

Life Cycle Costing in Sustainable Public Procurement: A Question of Value

A white paper from IISD

Though many procurers are using life cycle costing as a decision-making tool, its use is still far from being systematic and the calculation methodologies are sometimes far from robust. Moreover, procurers are not using life cycle costing to inform strategically advantageous decisions. It is therefore clear that the current sustainable public procurement model is not delivering the best value for tax payers' money. We believe this needs to change.



Oshani Perera, IISD
Barbara Morton, Sustainable Procurement Ltd.
Tina Perfremont, Perfremont Consulting Ltd

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International Institute for Sustainable Development

161 Portage Avenue East, 6th Floor

Winnipeg, Manitoba

Canada R3B 0Y4

Tel: +1 (204) 958-7700

Fax: +1 (204) 958-7710

E-mail: info@iisd.ca

Web site: <http://www.iisd.org/>

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Oshani Perera, IISD – operera@iisd.org

Barbara Morton, Sustainable Procurement Ltd. – BarbM110@aol.com

Tina Perfrement, Perfrement Consulting Ltd – tina@perfrementconsulting.co.uk

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Abstract

Though many procurers are using life cycle costing (LCC) as a decision-making tool, its use is still far from being systematic and the calculation methodologies are sometimes far from robust. Moreover, procurers are not using LCC to inform strategically advantageous decisions. It is therefore clear that the current sustainable public procurement model is not delivering the best value for tax payers' money. We believe this needs to change.

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Introduction: Why decisions on life cycle costing (LCC) are needed now

Life cycle costing (LCC) is defined in the International Organization for Standardization standard, *Buildings and Constructed Assets, Service-life Planning, Part 5: Life-cycle Costing* (ISO 15686-5) as an “economic assessment considering all agreed projected significant and relevant cost flows over a period of analysis expressed in monetary value. The projected costs are those needed to achieve defined levels of performance, including reliability, safety and availability.”

In the context of sustainable public procurement (SPP), the use of LCC is essential to demonstrate that procurement processes and decisions have to move beyond considering the purchase price of a good or service, for the purchase price does not reflect the financial and non-financial gains that are offered by environmentally and socially preferable assets as they accrue during the operations and use phases of the asset life cycle.

Typical LCC analyses are therefore based on:

- purchasing costs and all associated costs such as delivery, installation, commissioning and insurance;
- operating costs, including utility costs such as energy and water use and maintenance costs;
- end-of-life costs such as removal, recycling or refurbishment and decommissioning;
- longevity and warranty time frames of the asset.

Governments are waking up to the business case for sustainable public procurement. In tandem, they are also finding it is important to integrate LCC into these policies, as “green” and socially-preferable assets may carry considerably higher purchasing price tags than their less sustainable substitutes. This is particularly the case in middle- and lower-income countries where the markets for green and social goods and services are in their infancy.

It is true that the price premiums paid for sustainable assets may be largely offset through efficiency gains, cost savings and lowered risks during the product/project lifetime. But procurers still face difficult decisions. Whilst they are being required to make purchasing decisions that are better for their environment and their societies, they are also bound by the principle to award the tender to the most economically advantageous bid to ensure the best value for their money.

Incorporating LCC into procurement policies will provide procurers with the opportunity to demonstrate that the best value for money across the asset life cycle can only be assured by purchasing green and socially preferable alternatives.

But to what extent is LCC integrated into procurement policies? And do procurers and sustainable procurement policy-makers have the expertise to interpret LCC analyses to demonstrate the value for the public purse? These questions are particularly timely as governments roll out economic stimulus packages that have a strong focus on sustainable development. Large sums of public funds are being allocated to upgrade infrastructure, buildings and utilities in a manner that reduces energy and material inputs, lowers wastes and improves livelihoods. Governments need to ensure that these funds are put to optimum use and sustainable public procurement, with an inbuilt LCC requirement, can serve as a cost-effective tool to achieve these ends.

This white paper is based on:

- The review of national green and sustainable public procurement policies of over 30 countries;
- A review of five voluntary public sector initiatives to promote sustainable purchasing;
- Formal consultations with public procurers, sustainable public procurement policy-makers, enterprises that do business with the public sector and experts in LCC.

IISD developed this white paper to begin a global debate on the role of life cycle costing in sustainable public procurement and indeed, the effectiveness of sustainable public procurement as a cost-effective strategy for sustainable development.

We look forward to your perspectives on this debate, which can be addressed to Oshani Perera at IISD at operera@iisd.org.

1. Themes Emerging for this Inquiry

This section discusses the 23 issues that emerged from this inquiry.

Issue 1	Life cycle costing is not yet considered to be a critical component of SPP.
Issue 2	Making a decision on the basis of LCC may make it more expensive upfront.
Issue 3	A general appreciation for LCC is critical to change the procurement mindset from “the best value for money” to the “best value across the asset life cycle.”
Issue 4	Capital and revenue budgets conflict in terms of organization and time frames. This favours procurement decisions based on the cheapest upfront costs.
Issue 5	Research gaps in the application of LCC
Issue 6	Too much emphasis on financial returns: wider socio-economic gains need to be factored in
Issue 7	Lack of competence in conducting LCC and interpreting its findings
Issue 8	The data challenge
Issue 9	Are there sufficient tools for LCC?
Issue 10	Dealing with fluctuations in commodity and electricity prices when commissioning buildings and infrastructure developments
Issue 11	Carbon footprints and LCC efficiency
Issue 12	Compatibility with life cycle assessment
Issue 13	At which point in the public procurement process is LCC being used?
Issue 14	What LCC methodologies are used by public procurers?
Issue 15	LCC is only feasible in the case of selected goods and services.
Issue 16	The value of central purchasing platforms for smaller public sector organizations
Issue 17	LCC-efficient alternatives are not always the most environmentally and socially sustainable ones.
Issue 18	Should the responsibility for conducting LCC lie with procurers?
Issue 19	The value of designing tenders that embed LCC efficiency in core/mandatory specifications
Issue 20	Sustainable public procurement policies that enumerate LCC-efficient alternatives
Issue 21	Opportunities in green economic stimulus spending
Issue 22	The need for LCC in SPP becomes even more important when SPP is not mandated by a legislative or supra legal instrument.
Issue 23	LCC and “buy national” policies
Issue 24	A matter of semantics?

