

# Life-cycle costing tools

## Summary

Life-cycle costing (LCC) tools promote sustainable investment by allowing contracting authorities to estimate the total long-term costs of the goods, services and works they procure. LCC methodologies calculate costs by assessing the following: investment costs (e.g. purchase price and associated costs), operating costs (e.g. energy consumption), maintenance costs (e.g. service charges, replacement), and end-of-life costs (e.g. decommissioning and disposal).

Furthermore, LCC plays an important role in implementing green public procurement (GPP), as it encourages the choice of resource-efficient goods, services and works by putting a price tag on the cost of aspects, such as fuel, energy and water consumption. So-called environmental LCC also includes external costs of a given good, service or work, which may not be directly borne by the contracting authority. These include for instance carbon emissions, and environmental impacts such as soil erosion and pollution.

The 2014 Public Procurement Directives promote the use of LCC as a methodology to assess the most economically advantageous tender (MEAT),<sup>1</sup> provided that the calculation method and the data to be provided by the bidder are communicated in the procurement documents. Specific provisions for the calculation of environmental externalities are included in the Directives too.

However, calculating life-cycle costs is a complex task that requires setting parameters based on realistic assumptions about potential future costs, e.g. energy prices, need for repair or usage time. Other challenges in assessing costs consist in counting cost items only once, as well as determining the most important cost items. Furthermore, the calculations need to be product-specific for the assessment of life-cycle costs, if used in the evaluation of tenders.

To overcome the challenges in calculating LCC and support practitioners who wish to implement it, a number of MS have developed LCC calculation tools. The main purpose of these tools is to compare LCC between various products. Such tools are particularly relevant when the technical offer triggers different operations and maintenance costs, such as complex supply contracts or specific design and build works contracts. The LCC tools can be used either during the course of the needs analysis, as an instrument to estimate costs, or during the evaluation phase to select among offers. LCC tools are typically spreadsheet-based and product-specific. They pre-define the main categories of costs, which need to be filled with information from the supplier. The tool contains a 'summary tab' that allows making comparisons between various products. During the tender phase, the contracting authority may either request the information needed for the LCC calculations from bidders, or ask bidders to directly fill in the relevant data in the tool.

## Good Practice Examples

- ✓ Denmark
- ✓ Germany
- ✓ Latvia
- ✓ Sweden



## Impact

### Enhance value for money



The main purpose of LCC tools is providing a more complete assessment of the costs of goods, services and works, which in turn allows procurers to compare offers and select the one that provides the greatest value for money over the long term.

### Incorporate strategic procurement



By implementing LCC, contracting authorities are able to include 'green' aspects in their purchasing decision. Even though LCC will not always result in the greener choice, it is a more sustainable approach than traditional costing, as it incorporates elements such as fuel and energy consumption. Environmental benefits are even greater, if LCC tools take into account the costs of various environmental externalities, such as greenhouse gas emissions.

### Reduce administrative burden



LCC requires economic operators to provide additional data on the performance of their products e.g. energy, fuel, water consumption etc. This creates additional administrative burden for them.

## Related Good Practices

Library of strategic procurement criteria

## Input

### Cost – €€

- Medium set-up cost
- Low operation cost



### Time – Less than 6 months



### Complexity – High

- Set-up initial tool and calculation parameters
- Provide dissemination and guidance for users



## Key success factors and potential pitfalls

### Communicate clearly on LCC benefits

Practitioners may resist using LCC tools due to higher upfront investment costs that an LCC-efficient solution may require, and the greater exposure to the risk of legal challenge. Indeed, solutions that are cheaper over their lifetime often are more expensive to purchase. To overcome these concerns, the benefits of LCC need to be communicated and promoted clearly.

### Keep tools simple & provide guidance

Practitioners need simple tools that reduce the complexity of LCC calculations to overcome the barriers related to LCC implementation. For instance, ready-to-use spreadsheet formulas for calculating net present value are considered valuable by users. However, even a simple tool needs to be accompanied by clear guidance on how to make best use of it. Guidance materials needs to include an explanation of the cost parameters applied.

