# DOWNLOAD PDF LIFE CYCLE COST DEFINITION

## Chapter 1 : Life Cycle Costing: Meaning, Characteristics and Everything Else

*Sum of all recurring and one-time (non-recurring) costs over the full life span or a specified period of a good, service, structure, or www.nxgvision.com includes purchase price, installation cost, operating costs, maintenance and upgrade costs, and remaining (residual or salvage) value at the end of ownership or its useful life.*

It takes into account all costs of acquiring, owning, and disposing of a building or building system. LCCA is especially useful when project alternatives that fulfill the same performance requirements, but differ with respect to initial costs and operating costs, have to be compared in order to select the one that maximizes net savings. For example, LCCA will help determine whether the incorporation of a high-performance HVAC or glazing system , which may increase initial cost but result in dramatically reduced operating and maintenance costs, is cost-effective or not. LCCA is not useful for budget allocation. Lowest life-cycle cost LCC is the most straightforward and easy-to-interpret measure of economic evaluation. They are consistent with the Lowest LCC measure of evaluation if they use the same parameters and length of study period. Building economists, certified value specialists, cost engineers, architects, quantity surveyors, operations researchers, and others might use any or several of these techniques to evaluate a project. The approach to making cost-effective choices for building-related projects can be quite similar whether it is called cost estimating , value engineering , or economic analysis. Life-Cycle Cost Analysis LCCA Method The purpose of an LCCA is to estimate the overall costs of project alternatives and to select the design that ensures the facility will provide the lowest overall cost of ownership consistent with its quality and function. The LCCA should be performed early in the design process while there is still a chance to refine the design to ensure a reduction in life-cycle costs LCC. The first and most challenging task of an LCCA, or any economic evaluation method, is to determine the economic effects of alternative designs of buildings and building systems and to quantify these effects and express them in dollar amounts. Romm, Lean and Clean Managemen,  Costs There are numerous costs associated with acquiring, operating, maintaining, and disposing of a building or building system. Building-related costs usually fall into the following categories: Costs are relevant when they are different for one alternative compared with another; costs are significant when they are large enough to make a credible difference in the LCC of a project alternative. Initial costs Initial costs may include capital investment costs for land acquisition, construction, or renovation and for the equipment needed to operate a facility. Land acquisition costs need to be included in the initial cost estimate if they differ among design alternatives. This would be the case, for example, when comparing the cost of renovating an existing facility with new construction on purchased land. Detailed estimates of construction costs are not necessary for preliminary economic analyses of alternative building designs or systems. Such estimates are usually not available until the design is quite advanced and the opportunity for cost-reducing design changes has been missed. LCCA can be repeated throughout the design process if more detailed cost information becomes available. Initially, construction costs are estimated by reference to historical data from similar facilities. Alternately, they can be determined from government or private-sector cost estimating guides and databases. Means Building Construction Cost Database. Testing organizations such as ASTM International and trade organizations have reference data for materials and products they test or represent. Energy and Water Costs Operational expenses for energy, water, and other utilities are based on consumption, current rates, and price projections. Because energy, and to some extent water consumption, and building configuration and building envelope are interdependent, energy and water costs are usually assessed for the building as a whole rather than for individual building systems or components. Energy costs are often difficult to predict accurately in the design phase of a project. Assumptions must be made about use profiles, occupancy rates, and schedules, all of which impact energy consumption. At the initial design stage, data on the amount of energy consumption for a