Danish Ministry of the Environment

Guidelines for

Tools for Total Cost of Ownership in public procurement

Office IT equipment

Computers, screens, AV equipment and copy and print

Total Cost of Ownership and public procurement

What is Total Cost of Ownership?

Total Cost of Ownership is the total of all costs resulting from acquisition of a product and the costs involved in using the product during its period of use. Both direct and indirect costs may be included in the calculation of total costs, and the total costs price may be used as a criterion for awarding a tender. Professionals often use the abbreviation TCO.

Why TCO?

In continuation of the government's strategy for intelligent public procurement, the Environmental Protection Agency has instigated the development of national tools for incorporating TCO in public tenders. The aim of TCO is to calculate future outlay throughout the service life of the product. Instead of simply looking at the cheapest purchasing price, TCO tools make it possible to select the product that is cheapest throughout the service life of the product as a whole.

Who constitutes the target group?

This tool has been developed primarily for public procurement officials and tender consultants, though it can also be used by private purchasers and by companies more generally.

Why a TCO tool for office IT equipment?

The product groups for which TCO tools were initially developed were selected based on a number of parameters – including the ability of the industry to develop uniform data for determining operating costs and the presence of a financial and environmental potential in demanding products that are cheap to operate.

How is the TCO tool used?

These guidelines contain the information required to begin using TCO in public procurement. They consist of a quick guide and a more detailed description of how to use the tool and of its functions. Finally there are details of the background to the tool and a summary of the industry's involvement and how it has reacted to the tool.

How can I get more help?

The Danish Competition and Consumer Authority's guidelines on "Total Cost of Ownership in tender processes" from 2014 examines the legal tender aspects that must be taken into consideration when using TCO in public procurements, as well as the various ways in which to involve TCO throughout the tender process.

Good luck in using TCO.

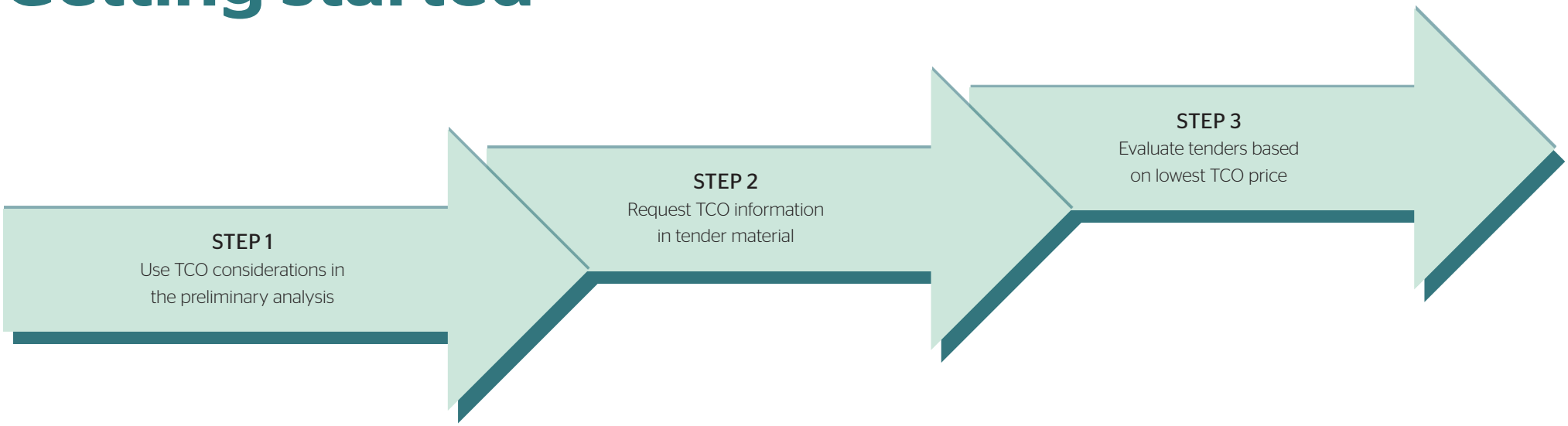
General information about tender processes.
www.kfst.dk

Information and directions on using dialogue with industry.
www.kfst.dk

Inspiration in the form of how others have worked with TCO.
www.ansvarligeindkob.dk

(Links in Danish only)

Getting started



1. Use TCO considerations in the preliminary analysis

Before starting a tender process, it is helpful to launch a market dialogue. Find out what products exist on the market and which best meet the actual needs of your organisation. Only some selected, directly measurable costs are included in the TCO tool. Before drawing up the tender, it is therefore important to enter a dialogue with the market in relation to other cost factors and to establish what significance these could have for the resulting costs/savings of using various product types.

