

Artículo de investigación

Features of Environmental Cost Management

Особенности Управления Экологическими Затратами

Características de la Gestión de Costos Ambientales

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Written by:

Larisa Nikolaevna Gerasimova¹⁹⁴

ORCID ID: 0000-0003-1144-6019

https://elibrary.ru/author_items.asp?authorid=534398

Tatiana Martemyanova Mezentseva¹⁹⁵

ORCID ID: 0000-0001-5377-1763

https://elibrary.ru/author_items.asp?authorid=381514

Natalya Nikolaevna Parasotskaya¹⁹⁶

ORCID ID: 0000-0003-0094-4485

<https://elibrary.ru/item.asp?id=36801185>

Vera Valeryevna Dvoretzkaya¹⁹⁷

ORCID ID: 0000-0002-5245-1888

https://elibrary.ru/author_items.asp?authorid=308890

Abstract

The article shows the essence of environmental protection costs, related to the environmental protection of a number of construction companies, as well as the need to form and implement an effective environmental strategy. The article examines the approaches of management accounting to the value and quantitative assessment of environmental protection costs. A cost management mechanism has been developed in the framework of the “business – process – function” categories, based on the acquisition of certain functions by costs at the intersection of functions and business processes, including the conditions necessary for accounting: accuracy, efficiency and quality of accounting data. The developed methodology for the functional and process accounting of environmental protection costs makes it possible to identify the costs by processes and functional blocks and ensure the creation of high-quality accounting information on the formation of environmental protection costs and their results.

Keywords: costs intended for nature protection purposes, management, construction works, business process, function blocks.

Аннотация

В статье раскрывается сущность затрат на охрану окружающей среды, связанных с охраной окружающей среды ряда строительных компаний, а также необходимость формирования и реализации эффективной природоохранной стратегии. В статье изучены подходы управленческого учета к стоимостной и количественной оценке природоохранных затрат. Разработан механизм управления затратами в рамках категорий «бизнес-процесс-функция», основанный на приобретении определенных функций затратами, при пересечении функций и бизнес-процессов, включающий в себя условия, необходимые для учета: достоверность, оперативность и качество учетных данных. Разработанная методология функционального и технологического учета затрат на охрану окружающей среды позволяет идентифицировать затраты по процессам и функциональным блокам и обеспечить создание качественной учетной информации о формировании затрат на охрану окружающей среды и их результатах.

¹⁹⁴ Moscow State University of Civil Engineering (National Research University) (MGSU), Moscow, Russia

¹⁹⁵ Financial University under the Government of the Russian Federation, Moscow, Russia

¹⁹⁶ Institute of Economics and business of the Professional education and investment Fund of the chamber of Commerce and industry of Russia, Moscow, Russia

¹⁹⁷ Financial University under the Government of the Russian Federation, Moscow, Russia

Ключевые слова: затраты, предназначенные для природоохранных целей, управление, строительные работы, бизнес-процесс, функциональные блоки.

Resumen

El artículo muestra la esencia de los costos de protección ambiental, relacionados con la protección ambiental de varias compañías de construcción, así como la necesidad de formar e implementar una estrategia ambiental efectiva. El artículo examina los enfoques de la contabilidad de gestión para el valor y la evaluación cuantitativa de los costos de protección ambiental. Se ha desarrollado un mecanismo de gestión de costos en el marco de las categorías de "función de proceso de negocio", basado en la adquisición de ciertas funciones por costos en la intersección de funciones y procesos de negocio, incluidas las condiciones necesarias para la contabilidad: precisión, eficiencia y Calidad de los datos contables. La metodología desarrollada para la contabilidad funcional y de procesos de los costos de protección ambiental permite identificar los costos por procesos y bloques funcionales y garantizar la creación de información contable de alta calidad sobre la formación de los costos de protección ambiental y sus resultados.

Palabras clave: costos destinados a la protección de la naturaleza, administración, trabajos de construcción, procesos de negocios, bloques de funciones.

Introduction

It is quite obvious today that any social and economic problems should be solved taking into account the requirements of environmental protection.

In view of the fact that construction activities are closely interconnected with human intervention in the natural environment, in order to preserve the ecological balance in nature and ensure its protection, it is necessary to make environmentally sound architectural and other decisions (Gogoleva, Bakhturina, 2015; Petrov, 2018; Chkhutiashvili, 2016).

