

## An Introduction to Total Cost Assessment

### Abstract

The purpose of this article is to clarify the concept of total cost assessment, a financial tool applied in preparing comprehensive business considering a range of costs as savings. Total cost assessment is useful in measuring financial gains of projects associated with pollution prevention approach.

**Keywords:** cost, cost assessment

### บทคัดย่อ

วัตถุประสงค์ของผลงานวิจัยนี้เพื่อทำให้เกิดความเข้าใจในแนวคิดของการประเมินต้นทุน และความสามารถในการใช้เครื่องมือทางการเงินเพื่อช่วยให้นำไปสู่การประหยัดของต้นทุนในเชิงธุรกิจ การประเมินต้นทุนที่เกิดขึ้นจะช่วยในการวัดกำไร และป้องกันความเสียหายทางการเงินของโครงการที่จะเกิดขึ้นอันใกล้ของธุรกิจได้

**คำสำคัญ:** การเงิน, ต้นทุน

### Pollution Prevention

Pollution prevention, often called P2, means avoiding, eliminating, and reducing pollution at source rather than treating or containing it after it has been created. It is the most effective approach to environmental management. Pollution prevention can be considered as an incentive for more efficient resource allocation, the most important objective in economics. Note that many publications refer to "cleaner production" rather than "pollution prevention". However, these environmental management concepts have the same meaning.

Pollution prevention often provides value-added benefits to the industry. It is as much about increasing efficiency, reducing costs, improving flexibility and gaining a competitive advantage as it is about protecting the environment. This double-edged approach makes P2 suitable for introducing environmental concerns in companies that resist the adoption of environmental protection measures which are frequently seen as being nothing more than costs without any economic benefits. With increasing regulatory and economic pressures from internal and external

sources, firms must ensure that their strategic decisions reflect the best available information on potential financial and non-financial impacts. That is exactly the type of help that Total Cost Assessment can offer.

### Total Cost Assessment

Total Cost Assessment (TCA), a method to financial analysis developed in 1991 by the Tellus Institute in Boston, United States, is a tool for preparing capital budgeting that encompasses a broad inventory of costs and savings. While there are other approaches to analyze project costs and savings, for example

Activity-Based Costing, TCA is usually less resource-intensive and facilitates a long term, strategic view of a firm's profitability.

TCA is used to identify internal costs that affect a firm's bottom line as represented by cost types I, II, III and IV in Cost Types table below, and should not be confused with other approaches that account for external or societal costs - not directly created or for which the firm is not held legally liable. These costs are the object of the Full Cost Assessment method which emphasizes the macroeconomic aspects of the environmental impact of a firm.

		Examples	Description	Cost Type	
Conventional Cost Accounting	Total Cost Assessment	Full Cost Assessment	I. Direct costs	Manufacturing site costs	Capital investment, operating, labor, materials, and waste disposal costs
			II. Indirect costs	Corporate and manufacturing overhead	Reporting costs, regulatory costs, and monitoring costs
			III. Future and contingent liability costs	Potential fines, penalties and future liabilities	Clean-up, personal injury, and property damage lawsuits; industrial accident costs.
			IV. Intangible internal costs (Company-paid)	Difficult-to-measure but real costs borne by the company	Cost to maintain customer loyalty, worker morale, union relations, and community relations.
			V. External costs (Not currently paid by the company)	Costs borne by society	Effect of operations on housing costs, degradation of habitat, effect of pollution on human health

**Figure 1** Cost Types

*Note.* From “Total cost assessment history, methodology, tools, and a case Study,” (p. 10), by Hamilton, M. et al., 2005, ASME's IMECE 2005. AIChE Institute for Sustainability.

TCA is based on conventional financial analysis methods. Thus, it is important to note that TCA does not require a major overhaul of a company's existing accounting and information systems, nor does it

necessarily require extra staff or major expenditures in equipment and software. Although computer tools may be used to reduce the time required to do calculations for TCA, they are not a requirement.

In summary, TCA is a complement – rather than a replacement – for existing project evaluation, capital budgeting, environmental spending and cost tracking systems that are already in place in many organizations. Conventionally, TCA accounts for:

- Direct and indirect costs and savings
- Costs and savings that are less quantifiable and/or occur over the long term; and
- The time value of money (which states that a unit of money today is worth more than a unit of money one year in the future given the opportunity for investment and returns).

The major benefit of TCA is that it helps to give weight to projects that generate longer-term savings to compete more successfully for limited capital funds within a company. This, in turn, provides companies with an opportunity to improve their bottom line through efficiencies and more accurate costing and pricing.

In the case of pollution prevention actions, TCA is a particularly relevant instrument, given that such investments often produce savings that might not be identified by more traditional approaches. This can happen because those savings, and costs, are misallocated or not allocated at all; it is hard to quantify or occur more than 3-5 years after the initial investment.

There is no standard formula for doing TCA. The basic steps can be applied to many business decisions in many different ways, in any industrial or service sub-sector. TCA approaches present six common steps for implementation to help in real financial savings:

1. define the scope of the option or decision under examination;
2. develop an inventory of relevant cost items (i.e., that are direct, indirect, contingent and less-quantifiable in nature);
3. allocate overhead costs to the processes or activities that resulted in their creation;
4. characterize and evaluate contingent and less-quantifiable costs;
5. analyze financial performance using incremental cash flows and financial indicators that account for the time value of money: NPV, IRR or similar tools; and
6. incorporate financial and non-financial information into a multiple accounts table that allows managers to make decisions involving explicit trade-offs.

Due to its simplicity, small companies can adopt TCA without extensive training or support, but they must be willing to commit the time and resources required to understand the method and concepts associated with time value of money.

In this way, TCA may be promoted as a valuable decision-making tool for small businesses, or companies with limited resources, that desire to enhance their capital investments decisions by adopting an environmental approach without the high costs associated to this type of project. .

While TCA is particularly useful for analyzing pollution prevention investments, or other types of environmental projects, TCA is actually a useful tool for helping make decisions on whether to invest in almost any type of capital investment.

Even if a particular project has little or no environmental considerations, TCA can still

be used to measure the value of a project to account for the time value of money.

### **Conclusion**

TCA is a valuable tool for analyzing environmental investments in any type of business, including past or prospective projects. TCA also tends to promote pollution prevention approaches for investments by making them more appealing than they would otherwise appear under conventional (less comprehensive) methods of project analysis. That would represent a gain for both the company-through with reduced costs, and for the environment, through decreased pollution impact.



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