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What is GPP?

Green Public Procurement (GPP) is the process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured.

What is GPP4Growth?

GPP4Growth brings together the experience and practices of nine public bodies from across the EU in a bid to improve those public bodies' capacity to implement policies that promote eco-innovation and green growth through 'Green Public Procurement' (GPP). 14% of the EU's total GDP is consumed by Europe's public authorities. This public expenditure on goods, services and works has a total estimated value of €1.8 trillion annually. This substantial public authority 'purchasing power' can be utilised to stimulate eco-innovation, resource efficiency and green growth by promoting environmentally friendly, resource-efficient goods and services.

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Roinn Cumarsáide, Gníomhaithe ar son na hAeráide & Comhshaoil
Department of Communications, Climate Action & Environment

Life Cycle Costing (LCC) Methodology and Resources

Executive Summary

This document is based on a guide prepared by the University of Patras in Greece, a GPP4Growth partner. That guide was created as a tool for GPP4Growth partners and other European public bodies to help them to implement Life Cycle Costing (LCC) techniques in their green public procurement (GPP) procedures.

This short brief first explains to readers what LCC is. It then directs readers towards a variety of tools which can be used to implement LCC in the procurement of certain product categories which are common to many public bodies' purchasing needs.

'LCC Methodology and Resources' (The full guide)

The full guide upon which this brief is based is called **'LCC Methodology and Resources: Guide for the use of Life Cycle Costing in Green Public Procurement'** and it contains detailed instructions on how to use the LCC tools mentioned below. The full guide document is available online on the GPP4Growth website and is a fantastic starting point for any public procurement staff wishing to implement LCC in their green procurement procedures.

Introduction

Public procurement is an excellent field for the application of LCC because the procurement needs of public authorities are characterized by their regularity, commonality and large quantity. These aspects of public procurement make the investment by public bodies in developing LCC tools and training procurement staff in their use worthwhile.

Green public procurement (GPP) can help to stimulate a critical mass of demand for more sustainable goods and services in the market. Similarly, GPP that utilises LCC can encourage suppliers to engage with LCC and to provide transparent solutions whose costs can be comprehensively assessed using LCC.

The first objective of this document is to introduce the reader to the concept of LCC. LCC is explained and some benefits of the approach and challenges in implementing it are noted. How LCC relates to the Most Economically Advantageous Tender criterion common to all public procurement in the EU is also outlined.

The second objective of this brief is to direct the reader towards several LCC tools that have been developed to help procurement staff to automate the calculation of life cycle costs for a range of products that are commonly procured by public authorities.

What is Life Cycle Costing (LCC)?

Article 68 of Directive 2014/24/EU defines LCC as follows:

Life Cycle Costing shall to the extent relevant cover parts or all of the following costs over the life cycle of a product, service or works:
(a) costs, borne by the contracting authority or other users, such as:
(i) costs relating to acquisition,
(ii) costs of use, such as consumption of energy and other resources,
(iii) maintenance costs,
(iv) end of life costs, such as collection and recycling costs.
(b) costs imputed to environmental externalities linked to the product, service or works during its life cycle, provided their monetary value can be determined and verified; such costs may include the cost of emissions of greenhouse gases and of other pollutant emissions and other climate change mitigation costs.

LCC aims to include all costs associated with the use of a product or service incurred over its entire lifespan or 'life cycle'. Along with consideration of the acquisition costs, maintenance and usage costs, and end of life costs, LCC also considers the costs related to social or environmental 'externalities' (noted in (b) above) that are associated with the product or service e.g. its environmental impact. It is important to reiterate that these externalities must be expressed in monetary form in order to form a part of an LCC assessment. This condition can often be difficult to satisfy, however:
- the level of adoption of LCC can be partial, meaning that one can select to take into consideration only a subset of relevant costs during the procurement process;
- several of the tools mentioned below incorporate a method to monetarily express certain environmental impacts of particular products and;
- as LCC becomes more commonly used, new methods for expressing environmental impacts in monetary form will be developed which will in turn make implementing LCC easier for procurement staff.

By 2016 every EU country had to incorporate EU directives 2014/24/EU and 2014/25/EU into its national law. These directives which concern procurement allow and promote a LCC approach in all public procurement.

LCC vs TCO

Just like LCC, the Total Cost of Ownership (TCO) of a product or service includes the acquisition costs, maintenance, usage and end-of-life costs (such as cost of disposal etc).

However, TCO does not include any monetary costs imputed to the environmental impact of a particular product or service, which LCC does aim to include in its cost-assessment of a product or service.

Benefits of LCC

Reduction of costs by choosing the most cost-efficient solution in the long-term.

Transparency of future operational costs.

Steers design decisions towards the reduction of total life cycle costs.

Flexibility of the meaning of the word 'value'. 'Value' may refer to the purchasing cost, the quality of the product or the environmental impact of it.

Challenges facing LCC

The need for reliable data for the proper calculations to take place.

The complexity of environmental issues making their evaluation uncertain and difficult.

Lack of procurement departments' knowledge of, and familiarization with, LCC concepts.

Occasional conflicts between cost efficient solutions and environmental-friendly solutions.

Despite the above challenges facing LCC which were highlighted in the Sustainable Public Procurement Regions Project Consortium's report on LCC (March 2017), there is a strong motivation to ensure that LCC is adopted to its full potential in public authorities.

In the methodology outlined by the full guide associated with this brief, financially measurable costs are included in LCC calculations and relevant impacts and costs that can't (yet) be presented in monetary form are addressed by noting the relevant GPP criteria which may apply to those environmental impacts and costs. This important point is demonstrated in the 'Indoor & Outdoor Lighting' example below.

