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Procedia Environmental Sciences 10 (2011) 147 – 151

Procedia

Environmental Sciences

2011 3rd International Conference on Environmental
Science and Information Application Technology (ESIAT 2011)

The Research of Environmental Costs Based On Activity Based Cost

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Abstract

This paper analyses the importance of applying activity-based cost to the environmental costs based on the traditional methods of environmental cost allocation, focuses on introducing how environmental costs account by activity-based cost, thus provide useful information for decision-making use.

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Selection and/or peer-review under responsibility of Conference ESIAT2011 Organization Committee.

Keywords: Environmental cost, activity-based cost, application

In recent years, environmental issues have become the focus of human's common problems. How to improve economic benefits without the expense of the environment has become a common concern. Corporate environmental cost accounting and control are becoming increasingly seriously considered. But we haven't obtained the better method on environmental cost accounting and control in China. The purpose of this paper is to analyze the current business environment costs accounting status based on corporate environmental costs and control, and then find out the environmental cost accounting problems. And according to the requirements of the sustainable development concept, try to find out the optimal way of environmental cost accounting in order to improve the business environment cost control as well as to enhance the economic efficiency of enterprises and improve the environment.

1. Definition and characteristics of environmental costs

1.1 The definition of environmental cost,

The international accounting and reporting standards for the United Nations Group of 15 meeting, the government document "Environmental accounting and financial reporting of the position announcement," the environmental cost is defined as: Environmental costs is an accounting entity in its process of sustainable development, in line with the principles of responsible for environment, for the management of business activities on the environment impact to take measures or is required to take measures costs, and other costs of execution environment for enterprise objectives and requirements to pay for. This definition is based on a clear corporate environment protection responsibility as the center, the load of the environmental impact of business costs and expenditure on preventive measures include accounting object, proposed environmental cost management goal is to manage business impacts on the environment and the implementation of environmental goals should reach the requirements.

In China, Professor Guo Daoyang to "environmental costs" of academic thought as a basis for the environmental costs are defined as: (1) due to environmental degradation and additional investment in the governance environment and ecology; (2) serious accidents cause environmental degradation lead to loss, and the resulting environmental management fees and penalties; (4) the investment t losses and waste of inefficient environmental management conditions.

Taking these definitions, we can from a business perspective, to define environmental costs as following: Environmental costs of business is an enterprise in order to fulfill environmental protection responsibilities, the implementation of national environmental protection laws, regulations and policies, and operations in order to prevent adverse impact on the natural environment and take appropriate measures to achieve environmental objectives

cost. It includes the reduction of pollutant emissions, waste material recycling and disposal, environmental management, environmental protection activities to support social and environmental damage compensation costs.

1.2 The characteristics of environmental costs

1) Environmental costs growing trend

On the national point of view, environmental costs are huge and growing costs. According to the statistical information of industrial "three wastes" discharge and handling in 2008 in China, we can see that in major cities in China, "running costs of waste water treatment facilities," "operating costs of waste gas management facility" and other management costs have shown varying degrees growth and increase the process of industrialization is with the increasing input cost is bound to show such an environment: a growing trend.

2) Non-symmetry of environmental costs

In manufacturing, not all products and production process produce equal environmental costs. However, the environmental costs are often combined in the enterprise manufacturing costs, and subsequently assigned to all products. Thus, environmental costs and related products, production processes and the critical links between related activities was cut off, and the environmental costs included in cost of manufacturing will lead to internal complementary, and the assessment of the profitability of the product off "more clean" products.

3) Dispersion of environmental costs

Environmental costs exist in a variety of commercial and business activities, such as dispersed in maintenance, management and product quality requirements, etc. even including the staff training, supervision and time in environmental aspects, these will directly raise labor costs.

2. Accounting for environmental costs of traditional distribution and its disadvantages

Environmental cost accounting should identify, distribute and measure for environmental costs. The main source of obtaining environmental cost information come from corporate accounting system. But in the traditional accounting system, it can't be confirmed and measured alone, it is combined into other cost projects. In foreign countries, environmental costs are generally included in "manufacturing costs" account; in our country, environment-related expenditures are generally included in "management fees" and other projects, and are not individually recognized and measured.

In the past, awareness of environmental issues is not seriously treated, there are no information needs of environmental costs inside and outside of enterprises. In this case, the environmental costs of enterprises will be included on other items which is understandable. However, with the social and economic development and deteriorating environmental conditions, such accounting practice can not meet the environmental management needs of the environment protection management times, exposed many shortcomings: First, the absence of the environmental costs shown separately, which can not supply a timely and comprehensive information on environmental costs to meet the environmental management decision-making needs. The second is simply include the environmental cost into manufacturing costs and is allocated, environmental costs and the corresponding products, processes and the critical links between environmental activities to be cut off, we are unable to understand the environmental cost is reasonable, but also distort the relationship between product cost and their earnings, and this leads to wrong decisions. Third, some environmental costs are not recognized and measured, which leads inadequate estimating and recognition for environmental costs.