All persons directly involved in construction should be also involved in the protection of the external environment. The designer must develop a project for future construction, based on the environmental legislation in force, the customer must approve the Statement of Work for the designer, including the obtaining of the necessary permits for construction; the contractor must perform all construction work, based on project documentation and legal requirements in the field of environmental protection.

In cases of causing any harm to the natural environment, the general contractor must fully compensate for the damage caused.

Summarizing the above, it is worth noting that construction companies must perform a number of activities aimed at restoring and preserving the natural environment. As a result, construction

companies incur significant costs in the event of elimination of the damage caused, restoration of the natural environment. Therefore, competent management of environmental costs plays an important role in the formation of the financial results of the company.

Materials and methods

The dialectical method, which is proposed as a general approach to the cognition of the subject in question, serves as the methodological basis. As a result of this study, the scientific apparatus of managerial accounting, as well as the standard methods of analysis and evaluation of various data, were applied. General scientific methods of knowledge were also used, such as: logical generalization, systems approach, economic and legal analysis, and various hypotheses.

Results and Discussion

Traditional methods of competent environmental management are primarily focused on the companies' passive compliance with environmental requirements, as well as on possible responses to the current pressure of all external parties (Voronova, 2016; Gerasimova, 2018; Gogoleva, Bakhturina, 2015; Ivanova, 2015; Mandrikov, 2017; Nguyen, Ignat, 2018; Pilkiene, Alonderiene, Chmieliauskas, Simkonis, Muller, 2018).

The negative consequences of environmental and economic risks that are associated with any violations are shown in Figure 1.

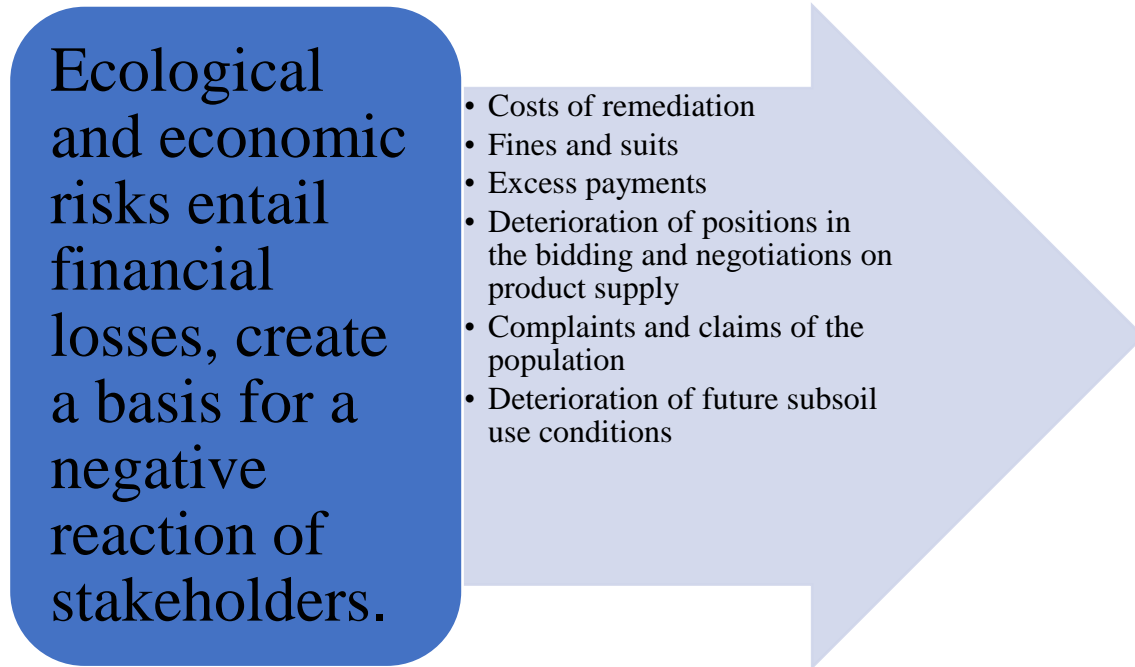


Figure 1: Negative consequences of the implementation of environmental and economic risks associated with violations of environmental legislation

The costs of environmental protection measures that are allocated on the basis of an economic production attribute have certain features: they are not embodied in the released goods, accordingly, an increase in such costs does not lead to production growth, and their absence does not cause a decrease in output. Therefore, such costs are rationalized (Gerasimova, 2018; Kutinova, 2014; Xu, Wang, Li, Huang, Xia, 2018).