Issue 1 Life cycle costing is not yet considered to be a critical component of SPP.

In the rush to promote “quick wins” and flagship initiatives to promote sustainable public procurement, are governments overlooking the critical importance of demonstrating “value for money” and the business case for sustainable public procurement?

This inquiry examined SPP policies in 28 countries and found that:

- The U.S.A., Japan, Switzerland and Norway may be alone in routinely applying LCC methodologies as a part of green and sustainable procurement policies.
- Sweden, UK, Denmark, Germany, The Netherlands, France, Austria, Korea, New Zealand and Australia report to be conducting “some form of LCC analyses” or “derivatives of it” in the procurement/commissioning of:
 - a. New energy-efficient buildings;
 - b. The refurbishment of existing buildings, especially heat, light and ventilation systems/units and building management systems;
 - c. Indoor and outdoor lighting, when budgets are over €50,000;
 - d. Solar thermal and PV applications;
 - e. Office equipment: computers, printers and photocopies when budgets are over €60,000.
- Some other nations, including Canada, Chile, South Africa, Argentina, Spain, India, Singapore, Italy, Portugal, Mexico, China, Costa Rica and Brazil, report to “have experimented” with the use of LCC methodologies in the commissioning of energy-efficient buildings.
- Vietnam, Mauritius, Ghana, Botswana, Senegal and Indonesia are in early stages of sustainable procurement policy development and are yet to consider the use of LCC therein.

Our concern is that unless LCC is picked up as an integral component in SPP policies, governments will be hard-pressed to demonstrate that the procurement of life cycle-efficient assets is indeed the best way to make the optimum use of tax payers’ money. Even if these assets command higher capital or purchasing costs, these can be offset by lower operating costs, lower maintenance costs, low risk premiums, avoided pollution control costs and avoided remediation costs during the use and end-of-life disposal of the asset.

Hence, the fundamental sustainable procurement businesses case is the most economically advantageous tender across the asset life cycle. Without LCC methodologies to demonstrate this, SPP policies run the risk of being sidelined or even abandoned on the premise that sustainable goods and services are more expensive.

In advocating the use of LCC, it is important that we acknowledge that the science of LCC is far from perfect. Its findings will be skewed based on how future costs are perceived and forecasted, the reliability of the data used, what discounting rates are applied and what stages of asset life cycle are included in the analysis. Additional uncertainties arise when quantifying the lowered risks, avoided environmental damage, avoided clean-up costs, and non-financial benefits such as the contributions to social cohesion through the creation of jobs, livelihoods and new industries. Forecasting such costs and benefits with an acceptable degree of certainty is very challenging.

“Whole life costing is a comparative tool which enables procurers to have an open debate and make better decisions. This will help achieve a mind shift on sustainability issues.” – Procurer from the U.K.

“All things being equal, whole life costing allows us to differentiate between options. It is about determining what the best choice is when considering broader sustainability issues. It is not only about working out how much a choice will cost over its life.” – Procurer from Chile

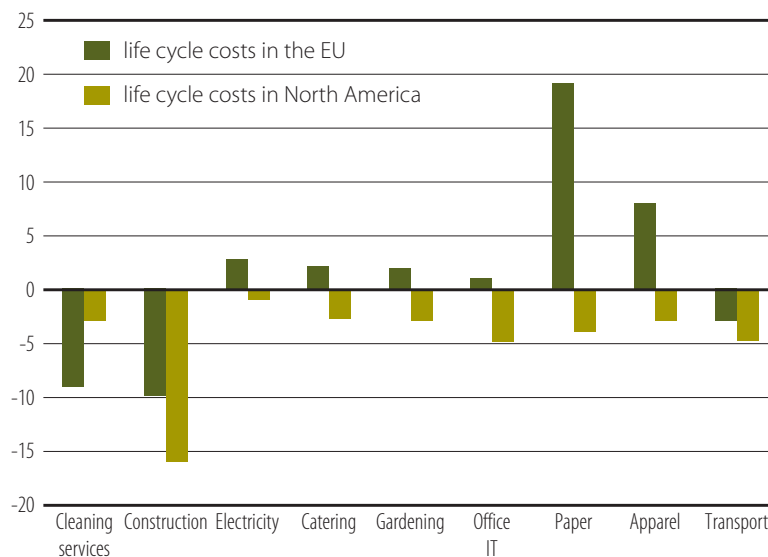
Issue 2 Making a decision on the basis of life cycle costing may mean paying more upfront.

In some countries, the production of sustainable and LCC-efficient goods and services is still embryonic, which means that the only way to source sustainable alternatives will be through expensive imports or paying a very high cost premium to stimulate infant local industries. In lower income economies, this difference can be higher, as much as 10 to 50 per cent. In time, however, the large volumes demanded by public procurement contracts can make economies of scale more feasible, and the prices of these products can be expected to decrease as more producers enter the market. Also, public procurers can begin to use their strong market positioning to negotiate bulk discounts as the market begins to mature.

Indeed, this has been the case in many industrialized countries. The early sustainable public procurement experiences across the 1980s in the U.S.A., Germany, Austria, Iceland, The Netherlands and Switzerland indicate that procurers were faced with 10 to 45 per cent price hikes when compared to “best value for money at the time of purchase.” Today, prices have equalized greatly. Procurers in the U.S.A. claim to not pay extra for sustainable alternatives, while their counterparts in Europe face premiums that can rise up to 18 per cent.

Figure 1 provides an estimate of life cycle costs of frequently purchases goods and services by public procurers in the EU and North America. The positive values indicate when LCC saving can be achieved.

Figure 1: Life cycle costs in the EU and North America



Sources: The data for the EU was obtained from *Collection of Statistical Information on Green Public Procurement in the EU*. The data for North America was obtained through communication with the US Environment Protection Agency and Environment Canada.

Procurers will always be under greater pressure to demonstrate that tax payers’ money is being well spent. Despite being aware of the benefits of procuring LCC cost-effective assets, procurers will continue to face the high capital outlay dilemma, and give way to selecting “best value for money at the time of purchase” unless there is a express mandate for them to do otherwise.