building can come from engineering analysis or from a computer program such as eQuest. When selecting a program, it is important to consider whether you need annual, monthly, or hourly energy consumption figures and whether the program adequately tracks savings in energy consumption when design changes or different efficiency levels are simulated. Quotes of current energy prices from local suppliers should take into account the rate type, the rate structure, summer and winter differentials, block rates, and demand charges to obtain an estimate as close as possible to the actual energy cost. Energy prices are assumed to increase or decrease at a rate different from general price inflation. This differential energy price escalation needs to be taken into account when estimating future energy costs. Water costs should be handled much like energy costs. There are usually two types of water costs: DOE does not publish water price projections. Operating schedules and standards of maintenance vary from building to building; there is great variation in these costs even for buildings of the same type and age. It is therefore especially important to use engineering judgment when estimating these costs. Supplier quotes and published estimating guides sometimes provide information on maintenance and repair costs. Some of the data estimation guides derive cost data from statistical relationships of historical data Means , BOMA and report, for example, average owning and operating costs per square foot, by age of building, geographic location, number of stories, and number of square feet in the building. The Whitestone Research Facility Maintenance and Repair Cost Reference gives annualized costs for building systems and elements as well as service life estimates for specific building components. Replacement Costs The number and timing of capital replacements of building systems depend on the estimated life of the system and the length of the study period. Use the same sources that provide cost estimates for initial investments to obtain estimates of replacement costs and expected useful lives. A good starting point for estimating future replacement costs is to use their cost as of the base date. The LCCA method will escalate base-year amounts to their future time of occurrence. Residual Values The residual value of a system or component is its remaining value at the end of the study period, or at the time it is replaced during the study period. Residual values can be based on value in place, resale value, salvage value, or scrap value, net of any selling, conversion, or disposal costs. As a rule of thumb, the residual value of a system with remaining useful life in place can be calculated by linearly prorating its initial costs. Other Costs Finance charges and taxes: For federal projects, finance charges are usually not relevant. Non-monetary benefits or costs: Non-monetary benefits or costs are project-related effects for which there is no objective way of assigning a dollar value. Examples of non-monetary effects may be the benefit derived from a particularly quiet HVAC system or from an expected, but hard-to-quantify productivity gain due to improved lighting. By their nature, these effects are external to the LCCA, but if they are significant they should be considered in the final investment decision and included in the project documentation. To formalize the inclusion of non-monetary costs or benefits in your decision making, you can use the analytical hierarchy process AHP , which is one of a set of multi-attribute decision analysis MADA methods that consider non-monetary attributes qualitative and quantitative in addition to common economic evaluation measures when evaluating project alternatives. Parameters for Present-Value Analysis Discount Rate In order to be able to add and compare cash flows that are incurred at different times during the life cycle of a project, they have to be made time-equivalent. To make cash flows time-equivalent, the LCC method converts them to present values by discounting them to a common point in time, usually the base date. The discount rate for federal energy and water conservation projects is determined annually by FEMP ; for other federal projects, those not primarily concerned with energy or water conservation, the discount rate is determined by The Office of Management Budget. These discount rates are real discount rates, not including the general rate of inflation. Cost Period s Length of study period: The study period begins with the base date, the date to which all cash flows are discounted. The study period has to be the same for all alternatives