However, just like other costs, environmental costs require valuation and quantification, analysis and tracking of their movement and condition, which is not possible without a systematic and full accounting of these costs (Figure 2) (Ghodrati, Wing Yiu, Wilkinson, Shahbazzpour, 2018; Iranmanesh, Shakhshi-Niaei, Yazdi, 2018).

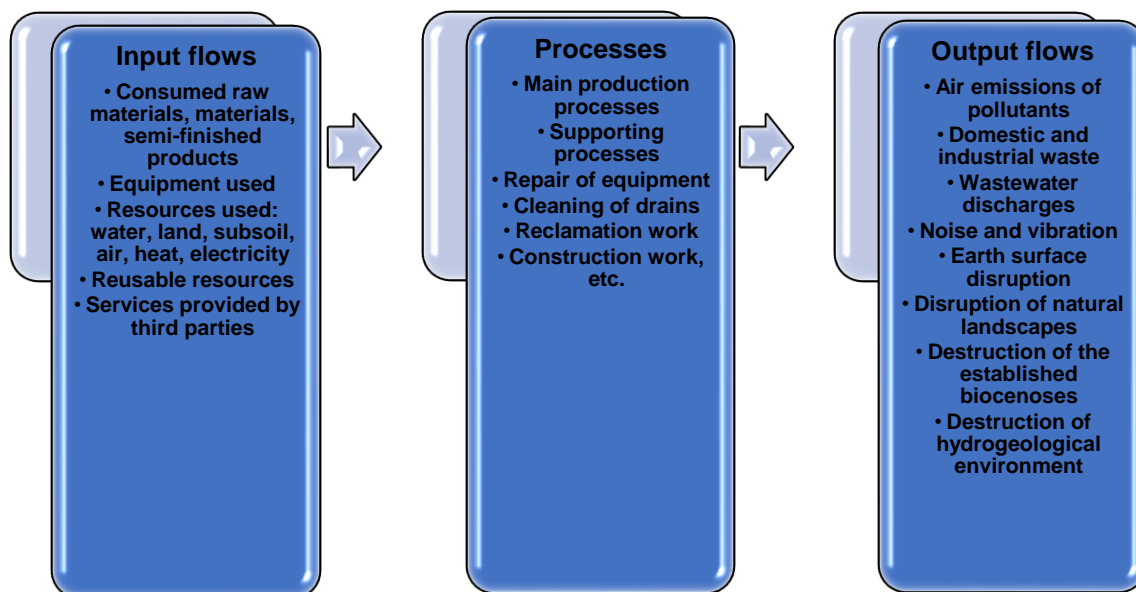


Figure 2 – Process approach to the identification of the environmental aspects

In this regard, it is advisable to develop a mechanism to manage the costs in managerial accounting, which would include all the conditions required for accounting: accuracy, efficiency, and quality of data accounting.

In this interpretation, the relevance of using the cost accounting of a construction company within the categories of "business-process-function" proposed by the authors is obvious when, in connection with the intersection of functions and business processes in general, the costs acquire certain functions.

This ensures the creation of high-quality accounting information on the formation of environmental expenditures and their results.

For example, the following should be used for a construction company:

A: business processes: 1) production; 2) distribution of indirect costs; 3) management;

B: functions:

1) government regulation of the construction business; 2) legal support of business processes;

3) construction greening; 4) environmental protection measures; 5) energy internal and external audit.

The formation of functional blocks by the example of the business process "Production" can have the following options:

- production – legal support;
- production – government regulation;
- production – greening of the construction;
- production – environmental protection measures;
- production – energy internal and external audit.

If necessary, it also becomes possible to detail the main functions by regions and individual categories.

The authors believe it is quite reasonable to divide the environmental costs into two functional groups:

1) greening of the construction, which implies an assessment of the effectiveness of an

environmental nature. Greening of the construction serves as a tool to enable environmental performance assessment and to form an optimal environmental policy in the company, ecological passport; ensures the selection of the priority of financial investments (optimal investment programs);

2) the costs of environmental activities that are allocated to the implementation of environmental actions (limiting the number of discharges and emissions of waste, standardization of MPC of various hazardous substances, limiting the amount of production waste, the level of MPC of emissions and emissions of harmful substances). Such events should be held by construction companies at least 1 time per year.

The application of the processor functional accounting method for environmental costs requires a detailed allocation of costs for analytical accounting purposes, allowing these costs to be presented as part of the company's total costs: direct, related to the execution of environmental protection measures, and indirect ones, including the amount of economic losses inevitable in those companies that experience the negative effects of pollution.