Issue 3 A general appreciation for LCC is critical to change the procurement and public sector budgeting mindset from “the best value for money” to the “best value across the asset life-cycle.”

Understanding LCC, even at its fringes, is essential if the public procurement mindset is to change from “best value for money” to “best value across the project/product life cycle.” As discussed in Issue 1, green and more socially equitable alternatives may involve higher capital outlays at the time of purchase. These premiums can often be offset through reduced operating and maintenance cost and avoided environmental risks. But such savings do not alter procurers’ concerns that they can be perceived to be too generous or even wasteful with scarce public funds.

To address this dilemma, elements of LCC need to be embedded into the main stages of the procurement process. This requires the setting of environmental, social and economic objectives at each stage of the procurement process: establishing the need to procure; setting specifications; developing pre-qualification questionnaires; developing award criteria for the evaluation tenders and making award decisions; contracting and contract monitoring.

Changing mindsets also requires that procurers appreciate the comparative environmental and social advantage of products and services, which can aptly be assessed by using LCC. Comparative advantage is determined through either product-related or performance-related criteria. Product criteria stipulate the design or composition of a product, whereas performance criteria specify performance aspects such as thresholds of energy efficiency, increased recyclability or longer user life. In targeting outcomes during the user life of assets, performance-based criteria promote innovation and enable bidding companies to develop creative strategies to attain the level of performance being requested. Product-based criteria, on the other hand, do not spur sustainable design improvements to the same extent, though often they do involve a lesser degree of uncertainty and risk. Using LCC will help procurers and policy-makers better appreciate the trade-off between these selection criteria and make the best decisions on a case-by-case basis.

SPP proponents also suggested that embedding LCC into procurement practices is best accompanied by an organization-wide (and even a government-wide) environmental management and social responsibility effort.

Issue 4 Capital and revenue budgets conflict in terms of organization and time frames. This favours procurement decisions based on the cheapest upfront costs.

We believe that the inability of procurers to reconcile capital and revenue budgets is a major reason why LCC lags behind. Indeed, the main motivation to apply LCC in the first place is that budgetary approval procedure requires it. But the typical organization and time frames applied in government budgets work against LCC and related thinking.

For example, multi-year accounting and budget frameworks that allow temporal flexibility to carry-over or borrow-against-the-future are important to account for benefits that accrue during user life of assets. This is rarely possible in public sector accounting.

There is also the issue of budget ownership, that is to say, split responsibilities for capital and operating costs. While procurement contracting might be the responsibility of one agency, budgets are controlled by another and the use and maintenance of the product/service/development belongs to yet another. As the benefits of SPP accrue during the project life and at its end disposal, those bearing the capital costs may not be the first to realize the benefits of sustainable alternatives. Many procurers are of the

view that widespread reforms on public expenditure management will be needed to enable LCC to be used as a standard procedure in procurement budgeting.

“I don’t use life cycle costing—even in large contracts—for three good reasons. Firstly, the financial gains or long-term benefits would not flow back to my department’s budget; secondly, the long-term financial benefits are beyond the time frames of the procurement contract; and thirdly, it is beyond my job description to make decisions based on future costs. My decisions are based on today’s prices.”
– Procurer from the U.K., March 2009

Issue 5 Research gaps in the application of LCC

While there has been considerable research on LCC in Canada, the U.S.A., Germany, The Netherlands, Switzerland, Austria and Australia, we found the bulk of this literature to be largely conceptual in nature. We found relatively little data on what LCC approaches and applications are being used and the extent to which they are taken up in procurement processes. Instead, the focus is on the potential benefits of LCC, technical issues pertaining to its application and LCC calculation methods. Corresponding cost models and costs data are believed to be too commercially sensitive to be widely published.

Issue 6 Too much emphasis on financial returns: wider socio-economic gains need to be factored in

There is an overwhelming consensus amongst procurers and SPP proponents that whole life costing methodologies are too focused on financial feasibility to serve as a “licence to operate” for sustainable public procurement.

Procurers are increasingly looking to adopt LCC methodologies to assess costs and benefits well beyond the sphere of discrete assets or services and to showcase how government spending is being directed to support the growth of green businesses, reducing green house gas emissions, providing for skills development and improving work-life balance. To this end, both the social benefits and the avoided social costs enabled by each tender need to be factored into the LCC equation. And this can be extremely challenging to forecast with an acceptable degree of certainty. Accounting for social costs and benefits is particularly challenging. For example, costs such as unemployment benefits that would have been necessary without the procurement of a given asset, or health care costs that would have been necessary if environmentally preferable alternatives would not have been procured, are particularly challenging to forecast.

Issue 7 Lack of competence in conducting LCC and interpreting its findings

Throughout this inquiry, respondents consistently referred to the “skills gap”; procurers lack the expertise to carry out LCC analyses and to interpolate its findings in procurement decision.

LCC involves methods of financial evaluation that calculate and analyze simple payback, net present value (NPV) and internal rate of return (IRR). Procurers across the world are largely unfamiliar with the two latter methods. Even when expertise exists, considerable debate and uncertainty surround the selection and use of appropriate discounting rates.

Public sector procurers tend to favour much lower levels of discount than their private sector counterparts and closely follow the rates recommended by Ministries of Finance and Treasury. These typically range between two and seven per cent net of inflation, or real discount rates. The private sector, on the other hand, uses discount rates between 2 and 18 per cent. This causes discrepancies in how tender applicants and procurers would analyze the future gains for LCC efficient assets.

Issue 8 The data challenge

Another aspect that challenges procurers is the calculation of costs and time ratios related to material/component durability, operating costs, maintenance costs, frequency of repair and replacement, etc. Procurers will be well served with dedicated databases that will provide benchmarks for these elements based on market conditions in their own geographies. Data in the public domain is often aggregated and incomplete. They are also presented in formats that make comparison and extrapolation difficult. In practice however, developing such intelligence or purchasing it can be rather expensive. There is also the issue that commercial databases may not be compatible among different countries or even among sectors of the construction industry within the same country.

Issue 9 Are there sufficient tools for conducting LCC?