3. The application of environmental cost

3.1 The theory of activity-based cost and its advantages

ABC (activity-based cost), which is based on calculation of operating costs, is regarded operating as the core, recognize and measure all the activities of consumption of enterprise resources, include the exact cost of consumed resources into operations, and then select the cost drivers, all operating costs are assigned to cost objects (products or services), which is cost calculation. ABC's guiding principle is: "the activities of consuming cost and activities consume resources." ABC is to treat direct and indirect costs (including expenses for the period) as the product (service) consumption cost equally, this calculation broadens the cost scope, and get the more accurate calculation of the product (service) costs. ABC said: operating is the activities or events which enterprises in order to achieve their business objectives for the product or product-related consumption of resources.

As can be seen from the above analysis, using traditional cost allocation of environmental cost often leads to distortions in cost information, and lead companies to take the wrong decisions. Since the unique concept of activity-based costing system and the cost allocation process, compared with traditional cost calculation, it can provide

more accurate cost calculation information, and objectively reflect the actual cost of the product. Activity based cost display in the process of resources convert into products, the operating plays important role. By setting the diversified cost base, manufacturing costs caused by a variety of cost drivers to allocation, we can make manufacturing costs (including environmental costs) allocation progress more detailed according to product objects. Thus it can greatly improve the environmental costs' distribution. Application of Activity Based Costing allocates for environmental costs, which can make environmental costs better associated with the operations caused these costs., which is helpful for enterprises to make decision for reducing environmental impacts and prevent pollution.

3.2 Research of Activity Based Cost of environmental costs

1) Activity Based Costing can recognize the cost of an enterprise environment.

Environmental cost calculation is the first step of environmental costs incurred. Environmental cost's recognition criteria include: ① whether the operation's occurrence is related to the environment; ② whether compliance with the principles of definability, measurability, relevance and reliability ③ determine the belonging period of cost-effectiveness. The progress of environmental costs recognition is shown in Figure 1:

2) The use of Activity Based Costing allocation of corporate environmental costs

Environmental expenditure confirmed will be allocated, and form environmental costs of product. However, due to non-quantifiable environmental costs and difficulty with the corresponding income (Environmental Revenue) matching ratio, these features make it very difficult to use existing accounting methods to account. Therefore, how to separate environmental costs from indirect costs be measured and accurately allocate different cost calculation objects become the key part of environmental cost allocation. In the use of Activity Based Costing can set cost operation cost library, according to cost drivers, rationally allocate environmental costs. Allocated as followings

① Analyze the environmental costs of the events, determine the activities. Operation is the main consumption of environmental resources, which can reflect the consumption of resources, and decompose environmental costs to each activity cost base. When determining the operation, we should pay attention to the following situations: if some environmental resource consumption can be directly determined by the consumption of a particular product, the direct cost can be directly credited to the cost of the product; If the cost of some environmental resources can be determined by what activities consume, then the cost can be directly credited to the jobs cost base; if the forms of cost are complex, and which does not meet the needs of above two situations, we need to select the actual working hours of the operations to allocate. Enterprises manufacturing costs of garbage transport fees, we can allocate according to the cleaners' wage..

② Environmental costs are assigned to each operation to, form the different cost libraries. To calculate the cost of production environment, we will divide different groups according to the properties, the group jobs aim at reducing the number of indirect cost allocation rate in order to simplify calculations. On this basis, the environmental costs of each group plus to form the corresponding cost library..

③ determine environmental cost drivers. Environmental costs drivers are the decisive factor which lead to environment cost occur, also is a criterion of allocating the cost of operation cost library into specific product environment cost. Environmental cost drivers can usually be divided into four categories: the amount of waste or emission stuff; the density of toxic waste or emissions; incremental environmental impact (emissions multiply by toxic substances product density); handle different types of waste or emissions-related costs.

④ The allocation calculation of cost drivers of the cost of operations library. The current environmental resources usage in operation cost library is divided by the current cost drivers amount to get cost drivers allocation rate of current operation library.

⑤ the cost of the operating costs of the library dates back to the products. The use of operating costs library cost drivers allocation and the number of consumed operation drivers calculate the environmental costs should be borne by each product. The specific formula is as follows:

the environmental cost shared by certain product = cost driver allocation ratio × operation number of the product consumed

A product's environmental costs = Σ the cost should be shared by the product in each activity center

3) Operating costs calculation must be considered the following factors

① Cost items to be considered completely. Cost in the environment in practical applications, according to the different decision-making purposes to determine the range of costs. Under normal circumstances only the measurement and allocation of internal costs, but if it is a long-term capital decisions, we must consider the cost or the project. To get the cost data, not only through the traditional accounting system, also need to use other channels. Table 1 shows the possible data sources of different environmental costs.

