies that invest heavily into the impact of environmental, social and governance issues (ESG), perform better than those who do not (RCM, 2011).

Vietnam's Growing Interest in Green Industrial Growth

However, private investors rarely take first steps to increase short-term costs. Rather, public finance is needed to crowd in private capital, hence the importance of public procurement. The Vietnamese government is well aware of this and has made several attempts to formulate legislation to achieve sustainable, value-driven growth. In its 2004 Strategic Orientation for Sustainable Development, for example, it elaborated a growth plan around cleaner production, environmental friendliness and clear industrialization. It focuses especially on the manufacturing sector, and calls for a prioritization of technologies that facilitate modern and clean production. More practically, the strategy focuses on raising the quality of products to reduce costs, and, hence, increase the role of technical standards in industrial processes (Government of Vietnam, 2004). Vietnam has also set specific standardization targets in its National Environmental Protection Strategy (Moerenhout & Lam, 2011).

The need for cleaner industrialization to maintain economic growth has become more prevalent in recent years. In 2009, a specific Cleaner Production in Industry Strategy was adopted to ensure that at least 50 per cent of all industrial production facilities are informed of the benefits of cleaner production methods by 2015, with at least 25 per cent

already implementing such methods (Government of Vietnam, 2009). The government angle of this shift towards green industrial processes was mainly laid out in the 2005 Environment Protection Law. This strategy includes both guidance for governments to encourage cleaner industrial processes ("soft law"), and specific incentives that the government can offer to encourage sustainable production and consumption. These include, among others, land-related preferences, exemption from and reduction of taxes, loans from environmental protection funds and the prioritization of official development assistance (ODA) capital (Moerenhout & Lam, 2011, p. 44). This law was continued by a 2009 decree further deepening incentives for environmental protection activities (Government of Vietnam, 2009, Decree No. 04/2009/ND-CP).

The Missing Procurement Angle

While well aware of the necessity of adding value through innovation and green industrialization to avoid the middle-income trap, Vietnam's legal framework is still missing the crucial procurement angle. The discrepancy between Vietnam's priorities in policy and development, and governmental priorities in spending may well harm the prospects of clean industrialization. As mentioned, procurement is a strong economic driver that is able to crowd in private capital. Nevertheless, as part of its examination of green growth, the government is currently conducting research on how green procurement could be successfully introduced in the future. As an important first step, the Korean International Cooperation Agency has provided assistance to upgrade Vietnam's public procurement system with the introduction of the electronic bidding system of the Republic of Korea (KONEPS) (Moerenhout & Lam, 2011, p. 44).

In spite of the absence of direct procurement policies to catalyze green industrial growth, Vietnam has made considerable progress in formulating legislation that is aimed at "greening" procurement. However, there are still shortcomings in the content and implementation of existing, indirect green procurement policies. For infrastructure projects, the most important tool is the environmental impact assessment (EIA), which is not procurement-specific. However, the effective implementation and follow-up of EIAs are still limited. There are also fines for not complying with environmental and social protection regulations. However, these fines are generally too low to enforce compliance. With regards to standardization, Vietnam's bidding law does not integrate any. If standards are integrated, it is in the technical requirements of tenders. However, in those cases, the environmental score is still relatively low, and time frame, quality and costs remain more important than environmental or social standards. In this regard, for example, bidding documents and evaluations often assess immediate projects costs, rather than longer-term savings and life cycle costs (Moerenhout & Lam, 2011, p. 44).

The Need for Efficient Procurement as a First Step

In addition to problems related to direct and indirect green procurement strategies, Vietnam's overall procurement policy contains flaws that need to be addressed if the government wants procurement to be efficiently used for innovation and green industrial growth. Primarily transparency and integrity are still underdeveloped. It is difficult or often impossible to comment on procurement-related regulation before it is adopted. When companies challenge a procurement decision, they are often excluded from future tenders. In addition, regulations are often applied in an inconsistent manner at different governmental levels. Often, there are no specialized procurement units within procuring entities and there is no procurement code of conduct. These inefficiencies make the implementation of a standardized procurement system very difficult (Transparency International USA, 2011, p. 40). The Vietnamese e-procurement system that South Korea is currently assisting with represents an important leap in this regard (Ketels, Nguyen, Nguyen & Hanh, 2010, p. 124).

Insufficient competition also harms the potential of procurement for green industrial growth. Generally, small- and medium-sized enterprises (SMEs) have difficulties complying with sustainability regulations because they did not implement prior requirements. However, because international market access is more and more conditioned upon such criteria, the companies are seeking training to catch up and reduce otherwise higher compliance costs. It would benefit Vietnamese growth if these market incentives were complemented by governmental enforcement and assistance. This can be primarily achieved by efficient procurement policies (Moerenhout & Lam, 2011, p. 44). From their side, state-owned enterprises (SOEs) often operate with a lack of transparency. There are conflicts of

interest as SOEs are often both bidders and procurers, with governmental entities often protecting and favouring "their" SOEs (Transparency International USA, 2011, p. 40).

If SMEs and SOEs, two important forces in the Vietnamese economy, do not structurally adjust, and the government does not tackle corruption and the lack of legislative enforcement, the potential to avoid the middle-income trap by generating green industrial growth seems relatively unfavourable. To date, procurement policies have not yet served as an efficient catalyst to investment in green growth. However, it is clear that they can play a critical role in the near future. The barriers experienced within Vietnam are indicative of barriers that South East Asian countries may experience when they are transitioning into lower middle-income economies. As in their case, efficient procurement can serve as important driver to avoid the middle-income trap and create added value through green industrial growth.

Section 3: The story continues . . .

Oshani Perera, Samuel Colverson and Tilmann Liebert
International Institute for Sustainable Development

Why Continue the Procurement and Green Growth story?

The sheer volumes and values involved when governments procure goods and services present in themselves an important incentive for greener growth, and, as demonstrated in this report, governments have certainly begun to walk the talk and use their purchasing power to transform markets. The challenge is to reach even higher levels of competitiveness, use smarter procurement methods, crowd in private capital, and use procurement as a more targeted incentive for green innovation and green industrial development.

And perhaps the momentum for green procurement is now, as the international policy framework is finally responding:

- The World Trade Organization (WTO) Agreement on Government Procurement's (GPA's) newly negotiated text (April 2012), Article X (6) provides for environmental considerations to be addressed through technical specifications and award criteria, supported by Article X (9) where "environmental characteristics" are included as indicative evaluation criteria. This provides, for the first time, the space for governments to use procurement to support the trade in "environmental goods and services" and indeed environmentally-preferable goods and services. Given the countries that are members, observers or are negotiating accession to the WTO GPA,[10] this will be an important space to watch in the coming years. Moreover, the WTO GPA commits to a Work Programme on Sustainable Procurement and a Work Programme on SMEs to guide the future work of the Committee.
- The United Nations Commission on International Trade Law (UNCITRAL) Model Law on Public Procurement (2011) supports, for the first time, government integration of social, economic and environmental dimensions in procurement decisions. The text also provides for socioeconomic policies to be considered when determining procurement methods, as well as for environmental performance to be included in award criteria in relation to supplier qualification. Hence governments can now choose to pre-qualify suppliers on environmental performance and include the same criteria in evaluating and awarding tenders.