This inquiry found complete consensus that there were more than enough tools and guidance available on LCC (though knowing where to find it all was another matter entirely). Therefore, procurers and sustainable procurement proponents were eager to ensure that the creation of more tools and guidance was avoided. Rather, they wanted to be provided with dedicated training and case studies on different approaches to LCC.

Those participating in this inquiry made a number of suggestions to ensure that LCC good practice was shared and became a useful learning tool. Suggestions included:

- Large-scale demonstration projects that take into account both local and cross-border economic, social and environmental benefits;
- Case studies on interpreting LCC analyses in procurement decisions;
- Case studies on how LCC has been applied to frequent areas of public sector spending, such as food; furniture; office equipment such as computers, printers and photocopiers; building and construction; building retrofits; cleaning materials and vehicles;
- Case studies on how avoided pollution control and clean up costs are factored into LCC;
- Case studies on how non-financial social benefits, such as improved productivity, better work-life balance and the creation of sustainable livelihoods, can be accounted for.

Issue 10 Dealing with fluctuations in commodity and electricity prices when commissioning buildings and infrastructure developments

Procurers are concerned about the accuracy of LCC against the backdrop of volatile commodity prices. The challenge procurers face is determining if LCC analyses based on average prices would produce a sufficiently accurate analysis given the global, and subsequently local, price volatilities in commodities and utilities. There also appears to be little published data on:

- the geographical variances in life cycle cost characteristics of constructed assets, and
- the durability and performance of construction components in lower income countries.

This inquiry finds that, in order to produce internationally comparable LCC outputs, quite some effort and funding will be needed to maintain normalized databases at a national or regional level. There have been early regional efforts to normalize certain fields of data. For example, the European Committee for Construction Economics (CEEC) Code of Measurement for Cost Planning provides a basis for the cross-border cost comparison of buildings. The Code defines standard cost groups for both construction and operating costs and might well be considered for a LCC framework.

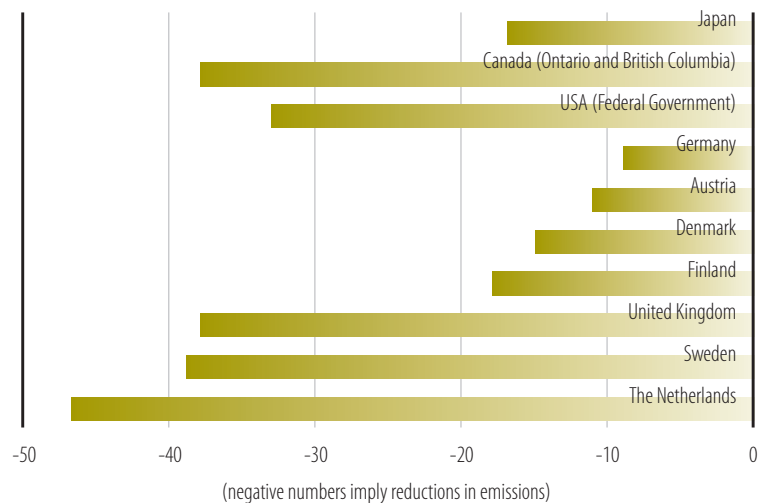
“There is a need for us to move on from focusing on cost focus to life cycle thinking. This is not about simply assigning a monetary value to green goods, or ‘free’ goods or public services. But instead, it would be about making the best of tax payers’ money now and in the future in making the environment safe, providing opportunities for societies to evolve in a thoughtful and intelligent manner, preserving areas of biological and aesthetic value and the like.”
– Procurer from Australia

Issue 11 Carbon footprints and LCC efficiency

There is a growing interest across procurers to demonstrate how buying life cycle cost-efficient products may be contributing to lowered carbon emissions across the public sector. As the urgency to mitigate climate change increases, governments appear to be looking to low-cost policy implementation mechanisms, and SPP can indeed be one of them.

Based on and drawing from the 2009 report *Collection of Statistical Information on Green Public Procurement in the EU* (PricewaterhouseCoopers, Significant and Ecofys), we are able to suggest that national green procurement policies in a number of industrialized countries are indeed reducing carbon emissions across the following product groups: electricity, construction, paper, textiles, transport, office IT equipment, food and beverages, and cleaning services. These estimates are made based on (a) the volume of procurement per product group and estimates of embedded carbon and estimated carbon output level of procurement per product group; (b) the level of embedded carbon in each product group; (c) estimated levels of carbon emissions during the use of the each product group.

Figure 2: Reductions in CO₂ emissions from green public procurement



Sources: Data for EU nations were obtained from *Collection of Statistical Information on Green Public Procurement in the EU* (PricewaterhouseCoopers, Significant and Ecofys, January 2009). The U.S.A. estimates were extrapolated by IISD based on 2008 performance results of the USEPA Environment Purchasing Programme. The Canada estimates were extrapolated by IISD based on data from Environment Canada. The Japan estimates were extrapolated by IISD based on data from the Japanese Green Purchasing Network.

One particular area of emerging interest to procurers is technologies in the light-weighting of road and rail vehicles. According the International Aluminium Institute, vehicle weight reduction directly reduces energy consumption because the energy required to move a vehicles is, except for the aerodynamic resistance, directly proportional to the weight of the vehicle, thus avoiding environmental impacts of all upstream activities including fuel use and energy conversion in the engine. International Aluminium Institute and Institut für Energie und Umweltforschung estimate that, in city buses, a nine per cent reduction in weight can bring 5.6 per cent energy savings and 83 kilo tonnes of CO₂ reductions across the vehicle lifetime. Similar figures are reported for long distance and heavy duty vehicles and even more favourable figures for passenger vehicles and new rail vehicles.¹

¹ International Aluminium Institute and the Institut für Energie und Umweltforschung (IFEU), *Energy Savings by Light-Weighting*, 2003.