Read more on page 4.

2. Request TCO information in the tender material

When drawing up the tender material, it is important to ask for the TCO values used in the relevant TCO calculation. In order to be able to use the values provided by the tenderers, it is important that these are stated using the standards given in the TCO tool. The TCO tool itself must either be integrated in the tender lists or included in the tender material, so that the supplier knows how the total TCO price will be calculated and used as a basis for the evaluation.

Read more on page 6.

3. Evaluate tenders based on lowest TCO price

When the tenders are received, the TCO price is calculated, and subsequently used as the basis for evaluation. The TCO price replaces the pure purchase price irrespective of the weighting of the price in the tender evaluation.

Read more on page 7.

1. Use TCO considerations in the preliminary analysis

Before a tender process is started, it is helpful to initiate a market dialogue and to find out what product types exist on the market and how to best meet the needs of your organisation at the cheapest price in the long term. Calculation of TCO is relevant where costs relate to both procurement and subsequent use.

Identify important cost drivers

Not all costs are included in the TCO tool itself, and are thus not used directly in the tender evaluation. We recommend including the significance of some of the costs in the preliminary analysis instead, where they can influence the selection of product type and thus which requirements are subsequently set out in the tender. In order to ensure market acceptance of the tools, an industry-acknowledged standard/method must exist on how costs are measured before this factor can be included in the tool. For example, product quality usually has some influence on the service life of the product, but in most cases it is not possible to ascertain different service lives between products. Standardised methods rarely exist for ascertaining the service life of products in any given use situation, and it may therefore be difficult to incorporate this TCO factor in the tool. It is therefore important to consider the effect of different quality parameters on the overall costs during the preliminary analysis. These considerations can subsequently be used as requirements and criteria in the tender material and thereby continue to have an effect on the total TCO price.

In the preliminary analysis, it is relevant to consider the expenses/savings that may result from different product types. How might certain product types affect work procedures? What related savings will this result in for operations?

What is the significance of e.g. a computer's performance work to your specific requirements? If the speed of the computer is the limiting factor and this result in waiting time, the overall TCO may be very expensive. Compile all of the questions that are relevant in terms of TCO that may feature in a market dialogue and the needs analysis. The answers you find can be used as part of the decision basis that you use to select a product type and thus what you ultimately ask for in your invitation to tender. This will ensure that TCO considerations are integrated early on in the tendering process.

Enter into dialogue with interested parties

It can be a good idea to involve the intended users and suppliers in these considerations. Use the needs analysis and the market dialogue as a decision-making basis for how TCO is to be involved in the tender process in question. See the Danish Competition and Consumer Authority's guidelines on opportunities for dialogue in tender processes www.kfst.dk (In Danish only).

When selecting which factors you wish to include in your TCO considerations, be pragmatic and make sure you only use significant factors that give a real picture covering the entire period of ownership.

TCO factors

It may be relevant to ask about the following TCO factors in connection with the needs analysis and market dialogue:

- Purchase price
- Total installation costs
- Training/teaching/instruction
- Other initial one-off costs
- Operating costs for energy (fuel, propellant, electricity)
- Operating costs for use of related products (e.g. coffee, filters)
- Maintenance costs (service inspections, repairs)
- Time wastage when using the product
- Labour costs for maintenance of the product (cleaning etc.)
- Service life
- Licence/subscription
- Residual value/disposal price
- Insurance
- Repairs
- Leasing or renting
- Costs for training employees in use of the product type
- Costs from changing supplier
- Other transaction costs

Important considerations when selecting office IT equipment

There may be a lot of hidden operating and maintenance costs associated with the purchase of office IT equipment.

That is why it is important to investigate how significant these costs are before issuing the invitation to tender. In connection with this, you might also consider whether the various operating costs should be included in a TCO calculation used to evaluate tenders, or whether it would be better to factor in these costs by e.g. setting minimum requirements in the tender documents, requesting a service agreement or similar. It is particularly important that you consider the points in the green boxes, as they will have a substantial impact on an overall TCO for office IT equipment.

