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LIFE CYCLE COST (LCC) - DESCRIPTION OF THE TOOL AND ITS PARAMETERS

LCC IN PROCUREMENT

The Swedish Environmental Management Council's LCC tool can be used in both the needs-analysis and in tender evaluation to clarify the total cost for a product during the period it will be used. Accordingly, the LCC tool shows the true costs that the purchasing division will need to pay for the purchased product.

In the needs-analysis the tool can be used to improve the planning of purchasing in order to clarify the difference in the costs of leasing or purchasing. It can also be used to make an estimate of what an environmentally compatible alternative will cost in comparison with a conventional product - perhaps this can result in a saving instead of an increase in the price!

If the tool is used in the tender evaluation it is best suited as an evaluation criterion. It is then necessary that the enquiry document clearly describes the parameters which must be included in the calculation and the documentation of the measurement methods to be applied so it is clearly evident which information the tenderer must provide. Below is an example of which data the purchaser should contribute with in the enquiry document and which data should be requested from the suppliers in order to make the evaluation.

<u>SUPPLIERS</u>	<u>PURCHASERS</u>
Conditions	<ul style="list-style-type: none"> • Number of years the calculation comprises (years of use) • Quantity of goods • Calculation interest in %
Investments <ul style="list-style-type: none"> • Purchase price • Cost of delivery for all goods (SEK) • Reinvestment is required during the years that the calculation embraces 	
Running costs <ul style="list-style-type: none"> • Consumption (e.g. litre/10 km) or power (kW) • Maintenance cost per year according to e.g. the manufacturer's recommendations (SEK) 	<ul style="list-style-type: none"> • Annual average use of the goods • Calculated running costs SEK/unit
Other costs <ul style="list-style-type: none"> • Annual tax in SEK • Phasing-out cost in SEK • Guarantee for repurchase in SEK (residual value) 	

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It is important to choose the parts from the aforementioned parameters that are appropriate to the purchase in question. The information requested from the suppliers must also be produced in a standardised manner in order to permit a comparison. For example, there are standardised data available for private cars, vending machines and white goods produced within the EU, however there is no data of this kind for e.g. catering equipment and large vehicles, which makes the job of producing information about running costs difficult. It is also important that there is a description concerning the follow-up of the winning tender.

DEFINITION AND EXPLANATION OF THE TOOL'S PARAMETERS

MSR's tool for life-cycle costs is best suited for products that consume energy during the operating phase. For example, operating and maintenance are major cost items for vehicles, lighting and office machinery during the life cycle and accordingly it is important to include these costs in the procurement. This is a general tool and should work for most products, but certain investments require more adapted calculations and we then refer to more specific tools.

The tool analyses an economic life cycle and *not* a life cycle according to “cradle to the grave”, accordingly the tool only takes costs that impact on the purchasing division into consideration and not other environmental costs that impact on society. In order to guarantee that the investment becomes environmentally compatible, we recommend that the tool is used as a supplement to the Swedish Environmental Management Council's environment criteria, perhaps as part of a needs-analysis or as an evaluation criterion.

The user can enter the necessary parameters into the calculation and this includes all costs that arise during the *period of ownership*. The tool includes red tabs with examples, however below follows explanations to some of the parameters in the tool:

- The parameters “Number of years of use” and “Quantity” are the only parameters in the tool that must be completed in order to define the prerequisites for the calculation. The purchasing division provides this information.
- The interest used internally within the purchasing division is entered as the cost of capital and consequently can vary depending on the organisation.
- It is possible to enter the total investment costs or to periodize the investment costs. Periodizing is primarily used when reinvestment is necessary if a product for example does not last the entire period of use or if it concerns a leasing agreement.
- It is possible to choose whether you wish to enter the total running costs per year or specified running costs. Specified running costs require the supplier to provide energy details about consumption or output. These data must be produced/developed using a standardised method in order to allow a comparison.
- The maintenance cost should be the average cost for service and maintenance, preferably according to the manufacturer's recommendations or similar.
- Phasing-out costs can be costs for waste or other costs that the owner will incur at the end of the period of use.

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- The residual to value is a very uncertain parameter as it occurs so far in the future. If this is used in the evaluation, a guaranteed repurchased value from the supplier should then be used.

Example:

SEK 1000 is paid into a bank account at 5% interest. In two years this money would have grown to SEK 1102. However the present value is SEK 1000.

PRESENT VALUE

The present value method is used to recalculate all expected expenses in the investment and any earnings to a present value in order to compare future costs with those of today. This is because a Swedish Krona today has a different value from a Swedish Krona tomorrow, as a Swedish Krona today can be invested or provide a return in some other way. Therefore all future costs are recalculated to the time of the purchase. The extent to which the future costs are counted down depends on the rate of interest chosen and this can accordingly have a major significance for the final overall cost. A high interest rate therefore affects running and maintenance costs and ascribes these less significance in the total calculation.

SENSITIVITY ANALYSIS

Accordingly interest is an uncertainty factor in this context. The calculation will change depending on the cost of capital used. The interest will vary slightly between different activities and should be drawn up within the organisation. Real or nominal interest rate can be used. The real interest rate is approximately the nominal interest rate minus the inflation rate. In order to gain an understanding of how the interest rate affects the final cost there is a sensitivity analysis included in the LCC tool which shows how the cost would appear if you do not use cost of capital, i.e. if this was 0 %.

Real rate of
interest = Nominal
Interest rate -
Inflation

Another uncertainty is the running cost, which can change in the future. A change in price, such as the electricity price increase, can significantly affect the values in the calculation and the tool therefore provides a sensitivity analysis for this parameter, which shows how the total cost is affected if the running costs increase by 20%. This figure is in no way an estimation of how running costs in reality will change, but highlights the parameter's sensitivity to possible changes.

Another uncertainty factor that affects the cost is the number of years the product will be used. This can be the economic lifespan or the total lifespan that the product will be in, in its existing condition. Depending on what you choose, the residual value or the phasing out costs can be included in the model. Lifespan must be defined by the purchaser and will have a significance for the final total cost as the basic investment from a cost standpoint becomes less important the more years the product is used.