

Total Cost of Ownership

Having regard to the Total Cost of Ownership (TCO) will assist you in choosing the best tenderer from a tendering process. TCO is the cost you expect to incur throughout the entire life cycle of the purchase. Alongside the financial aspects of the purchase you can also weigh up the environmental aspects.

1. When should you consider the TCO?

You should consider the TCO if you expect to be able to make a smarter purchase by looking at the total life cycle costs of a product or service. If, for example, you select purely on the basis of purchase price, that might have negative consequences: the initial investment may well be low, but in the long term a 'cheap' solution may turn out to be expensive. You should consider higher maintenance costs or damage to the environment through high energy consumption. By applying the TCO, an innovation requiring a higher initial investment gets a fair chance.

Whether or not you conduct a TCO analysis yourself will depend on the solution and the form of contract. Normally it is obvious that the greater the responsibility you take yourself for the costs during the total life cycle of the solution, the more important a TCO analysis is.

Environmental effects are a factor that is increasingly taken into account, but not always. If it is purely the financial costs that are examined, this is known as *whole-life costing*. Given that operating costs (such as electricity consumption) are determinant of the environmental effects, it is possible to give an indication here.

2. Organisational prerequisites

Not all organisations are familiar with the TCO, so it can be useful to first inform colleagues about this way of thinking (LCC is related to TCO). [ICLEI](#) has developed a [short PowerPoint presentation to help explain it all](#). You should also think about the following organisational issues, which are important if you apply the TCO:

- Support for TCO.
Support is needed from managers in order to assess procurement budgets on the basis of total costs.
- A higher initial investment.
Because the use of TCO involves looking at costs in a different way, it may be that your organisation needs to take account of significantly higher initial investment. This will need to be properly explained and justified.
- Reconciling budgets.
Prepare yourself for the fact that your organisation will not always take account of total costs and income. It may be that initial investment is written down to one department, whilst the benefits accruing from lower maintenance costs are credited to another department. A new way of working may be necessary, because the TCO method assumes an overarching vision of the accounts. You should also be aware that the TCO can result in a different allocation of costs over time.
- Risk management.
It is often not possible to exactly quantify future costs: these need to be estimated. Your

organisation must therefore be prepared for unexpected benefits and burdens, even (and sometimes especially) when you make a purchase *without* applying a TCO analysis. You can limit risks in part by entering into performance contracts with suppliers. Your organisation must determine the extent of risk you are willing to accept in terms of investment that must be recouped in the future. Further details on this are set out in the step-by-step plan.

3. Sustainability

Alongside the financial effect, you can also take account of the environmental effects of a purchase. On the basis of the water, gas and electricity consumption of the solution you can make an estimate of total CO₂ emissions when it is in use. By doing this, you can also apply the TCO method to achieving reductions in CO₂ emissions as part of your sustainable procurement.

4. Step-by-step plan

By following the steps below, you can carry out a TCO analysis yourself. In using this instrument, we are assuming that a need analysis and a market survey have been carried out and it is therefore clear what goals you wish to achieve by means of the eventual tender and what directions possible solutions can take.

Step 1: Decide on the period to be analysed

This period will usually be the expected lifetime of the solution. The Rijkswaterstaat regards the life cycle for infrastructure as a period of 100 years. In respect of most IT hardware, the relevant period is between five and ten years.

Step 2: Collate costs data

Depending on the product or service, it is possible to distinguish between several types of costs. Estimate the costs with the help of the table below.

<i>Type of cost</i>	<i>Example</i>
1. Purchase price or initial investment.	Purchase of a printer.
2. Life cycle in years.	The economic life cycle is determined according to the most expensive part. A printer's drum kit is often the most important part and has to be replaced, for example, every three years. Sometimes the printer needs to be entirely replaced.
3. Cost of periodic replacement.	The cost of replacement of the drum kit (or the cost of a new printer).
4. Removal costs in the case of replacement.	The cost of removal and processing of the drum kit of printer.
5. Annual costs, such as replacement parts, consumables and the replacement or purchase of accessories.	The use of paper and ink.