considered. The service period begins when the completed building is occupied or when a system is taken into service. This is the period over which operational costs and benefits are evaluated. In FEMP analyses, the service period is limited to 40 years. It starts when the project is formally accepted, energy savings begin to accrue, and contract payments begin to be due. The contract period generally ends when the loan is paid off. All single amounts e. Constant-dollar analyses exclude the rate of general inflation, and current-dollar analyses include the rate of general inflation in all dollar amounts, discount rates, and price escalation rates. Both types of calculation result in identical present-value life-cycle costs. The constant-dollar method has the advantage of not requiring an estimate of the rate of inflation for the years in the study period. Alternative financing studies are usually performed in current dollars if the analyst wants to compare contract payments with actual operational or energy cost savings from year to year. Life-Cycle Cost Calculation After identifying all costs by year and amount and discounting them to present value, they are added to arrive at total life-cycle costs for each alternative: They are sometimes needed to meet specific regulatory requirements. Some federal programs require a Payback Period to be computed as a screening measure in project evaluation. All supplementary measures are relative measures, i. Uncertainty Assessment in Life-Cycle Cost Analysis Decisions about building-related investments typically involve a great deal of uncertainty about their costs and potential savings. Performing an LCCA greatly increases the likelihood of choosing a project that saves money in the long run. Yet, there may still be some uncertainty associated with the LCC results. LCCAs are usually performed early in the design process when only estimates of costs and savings are available, rather than certain dollar amounts. Uncertainty in input values means that actual outcomes may differ from estimated outcomes. There are techniques for estimating the cost of choosing the "wrong" project alternative. Deterministic techniques, such as sensitivity analysis or breakeven analysis, are easily done without requiring additional resources or information. They produce a single-point estimate of how uncertain input data affect the analysis outcome. Probabilistic techniques, on the other hand, quantify risk exposure by deriving probabilities of achieving different values of economic worth from probability distributions for input values that are uncertain. However, they have greater informational and technical requirements than do deterministic techniques. Whether one or the other technique is chosen depends on factors such as the size of the project, its importance, and the resources available. Since sensitivity analysis and break-even analysis are two approaches that are simple to perform, they should be part of every LCCA. Sensitivity Analysis Sensitivity analysis is the technique recommended for energy and water conservation projects by FEMP. Sensitivity analysis is useful for: To identify critical parameters, arrive at estimates of upper and lower bounds, or answer "what if" questions, simply change the value of each input up or down, holding all others constant, and recalculate the economic measure to be tested. Break-even Analysis Decision-makers sometimes want to know the maximum cost of an input that will allow the project to still break even, or conversely, what minimum benefit a project can produce and still cover the cost of the investment. To perform a break-even analysis, benefits and costs are set equal, all variables are specified, and the break-even variable is solved algebraically. Design and Analysis Tools The use of computer programs can considerably reduce the time and effort spent on formulating the LCCA, performing the computations, and documenting the study. Listed below are several LCCA-related software programs: Application LCCA can be applied to any capital investment decision in which relatively higher initial costs are traded for reduced future cost obligations. It is particularly suitable for the evaluation of building design alternatives that satisfy a required level of building performance but may have different initial investment costs, different operating and maintenance and repair costs, and possibly different lives. LCCA provides a significantly better assessment of the long-term cost-effectiveness of a project than alternative economic methods that focus only on first costs or on operating-related costs in the short run.