10 Currently, 42 WTO Members are covered by the WTO Agreement on Government Procurement. These comprise: Armenia, Canada, the European Communities, including its 27 member States; Hong Kong, China; Iceland; Israel; Japan; South Korea; Liechtenstein; the Kingdom of the Netherlands with respect to Aruba; Norway; Singapore; Switzerland; Chinese Taipei and the United States. Twenty-two other WTO Members have observer status under the Agreement. These are: Albania, Argentina, Australia, Bahrain, Cameroon, Chile, China, Colombia, Croatia, Georgia, India, Jordan, the Kyrgyz Republic, Moldova, Mongolia, New Zealand, Oman, Panama, Kingdom of Saudi Arabia, Sri Lanka, Turkey and Ukraine. Currently, nine WTO Members are in the process of acceding to the Agreement on Government Procurement: Albania, China, Georgia, Jordan, the Kyrgyz Republic, Moldova, Oman, Panama and Ukraine. In addition, a further six WTO Members have provisions in their respective Protocols of Accession to the WTO with regard to accession to the Agreement. These additional Members are: Croatia, the Former Yugoslav Republic of Macedonia (FYROM), Mongolia, Montenegro, the Russian Federation and Saudi Arabia.

One of the ripple effects of these developments is likely to be a move by an increasing number of lower-income countries to enter the green procurement policy space and position procurement as a more potent tool for green economic expansion. For businesses, it signals that green competitiveness is important, for it is now a criterion on which large tenders might be won or lost. The Partnership for Procurement and Green Growth is of the view that this momentum needs to be accompanied with more thinking and action on how:

- Procurement can be used as an incentive for green industrial growth.
- The different types of procurement and the different procurement methods could be reconfigured to drive innovation and technology transfer.
- Public-private partnerships (PPPs) and private finance initiatives (PFIs) can be better designed to deliver on sustainable development.

Some of the immediate steps in this direction are discussed below.

1. Providing Market Certainty

Recognizing That There Are Different Levels of Green

Different jurisdictions and procurement entities are using different criteria to identify green products and develop green product specifications. For example, specifications for sustainable timber can range from compliance with international certification schemes, to sourcing from community-owned and -managed forests, to self-declarations from suppliers, to sourcing from domestic plantations. This creates market distortions that impede the commercialization of green products. For suppliers, it presents problems for achieving economies of scale and passing the related cost reductions down to the consumer. The debate in addressing this distortion hinges on the need to maintain flexibility within procurement policy. Should not procurers be given the flexibility to define different levels and characteristics of "green performance" based on their country's industrial, economic and social priorities?

Solutions to Deploy When Greener Goods, Services and Infrastructure Cost More to Purchase

It is well established that purchasing greener products can help users reduce water and energy consumption as well as lower waste management and maintenance costs. This is especially true in relation to energy and energy-related products including building materials, refrigeration and lighting appliances, and office IT equipment. Incorporating design for environmental aspects into infrastructure will also provide for more user-friendly and more durable assets. In Europe, for example, the evaluation of the EU Green Public Procurement Policy in 2008 indicated that the public sectors across the "green 7"[11] had lowered their energy and carbon footprint by an average of 25 per cent by purchasing greener products (Centre for European Policy Studies, 2012).

The challenge in many lower-income countries is that greener products often command higher purchasing prices than their less-sustainable alternatives, and procurers are hard pressed to justify the additional spending, even if all or a part of these additional costs can be recuperated in the form of cost savings during use and disposal. Procurers are mandated to demonstrate value for money and, in most procurement mindsets, value for money in interpreted as the lowest purchasing price. In lower income countries where essential public services are not being delivered due to the lack of funds, it is extremely difficult for procurers to justify even the slightest increase in purchasing costs.

The problem is compounded by the fact that multi-year accounting frameworks, which provide public entities with the possibility to work across capital and expenditure budgets and to record and use future savings associated with current spending, are not in place in many jurisdictions (not just in lower-income countries). This is due to fundamental accounting incompatibilities with public financial management rules that go beyond the remit of this chapter. The World Bank developed the Medium Term Expenditure Framework to address this incompatibility and to facilitate the rollout of energy service contracts and other sustainable procurement options. The use of this Framework has, however, been limited.

[11] The term "green-7" is used by the European Commission to refer to the seven countries with a higher level of green public procurement compared to other EU Member States. They are: Austria, Denmark, Finland, Germany, Netherlands, Sweden and the U.K.

It is critical to help procurers deal with the issue of increased purchasing costs for green goods and services: there are several ways this could be done:

- Well-directed market consultation is essential to inform suppliers, well in advance, that green procurement policies are in the pipeline, and that future tenders will include environmental and social criteria. Market consultation is imperative to assess the willingness and capacity of the private sector to invest and upgrade, which will in turn help procurers determine where to set the green performance bar—not too low so as to distort markets but not too high as to crowd out domestic suppliers.
- Adequate lead time is essential to provide companies with the time to upgrade and seek out solutions to meet green demands in a cost-effective manner.
- Bundling the needs of a larger number of public entities to create bulk buying contracts can help stimulate economies of scale and thereby reduce purchasing prices.
- Longer-term contracts are helpful to negotiate lower prices.
- Using and establishing central procurement platforms can be helpful. Central purchasing platforms can negotiate bulk discounts with suppliers, warehouse large volumes and dispatch smaller quantities to individual entities on demand.
- The use of service contracts is gaining ground all over the world, as is the interest in integrated performance contracts that seek to bundle groups of products into single service offerings. For example, instead of buying office IT equipment category by category, procurers can opt to purchase a service that will provide not only the hardware, but also the software, server and cloud computing solutions in an integrated package. This reduces purchasing costs for the procurer and prompts suppliers to seek out the most cost and eco efficient solutions. The value added in service contracts is that the monetary benefits of eco-efficiency—reduced operation and maintenance costs—accrue to the supplier, and this perpetuates continuous improvement.

But perhaps the critical manner in which purchasing costs can be lowered is to incrementally increasing the focus on environmental and social performance over time. This requires that procurers balance environmental and social requirement across technical specifications (conditions that suppliers are legally required to meet), award criteria (the core conditions on which bids are evaluated as well as the additional conditions on which bidders are granted extra points), and contract performance conditions.

At the early stage of SPP policies, even when lead time is provided to suppliers, policy-makers can begin to include environmental and social criteria as "additional" award criteria, rather than as conditions in technical specifications. The added advantage of this approach is that it will help level the playing field for both domestic and foreign suppliers while still rewarding the frontrunners who will be grated additional points. This will also help limit the extent to which domestic suppliers might be disadvantaged in the early stages of green public procurement implementation.

The other option is to also include environmentally and socially responsible performance aspects in contract performance. For example, compliance with voluntary environmental and social performance standards, extended producer responsibility obligations and sustainable supply chain management initiatives can be included as contract conditions.

So many labels and so many standards...

As much as there are different levels of environmental performance, there is also a large proliferation of eco-labels, certification schemes and voluntary standards on sustainable performance. Public agencies and suppliers around the world often cite the "eco-label dilemma." IISD research indicates that globally, there are over 400 eco-labels in operation, and for sectors that are frequent areas of public spending there are around 40 labels—all indicating varying levels of performance. For example, Hewlett Packard says that the company "faces 50 labels – and have decided to seek to influence 13 and prioritize compliance with 12" (Personal communication with IISD, May 2012).

This is leading in part to the fragmentation of demand—as different entities are using different eco-label intelligence and different performance criteria in articulating green tenders. As stated by the Confederation of Danish Industry in an interview with IISD in May 2012, "municipalities—even within the same metropolitan area—are using different green criteria when buying the same product. This poses problems for suppliers, as they are not able to scale up supply and reduce unit costs."

Does Green Public Procurement Provide for Greater Transparency?

Public procurement has always been a process that has been subject to capture by special interests in both industrialized and lower-income economies. It is also widely believed that introducing environmental and social criteria into procurement decisions increases opportunities for further private capture.