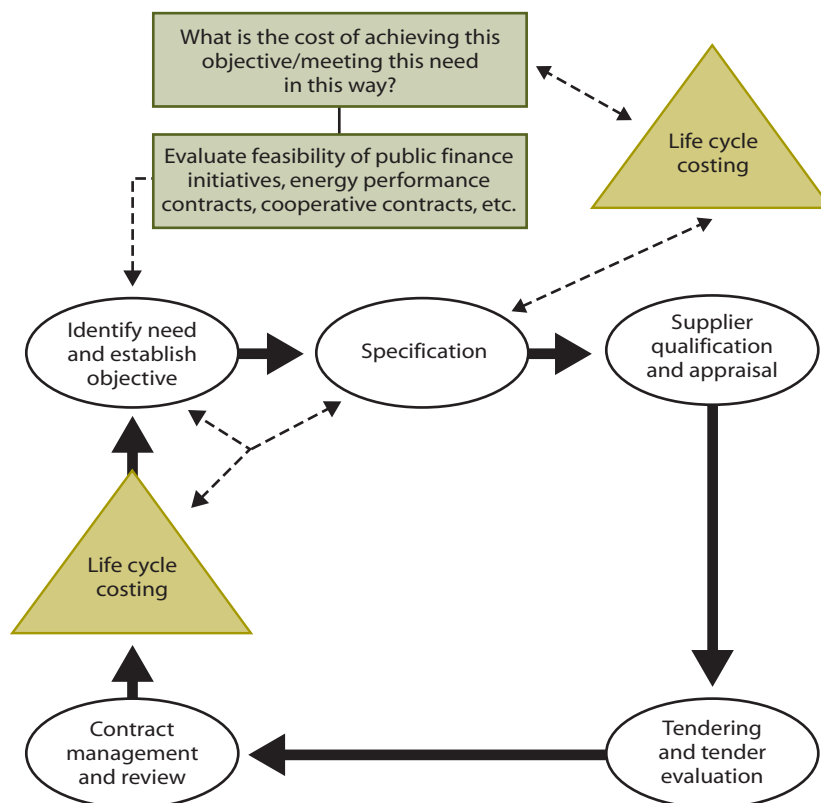
Issue 12 Compatibility with life cycle assessment

Life cycle assessment (LCA), which provides for the estimation of cumulative environmental impacts of an asset throughout its life cycle (from cradle to cradle), has been the subject of considerable research and applications across the world. It has also been used within the context of sustainable public procurement to determine the “best environmental value”—all the procurers that participated in this inquiry stated that they had sometimes consulted LCA data when making decisions on the procurement of chemicals, furniture, electric and electronic equipment, food and beverage, paper and packaging. However, they find LCA to be of limited value due to its focus on environmental impacts rather the financial value of assets during their lifetime.

A growing group of procurers are interested in assigning monetary values to environmental and social impacts to allow these aspects to be factored into LCC analyses. In this regard, it is important to reiterate that LCA and LCC are two different sciences and are governed by considerably different considerations. There has been some early research on this aspect, and we are of the view that, at the present time, it is too early to make any assertions.

Issue 13 At which point in the public procurement process is LCC being used?

Figure 3: Life cycle costing in public procurement



Source: Based on *Environmental Purchasing in Practice*, published by The Institute of Environmental Management and Assessment, the Chartered Institute of Purchasing and Supply, and the National Health Service – Purchasing and Supply Agency, 2002.

Public procurers appear to use LCC to:

1. Design environmentally and socially preferable tender specifications. This includes both mandatory (or core criteria) as well as the optional (or additional) elements that suppliers are required to meet.
2. Develop indicators on which bids will be appraised.
3. Justify the purchase of environmentally and socially preferable alternatives that require a high purchasing cost but would provide the best value for money across the life cycle.
4. Determine the “need to purchase” and subsequently discern between the outright purchase of an asset and the option of contracting services that would full this need. For example, organizations could opt to lease office equipment such as laptops, integrated printers and photocopiers instead of purchasing them. The advantage is that such service contracts typically include maintenance, repair, replacement and end-of-life disposal services, which passes the benefits of LCC-efficient design back to the manufacture. Such service contracts are of growing use in the procurement of information and communication technologies, vehicles and transport services, and catering services.
5. Evaluate the costs and benefits of designing building and infrastructure projects as private finance initiatives (PFI)s. PFIs are a procurement method that secures private funding for public institutions in return for part-privatization. They provide an operational framework for transferring responsibility, but not accountability, for the delivery of public services to private companies. Related contracts require that private enterprise develop the infrastructure on behalf of the public sector, as well as deliver associated services such as management, operation and maintenance in its user phase.
6. The value of PFIs in promoting sustainable public procurement is that the developer is also being contracted to operate and maintain the asset. Developers are then provided with a direct incentive to employ best practices in elements such as design for the environment, vernacular architecture, energy efficiency and indoor aesthetics that improve the LCC efficiency of the development. PFIs also help public sector procurers to build an ongoing relationship with a diverse group of suppliers in such a way that best practice from one project can be applied to the next.
7. Establish Energy Performance Contracting Agreements, a policy option of increasing uptake in North America and the European Union, which are contractual agreements that oblige developers to build and refurbish in such a manner that specified levels of energy costs savings can be guaranteed.²
8. Establish Cooperative Contracts, which are agreements between buyers and vendors designed to reduce the administrative burden of contracting, while leveraging volume to negotiate preferred pricing and service for members of a group or consortium.

Issue 14 What LCC methodologies are used by public procurers?

This inquiry finds that procurers around the world are adopting a wide variety of approaches, formats and cost breakdown structures in their LCC analyses. The most quoted was the *Service-life planning, Part 5: Life-cycle Costing for Buildings and Constructed Assets*, published by the International Organization for Standardization (ISO 15686-5, Buildings and Constructed Assets). Procurers appeared to be using it to determine what could be counted when performing LCC analyses, while specialists were adapting it for a wider range of future costing in non-construction costs such as land, finance and user-support charges; income-related costs such as income from sales and potential third party income during operation; and life cycle costs such as construction, operation, maintenance and end-of-life disposal.

² The European Union Directive on Energy End-use Efficiency and Energy Services (EE+ES-Directive) supports the Energy-Contracting concept and views it as an important market instrument to implement energy efficiency.