## Chapter 2 : Life Cycle | Definition of Life Cycle by Merriam-Webster

*Life-cycle cost analysis (LCCA) is a tool to determine the most cost-effective option among different competing alternatives to purchase, own, operate, maintain and, finally, dispose of an object or process, when each is equally appropriate to be implemented on technical grounds.*

Cost for predictive maintenance Disposal costs. For the purpose of this Tool, it is sufficient to say that if one has all the required cost values inputs , then a complete LCCP analysis can be performed readily in a spreadsheet, since it really involves summations of costs for several options and computations involving discount rates. With respect to the cost inputs for such an analysis, the costs involved are either deterministic such as acquisition costs, disposal costs, etc. Most of the probabilistic costs are directly related to the reliability and maintainability characteristics of the system. As a result, this analysis will enable the Utility to: A thorough Life Cycle Cost analysis yields a higher level of confidence in the project decision, which is part of the Project Validation calculation. Combined with a Risk Reduction analysis to identify the risk reduction of various alternatives considered, the information from Life Cycle Cost preparation is summarized in a business case, providing a consistent approach to the review of projects. Life Cycle Costing Methodology Used For This Tool The life cycle of an asset is defined as the time interval between the initial planning for the creation of an asset and its final disposal. This life cycle is characterized by a number of key stages: As shown in Figure 2, there are day-to-day, periodic and strategic activities that may occur for any asset. The asset life cycle begins with strategic planning, creation of the asset, operations, maintenance, rehabilitation, and on through decommissioning and disposal at the end of the assets life. The life of an asset will be influenced by its ability to continue to provide a required level of service. Many assets reach the end of their effective life before they become non-functional regulations change, the asset becomes non-economic, the expected level of service increases, capacity requirements exceed design capability. Technological developments and changes in user requirements are key factors impacting the effective life of an asset. Objectives of the Methodology Life cycle costing note: The objectives of life cycle costing are: Estimating Life Cycle Costs The life cycle cost of an asset can be expressed by the simple formula: Impact of Analysis Timing on Minimizing Life Cycle Costs A major portion of projected life cycle costs stems from the consequences of decisions made during the early phases of asset planning and conceptual design. It is the early decisions made during the design of an asset, definition of operations and maintenance requirements, and setting of the operating context of the asset that commit a large percentage of the life cycle costs for that asset. Figure 3 provides an indication of the level of cost reduction that can be achieved at various stages of the project. It shows that as a project moves from strategic planning that the majority of decisions have been made that provide the majority of the cost to the project. The best opportunities to achieve significant cost reductions in life cycle costs occur during the early concept development and design phase of any project. At this time, significant changes can be made for the least cost. To achieve the maximum benefit available during this stage of the project it is important to explore the following: The concept of the life cycle of an asset provides a framework to document and compare alternatives. Selecting Potential Project Alternatives for Comparison The intervention or treatment alternatives available to be considered include: Do-nothing - The Do-Nothing option is literally not investing any money on any form of maintenance or renewal, including that recommended by the design engineer or OEM vendor. This alternative is generally intended to set a conceptual baseline for asking the question: It is the realistic baseline case against which other alternatives are compared. Renewal Major Repair, Rehabilitation or Replacement - Assessment of different rehabilitation or replacement strategies requires an understanding of the costs