The reality, however, is the reverse. When governments include environmental and social criteria into procurement decisions, it requires much wider market consultation than traditional procurement because the private sector needs to understand the new green priorities of the government and have the opportunity to discuss them, negotiate lead times, finance upgrades, seek out new suppliers and more. Introducing environmental and social criteria into procurement will also require governments to increase disclosure on the tendering process, including the criteria on which tenders will be evaluated and awarded. This all works in favour of better transparency.

It is important to realize that including environmental and social criteria does not complicate procurement procedures, but rather requires that they are carried out with a different mindset. As such, well designed sustainable public procurement policies do not increase opportunities for cronyism, but rather provide an additional channel through which to mitigate it.

In Favour of Smaller and Minority-Owned Businesses

For many years, governments have been operating preferential programs to support smaller business and minority groups, including purchasing quotas, framework agreements and central purchasing platforms and small business cooperatives.

For example, in the United States, the General Service Administration's Office of Small Business Utilization (OSBU) operates a dedicated program for small, disadvantaged, veteran, service-disabled veteran-owned, historically underutilized business zones and women business owners. OSBU is oriented to helping small businesses partner with GSA and gain access to federal procurement opportunities. Small business services provided include business development and counselling and dedicated procurement programs on green supplies, green IT, renewable energy technology and environmental services.

It is well worth exploring to what extent these programs have generated positive economic multipliers and to determine the extent to which they can be replicated elsewhere.

2. Driving Green Innovation

Using Procurement as a Targeted Incentive for Innovation

Green growth would be well served by direct synergies between procurement and innovation policies, such as targeting investment for R&D to priority procurement spending. For example, the U.S. Small Business Innovation Research (SBIR) program reserves 2.5 per cent of the total extramural (non-academic) research budgets of all federal agencies with extramural research budgets in excess of US$100 million for contracts or grants to small businesses. In 2010, that represented over US$1 billion in research funds. Over half the awards are made to companies with fewer than 25 people and a third to companies of fewer than 10. A fifth are minority or women-owned businesses.

The EU is also moving in this direction. The "Innovation Union" Communication (European Commission, 2010) identifies public procurement as a significant opportunity to foster innovation:

> Unsatisfactory framework conditions, ranging from poor access to finance, high costs of IPR, to slow standardisation and ineffective use of public procurement. This is a serious handicap when companies can choose to invest and conduct research in many other parts of the world. . . . . [r]emaining barriers for entrepreneurs to bring "ideas to market" must be removed: better access to finance, particularly for SMEs, affordable Intellectual Property Rights, smarter and more ambitious regulation and targets, faster setting of interoperable standards and strategic use of our massive procurement budgets.

The figure below indicates the estimated annual budget investment necessary to spur procurement for innovation within the EU, and points towards the importance of aligning spending and procurement policies if innovation for green growth is to be achieved.

INDICATIVE BUDGETARY IMPLICATIONS

Amounts			
Annual Public Procurement Spending of Member States above EU thresholds Estimate (PWC et al, 2011[3])		€400 **Billion**	CURRENT ESTIMATE
"Innovation Union" targets[4] per year		*€ 10 **Billion***	TARGETS
Estimated Innovation Potential Proportion of Annual spending in the EU (€400 Billion)	3.0%	€ 12 **Billion**	
Recommended Cross Border Procurement Proportion of the Innovation Potential (€ 12 Billion)	6.0%	€ 720 **Million**	

	Low Estimate		*High Estimate*		
	Factor	*Amount €*	*Factor*	*Amount €*	
Current EC co-financing rate of innovation procurements projects CIP (DG ENTR – 55%) & FP7 (DG INFSO – 75%) **applied to Cross Border Targets** (€ 720 Million)	55.0%		75.0%		CURRENT PILOTS Co-financing rates
Recommended Total Annual EU Budget (55% & 75% of € 720 Million)		**€ 396 Million**		**€ 540 Million**	BUDGET NEEDED
Of Which Strand 1 Share of Budget Proportion	60.0%	€ 2376 **Million**	60.0%	€324 **Million**	
Of Which Strand 2 Share of Budget Proportion	35.0%	€ 138.6 **Million**	35.0%	€189 **Million**	
Of Which Strand 3 Per Year Share of Subtotals	5.0%	€ 19.8 **Million**	5.0%	€27 **Million**	
Seven Year EU Budget Spend on this Policy €		**€ 2.77 Billion**		**€ 3.78 Billion**	

Source: EC (2012)

Funding Green Public Procurement

There is also a strong case to be made for dedicated financing to support the use of procurement as an incentive for green growth. In fact, the review of President Obama's executive order by the IBM Center for Business of Government, "Implementing Sustainability in Federal Agencies, An Early Assessment of President Obama's Executive Order 13514" makes a specific recommendation on the need for "improved finance mechanisms for investing in sustainability" and makes the case for a revolving fund for this purpose.

Funding is not only needed for building capacities and for upgrading procurement procedures and information systems. Money is needed for funding green procurement audits and for ensuing green upgrades and retrofits—especially in energy efficiency. In addition, awards for high-performing facilities, agencies and cities as well as initiatives that rank and rate performance are of high value and require dedicated funding.

Pre-Commercial Procurement

One method for public entities to trigger green growth is to expand the use of pre-commercial procurement—the procurement of R&D services that enables the public sector to:

- Share the risks and benefits of designing, prototyping and testing new products and services with the suppliers.
- Create the optimum conditions for wide commercialization and take-up of R&D results through standardization and/or publication.
- Pool the needs to several public agencies to deliver on a range of public policies that require products and services that are yet to be commercialized. These could include innovations in healthcare on HIV and to deal with the impacts of an ageing population, renewable energy and greener technologies for water and waste treatment, energy efficiency technologies, e-education tools and more.

By acting as technologically demanding first buyers of new R&D, public procurers can drive innovation by establishing long-term demand for related products and services. Pre-commercial procurement can also reduce time to market by developing a strong domestic supply base for new solutions.

Forward Commitment Procurement

Forward Commitment Procurement (FCP)—a method of engaging with potential suppliers to describe both the present and future requirements of the public sector—is gaining ground within the U.K. and EU and is considered a specialized tool for supporting environmental innovation. This method, as with pre-commercial and first commercial procurement, addresses difficulties when public organizations require products that are not commercialized or are very expensive to purchase.

By focussing on outcome-based specification needs instead of purchasing for immediate perceived needs, purchasers encourage industry to innovate the best solution rather than trying to match pre-existing technology to varying contexts. In the case of FCP, industry is encouraged to invest with the assurance that a solution that meets the identified needs will be purchased upon development. Through the stages of identification, market engagement and finally procurement, the market becomes aware of future needs and is able to agree on specifications, price and quality in advance, effectively allowing a future market to be made visible and credible by balancing the risks of supply and demand innovation.

Within the U.K., the FCP model has proved successful in several cases, including in Her Majesty's Prison Service (HMPS) "Zero Waste Mattress and Pillow Solution" which has achieved significant environmental and cost savings estimated to be in the region on £5 million over the life of the contract. Beginning in 2006, HMPS used the FCP market and consultation process to engage with the marketplace, which included multi-sectoral workshops, both making their unmet needs known to the market and also realizing potential solutions that already existed. At the end of the market sounding period, over 30 submissions were received from a range of multinationals, SMEs and social enterprises, which led to a further workshop in 2007 to test the viability of suppliers and supply chains to meet tender requirements. HMPS were able to put the acquired knowledge to use in constructing their procurement strategy and contracting approach, and successfully signed a supplier contract in 2009 for the supply of a fully managed service for mattresses and pillows that would achieve a zero-waste solution by 2012.