However, most procurers also reported that they did not follow a rigorous methodology in LCC. We were hence not able to identify any patterns in these approaches, except that they were specifically tailored to calculate the “value for money” depending on

- the time period for which the procurers and the commission organization were required to exercise responsibility for the asset, and
- the “time value” the procurers and the commissioning organization placed on their funds.

It also appears that most LCC methodologies were not accompanied by risk assessments and sensitivity analyses of key parameters to likely changes.

This finding corresponds to Issue 4, which discusses how conflicts between capital and operations/revenue budgets lowers the case for capital budget holders to support environmental and social features that might cost more at the outset, but bring sizable benefits during the use phase.

Issue 15 LCC is only feasible in the case of selected goods and services.

LCC can be most feasibly applied to certain categories of products and services. Table 1 reflects the current experience of producers in this regard.

Table 1: Products and services that best suited for life cycle costing in procurement decisions

Frequently purchased items	Level of applicability of life cycle costing		
	Very applicable	Moderately applicable	Not applicable
Products			
Office and server ICT equipment			
Vehicles			
Indoor lighting			
Outdoor lighting			
Paper			
Office supplies			
Fuel			
Furniture			
Apparel made with modern fibres and polymers			
Services			
Software			
Electricity			
Transport			
Couriers and postal services			
Waste handling			
Catering: food			
Catering: beverages			
Works			
New buildings			
Refurbishment of existing buildings			
Landscaping			
Railways			
Roads			

Issue 16 The value of central purchasing platforms for smaller public sector organizations

Central purchasing platforms were viewed as valuable resources to promote sustainable public procurement and LCC-efficient purchases across the public sector, especially when procurement functions were decentralized and smaller public sector organizations lack the expertise for these methodologies. The benefits of centralized platforms were considered to be:

- Their ability to accumulate expertise on LCC and SPP, given that they are larger and operate diverse portfolios of products and services;
- Larger volumes of turnover triggers faster learning and the easier replication of best practice;
- The ability to operate economies of scale and purchase large volumes, which enables the negotiation of bulk discounts.

Issue 17 LCC-efficient alternatives are not always the most environmentally and socially sustainable ones.

Research and experiences with LCC in Finland, Canada, Sweden and the U.S.A. suggest that the most LCC-efficient alternatives are not always the most sustainable in terms of environmental and social attributes. Our research came across several instances where procurers were purchasing energy-efficient lighting, as well as organic and low carbon food products and commissioning low impact infrastructure, and related bids were short-listed based on results of life cycle assessments and LCC analyses. In all of the cases, the most advantageous in terms of LCC was not the one that received best life cycle assessment rating.

Issue 18 Should the responsibility for conducting LCC lie with procurers?

LCC is a new and evolving science that requires specific expertise. If procurers are to use this methodology with some accuracy, they would be well served with wider knowledge of the positive externalities that can be realized through the procurement of sustainable assets. Procurers would also need to interpret expert advice on environmental technologies, given the fast pace of innovation in this field. In addition, if SPP is to be used as an implementation tool for sustainable development, procurers would also need to have an appreciation for what these goals might be.

How feasible is it to expect procurers to have such multi-disciplinary skills? Currently, a large majority of procurement professionals across the world tend to hail from academic backgrounds that lean towards business administration, international relations, political sciences, social sciences, history and the arts. They would need dedicated and continuous skill-building if they are to incorporate LCC analyses into procurement decisions. This is a costly exercise and will be beyond the reach of many public sector organizations.

One way to address this issue is to position the responsibility for LCC analyses higher up the procurement policy hierarchy. In the U.S.A. for example, LCC analyses are conducted before sustainable alternatives are spelt out in Executive Orders and Federal Acquisition Regulations. Therefore, when the federal government requires the purchase of a greener alternative, it also inherently signals to the market that it is life cycle cost-effective. This point is further discussed in Issue 20 below.

Issue 19 The value of designing tenders that embed LCC efficiency in core/mandatory specifications

One strategy to remove the burden of LCC analyses from procurers is to provide them with sufficient policy guidance and tools to include LCC-efficient benchmarks as mandatory/core specifications. This approach is favoured in countries such as Switzerland, Sweden, Finland, Norway, Denmark, the U.S.A. and Canada. Procurers are provided with checklists and/or specifications on LCC efficient products, services and assets with the requirement that they are used as mandatory specifications in related tenders. These countries have also set up dedicated centres of expertise that procurers can tap into for additional guidance.

Procurers are then faced with a less technical task when determining the best value for money, as they are dealing with a level playing field of LCC-efficient options. Simply using payback calculations is hence likely to be more than sufficient.

Issue 20 Sustainable public procurement policies that enumerate LCC-efficient alternatives

What would be the impact if SPP policies were developed to include specifications on LCC-efficient products and services with a requirement that they are purchased by all public sector organizations? The burden of responsibility for conducting LCC and getting it right would then be moved higher up the government hierarchy where allocating funds for modelling and research might be somewhat easier. Government may also make efficiency gains, as individual organizations will not need to devote resources and replicate efforts in conducting LCC analyses on their own.

The most notable gain in such a scenario would be that SPP would be sufficiently well positioned in the government hierarchy to be picked up as a vehicle for sustainable development. SPP can then also be used to signal to the market that the demand for sustainable alternatives is consistent, long term and rising.

For this scenario to be workable however, the fundamental checks and balances that provide for government accountability, transparency and good governance must be in place. It is also likely that public procurement processes would need to be modernized to carry through these reforms. Without such safeguards, SPP policies could well be used to suit private and special interests rather than bring sustainable development to the nation.

When policy enumerates life cycle cost effective alternatives: The case of the U.S.A.

In the U.S.A., Executive Orders and Federal Acquisition Regulations provide guidance on environmental attributes of target products and federal agencies are required follow these specifications when they purchase related items. LCC and life cycle analyses are used in the development in these specifications.

To enable the wider uptake of federal procurement policies, the US Environmental Protection Agency has designed a voluntary Environmentally Preferable Purchasing (EPP) program that targets a wide array of products and services that go well beyond the federal requirements. The EPP program also provides procurers with practical tools, checklists and guidance to implement the federal requirements and, indeed, to take them several steps further. These programs have also been used by state governments to develop sustainable public procurement efforts of their own.