and longevity of different asset intervention strategies. Each strategy is costed for the expected life of that strategy, converted to an equivalent present worth, adjusted for varying alternative life lengths, and compared to find the least overall cost. Non-Asset Solutions - In certain circumstances the non-asset solution providing the same level of service without a major additional investment can be a viable alternative for example, using pricing strategies to reduce the consumption of water. Change Levels of Service - Most life cycle costing assumes a constant Level of Service across options being compared. When such is not the case which is not infrequent in reality , comparisons across alternatives with different levels of service that is, different levels of benefit must intro duce a projected benefits section for each alternative in addition to the cost projections. This, of course, takes the analysis into the realm of benefit cost analysis see the Benefit Cost Tool for much more discussion and tool support. Dispose - Disposal of the asset is retiring the asset at the end of its useful life. Perhaps the function or level of service originally desired from the asset is no longer relevant. It is unlikely that all seven of the alternatives listed above are feasible for each analysis; rather than waste money on obviously irrelevant options, the practitioner is encouraged to reduce the analyzed set to only those that are thought to be feasible. The Effect of Intervention A single intervention option for the entire life cycle is not likely to be the best approach to maximizing the life extension for an asset. Multiple strategies and options will need to be studied to determine the optimal strategy or combination of strategies for maximum life extension. Optimal Renewal Decision Making uses life cycle cost analysis as a core Tool for determining the optimum intervention strategy and intervention timing. Estimating Future Costs Knowing with certainty the exact costs for the entire life cycle of an asset is, of course, not possible; future costs can only be estimated with varying degrees of confidence. Future costs are usually subject to a level of uncertainty that arises from a variety of factors, including: The main goal in assessing life cycle costs is to generate a reasonable approximation of the costs consistently derived over all feasible alternatives , not to try and achieve a perfect answer. As rehabilitations and or replacement of assets occur during the life cycle, adjust both operations and maintenance costs appropriately. Both maintenance and operations costs are likely to materially increase as the asset ages. The timing of the rates of increases in the flow of costs over time are instrumental in determining total life cycle costs and can substantially impact the outcome of the investment decision. It is therefore important to: Be systematic, realistic and detailed in estimating the future flow of real costs Document in a notes section what the assumptions are Inflation is likely to occur but should be taken into account in the discounting of future costs see next section. The Management of Cash Flow The application of Life Cycle Cost analysis to find that alternative with the lowest life cycle costs is important, but there will also likely be organizational cash flow issues that need to be considered. There will always be competing demands for the available cash resources of the organization at any given time. Management of cash flow is simplified if the pattern is predictable over the long term. It is conceivable that the lowest cost solution might not be the best solution from the aggregate cash flow perspective. Life cycle analysis provides a sound basis for projecting cash requirements which can assist the Chief Financial Officer in managing the cash cycles of the organization. The Tool is designed to be interactive where a utility manager can either follow the LCCP process on a sequential step by step basis or, where a utility manager already understands the concepts of LCC, the Tool can be used to provide more detailed information on a particular aspect of the analysis. LCCP Tool Structure Users of the Tool should follow the flow chart through the various sequential steps of creating a life cycle cost analysis profile. At each step the user is able to access knowledge relevant to the particular step. The steps in the Tool are:

## Chapter 3 : Whole-Life Cost

*Life-cycle cost analysis example. While life-cycle costing can be applied to acquisition of any type of asset, life-cycle cost analysis is generally only used to compare building costs.*

Meaning, Characteristics and Everything Else Article shared by: In this article we will discuss about Life Cycle Costing: Meaning of Life Cycle Costing 2. Characteristics of Life Cycle Costing 3. Meaning of Life Cycle Costing: Life cycle costing is a system that tracks and accumulates the actual costs and revenues attributable to cost object from its invention to its abandonment. Life cycle costing involves tracing cost and revenues on a product by product base over several calendar periods. Life Cycle Cost LCC of an item represents the total cost of its ownership, and includes all the cots that will be incurred during the life of the item to acquire it, operate it, support it and finally dispose it. Life Cycle Costing adds all the costs over their life period and enables an evaluation on a common basis for the specified period usually discounted costs are used. This enables decisions on acquisition, maintenance, refurbishment or disposal to be made in the light of full cost implications. In essence, Life Cycle Costing is a means of estimating all the costs involved in procuring, operating, maintaining and ultimately disposing a product throughout its life. Life cycle costing is different from traditional cost accounting system which reports cost object profitability on a calendar basis i. Thus, product life cycle costing is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of the life cycle planning and cost data to clarify the economic impact on alternative chosen in the design, engineering phase etc. It is also considered as a way to enhance the control of manufacturing costs. Characteristics of Life Cycle Costing: Product life cycle costing involves tracing of costs and revenues of a product over several calendar periods throughout its life cycle. Product life cycle costing traces research and design and development costs and total magnitude of these costs for each individual product and compared with product revenue. Each phase of the product life-cycle poses different threats and opportunities that may require different strategic actions. Product life cycle may be extended by finding new uses or users or by increasing the consumption of the present users. Stages of Product Life Cycle Costing: Following are the main stages of Product Life Cycle: It will establish what product the customer wants, how much he is prepared to pay for it and how much he will buy. It will give details such as required life, maximum permissible maintenance costs, manufacturing costs, required delivery date, expected performance of the product. Proper drawings and process schedules are to be defined. From the drawings a small quantity of the product will be manufactured. These prototypes will be used to develop the product. Testing and changing to meet requirements after the initial run. This period of testing and changing is development. When a product is made for the first time, it rarely meets the requirements of the specification and changes have to be made until it meets the requirements. The manufacture of a product involves the purchase of raw materials and components, the use of labour and manufacturing expenses to make the product. When a manufacturing product comes to an end, the plant used to build the product must be sold or scrapped. Benefits of Product Life Cycle Costing: Following are the main benefits of product life cycle costing: There are a number of factors that need to be managed in order to maximise return in a product. Life Cycle Costing Process: Life cycle costing is a three-staged process. The three stages are: LCC Analysis is a multi-disciplinary activity. An analyst, involved in life cycle costing, should be fully familiar with unique cost elements involved in the life cycle of asset, sources of cost data to be collected and financial principles to be applied. He should also have clear understanding of methods of assessing the uncertainties associated with cost estimation. Number of iteration may be required to perform to finally achieve the result. All these iterations should be documented in detail to facilitate the interpretations of final result. The Life Cycle Costing process begins with development of a plan, which addresses the purpose, and scope of the analysis. Define the analysis objectives in terms of outputs required to assist a management decision. Determination of the LCC for an asset in order to assist planning, contracting, budgeting or similar needs. Evaluation of the impact of alternative courses of action on the LCC of an asset such as design approaches, asset acquisition, support policies or alternative technologies. Identification of cost elements which act as cost drives for the LCC of an asset in order to focus design, development, acquisition or asset support efforts. Make the detailed schedule with regard to planning of time period for each phase, the operating, technical and maintenance support required for the asset. Identify any underlying conditions, assumptions, limitations and constraints such as minimum asset performance, availability requirements or maximum capital cost limitations that might restrict the range of acceptable options to be evaluated. Identify alternative courses of action to be evaluated. The list of proposed alternatives may be refined as new options are identified or as existing options are found to violate the problem constraints. Provide an estimate of resources required and a reporting schedule for the analysis to ensure that the LCC results will be available to support the decision-making process for which they are required. LCC Model is basically an accounting structure which enables the estimation of an asset components cost. Life Cost Analysis Preparation: The Life Cost Analysis is essentially a tool, which can be used to control and manage the ongoing costs of an asset or part thereof. Estimates of capital costs will be replaced by the actual prices paid. Changes may also be required to the cost breakdown structure and cost elements to reflect the asset components to be monitored and the level of detail required. Targets are set for the operating costs and their frequency of occurrence based initially on the estimates used in the Life Cost Planning phase. However, these targets may change with time as more accurate data is obtained, from the actual asset operating costs or from the operating cost of similar other asset. Implementation of the Life Cost Analysis involves the continuous monitoring of the actual performance of an asset during its operation and maintenance to identify areas in which cost savings may be made and to provide feedback for future life cost planning activities. For example, it may be better to replace an expensive building component with a more efficient solution prior to the end of its useful life than to continue with a poor initial decision.