The Case for Performance-Based Specifications

Instead of questioning "what needs to be purchased?" procurers can influence green innovation patterns by asking "what requirements need to be realized?" This would enable procurers, suppliers and intermediaries to collaborate and innovate to find the optimal mix of products, services and technologies that is fit for purpose. For example, instead of focussing on the purchase of individual products (such as lighting), articulating needs around energy efficiency can enable suppliers to design customized services that may include green buildings or the use of energy services contracts to provide a more integrated approach to achieving identified priorities.

Performance-based specifications enable suppliers to calibrate the optimum mix of technologies and services to propose solutions that are cost-effective and sustainable. The challenge is that for procurers to develop such specifications, they need to have some technical appreciation for the services under tender.

The Role of Clean Technology Platforms and Intermediaries

As procurers work to buy state-of-the-art green technologies and promote innovation, they need to have a greater appreciation for the market for green technologies and, moreover, be able to have a technical dialogue with suppliers and assess options on innovative solutions.

Working with technology platforms and similar intermediaries is critical to facilitating these dialogues and assisting procurers in the design of tenders and suppliers in making innovative proposals. The issue is that such intermediates are expensive to establish, and many countries lack the tech-savvy innovation climate to establish these services in the first place.

The contribution by the Copenhagen Cleantech Cluster in Section 2 of this report demonstrates the emerging application for the cluster approach and begins to make the case for their increased role in the procurement of innovation.

Opportunities From Technology Transfer

Managed strategically, procurement should be considered one of the mechanisms by which governments can build and strengthen domestic industries through acquiring technology transfer and supporting the subsequent diffusion within domestic markets and institutions. Additionally, the opportunities afforded by technology transfer within the scope of forward commitment or pre-commercial procurement offers low-income countries the opportunity to bring clean technology to the domestic market that hasn't previously existed. Whether it be through the purchase of equipment and services, turnkey installations, joint ventures or consultancy agreements, procurement is placed to support the growth of domestic technological take up and bring new green technologies to market.

One example is to take advantage of joint ventures and public–private partnerships to couple domestic companies with foreign partners as a means of gaining access to advanced processes and product technologies, management knowledge and broader export market opportunities. Joint ventures are particular effective for absorbing and learning technology as there is an inherent transfer of processes, skills training and product knowledge associated with daily operations on shared projects. Policies that reserve sectors for domestic investors, provide incentives to train and upgrade the local labour force, and use domestic raw materials can also be coupled with green procurement policies to create synergies for clean technology development.

Green Growth Through Offset Agreements in International Procurement: Ensuring positive net benefits

Offset agreements—where procuring governments receive additional, non-monetary benefits from foreign suppliers beyond the procured "base good"—are commonly used in certain countries and sectors as a kind of trade balance mechanism. These include countertrade, foreign investment, technology transfer, subcontracting, and training and services—most of which could be designed as mechanisms to foster green growth. However, the usually long time periods over which offsets are delivered, as well as the multitude of offset types, make it generally hard to evaluate their benefits for economies. Nevertheless, the common inclusion of offsets in procurement agreements indicates that they are often preferred in lieu of price discounts. Particularly for developing countries, offsets can lead to tangible economic benefits and could be employed strategically so as to build technology and skills in green economic sectors. In many instances of their traditional (non-green) use, however, it is not clear whether offset agreements represent positive net benefits for an economy, warranting significantly improved monitoring and evaluation of these.

The Case for Market Consultation

Understanding the capacity and performance of the marketplace is fundamental in the transition from the mindset of "procuring a product" to one of "procuring a solution." Procurers who engage with the private sector and assess the market during the planning process are better equipped to design tenders and projects that take advantage of the latest technological solutions. Moreover, such knowledge also allows procurers to design tenders and partnerships in such a way as to support and incentivize greater innovative efforts in line with strategic policies and goals. An adequate level of consultation is also needed for procurers to know where to set the bar in terms of performance expectations, but also how to balance tender requirements across specifications and awards.

Analysis that combines market feasibility studies along with an understanding of international best practices not only helps identify project risks but also leads to better appreciation of the challenges and opportunities that exist within the market. This was the case with the Institute of Electricity of Costa Rica, where, following an assessment process, the Institute decided to outsource the entire management service for its tire distribution, collection and disposal needs rather than manage the individual services themselves. The shift in practices resulted in overall annual cost savings of 20 per cent due to efficiencies in administration, storage and transport, also reducing the associated CO2 emissions per tire by 54 per cent (UNEP, 2012, p. 19).

Changes in Procurement Procedures and Processes to Provide Innovation and Scaling

In consideration of the necessary scale and lead time required for green innovation, public procurement procedures and processes need also to change and be more innovative. For example, green innovation could be aided by bundling tenders to increase the purchasing power and the market bargaining position of the public purse, where traditional tendering timetables could also be altered to give new suppliers additional lead time. The Scottish government used flexibility in its tendering timescales to promote collaboration between potential bidders and also split requirements into specialist markets to facilitate the greater involvement of SMEs and niche firms in procuring temporary and consultant public sector staffing solutions. Achieving its aim of providing greater access to public contracts for SMEs, the procurement exercises saw 44 per cent of total expenditure on temporary staff now directed to SME firms, as well as 51 separate firms developing collaborative bids in order to win contracts (UNEP, pps. 49–50).

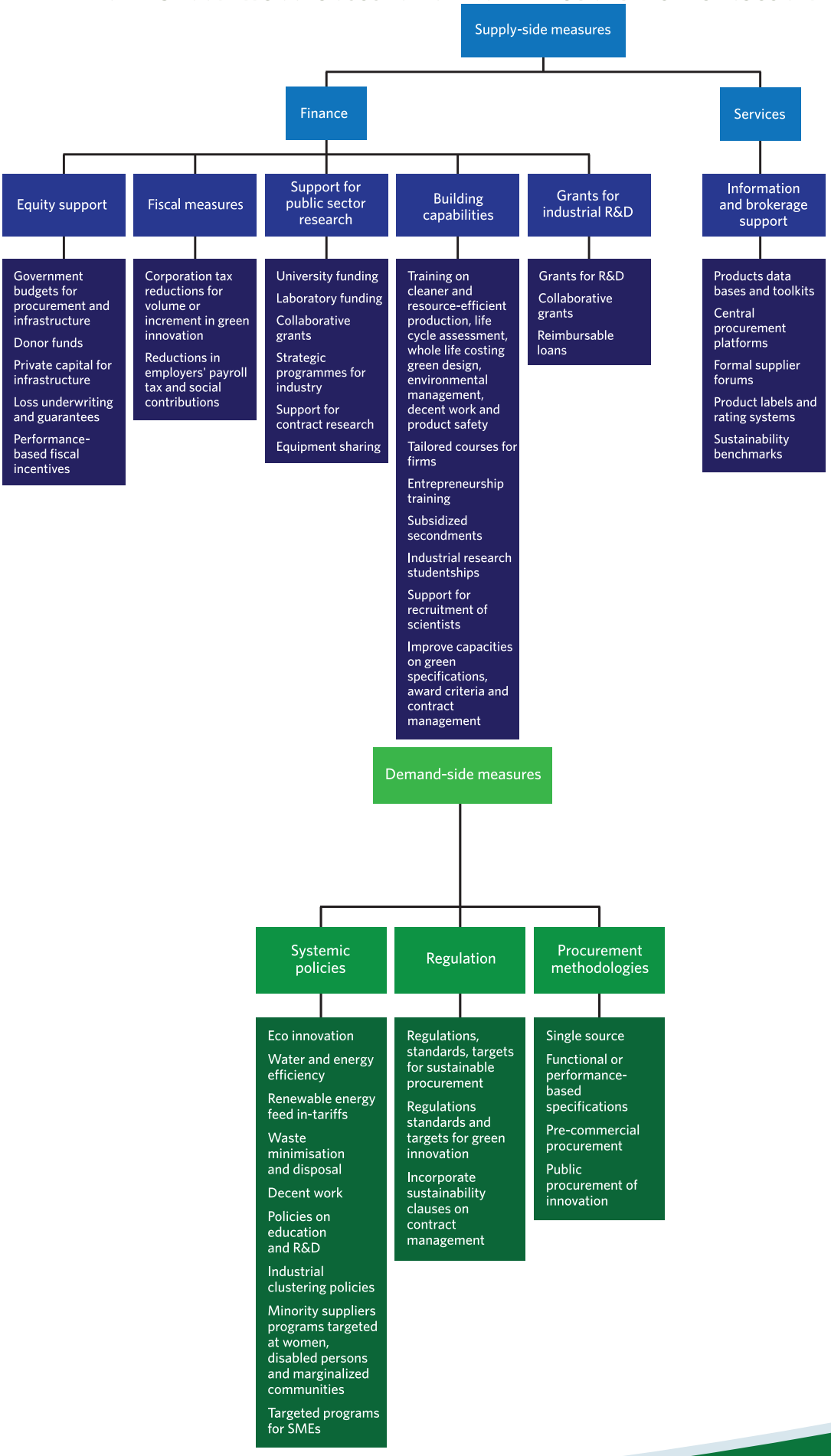
It is also critical for environmental and social criteria to be integrated into procurement systems and software to make meeting green needs easier. Procurers should not be burdened with cumbersome programs or be asked to undertake additional analyses in order to select green. The case study on procurement systems contributed by Lawrence Berkeley National Laboratories in Section 2 highlights the difficulties in scaling up green procurement when environmental attributes are not integrated into procurement systems.