Read more in the Danish Competition and Consumer Authority's guidelines on "Total Cost of Ownership in tender processes" in relation to involvement of TCO prior to the actual tender. www.kfst.dk (in Danish only)

In the TCO tool itself, we have included the TCO factors that are deemed to be the most relevant for inclusion in an actual calculation. If your preliminary analysis identifies other relevant cost factors, these may be included in the form of (minimum) requirements in the invitation to tender or by actually changing the tool so that they are included.

The TCO tool can be adapted at any time to the individual organisation's actual invitation to tender and the organisations requirements for the inclusion of TCO factors. The tool may thus be extended by adding more TCO factors, if required.

Paper waste

With printer solutions, you can avoid print wastage by requesting a function whereby items are not printed until they are approved at the printer. Consider whether a function like this would be suitable for your needs and help to reduce paper wastage.

Saving electricity

It is a good idea to stipulate a requirement that the products have automatic power-saving functions (e.g. sleep mode), and that the products are set to use these electricity-saving functions.

Waiting time

Consider how much waiting time the product involves. For example, a computer that is too slow for the actual requirement may result in unnecessary waiting time. If this waiting time is converted into salary, the price across the computer's service life will often exceed the saving to be had from buying a less powerful computer. High-speed printing may likewise save on waiting time.

Identify your needs

One area where clarification is important is the organisation's needs in terms of the products function. The more precise the need specification, the easier it is to define the product requirements. It can be very expensive during operation to buy products that are either over- or undersized in relation to the actual requirement. If necessary, enter into a dialogue with suppliers before issuing the invitation to tender. The suppliers will be able to advise you and analyse your needs, and the market dialogue will give you the opportunity to find out which product types are best for the need defined.

Receiving further guidance and support

Use the EU Green Public Procurement criteria

Consider a performance based tender

As an alternative to using TCO calculations to calculate total costs for a product, you may want to consider a performance based tender.

In a performance based tender, the contracting entity does not prepare a detailed description of how the commission is to be filled, but instead sets out a number of performance based requirements (goals). The product, and any essential service provisions associated with the product, are therefore bought in as a collective service, allowing the contracting entity to hand over responsibility for ensuring low overall costs to the tenderers. You should note however that costs for electricity are not usually included in the tender price in the case of a performance based tender. In this case the TCO calculation can be used together with a performance based tender. See the guidelines from the Danish Competition and Consumer Authority concerning functional requirements in tenders.

www.kfst.dk (in Danish only)

Request TCO information in the tender material

2.

Once it has been decided which product solution is to be requested in the tender, TCO can be incorporated into the relevant tender in order to identify the supplier offering the product with the lowest overall costs.

Go through the following steps to complete and use the TCO tool:

The tool's **blue** area contains the information to be provided by the supplier, and thus the information to be requested in the tender material. It is important to stress that information is provided in accordance with the standards stated or equivalent standards. The information can be requested via individual tender lists. Tenderers can also enter the information in the tool itself.

In the **green** area, you enter your own information about usage/needs within your organisation. This lets tenderers know your specific needs and allows them to offer the product that meets your needs at the cheapest price.

The **brown** area is completed in advance with various qualified background data. If your organisation has more precise information, this can be used instead. The basis for the background data used can be found in the tool's help texts.

Remember to publish the evaluation method, including the partly-completed total costs tool together with the tender material in order to create transparency and consistent competition conditions.

Specific to office IT equipment, there will in some cases be requests for a lot of different product types in the same invitation to tender. In this case, it may be beneficial to perform a TCO calculation in your own tender documents (tender lists). This can be done by copying the calculation method from the tools to your tender lists.

Supplement with energy and environmental requirements

It is recommended that you supplement the TCO-calculation with minimum requirements for energy consumption in order to avoid cheap but very power-hungry products.

There are also other environmental requirements that may be relevant to your tender.

Find, for example, guidelines for energy and environmental requirements in EUs Green Public Procurement criteria's or at:

www.csr-indkob.dk (in Danish only)

It can be considered to establish sanction options in the event the supplied products do not conform with the information provided by the tenderers in relation to TCO. Guidelines concerning sanction options can be found in the Danish Competition and Consumer Authority's guidelines on total costs from 2014.

www.kfst.dk (in Danish only)

Evaluate the tenders on the basis of lowest TCO price

3.

Once the tender period has ended, the submitted tenders must be evaluated on the basis of lowest TCO price.

The tool automatically calculates the TCO price for the product based on the details entered. If several tenders have been received, the details can be copied over into one tool if necessary, to allow comparison of the various tenders by means of graphs and bar charts at the bottom of the tool.