As a representative of the US Office of Management and Budget, Executive Office of the President 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. Sustainable public

procurement needs to be made simple. Public procurement is full of procedures and red tape as it is, we must not add more. If procurers are asked to perform additional analyses, the policy is doomed to fail.”

The Energy Star program was first developed by the US EPA in the early 1990s as a voluntary program to complement federal purchasing requirements on energy-efficient products. Today, Energy Star is an international standard used by both the public and private sectors. In the U.S.A. in 2008 alone, it is estimated to have saved US\$19 billion from 1996 to 2006.

Similarly, the Electronic Product Environmental Assessment Tool (EPEAT), specified by US Federal Purchasing Regulations since 2001, now covers more than 60 per cent of the U.S. market. EPEAT is a procurement tool that evaluates, compares and selects desktop computers, notebooks and monitors based on 23 environmental attributes. EPEAT-registered products are rated Gold, Silver or Bronze, depending on the percentage of 28 optional criteria they meet above the baseline criteria. EPEAT operates an ongoing verification program to ensure the credibility of the registry.

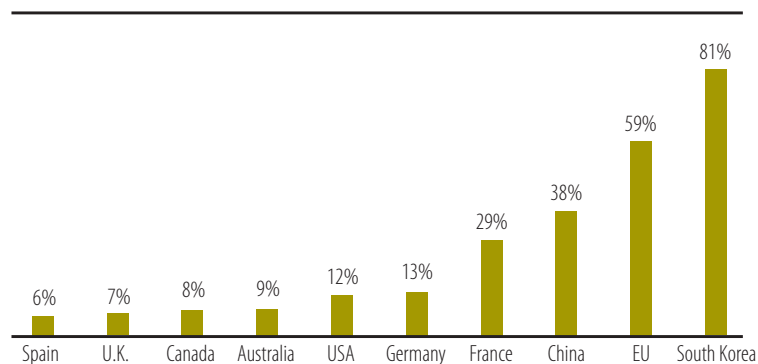
Issue 21 Opportunities in green economic stimulus spending

The global financial crisis and the ensuing roll-out of government economic stimulus packages could potentially be the most important showcase for sustainable public procurement.

China and the U.S.A. lead in terms of size of their overall stimulus plans and the percentage allocation for green growth. All countries have committed large amounts to co-fund renewable energy investments, energy-efficient buildings, modernize grids and water infrastructure, and provide for mass transit. The South Korean Green New Deal is, however, the most notable, as it allocates 80 per cent to green growth, including expansion of information and communication infrastructure.

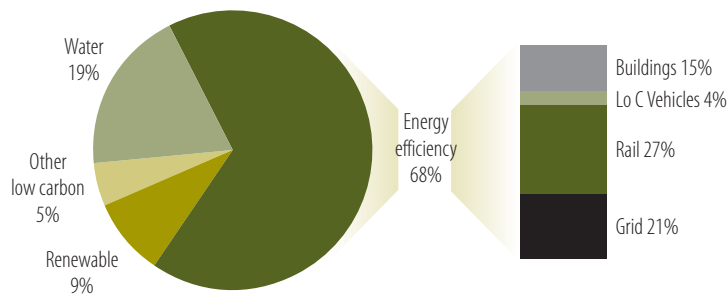
Given the large sums of spending involved, the need to use LCC analyses to ensure “value for money across the life cycle” is particularly urgent. Procurers are finding that they are not just responsible for unusually large budgets, but they are also required to explore alternative procurement and asset ownership models that will include public-private partnerships, private finance initiatives, integrated service contracts, energy performance contracting and more. The stakes involved are particularly high, as commentators are keeping a watchful eye on the impact of these funds and whether they do generate on the promised positive externalities: new green industries, green jobs, rural development and the overall transition to low-carbon living. Now is the opportunity to establish the case for sustainable and life cycle-efficient public procurement.

Figure 4: National green stimulus ranking as a percentage of the total government economic stimulus spending



Source: *A Climate for Recovery*, HSBC Global Research, February 2009

Figure 5: Green stimulus theme allocation



Source: *A Climate for Recovery*, HSBC Global Research, February 2009

Issue 22 The need for LLC in SPP becomes even more important when SPP is not mandated by a legislative or supra legal instrument.

Public procurers in emerging and lower income economies might often be experimenting with sustainable procurement in the absence of a specific law, guidelines or other supra legal instrument that mandates procurement to be conducted with due consideration to environmental and social impacts. Procurers in these instances are particularly interested in learning about LCC, given their constant concern that they are often paying a higher purchasing cost for environmentally and socially preferable goods and services, and that some day in the future, they can be accused of wasting public funds.

The need to integrate LCC into procurement decisions may hence be particularly important in the very early stages of sustainable public procurement activity to support experimentation by proactive practitioners and policy-makers, which will in turn establish the case for laws or supra legal supporting frameworks.

Issue 23 LCC and “buy national” policies

In the wake of the 2008–09 global economic downturn, and indeed, in the roll-out of government economic stimulus spending, many governments are also promoting “buy national” programs and prioritizing nationally-based and homegrown enterprises in public tenders. Indeed, “buy national” programs are also being featured as components of green and sustainable public procurement initiatives on the grounds that they support the creation and expansion of “green jobs” and “green industries” within the economy.

The questions we posed to procurers working with “buy national” policies were twofold:

1. Would “buy national” policies radically change the suppliers who traditionally did business with the government?
2. Would “buy national” policies pre-empt procurers to purchase less LCC-efficient products and services on the grounds that they are manufactured within the economy?

This inquiry was not able to develop firm conclusions, especially given that these policies were in their very early stages of implementation. Most procurers were also of the view that LCC efficiency would not be compromised in “buy national” policies. Procurers appeared to be focusing on where companies were headquartered and if tender applications were made from joint ventures, subsidiaries, mergers or greenfield operations established within their economy. They also tended to concentrate on the local equity component of the tendering firm as opposed to where raw and semi-processed materials were sourced from and where manufacturing took place. Only three procurers mentioned that “buy national” policies would require an investigation into whether resources were sourced from within the economy and if the procurement effort would support local industries, especially those that employed large numbers and had an international comparative advantage.