Increased Synergies Across Policy Frameworks

The ability of procurement to trigger green growth is dependent on an integrated policy framework that takes into account the interrelationship between supply and demand side measures. Considering the correlation between demand and supply side dynamics within procurement related policy will lead to greater results and a more efficient use of resources. For example, initiating demand-side policy reform on procurement standards should be supported by the opposite supply-side action to increase training and capacity within the private sector. Similarly, the benefits of implementing new demand-side mechanisms for pre-commercial procurement will not be fully achieved without complimentary investment and fiscal support measures to enable the private sector to launch R&D.

The tree diagram below charts some of the supply- and demand-side factors at play within innovative public procurement frameworks.

ENABLING FRAMEWORK FOR SUSTAINABLE AND INNOVATIVE PUBLIC PROCUREMENT



Source: Adapted from Georghiou (2006), p. 23

3. The Greening of Private Finance Initiatives

The Case for Examining PFIs

Governments are increasingly challenged by pressing demands to expand public services and upgrade infrastructure: they are increasingly looking to private finance initiatives (PFIs) to fulfil this need. PFIs are procurement contracts under which governments seek to crowd-in private sector financing and expertise in design, construction, operation and management into the delivery of public services and assets. These include schools, hospitals, roads, railways, airports, power plants and distribution services, waste management services, correction facilities, retirement homes and more. The benefits may include improved service delivery and improve operating efficiency by drawing on the expertise and efficiency of the private sector and the ability to crowd-in private capital to speed up the delivery of infrastructure and services. At least on paper, PFIs should enable the more efficient use of resources by improving the identification of long-term risks and their allocation while maintaining affordable tariffs.

In theory, PFIs are aimed to combine the different skills and resources of the private and public sector and allow for the sharing of risks and responsibilities. In reality, however, experience with PFIs has been mixed. While they have certainly provided governments with a mechanism to deliver on badly needed public services and upgrade infrastructure, they have also brought losses to the public purse, foregone the value-for-money imperative and have not always delivered on sustainable development. Further work is required on these hugely complex and long-term procurement contracts and to gain insight into how they might be used as triggers for greener growth.

The case study in Section 2, "Promoting Sustainability: Early experience of Dutch infrastructure PPP contracts" begins to unpack the lessons from early efforts to integrate sustainability into PFIs.

The Play out of PFI Credit Instruments

Amongst the first steps in redesigning PPPs and PFIs is watching the play out of government-backed credit instruments that are aimed at increasing certainty for related investments.

Since the 2008–09 global financial crisis, the enduring instability of global financial markets and the ongoing challenges in containing sovereign debt, there is widespread consensus that PFIs should not be "bailed out" by the public purse. In the U.K. for example, the public sector organizations were forecast to have to pay almost £1bn extra to banks on PFI deals established in 2008/09 following severe credit crunch margin hikes (Laing, 2010).

Policy-makers and PFI companies have learned important lessons about the uncertainties and challenges in forecasting and containing cost and risks. Governments are also deciding that cost overruns cannot be accommodated by the public purse, especially in light of shrinking public budgets and also because PPP related-efficiency does not translate back into large budgets for the procuring entity. In other words, the efficiency gains and costs saving enabled by green, prudent and practical procurement accrues not to the procurement agency (or the PPP-originating entity) but to the end user (or the PPP operator).

To help address such risks, governments are rolling out a number of dedicated PFI credits instruments. For example, the Viability Gap Fund (VGF) in India enables the central government to meet up to 20 per cent of the capital cost of a project being implemented as a PFI by a central ministry, state government, statutory entity or a local body The state government, sponsoring ministry or the project authority can pitch in with another 20 per cent of the project cost to make the project even more attractive for the investors. Potential investors bid for these projects on the basis of VGF needed. Those needing the least VGF support will be awarded the project. The scheme is administered by the Ministry of Finance. The eligible sectors include roads, ports, airports, railways, inland waterways, urban transport, power, water supply, infrastructure projects in special economic zones and tourism. Moreover, the Government now proposes to add projects on public social services to the list (Ministry of Finance India, 2008).

Similarly, in the U.K., vehicles such as Infrastructure UK,[12] Lift (Local Improvement Finance Trust[13]) and the National Health Service Procure 21[14] which focus on the public health sector also seek to offer both lenders and public procurers safer route for PFIs. Of particular interest is that the schemes also provide for more streamlined and "fast track" procurement processes that are in line with public sector budget tightening and cost-cutting strategies that presently ongoing.

It is also important to note that stakeholders are now approaching PFIs more cautiously, with a "make do and mend" mindset, even when investing in PFIs in Brazil, Russia, India and China (BRIC). There is no doubt that a more long-lensed investment and assets management approach will contribute greatly toward assessing the need for public assets and considering the use of all existing infrastructure before new developments are commissioned.

Concluding Remarks

Procurement is not what it used to be. Three decades ago, public procurement was primarily about purchasing. The objective was to obtain the best value for money which was implemented in favour of selecting the cheapest option at the point of purchase.

Today, procurement is being positioned as an economic driver, an incentive to spur green innovation, green industrialization, to build-up SME competitiveness and much more. Japan and South Korea have been raising the bar on environmental requirements in public tenders for over a decade. In fact, the South Korean 2009 stimulus package of 50 trillion won was dedicated 81 per cent to environmental and energy efficiency improvements and was targeted to generate 940,000 green jobs. Similarly, China, France, Germany, the United States, Mexico, and South Africa also included green components in their 2009 stimulus packages in the range of 10 to 20 per cent (UNEP, 2009). While countries have had varying degrees of success in implementing their green stimulus programs, the most successful have been those that complemented spending with policy incentives and commercial frameworks to catalyze future green investments long after the stimulus period ended. Two such instruments were green public procurement and green private finance initiatives.