Within the development of a more detailed classification for analytical accounting purposes, it is necessary to make decisions on these issues:

- formation of a cost reservation system for environmental protection measures;
- creation of analytical accounting of costs for environmental protection measures;

- creation of uniform forms of internal reporting of the company on the costs incurred for environmental protection measures.

It is worth noting that such decisions are closely interrelated with the creation of timely, accurate and reliable data on environmental costs. Therefore, they should be drawn up as separate elements of the company's accounting policies.

In an organization, from the point of view of management accounting, internal processes are capable of fixing themselves for the effect of any one of the categories mentioned above (the function of the process is revealed). In a similar section, the accounting of all environmental protection costs at an enterprise can be carried out according to a structural breakdown (if the activity of the structural unit is taken as a process).

Thus, in the context of accounting and analytical provision, the mechanism for managerial information creation reflects the main property of costs – to perform the generalized functions of processes and costs.

Similarly, in the framework of ensuring the activities of the bulk of the processes (internal) aimed at achieving any effects from this category, there are costs that are aimed at acquiring the effects of all cross-categories. Taking into account the intersection of business processes and functions, the costs are allocated for individual functional blocks (Table 1).

Table 1: The example of the formation of functional blocks for business processes with the function "Environmental protection measures"

Business process	Function block	Cost function	Examples of costs associated with environmental activities
Production	Production – Environmental measures	Environmentally safe production process	Product certification The introduction of new production technologies Training Regulatory
Management	Management – environmental activities	Environmental load on the operation of management units	environmental fees and charges Financial penalties Sanctions
Distribution of indirect costs	Distribution of indirect costs – environmental measures	Ecological support of general business processes	Environmental risk insurance Environmental audit

Management	Production – Environmental measures	Organization and management of environmental policy	Payment for environmental consulting services Costs of special- purpose production services Maintenance of environmental control services
Management	Distribution of indirect costs – environmental measures	Ecological and legal support of material and technical conditions for the operation of auxiliary and service units	Cost of compliance with boiler room safety standards Maintenance of services for cleaning the area from industrial pollution Acquisition of environmental property
Distribution of indirect costs	Production – Environmental measures	Creation of the environmental legal framework for production service	R&D on the development of environmental technologies Construction of health centers

Thus, the costs are identified by functional units and main processes; for example, variable direct costs of production of one unit of a product; unallocated costs; the costs that are subject to primary distribution (the acquisition of a licensed program for the purpose of management accounting refers to general business expenses, which must be fully allocated to the management process).

Conclusion

One of the main criteria for the effectiveness of the analytical accounting mechanism of a company today is the adequacy of this provision to the existing management systems. As a result of projecting, it is necessary to take into account possible environmental consequences when making a certain decision.

The environmental approach should reflect the functions and business processes of the construction organization. The improper organization, work and ill-conceived technologies entail enormous costs of materials and energy and lead to severe pollution of the natural environment.

In this relation, the object of management accounting with primary informational importance is the cost of environmental protection, formed under the influence of external threats.

However, there are no scientifically grounded ways to identify these costs and to ensure their accounting and control.

In relation to the aforementioned, economic entities must independently identify the qualifying features of environmental protection costs and their functional capabilities. It is necessary to build their effective system in managerial accounting, able to provide all accounting results of actual costs incurred for environmental activities and generate reliable, relevant information.

As a result, a methodical approach is developed to determine the typology of environmental protection costs, based on the relationships among the categories of "business-process-function"; the stages of setting up a cost accounting for environmental protection with the aim of fulfilling the indicators of effective budgets are defined.

The grouping, general structure and main functions of environmental protection costs provide quite reliable information about the actual costs incurred for environmental protection activities. In addition, the recommended methodology for the functional and process accounting of environmental protection costs fully complies with the established norms for the formation of effective systems, being accessible and useful for making and considering various kinds of management

decisions that are aimed at the economical and purposeful use of finance in the environmental performance of companies.

The proposed method of accounting for environmental expenditures in its entirety makes it possible to revise the approaches to the method of tracking the data directly related to an increase in the parameters of the operation of construction corporations; to establish the relationships among all target values, critical areas of activity, required expenditures, as well as the expectations from managerial decision making; and significantly improve the processes of formation of the company's financial sustainability strategy in the conditions of constant competition.

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