LCC and Most Economically Advantageous Tender (MEAT)

Public procurement across the EU now utilises the MEAT criterion rather than the Lowest Price criterion when assessing tenders and awarding contracts for work, goods or services. The MEAT approach aims to ensure that the best value for money is achieved rather than just the lowest purchase price. This 'value for money' is considered across the entire lifespan of the product or service in question. Therefore, LCC's comprehensive approach to true cost consideration in the long-term makes it the perfect tool to help identify the Most Economically Advantageous Tender and award contracts accordingly.

Life Cycle Costing Tools

The following LCC tools are categorised under the product categories which they are applicable to. These product categories were selected because they represent some common procurement needs of public bodies. The products mentioned are also characterized by heavy energy consumption and this allows the benefits of assessing the products using LCC to be more substantial. More details about the tools mentioned below and links to them can be found in the full 'LCC Methodologies and Resources' guide.

Indoor & Outdoor Lighting

Factors to consider when assessing lighting solutions may include the energy efficiency of a given solution, the lifespan of the solution, its dimming abilities and environmental externalities such as gas emissions, resource efficiency and light pollution.

These latter three environmental externalities cannot be included as part of LCC as they aren't currently financially measurable. Therefore, these externalities must be addressed using GPP criteria within the tender. For example, in the case of light pollution, the EU criteria for the Ratio of Upward Light Output (RULO) is set to 0% and should be adhered to in tenders for lighting systems. The RULO is the amount of light emitted above the horizontal plane of the electric light unit so keeping this at 0% minimizes light pollution i.e.it minimizes any excess light shining where it is not needed.

LCC tools relevant to Indoor & Outdoor Lighting:

1. **Generic Luminaire by the European Commission (Outdoor & Indoor)**
2. **Lighting System by the National Agency for Public Procurement (Indoor)**
3. **Lighting System by the National Agency for Public Procurement (Outdoor)**
4. **Super-efficient Equipment and Appliance Deployment (SEAD) by the Clean Energy Ministerial (Outdoor)**

Vehicles

Some factors to consider when assessing the life cycle costs of vehicles include the vehicles' energy consumption and environmental externalities such as CO2 and other pollutant emissions. The tool below also has the capacity to factor in the cost of tax per vehicle, insurance, the cost of any extra infrastructure required such as charge points for electric vehicles, the cost of parking for specific types of vehicles and so on. (For further information on the promotion of clean and energy-efficient road vehicles, see Directive 2009/33/EC and its amendment, Directive 2019/1161.)

LCC tools relevant to Vehicles:

1. **Generic Clean Fleets by the European Commission**

LCC vs LCA

Life Cycle Assessment (LCA) is a technique used to analyse the environmental impacts of products and services across the course their life cycles.

LCC focuses on quantifying the monetary costs of a product or service incurred over their life cycle.

Although LCA and LCC share common characteristics, the two should not be confused.

Contact :
The Department of Communications, Climate Action and Environment

Address:
Newtown Road,
Wexford, Ireland , Y35 AP90

Tel: 01 6782570
Email:
gpp@dccae.gov.ie

Office IT Equipment

Factors to consider when assessing the long-term costs of IT equipment include, but are not limited to, the energy consumption of the IT equipment in question and their lifespan extension. The provision of extended standard guarantees indicates a manufacturer's confidence in their product's predicted lifespan. The market availability of spare parts should also be considered. Potential suppliers are encouraged to put forward prices of spare parts and indicative associated labour costs for repairs and replacements. This should encourage competitive manufacturers to reduce repair and upgrade costs.

Environmental externalities to be considered include the use of hazardous materials in the production of IT equipment and end of life-related impacts such as the environmental impact of the extraction processes of the hazardous materials contained in IT equipment. Currently, there are no monetization methodologies (that the authors of the guide know of) for either of these externalities and as a result they do not yet fall within the scope of LCC or within the scope of the tools mentioned below. Again, if externalities like these are difficult to quantify and express in monetary terms, they can be excluded from the LCC but rules about their incorporation within any potential solution may be used as a technical specification, award criterion or contract clause instead.

LCC tools relevant to Office IT Equipment:

1. **LCC tool for Computers and Monitors from the European Commission**
2. **LCC tool for Office IT from the European Commission**

Vending Machines

Environmental factors to consider when using LCC in relation to vending machines may include the machines' energy consumption and associated CO2 emissions. These machines often run 24 hours a day, 7 days a week so the use of efficient lighting systems within them can greatly lessen their energy consumption. During the machines' end of life phase, the cost of the disposal and treatment of their plastic or metal components must also be considered.

LCC tools relevant to Vending Machines:

1. **LCC Tool by the National Agency for Public Procurement**
2. **LCC tool by the European Commission**

More LCC Resources

The full LCC Methodology and Resources guide contains a description of, and links to, 26 resources which will help public procurers as they utilise LCC in their own procurement processes. The resources include relevant EU Directives, practical LCC tools and various guides and reports that may inform one's understanding and use of LCC when procuring some of the most commonly tendered for products and services that public authorities need.

More Information

This policy brief is provided by Department of Communications, Climate Action and the Environment of the Republic of Ireland / Roinn Cumarsáide, Gníomhaithe ar son na hAeráide agus Comhshaoil, and is based on a guide prepared by the University of Patras. The full guide is called 'LCC Methodology and Resources: Guide for the use of Life Cycle Costing in Green Public Procurement' and is available online at the GPP4Growth website.

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