At the time of writing, the EU, South Korea and the United States are moving forward to strengthen the influence of green public procurement. The proposed text of the draft EU Procurement Directives (aimed at revising Public Procurement Directives 2004/17/EC and 2004/18/EC) includes provision for eco-labels, fair trade labelling and life cycle costing intelligence to be included in award criteria.[15] Moreover, the proposed text provides procurers the option to use product labels in technical specifications, though no provisions are being made to recommend any particular label at this point. The EU Directorate General on Enterprise and Industry has also launched a series of dedicated funds to increase the procurement of innovation, and pre-commercial and first commercial procurement across member states.

In the United States, President Obama's Executive Order 13514 on "Federal Leadership in Environmental, Energy, and Economic Performance," sets out specific performance targets in water use, pollution and waste, buildings and infrastructure, greenhouse gas emissions, and the purchase of green products, specifically identifying the use of eco-labels Energy Star and EPEAT to ensure that 95 per cent of new contracts improve environmental sustainability. The EO also directs federal agencies to "leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services"(EO 13514, Section 1, 2009). Also, the Small Business Innovation Research (SBIR) program focuses on funding domestic small businesses to engage in federal research and development that has the potential for commercialization. Its sister initiative, the Small Business Technology Transfer Program (STTR), expands funding opportunities and includes joint venture opportunities for small businesses and non-profit research institutions. The unique feature of the STTR program is the requirement for the small business to formally collaborate with a research institution in the early phases of funding.[16]

[12] For more information see http://www.hm-treasury.gov.uk/ppp_infrastructureuk.htm
[13] For more information see http://www.communityhealthpartnerships.co.uk/index.php?ob=1&id=488
[14] For more information see http://www.procure21plus.nhs.uk/
[15] As posted at http://ec.europa.eu/internal_market/publicprocurement/index_en.htm
[16] The SBIR and The STTR programmes are posted at http://www.sbir.gov/about/about-sbir

The challenge, however, is that many stakeholders are not yet convinced that procurement and PFIs can successfully be positioned as green growth drivers. For one, they are concerned that procurement, being a complex process and one that is subject to corruption and cronyism in many jurisdictions, can become further complicated and opaque if additional elements are introduced. But on the contrary, anecdotal evidence suggests that introducing sustainability criteria increases the pressure on the public sector to ameliorate transparency and market consultation on tendering in a substantive manner.

Development partners are also concerned that in lower-income countries, public financial and administrative systems are "too immature" for green public procurement. However, multilateral development banks are categorical in that they view these reforms as ongoing processes (and not as discrete, one-time interventions). They hence advocate that economic development policies such as green public procurement should not wait for public administrative capacity building above and beyond the minimum requirements of adequate legal provision, formal tendering processes and documents, public disclosure of tenders, implementation of baseline public financial management reforms and a fledgling domestic private sector.

Others are also concerned that green public procurement might provide an unfair advantage to foreign suppliers and crowd out domestic companies who may not be able to meet the demands of green tenders. The reality, however, is that green public procurement serves as a de facto incentive as it provides scaled-up and long-term demand for green. The complexity is to ensure: a) adequate and transparent market consultation to determine where public procurement and PFI policies need to set the bar on sustainability performance; b) the lead time required for domestic suppliers to seek finance and upgrade in order to be ready to respond to greener tenders; c) improved capacity of both suppliers and procurers in the art of building in and meeting sustainability requirements across specifications, award criteria and contract conditions; d) assessment of the appropriateness and implementing targeted "set asides" for industries where green competitiveness needs to be boosted; e) alignment of green procurement with the wider macroeconomic, social and environmental policies so that they work in the same direction.

Green procurement is a cross-cutting policy and needs to be calibrated as such. IISD and the Partnership for Procurement and Green Growth endeavour to further the wider uptake of green procurement and PFIs across the world. We greatly welcome the leadership provided by the Global Green Growth Forum to this important and catalytic agenda.

References

Atsma, J. (2011, June 24). Advies over Duurzaam Inkopen, brief aan Tweede kamer (DGM/PDI 2011047226), Ministerie van Infrastructuur en Milieu, Den Haag.

Australia Green Infrastructure Council (AGIC) (2012). *IS rating scheme*. Retrieved from http://www.agic.net.au/ISratingscheme1.htm

Australian Procurement and Construction Council. (2007). *Australian and New Zealand Government framework for sustainable procurement*. Deakin West, ACT, Australia: APCC Inc.

Bolsa Eletrônica de Compras website. (n.d.). Retrieved from http://www.bec.sp.gov.br/publico/aspx/recursosOc.aspx?nroOc=080258000012009OC00017&chave

British Standard Insititution. (2010). *Principles and framework for procuring sustainably–Guide*. London: BSI group.

Broome, J. (2002). *Procurement routes for partnering: A practical guide*. London: Thomas Telford Publishing, Thomas Telford Ltd.

Cadterc Studies in their Specific Socio-Environmental Instructions. (n.d.). Retrieved from http://www.cadterc.sp.gov.br/estudos

Carvalho, P. (2008, Dec. 3). SP inicia concessão de selo Madeira Legal, Terra/Sustentabilidade. Retrieved from http://www.nossasaopaulo.org.br/portal/node/2173

Casey, E. & Kelley, J. (2010). *Austroads research report AP-R371/10. National Pre-Qualification System for Civil (Road and Bridge) Construction Contracts.* Sydney: Austroads Ltd..

Catálogo Socioambiental. (n.d.) Retrieved from http://www.bec.sp.gov.br/BEC_Catalogo/CatalogoPesquisaSocioambiental.aspx? chave=

CEEQUAL Ltd., 2012a. *CEEQUAL for International Projects*. Retrieved from http://www.ceequal.com/international.html

Centre for European Policy Studies. (2012). *The uptake of green public procurement in the EU27*. Brussels, Annex C. Retrieved from http://ec.europa.eu/environment/gpp/pdf/CEPS-CoE-GPP%20MAIN%20REPORT.pdf

Centre for Excellence and Innovation in Infrastructure Delivery (CEIID). (2010). *Infrastructure procurement options guide*. Perth: Centre for Excellence and Innovation in Infrastructure Delivery. Government of Western Australia.

Contracting for Environmentally Preferable Products and Services. Federal Acquisition Regulations Subpart 23.7—(23.705). Retrieved from https://www.acquisition.gov/far/html/Subpart%2023_7.html

Crook, A. (2011, July 3). Carbon tax hit list: Naming Australia's biggest polluters. *Crikey*. Retrieved from http://www.crikey.com.au/2011/07/13/carbon-tax-hit-list-naming-australias-biggest-polluters/

Curkovica, S. & Sroufe, R. (2007). Total quality environmental management and total cost assessment: An exploratory study. *Int. J. Production Economics*, 105, 560–579.

D'Amico, V. (2010, Mar. 15–17). Desenvolvimento Sustentável: Poder de Compra. *III Congresso Consad De Gestão Pública*, p. 6. Retrieved from http://www.repositorio.seap.pr.gov.br/ arquivos/File/Material_%20CONSAD/paineis_III_congresso_consad/painel_16/desenvolvimento_sustentavel_poder_de_compra.pdf

D'Amico, V. & Agune, R. M. (2007, Oct. 30–Nov. 2). A experiência do Governo do Estado de Sao Paulo—Brasil na implantação de compras públicas sustentáveis. Compras públicas sustentáveis: o novo desafio para administração pública. *XII Congreso Internacional Del Clad Sobre La Reforma Del Estado Y De La Administración Pública*, Santo Domingo, República Dominicana, pp. 11–14.