Select the tender which has the lowest TCO price overall according to the TCO tool. This allows the contract to be awarded based on the lowest overall costs of procurement of the specific product and the costs of using the product during its period of use.

When the tenders are evaluated, in addition to the TCO calculation, one or more qualitative criteria may also be established on which the tenders must compete. There will often be factors other than total costs that will have some significance in terms of overall evaluation of the tenders. This could be quality or user-friendliness, for example.

Relevant links

Click on the links to see more. Links in Danish only.

The Danish Energy Agency's procurement recommendations
www.ens.dk

The tender portal – The responsible procurer
www.csr-indkob.dk

Forum for sustainable procurements
www.ansvarligeindkob.dk

The Danish Competition and Consumer Authority's guidelines on functional requirements
www.kfst.dk

Danish Standard's DS 700 series
www.ds.dk

Baltic GPP – Green Public Procurement
www.balticgpp.eu

The Danish Competition and Consumer Authority's guidelines on total costs in tender processes
www.kfst.dk

The Danish Competition and Consumer Authority's guidelines on opportunities for dialogue in tender processes
www.kfst.dk

The Danish Competition and Consumer Authority's guidelines on the tender process – Step by step
www.kfst.dk

The Danish Energy Agency's checklist for energy-efficient design – Lighting
www.sparenergi.dk

Guidelines from the Danish Building Research Institute
www.sbi.dk

Guide to the tool's functions

1 For screens, monitors, televisions, computers, home servers, printers and multifunction machines, electricity consumption is calculated using the latest ENERGY STAR® measuring method for the relevant product range. For projectors in use, the measuring methods ISO/IEC 21118 and IEC 61947-1 are used. In standby mode and when off, IEC 62301 is used.

It is important that, before the supplier completes the blue field, the contracting entity decides whether a service agreement and leasing/renting are relevant to the issued invitation to tender. If they are not relevant, this must be made clear to the supplier, possibly by removing the relevant lines from the blue area.

2 The green area must be completed by the contracting entity.

3 The brown area contains background data that is completed in advance. It is possible however for the procurer to change the background data if more precise information is available.

4 The grey area contains the results of the TCO calculation.

5 TCO prices for the various tenders received are illustrated by means of two diagrams that show the gains. The graph shows whether, and if so when, one product pays for itself compared to the other. The bar chart shows distribution between operating costs and purchase costs in the specific calculation.

6 Much of the information to be provided by the supplier requires the conditions for the data to be described in the tender material, e.g. in the requirements specification. If, for example, a price is requested for a service agreement, the requirements specification must state precisely what is to be included in this agreement.

7 This tool does not necessarily give an accurate picture of TCO for an existing product compared with a new solution (product). If a comparison of this kind is required, it is recommended that a rough calculation be performed based on the TCO factors highlighted under "TCO PRIOR TO TENDER".

8 The formula used to calculate the final TCO price is explained under a separate tab in the Excel TCO tool itself.

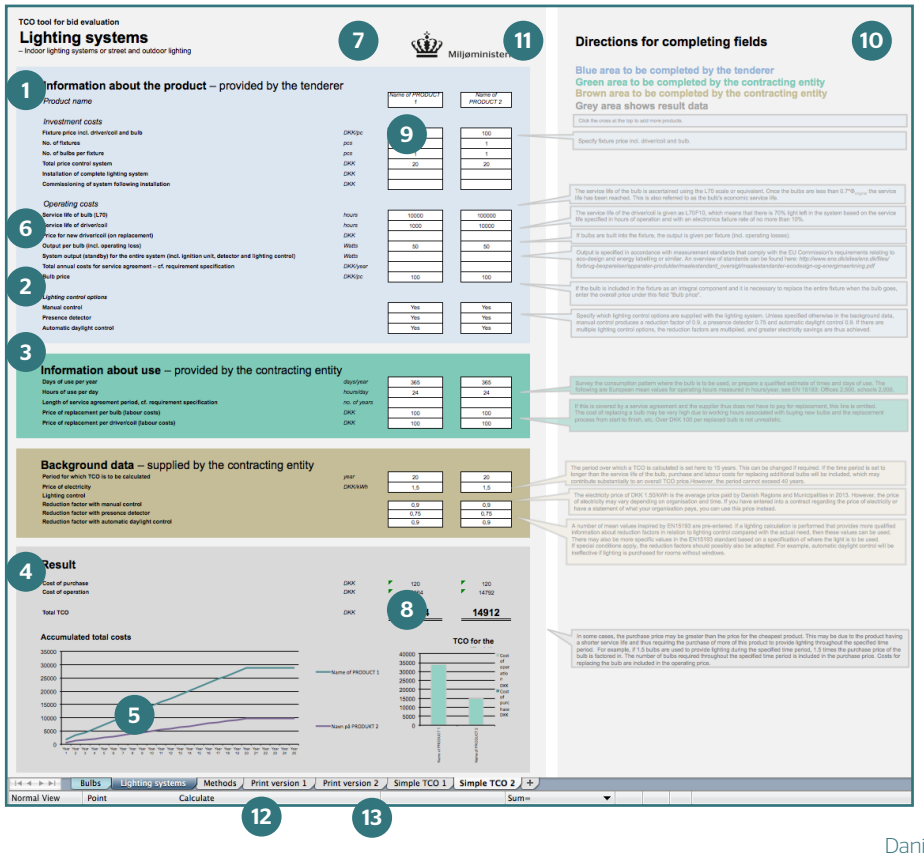
9 If not all values are required to be included in the TCO calculation, these can be removed by deleting the lines from the tool in order to remove them from the formula. This might be the case if a service agreement were required, for example.