6. Fixed annual costs and maintenance.	Contract costs paid to supplier and any fixed maintenance operations for the printer.
7. Use of gas, electricity (peak and off-peak hours) and water. Calculate the number of kWh consumed per year.	How much electricity the printer consumes. Don't forget to take account of, for example, energy consumption in the standby setting.
8. Expected annual change in usage costs.	The expected changes in the cost of electricity consumption.
9. Other costs payable by the purchaser.	Other costs related to the ownership and use of the printer.
10. Indirect costs.	Costs arising from the purchase, such as a new IT system to be able to control printers by means of a different protocol.

You can use the experience of experts to estimate, for example, the maintenance costs. Also use market parties to get competitive prices. Manufacturers' product sheets and the research reports of research institutes can also provide a good indication of the costs liabilities during the life cycle. Publications from [CROW](#) indicate ratios for projects relating to infrastructure, traffic, transportation and public spaces.

Step 3: Determine the discount rate

As stated above, a solution may require a big initial investment that has to be recouped in the future. We can therefore describe this as an investment with a specific risk profile, since you cannot know for certain how far the expected costs and benefits will match the actual costs and benefits.

In making decisions on financial investments, organisations apply the 'discount rate': in simple terms, this means that the investment must deliver more over the entire life cycle than the capital investment could otherwise have earned from bank interest on savings, or other return, plus a return on top of that (a safety margin). Your organisation can decide for itself how much return you require from a project.

Another important related concept is the [Net Present Value](#). This is an indication of the total value of a project (positive or negative), calculated at today's value.

Step 4: determine the form of contract

Compare various forms of contract. Think also of DBFM(O) contracts, leases and service contracts. It is normal to set out agreed terms in performance contracts. You should record the performances 'promised' by suppliers in the document, including the bonus or penalty applied according to whether the actual performance is above or below this norm.

Step 5: Draw up a draft calculation

Use this [Excel sheet](#) to draw up a rough calculation of costs for the entire life cycle of a solution, on the basis of your estimates for the various costs in step 2. In the said Excel sheet the life cycle is a standard 25 years. A manual for the Excel sheet is available [here](#). The manual also explains sample calculations involved in the purchase of light bulbs, solar panels and buildings. You can also perform your own calculation by using, for example, a [general Excel sheet](#) as a basis and adapting this to your requirements.

Step 6: Determine the most important factors

By looking at the development of costs you can estimate the most important factors in the life cycle of the solution. You can deliberately vary the input in Excel (within the limits set by your estimate) to get as good a feel as possible for the most important factors. What variables have the biggest effect on the total costs? And on use? And on CO₂ emissions? Using the most influential factors, you can draw up criteria for your tendering process. For example, for many IT products energy consumption is a determining factor in the total costs.

Step 7: Select criteria for your tendering process

Within current EU directives an award is based on the MEAT or the lowest price. If you want to question the life cycle costs, then the calculation of these must be comprehensible. The costs factors can be translated into MEAT criteria in the request. By adjusting the weighting as in the TCO analysis, you can make an award based on the lowest costs across the total life cycle.

Step 8: Point to note with regard to performance contracts

As from the preceding step, the tendering process continues, in principle, as normal. We need to make one further point: if performance contracts are agreed with suppliers, then the contract managers within your own organisation must pro-actively comply with these contracts. This can require a greater investment of time than for a simple purchase. Keep suppliers to their word. Monitor the actual performance of the chosen solution, so that in the future, where necessary, you can make more accurate estimates of comparable purchases.

5. Legal framework

There is no legal framework relating the performance of a TCO analysis. You should note, however, that there are provisions governing the application of MEAT criteria.

6. Further information

[PIANOo Handreiking EMVI](#)
[ICLEI](#)

7. Source

This information was taken from the “Innovation Procurement for Contracting Authorities” document that was prepared by [PIANOo](#) in 2017.