Danish Ministry of the Environment. (2008). Modernizing sewers and wastewater systems with new technologies. Retrieved from http://www.ecoinnovation.dk/NR/rdonlyres/8A77E57C-FEB6-404B-9F53-4B827EFDB1B8/0/spildevand_baggrundsartikel_1.pdf

Decree No. 42836 (1998, Feb. 2) as amended by Decree No. 48092 (2003, Sept. 18). State of Sao Paulo, Brazil.

Decree No. 50170 (2005, Nov. 4). State of Sao Paulo, Brazil.

Decree No. 53047 (2008, June 2, 2008). State of Sao Paulo, Brazil.

Dilger, A., Riley, C., Young, S., Bengtsson, J., & Kneppers, B. (2011). *Greenhouse gas assessment workbook for road projects*. Transport Authorities Greenhouse Group.

Eccles, R.G., Ioannou, I., & Serafeim, G. (2011, Nov. 25). *The impact of a corporate culture of sustainability on corporate behavior and performance*. (Harvard Business School Working Paper 12-035). Retrieved from http://www.hbs.edu/research/pdf/12-035.pdf

Ecofrotas, (2012). Ecofrotas prevê crescimento de 12,5% em 2012. Retrieved from http://www.ecofrotas.com.br/destaques/imprensa/43.html

Eco-Innovation Observatory. (2011). EIO country brief 2010: Denmark. Retrieved from http://www.eco-innovation.eu/media/EIO_Country_Brief_2010_Denmark.pdf

EPA website. (n.d.). Retrieved from http://www.mst.dk/Virksomhed_og_myndighed/Gron_strategi/baeredygtige_indkoeb/vaerktoejer_til_baeredygtige_indkoeb/

EPEAT. (2010). *Environmental benefits report 2010*. Retrieved from http://www.epeat.net/documents/EBReport2010_final.pdf

Estache, A., Iimi, A., & Ruzzier, C. (2009). *Procurement in infrastructure*. Retrieved from http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-4994

European Commission (E.C.). (2009). *Mobilising private and public investment for recovery and long term structural change: Developing public private partnerships*. COM(2009) 615 final, Brussels.

E.C. (2010). *Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions*. Retrieved from http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf

E.C. (2011). *Public procurement indicators 2010*. Retrieved from http://ec.europa.eu/internal_market/publicprocurement/docs/indicators2010_en.pdf

E.C. (2012, February). *Summary of the Feasibility study on future EU support to public procurement of innovative solutions*. Retrieved from http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/files/meeting-procurement-feb2012/summary-eu-support-public-procurement-innovative-solutions_en.pdf

Eversdijk, A.W.W, M.C.J. Nagelkerke, C. Sewbalak, E. van den Blink en C. Rodenburg. (2011, June 29). *Evaluatie DBFM-aanbestedingen A15 Maasvlakte–Vaanplein en A12 Utrecht Lunetten–Veendendaal*, Utrecht.

Executive Order 13,423 (2007). Strengthening Federal Environmental, Energy, and Transportation Management. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2007-01-26/pdf/07-374.pdf

Executive Order 13,514 (2009). Federal Leadership in Environmental, Energy and Economic Performance. Retrieved from http://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf

Faith-Ell, C. (2005). *The application of environmental requirements in procurement of road maintenance in Sweden*. Stockholm, Sweden: KTH Land and Water Resource Engineering Department.

Federal Electronics Challenge. (n.d.). Why electronics? Retrieved from http://www.federalelectronicschallenge.net/resources/docs/workshop_issues_overview.pdf

Federal Electronics Challenge. (2003). *Recommended criteria for plastics in new product design and end-of-life management developed by the FEC plastics task force of the stakeholder dialogue project for recycling engineering thermoplastics*. Retrieved from http://ww2.epeat.net/Docs/FEC%20Plastics%20Recommendations.pdf

Feige, A., Wallbaum, H., & Krank, S. (2011). Harnessing stakeholder motivation: Towards a Swiss sustainable building sector. *Building Research & Information*, 39(5), 504–5017.

Figueiredo, F. E. L. (Org.), (2011). *Painel da Qualidade Ambiental*. Secretaria do Meio Ambiente/Coordenadoria de Planejamento Ambiental. Retrieved from http://www.ambiente.sp.gov.br/wp/cpla/files/2011/05/Painel_qualidade_ambiental_2011.pdf

Garcia-Alonso, M. D. C. & Levine, P. (2008). Strategic procurement, openness and market structure. *International Journal of Industrial Organization, 26*, 1180–1190.

General Statistics Office of Vietnam. (2011). Key indicators on National Accounts, 2011. Retrieved from http://www.gso.gov.vn/default_en.aspx?tabid=468&idmid=3&ItemID=9911

Georghiou L. (2006). Effective innovation policies for Europe—The missing demand-side. Economic Council of Finland.

Gollagher, M. & Young, N. (2009). *Paper #2112. Alliance contracting—A business model to support sustainability and facilitate innovation and action on climate change?* Aalborg, Denmark, Joint Actions on Climate Change.

Government of Vietnam. (n.d.). Decree No. 04/2009/ND-CP

Government of Vietnam. (2004, Aug. 17). Decision No. 153/2004/QD-TTg

Government of Vietnam. (2009, Sept. 7). Decision No. 1419/QD-TTg

Hauck, A. J., Walker, D. H. T., Hampson, K. D. & Peters, R. J. (2004). Project alliancing at National Museum of Australia—Collaborative process. *Journal of Construction Engineering and Management, 130(1)*, 143–152.

International Road Federation (IRF). (2010). *The software key to sustainable roads. World Highways Sustainability for Road Infrastructure*. Retrieved from http://www.irfghg.org/about.php

Kappeler A., & Nemoz, M., (2010, July). *Public-Private Partnerships in Europe–Before and during the recent financial crisis*. European Investment Bank.

Kenley, R., London, K. & Watson, J. (2000). Strategic procurement in the construction industry: Mechanisms for public sector clients to encourage improved performance in Australia. *Journal of Construction Procurement*, 6(1), 4–19.

Ketels, C., Nguyen, D. C., Nguyen T. T. A. & Hanh, D.H. (2010). Vietnam competitiveness report 2010.

Laing, R. (2012). The death of PFI . . . or at least as we know it. Retrieved from http://opinion.publicfinance.co.uk/2009/12/the-death-of-pfi%E2%80%A6-or-at-least-as-we-know-it/

Lam, K., Ng, S. T., Hu, T. & Skitmore, M. (2000). Decision support system for contractor pre-qualification: Artificial Neural Network Model. *Engineering, Construction and Architectural Management, 7(3)*, 251–266.

Lam, K. & Yu, C. (2011). A multiple kernel learning-based decision support model for contractor pre-qualification. *Automation in Construction, 20*, 531–536.

Lehtiranta, L., Hampson, K. & Kenley, R. (2012). *Evaluation of green public road procurement in Australia: Current practices and gaps to fill.* Sao Paulo, 4th CIB International Conference on Smart and Sustainable Built Environment.

Lewis, J. I. & Wiser, R. H. (2007). Fostering a renewable energy technology industry: An International comparison of wind industry policy support mechanisms. *Energy Policy, 35*.

Linha Economia Verde (n.d.). Retrieved from http://www.agenciadefomentopaulista.com.br/portal.php/linha_economia_verde

Lower House of Netherlands Parliament. (2009, October 16). *Sustainable development and policy*, Parliamentary Year 2009–2010, 30196, No. 82, The Hague.

Ministry of Finance India. (2008). *Scheme and Guidelines for Financial Support to Public Private Partnerships in Infrastructure*. Retrieved from http://www.pppinindia.com/pdf/scheme_Guidelines_Financial_Support_PPP_Infrastructure-english.pdf

Ministry of Infrastructure and the Environment. (2011, May). *Sustainable Public Procurement Manual for Government Procurement Officers*, The Hague.