10 Brief directions for how the various values can be gathered are found to the right of the tool.

11 Click on the plus sign to add more product columns.

12 The tool has a print tab and a tab containing a description of the calculation method.

13 Tab with a simplified version of the tool. This version does not include calculation of current value and energy price increase. The calculation formula in this version is therefore simpler, and it will therefore be easier to add/remove factors or integrate the method into individual tender lists.



Background

Background to the TCO tools

Further to the Danish government's strategy for intelligent public procurement, the Environmental Protection Agency has initiated the development of national tools for involving Total Cost of Ownership (TCO) in tenders within the public sector.

The Environmental Protection Agency has been in charge of development of this TCO tool. Development of the tools is qualified by an advisory group made up of representatives of National Procurement Ltd. Denmark, The Danish Building & Property Agency, The Confederation of Danish Industry, The Danish Energy Agency, Danish Regions, City of Copenhagen, Local Government Denmark, The Danish Competition and Consumer Authority, The Danish Construction Association, the Agency for Modernisation, the Danish Ministry of Climate, Energy and Building, the Danish Chamber of Commerce, Central Denmark Region, the Danish Ministry of Business and Growth and the Environmental Protection Agency.

FORCE Technology, department of applied environmental assessment, acting as consultants to the Environmental Protection Agency, has been responsible for the development of the TCO tools and guidelines. Operate A/S and Responsible Procurement Excellence have also been involved in development as subcontractors.

The industry's acceptance of the methods

During development of the TCO tools for office IT equipment, there was continuous dialogue with the industries. Contact was made with the following companies, which were given the opportunity to comment on the tools: Descom, ATEA, Lenovo, Dustin, Dell, Xerox A/S, Epson, Ricoh Danmark A/S, Brother Nordic A/S, Sharp Electronics Danmark, OKI Systems Danmark A/S, Konica Minolta Business Solutions Denmark, Canon Danmark A/S, Hewlett-Packard ApS, DI, the Danish Chamber of Commerce and the IT industry. This dialogue took place in 2014, and the final meeting was held in November 2014.

All feedback reflects that the industry is prepared to submit bids for tenders, where the TCO tools are used.

The TCO tools within office IT equipment are all based on the same method as the TCO tools that National Procurement Ltd. Denmark used in actual invitations to tender.

Comments from the industry
The copy and print industry has expressed a desire for a more ambitious TCO tool that would factor in various working time savings to be had from advanced products.

However, direct integration into the tool has not been possible as there is no objective measuring method agreed within the industry for calculating working time savings.

Instead, contracting entities are encouraged to consider the working time savings to be had from different product types and functions before issuing the invitation to tender, see section on TCO considerations in the preliminary analysis.

Disclaimer

We wish to stress that the TCO tool and these directions contain material and information which is generally very extensive and complex. Although both guidelines and tools are updated continuously, we are unfortunately unable to guarantee that all information is fully updated at all times.

Specifically for these reasons we must renounce any potential liability for errors, omissions and insufficient updates that may be contained in information and analyses in the TCO tool, including in texts, diagrams and guidelines.

Liability for the content of websites to which references or links are provided, as well as material which has been explicitly produced by other parties rests solely with the stated author.

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