### Build core expertise

Given the complexity of LCC, contracting authorities need to set up a core expertise for LCC, particularly for complex procurements. Relevant profiles include economists, product experts, environmental experts, but also users and operators.

### Offer full transparency of LCC cost parameters to economic operators

It is important to communicate transparently about cost parameters used for LCC to ensure that economic operators are informed on the methods used to evaluate their bids, and to reduce the likelihood of legal challenge.

### Risks in setting the calculation parameters

Setting calculation parameters is challenging, as a number of parameters may be misjudged, which have a large impact on the calculations. This is the case for instance for the energy price, usage time and discount rate. In this respect, the most important is for all stakeholders to be clearly informed about the parameters used.

### Apply penalties for not delivering on performance

To avoid abuse of LCC with companies making empty promises (e.g. on environmental performance), supplier's claims related to costs and environmental performance should be incorporated into their contractual obligations. This allows contracting authorities to include a mechanism to sanction economic operators for failing to deliver on the stated environmental or cost performance, e.g. minimum energy performance.

### Quantify environmental costs

The challenge in including external environmental costs in procurement is the difficulty in verifying these effectively. Indeed, the award of the contract has to be based on quantifiable and verifiable information to guarantee an objective evaluation, which requires environmental costs to be expressed in monetary terms.

### Reduce risk of litigation

The 2014 Procurement Directives open up opportunities for the use of LCC, but at the same time bring a degree of uncertainty. There is a greater risk of litigation of rules that have only been applied for a relatively short time. For instance, the concept of data to be provided "with reasonable effort by a normally diligent operator" is likely to lend itself for a challenge in court.

## Case Study

### Sweden – LCC tools developed by the National Agency for Public Procurement\*

In Sweden, the National Agency for Public Procurement provides contracting authorities with a number of spreadsheet-based LCC tools available for download on its website. Specifically, the Agency has developed one general LCC tool and six product-specific tools, namely for white goods, cars, indoor lightning, outdoor lighting, vending machines, and commercial refrigerators and freezers. The LCC tools were first developed in 2009, and updated with a user-friendly interface in 2016. The development of the tools was initiated based on demands from the government and from users to facilitate LCC usage.

These tools have two main types of application: they can either be used in the initial phase of the tender to refine the procurer's awareness of the costs involved and to test various costs scenarios, or for the evaluation of tenders. Furthermore, LCC tools may help in creating a basis for cost discussion with suppliers.

The general LCC tool covers the basic parameters related to life-cycle costs, such investment costs, operating and maintenance costs, and other costs (e.g. insurance, taxes, disposal, residual value etc.) and includes climate impact measured in CO2 equivalents. It is intended primarily for use during the needs analysis phase, allowing contracting authorities to get a sense of the real costs of the product. The product-specific tools, on the other hand, are meant for use in the tender evaluation phase.

To use the LCC tools, the contracting authority needs to define the basic conditions for calculation, which, for the general LCC tools, consist of the usage time, the discount rate, the price of electricity, fuel and water, annual price change, climate impact energy usage, and financing costs (for leasing or renting). In the case of the specific LCC tools, the calculation conditions are adapted to how the product is used. For instance, the LCC-tool for professional refrigerators and freezers includes the number of years of use and the annual days of use as part of the parameters for the calculation.

The LCC tools include the following dimensions ('tabs'):

- Introduction: general instructions on the use of the tool;
- Calculation sheet: life-cycle costing analysis of several product solutions based on standardised parameters;
- Tool parameters: detailed definition of cost parameters applied for the calculations;
- Results: visual presentation of the results of the cost comparisons;
- Climate impact factors: factors for calculating the environmental impact from energy;
- Respondent sheet: sheet for the supplier to attach to the tender.

In terms of calculation methodology, the LCC tools are based on the present value method and calculate future costs to present value. The equation for the calculation of the present value is specified in the tool. The various parameters chosen by the contracting authority in the 'calculation conditions' have an effect on the final results.

\*Feasibility study on implementing life-cycle costing tools based on the Swedish case study - available on the [e-library of public procurement good practices](#).



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<sup>1</sup> See Article 67 and Article 68 of Directive 2014/24/EU