Ministerie van Infrastructuur en Milieu. (2011, January). *Handleiding duurzaam inkopen voor overheidsinkopers*, Den Haag.

Moerenhout, T., & Lam, N. T. (2011). *Preparedness assessment for the integration of sustainability criteria into the public procurement of infrastructure in Vietnam*, 2011.

Muçouçah, P. S., (2009). *Empregos Verdes no Brasil: Quantos São, Onde Estão e Como Evoluirão nos Próximos Anos*. (Organização Internacional do Trabalho). Retrieved from http://www.oit.org.br/sites/default/files/topic/green_job/pub/empregos_verdes_brasil_256.pdf

Murphy, H. (2011a). *Sustainable procurement practices*, Melbourne: VicRoads.

Murphy, H. (2011b). VicRoads Sustainability Initiative: a Star rating tool for roads. *IRF Bulletin*, December, 6.

Nguyen Xuan Thanh, D. D. (2009). *Vietnam's infrastructure constraints*. Harvard Kennedy School, ASH Institute for Democratic Governance and Innovation, Harvard.

NovusTI website. (n.d.). Retrieved from http://www.novusti.com/

Organisation for Economic Co-operation and Development (OECD). (n.d.). Main Science and Technology Indicators Database. Retrieved from http://dx.doi.org/10.1787/888932485975

OECD. (2012). *Towards green growth*. Retrieved from http://www.oecd.org/dataoecd/32/49/48012345.pdf

People's Republic of China. (2002, June 29). The Government Procurement Law of the People's Republic of China (Order of the President No.68).

Perera, O., Morton, B., & Perfrement, T. (2009, December). *Life cycle costing in sustainable public procurement: A question of value*. Winnipeg: International Institute for Sustainable Development. Retrieved from http://www.iisd.org/pdf/2009/life_cycle_costing.pdf

Philipps, S. (forthcoming). *Bureaucratic decision-making in urban China. A city-level case study on green public procurement in North China after 2004*. Cologne China Studies Online. Working Papers on Chinese Politics, Economy and Society 2012, no. 1.

Philipps, S., Espert, V. & Eichhorst, U. (2011) *Advancing sustainable public procurement in urban China: Policy recommendations*. SuPP-Urb-China Paper No. 14_EN, Wuppertal Institute: Wuppertal.

Philipps, S., Marsille, C., Schröder, P., & Haberland, T. (2011). *Sustainable public procurement in urban China: How the government as consumer can drive sustainable consumption and production*. SuPP-Urb Project Publications. Wuppertal.

PricewaterhouseCoopers. (2009, January). Collection of statistical information on green public procurement in the EU, 2009, Appendix C. Retrieved from http://ec.europa.eu/environment/gpp/pdf/statistical_information.pdf

RCM. (2011). RCM sustainability white paper. Transparency International USA. (2011). *APEC procurement transparency standards in Vietnam*. Center for International Private Enterprise and Towards Transparency.

Relatório da Execução Orçamentária: Materiais e Serviços (n.d.). Retrieved from http://www.fazenda.sp.gov.br/cge2/siafisico/detms11.asp?item=2.3E1&ano=2011&mes=&tiporel=01

Rijkswaterstaat. (2010). *Annual report Rijkswaterstaat 2010*. Rijkswaterstaat, Dutch Ministry of Infrastructure and the Environment.

Rijkswaterstaat (RWS). (2012a) Memo Duurzaam Inkopen in de GWW, Utrecht.

RWS. (2012b). Memo Duurzaam inkopen GWW, Den Haag.

RWS. (2010, December 20). *Evaluatie uitvraag duurzaamheid A12 Lunetten-Veenendaal.*

Russell, J. S., Benson, C. H. & Fox, P. J. (1990). A stochastic decision model for contractor prequalification. *Computer-Aided Civil and Infrastructure Engineering, 5(4)*, 285–297.

Secretaria do Meio Ambiente do Estado de São Paulo, Programa Estadual de Contratações Públicas Sustentáveis: Relatório 2008/2009 (SEMA/SP 2010). Retrieved from https://sites.google.com/site/comprassustentaveis/noticias/1orelatoriodecontratacoespublicassustentaveisdoestadodesaopaulo/Relatórioconsolidado.pdf

SKAO. (2011). *Brochure: CO_2-performance ladder*. SKAO: Stichting Klimaatvriendelijk Aanbesteden en Ondernemen (Independent Foundation for Climate Friendly Procurement and Business). Utrecht.

Song, L., Mohamed, Y. & AbouRizk, S. M. (2009). Early contractor involvement in design and its impact on construction schedule performance. *Journal of Management, 25(1)*, 12–20.

Stocker, A. & Luptacik, M. (2009). Modelling sustainability of the Austrian economy with input-output analysis modelling framework and empirical application. In *Handbook on Input-Output Economics in Industrial Ecology.* pp. 735–776. Dordrecht: Springer.

Sydney Morning Herald. (2011). *Carbon tax gets green light in senate*. Retrieved from http://www.smh.com.au/business/carbon-tax-gets-green-light-in-senate-20111108-1n4rp.html

Tan, Y., Shen, L. & Hong, Y. (2011). Sustainable construction practice and contractors' competitiveness: A preliminary study. *Habitat International, 35*, 225–230.

Teixeira, P. A. (2011, Nov. 22). Empresas de São Paulo têm linha de crédito para reduzir emissão de gases, Portal Canal Energia. Retrieved from http://www.agenciadefomentopaulista.com.br/lenoticia.php?id=7

United Nations Environment Programme (UNEP). (2009). *Global green new deal. An update of the G20 Pittsburgh Summit*. Retrieved from http://www.unep.ch/etb/publications/Green%20Economy/G%2020%20policy%20brief%20FINAL.pdf (2012). The impacts of sustainable public procurement. Paris.

UNEP. (2011). *Towards a green economy—Pathways to sustainable development and poverty Eradication*. Retrieved from http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf

United Nations Industrial Development Organization (UNIDO). (2012, March). *Vietnam industrial investment report 2011: Overview and summary of findings.*

World Trade Organization. (2010). *WTO trade policy review China*. World Trade Organisation.Uttam, K., Faith-Ell, C. & Balfors, B. (2012). EIA and green procurement: Opportunities for strengthening their coordination. Environmental Impact Assessment Review, 33, 73–79.

Walker, D. & Hampson, K. (2003). *Procurement strategies. A relationship-based approach*. Oxford: Blackwell Science Ltd.

Wong, C. H., Holt, G. D. & Cooper, P. A. (2000). Lowest price or value? Investigation of U.K. construction clients' tender selection process. *Construction Management and Economics, 18*, 767–774.

World Bank. (2011). *Scaling up low-carbon infrastructure investments in developing countries: The Critical Mass Initiative working report as of January 2011*. Retrieved from http://www3.weforum.org/docs/WEF_EI_CriticalMass_Report_2011.pdf, p. 6

Zammataro, S. (2010). *Monitoring and assessing greenhouse gas emissions from road construction activities: The IRF GHG calculator*. Retrieved from http://www.irfnet.org/files-upload/pdf-files/CHANGER_Article_May2010.pdf

Zhanga, Z. & Baranzinic, A. (2004). What do we know about carbon taxes? An inquiry into their impacts on competitiveness and distribution of income. *Energy Policy, 32*, 507–518.

Published by the International Institute for Sustainable Development.

International Institute for Sustainable Development
Head Office
161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba, Canada R3B 0Y4
Tel: +1 (204) 958-7700 | Fax: +1 (204) 958-7710 | Website: www.iisd.org