## Chapter 4 : Life cycle | Define Life cycle at www.nxgvision.com

*Life Cycle Costing (LCC) is an important economic analysis used in the selection of alternatives that impact both pending and future costs. It compares initial investment options and identifies the least cost alternatives for a twenty year period.*

Financial[ edit ] Whole-life cost analysis is often used for option evaluation when procuring new assets and for decision-making to minimize whole-life costs throughout the life of an asset. It is also applied to comparisons of actual costs for similar asset types and as feedback into future design and acquisition decisions. The primary benefit is that costs which occur after an asset has been constructed or acquired, such as maintenance, operation, disposal, become an important consideration in decision-making. Previously, the focus has been on the up-front capital costs of creation or acquisition, and organisations may have failed to take account of the longer-term costs of an asset. It also allows an analysis of business function interrelationships. Low development costs may lead to high maintenance or customer service costs in the future. When making this calculation, the depreciation cost on the capital expense should not be included refer page 2 of [2] Environmental and social[ edit ] Main article: Life cycle assessment The use of environmental costs in a whole-life analysis allows a true comparison options, especially where both are quoted as "good" for the environment. For a major project such as the construction of a nuclear power station it is possible to calculate the environmental impact of making the concrete containment, the water required for refining the copper for the power plants and all the other components. Only by undertaking such an analysis is it possible to determine whether one solution carries a lower or higher environmental cost than another. This may be the compulsory re-location of people living on land about to be submerged under a reservoir or a threat to the livelihood of small traders from the development of a hypermarket nearby. Whole-life cost topics[ edit ] Project appraisal[ edit ] Whole-life costing is a key component in the economic appraisal associated with evaluating asset acquisition proposals. An economic appraisal is generally a broader based assessment, considering benefits and indirect or intangible costs as well as direct costs. In this way, the whole-life costs and benefits of each option are considered and usually converted using discount rates into net present value costs and benefits. This results in a benefit cost ratio for each option, usually compared to the "do-nothing" counterfactual. Typically the highest benefit-cost ratio option is chosen as the preferred option. Historically, asset investments have been based on expedient design and lowest cost construction. By using whole-life costs, this avoids issues with decisions being made based on the short-term costs of design and construction. Often the longer-term maintenance and operation costs can be a significant proportion of the whole-life cost. Asset management[ edit ] During the life of the asset, decisions about how to maintain and operate the asset need to be taken in context with the effect these activities might have on the residual life of the asset. Other issues which influence the lifecycle costs of an asset include: Although the general approach to determining whole-life costs is common to most types of asset, each asset will have specific issues to be considered and the detail of the assessment needs to be tailored to the importance and value of the asset. High cost assets and asset systems will likely have more detail, as will critical assets and asset systems. Maintenance expenditure can account for many times the initial cost of the asset. Although an asset may be constructed with a design life of 30 years, in reality it will possibly perform well beyond this design life. The appropriateness of the maintenance strategy must be questioned, the point of intervention for renewal must be challenged. The process requires proactive assessment which must be based on the performance expected of the asset, the consequences and probabilities of failures occurring, and the level of expenditure in maintenance to keep the service available and to avert disaster. IT industry usage[ edit ] Whole-life cost is often referred to as " total cost of ownership TCO " when applied to IT hardware and software acquisitions. Use of the term "TCO" appears to have been popularised by Gartner Group in [4] but its roots are considerably older, dating at least to the first quarter of the twentieth century. A TCO assessment ideally offers a final statement reflecting not only the cost of purchase but all aspects in the further use and maintenance of the equipment, device, or system considered. This includes the costs of training support personnel and the users of the system, costs associated with failure or outage planned and unplanned , diminished performance incidents i. When incorporated in any financial benefit analysis e. Understanding and familiarity with the term TCO has been somewhat facilitated as a result of various comparisons between the TCO of open source and proprietary software. Because the software cost of open source software is often zero, TCO has been used as a means to justify the up-front licensing costs of proprietary software. Studies which attempt to establish the TCO and provide comparisons have as a result been the subject of many discussions regarding the accuracy or perceived bias in the comparison. Automobile industry, finances[ edit ] Total cost of ownership is also common in the automobile industry. In this context, the TCO denotes the cost of owning a vehicle from the purchase, through its maintenance, and finally its sale as a used car. Comparative TCO studies between various models help consumers choose a car to fit their needs and budget. TCO can and often does vary dramatically against TCA total cost of acquisition , although TCO is far more relevant in determining the viability of any capital investment , especially with modern credit markets and financing. Some instances of "TCO" appear to refer to "total cost of operation", but this may be a subset of the total cost of ownership if it excludes maintenance and support costs.

## Chapter 5 : What is Life-Cycle Costing (LCC)? - Definition from Corrosionpedia

*The total amount a company spends on an asset over its entire usable life. Examples of whole-life costs include planning, research, purchase price, and maintenance.. Companies estimate the whole-life cost prior to purchasing a new asset to determine whether or not it will be cost.*

## Chapter 6 : Life-Cycle Costing: Meaning, Benefits and Effects

*Life-cycle costing (LCC) is a technique used to estimate the total cost of ownership. It is a system that tracks and accumulates the actual costs and revenues attributable to cost object from its invention to its abandonment.*

## Chapter 7 : life-cycle cost definition | English definition dictionary | Reverso

*Life-cycle costing is a costing tool used to determine the one-time and recurring costs associated with a major purchase over the lifetime of the good or product. One-time cost is pretty simple.*

## Chapter 8 : Life Cycle Cost - The Project Definition

*Life cycle costing (note: the terms "life cycle costing" and "life cycle cost projections" are used interchangeably in this Tool) analysis can be carried out during any phase of an asset's life cycle.*

## Chapter 9 : Life-cycle cost analysis - Wikipedia

*Procurement and production costing technique that considers all life cycle www.nxgvision.com procurement, it aims to determine the lowest cost of ownership of a fixed asset (purchase price, installation, operation, maintenance and upgrading, disposal, and other costs) during the asset's economic life.*