This inquiry also made a concerted effort to discuss the fact that “buy national” policies contradict the World Trade Organisation’s (WTO) multilateral rules for trade, namely the Most Favoured-Nation treatment (which prohibits countries from discrimination amongst goods originating from different countries), and the National Treatment rule (which prohibits governments from discriminating between imported products and domestically-produced goods). In addition, “buy national” policies are also in contravention of the WTO Agreement on Government Procurement, which has 28 parties and opens up public tendering markets (above specified monetary thresholds) to international competition. It is designed to make laws, regulations, procedures and practices regarding government procurement more transparent and to ensure they do not protect domestic products or suppliers, or discriminate against foreign products or suppliers. It also reinforces the rules guaranteeing fair and non-discriminatory conditions of international competition. For example, signatory governments are required to put in place domestic procedures by which aggrieved private bidders can challenge procurement decisions and obtain redress in the event such decisions were made inconsistently with the rules of the agreement. The consensus across international trade policy-makers and international procurement experts was that nations need to support their economies in times of crisis, and especially during a global economic downturn. As one policy-maker suggested during the World Trade Organisation Public Forum on September 2009, “we are all in glass houses—who will throw the first stone”?

Issue 24 A matter of semantics?

Practitioners, and those who advise them, are using a number of terms to describe LCC and its derivations. This inquiry found that often LCC was used interchangeably with terms such as *whole life costing*, *full cost accounting*, *whole life value* and *total cost of ownership*.

We are of the view that these diverse terminologies do refer to LCC, in that they are systematic accounting approaches that seek to evaluate all costs and immediate externalities associated with a product or service. But different terms may have arisen based on how LCC is being adapted in different sectors. For example,

- *total cost of ownership* often appears to be used when LCC methodologies are being adapted to evaluate information and communication technologies;
- *whole life costing* appears to be used when LCC is being used to assess the cost-effectiveness of renewable energy technologies;
- *full cost accounting* is the preferred term across the materials management and the end of life treatment, recycling and waste management professions; and
- *whole life value* and *life cycle costing* are used interchangeably across the building and construction sector.

2. Moving forward



Photo – iStockphoto: Pglam

This white paper establishes that, though many procurers have begun to use LCC as a decision-making tool, its use is still far from being systematic and the calculation methodologies are sometimes far from robust. Often, it is limited to quantifying the monetary value of selected costs; in most countries, non-financial elements are only now entering the discussion. Moreover, procurers tend not to be able to use LCC to inform bigger, more strategically advantageous decisions. For these reasons it is clear that the current sustainable public procurement model is not delivering the best value for tax payers' money. We believe this needs to change.

Our evidence shows that there are limits on the extent to which the practice of LCC in most current, routine procurement decision-making processes can support the delivery of sustainable procurement. Even when LCC is recognized as important and used appropriately, it cannot overcome the inherent restrictions imposed by capital cost constraints, for example.

Our report also highlights a lack of motivation to use LCC because, often, the financial gains or long-term benefits will not flow back to the original decision-maker; the long-term financial benefits are beyond the scope (or term of office) of the decision-makers working on the initial procurement proposal; and the consideration of future issues is beyond the scope of responsibility of the decision-maker/procurer.

So, it is clear that organizations will stand a better chance of delivering sustainable procurement when budgets are set that account for costs and benefits across departmental boundaries, across several financial years and without the false economies of short-term capital cost constraints that currently act against the achievement of long-term value.

It follows that better value for tax payers' money is delivered when life cycle costing or "whole life value thinking" is applied at the level of resource allocation. We should be focusing our attention on those who allocate budgets and scrutinize the use of public funds rather than on those who are able to make procurement decisions only within strict budgetary and financial limits.

Recommendation 1:

LCC should be part of public expenditure policy—including procurement policy—and thereby should be integrated into sustainable public procurement policies. LCC, or whole life value thinking, will then be an integral part of the resource allocation process. Since resource allocation and budget setting is undertaken at a much higher level in the organization than routine procurement decision-making, “whole life value thinking” will begin to permeate all public spending decisions.

Recommendation 2:

LCC should be made a necessary component in sustainable public procurement policies and those responsible for public expenditure policy should provide the necessary tools, platforms, budgets and expertise to perform this analysis in a cost-effective manner.

Many of the best cases of sustainable procurement are to be found where new funding models have been applied. This might be described as sustainable procurement being delivered in spite of, rather than because of, the resource allocation systems in place in many organizations.

Recommendation 3:

Alternative models of asset design and delivery, such as energy performance contracting agreements, need to be promoted as efficient means of implementing sustainable public procurement policies.

Recommendation 4:

Organizations should be enabled to retain at least a proportion of savings achieved through sustainable procurement to “pump-prime” initiatives with higher upfront investment costs.

Recommendation 5:

Alternative models of asset ownership, such as private finance initiatives and such other private-public partnership, need to be explored to provide more efficient models for delivering LCC efficient public procurement.

So it also follows that:

Recommendation 6:

LCC should be promoted more as a tool for showing value for money, rather than simply a method for calculating the costs of purchasing environmentally and socially preferable good, services and assets.

Recommendation 7:

Clear guidance should be provided on how and when organizations should capture and report benchmark data used in life cycle costing exercises. This will help raise the standard of life cycle costing overall, as well as improve the quality of data. Indirectly, it is also likely to contribute to better management information systems and more effective reporting.

IISD looks forward to pursuing work on these recommendations and welcomes perspectives and expressions of interest from all stakeholders. We are convinced that sustainable public procurement can be a cost-effective strategy for realizing sustainable development, but we need to enable public budget holders and procurers to rework the typical procurement question from “What is the cost of buying this asset?” to “What is the cost of achieving this objective in this way?” LCC needs to be made an integral part of sustainable procurement policies to allow this to happen.

Contacts:

Oshani Perera, operera@iisd.org

Clarita Martinet-Fay, cmartinet@iisd.org

3. Resources

A selection of life cycle costing tools used by the procurers and stakeholders that participated in this project:

International Organization for Standardization standard, ISO 15686 -5, Buildings and Constructed Assets, Service-life planning Part 5: Life-cycle Costing (ISO 15686-5)

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