② Operation analysis. Analysis of operations refers to operations carried out by companies to identify, describe and evaluate. This analysis process analyzes the operations, the number of the people were involved in activities as well as the time and resources that the activities spent. Also analyze the reasons of job cost drivers, and accordingly evaluate the value of operations on the enterprise, to distinguish value-added operations and non-value added operations as well necessary operations and unnecessary operations. Based on the analysis results of the operation, determine the saving ways for environmental cost. Activity Based Costing provide four cost savings for environment job elimination which means the elimination of unnecessary non-value-added jobs; job choice, which means from a number of different operation (chains) to select the best jobs (chain); Operations to reduce, that is, to improve necessary operation efficiency of non-value-added operations or to improve the unnecessary operation non-value-added operation which cannot be eliminated in a short time. Operation share, which means o improve the efficiency of value-added operations and necessary operation by reaching a certain scale of economy.

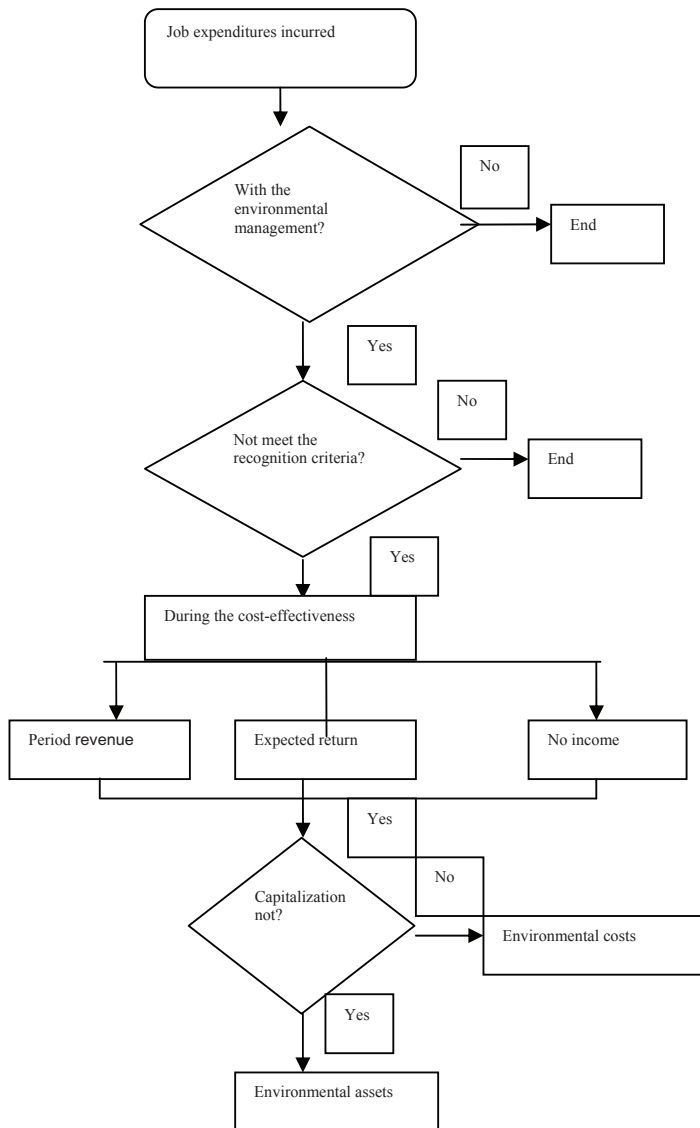


Figure 1 the ABC process-based environmental costs incurred

③ Do good basic management on the environmental cost information. Activity Based Costing require a higher degree for maturity of enterprise environments cost systems. In the basic work with particular attention to the

following: establish a perfect data systems providing basic information for environmental cost, with special emphasis on the accuracy of the original cost data collection; establish and improve the environmental costs expenditure data processing system; sound computing system for the job workload; Develop a comprehensive environmental cost accounting system.

Table 1 Environmental costs of the possible data sources in

Environmental costs	Sources of information
License fees and fines	Regulatory documents, management staff estimates
Maintenance costs of environmental protection facilities	Maintenance records, service contracts
the output in addition to products	waste discharge estimates, production records
The cost of punishment and forced off-work	Business records
Depreciation expense	Assets account records
Monitoring costs	Engineering and technical staff and management estimates
Environmental audit fees	management staff estimates· Contract
Training costs	Staff training records, managers estimates

④ Combined with other environmental costs methods. ABC accounting method require information mainly from existing cost accounting system, so it considers only the actual expenditures of the enterprise's internal environmental costs, which can not be measured for the external environmental costs, so it requires calculating the environmental costs of other methods (Such as life cycle, overall quality management, environmental design and complete cost method, etc.) combined. For example, the environmental cost is due to the production process to bring the waste generated, through environmental design, improved processes, increased conversion rate of raw materials, or improved materials, reduce waste output, or reprocessing of waste to become valuable products to reduce the relevant environmental costs, thereby reducing the impact on the environment.

In short, the environmental costs because of its complexity, the decision process more difficult in the specific application, but because of using Activity Based Costing can provide us with more detailed information on environmental costs accurately calculate the environmental cost of our choice. But in the use of database ABC because of difficulties in distribution, it is difficult to select the cost drivers and increase the difficulty of calculating workload, which is subject to specific accounting improve the actual work, this paper discusses only the specific methods used for the practice for the environmental costs to provide more useful information for decision-making.

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