

# ENVIRONMENT MANAGEMENT ACCOUNTING AS A MODERN TOOL FOR INTERNAL MANAGEMENT OF A COMPANY

**Radana Hojná**

Technical University of Liberec  
Faculty of Economics  
Department of Finance and Accounting  
Studentská 2, 461 17 Liberec 1, Czech Republic  
[radana.hojna@tul.cz](mailto:radana.hojna@tul.cz)

## **Abstract**

The significance of environmental protection as well as the constantly growing demands of both the market and general public put manufacturers under more pressure. To meet the requirements for environmental protection, various statutory as well as voluntary environmental tools are implemented. Under the existing conditions the implementation of one of the voluntary environmental tools, which may be introduced into a company information system, becomes the important part of the internal management of company spending. This voluntary tool is the environmental management accounting (EMA). EMA keeps records and settles spending and expenditures associated with the impacts of the company actions on environment. It allows managers to exactly determine what part of their total expenses is connected with environmental issues. Such information facilitates them to make decisions on the implementation of environmental actions aimed at the improvement of company efficiency and also the mitigation of negative impacts of the company activities on environment.

## **Introduction**

In highly developed societies environmental protection recently becomes one of the overriding priorities and needs. Environmental deterioration becomes a major global economic, social as well as political problem. Recently the responsible approach of companies to environmental protection is one of the presumptions for successful business undertaking. The effort for more friendly approach to environment is invoked by various factors – both external (legislation, public opinion) and internal (depending on the active approach of companies to environmental issues). [1] Nowadays companies – either by law or voluntarily – start to implement various measures in order to mitigate their negative impact on environment and thus improve their reputation, market position and profitability. [2]

Environmental protection is based on a legislative basis but still it offers an option to make use of voluntary tools beyond the scope of the applicable legislative regulations. In the Czech Republic the legislative basis is especially represented by the Act No. 17/1992 Coll., on Environment. This act stipulates general terms and principles applicable in the field of environmental protection as well as obligations of all business entities associated with protection and improvement of the state of environment. [3, 4]

## **1 EMA (Environmental Management Accounting) Subsystem Specification**

The resolution of problems relating to environment and the protection thereof recently becomes an integral part of managerial effort of many business entities. Such entities are more increasingly concerned in environmental tools based on their *voluntary activities*. A crucial voluntary tool that may be implemented in the company information system as one of accounting subsystems is the *Environmental Management Accounting* (EMA). This tool is

generally perceived as a “*part of management that is aimed at identification, gathering, estimation, analyses, reporting and sharing of information on material and energy flows, information on environmental costs and other value information that is considered relevant for decision-making in the company*”. [5]

The way of processing and utilization of such information depends on the specific decision by each particular company. The share of environmental costs in total costs of the company has been constantly increasing and so is the importance and relevancy of environmental profile of contemporary organizations. These circumstances greatly contribute to the fact that the existing management accounting systems are more increasingly inadequate to meet the demands and requirements of modern organizations management.

Environmental management accountancy is a voluntary activity of a business entity that may be classified as one of the voluntary tools of the Czech Republic environmental policy. The main purpose of this activity is to maintain and improve the quality of environment, health and life of population, hand in hand with the fulfillment of requirements for sustainable development. EMA is a managerial tool helping the enterprises to make sound decisions in the field of a corporate environmental policy, considering the general environmental policy of the relevant country. Information obtained from EMA may be used by both internal users (management) and external users. Such information may be included in the reports on company impacts on environment intended for suppliers, customers, employees or investors. One of the main advantages of EMA is its versatility – it may be implemented in large, medium-sized or small enterprises, in various industrial branches as well as in the tertiary sector. It may be applied to the whole enterprise, but also within a single department or to one product range only. [2]

## **2 Environmental costs of a company as an information platform for EMA**

Costs on environmental protection that closely relate to reduction of the level of contamination, waste disposal, to various fees or insurance have been - due to strict environmental regulations – constantly increasing in the recent years. *Standard* financial accounting and management accounting however do not provide complex insight into the approach of companies to environmental issues. Financial accounting does not care much about this matter, while the management accounting often documents environmental costs in an inadequate way. Environmental costs in common management accounting are often limited to certain fees and operating costs of terminal equipment. In the common *management accounting subsystem* the environmental costs (reduction of environmental pollution, waste management, legal charges and fees, insurance, fines, etc.) are hidden - they are incorporated in the total overhead (indirect) costs (either as *indirect product costs* or *overhead administrative expenses*). Managers are therefore not able to clearly identify such costs and work with them more thoroughly. There is no feedback that would motivate responsible employees to manage and subsequently reduce such costs. Another problem of the commonly used management accounting is inaccurate allocation of environmental costs. It may even lead to incorrect managerial decisions in the field of promotion of the manufacture of environmentally friendly products (environmental costs that did not relate to the manufacture of specific products are incorrectly allocated to such products due to the selected budget bases). [6]

By manufacturing products or providing services that satisfy needs of customers, companies interfere with the surrounding environment. In order to be able to realize their products, companies consume materials, energies, water and services. In connection with their business activities they *generate waste* (solid, liquid or gaseous). Consumption of material, energies, water and services, *production and subsequent disposal of waste* leads to generation of costs

that are directly compensated by the company. Whenever such costs reach higher values and affect economic and financial situation of the company, it is purposeful to pay a reasonable attention to them. Enterprises have a reporting obligation pursuant to the amendment to the Act No. 563/1991 Coll., on Bookkeeping, effective since 1. 1. 2004. In accordance with this act the companies are obliged to include information about their activities in the field of environmental protection into their annual reports. [7]

In order to manage the above mentioned cost items properly, environmental management accounting (EMA) may be efficiently used. The environmental management accounting system is primarily aimed at the costs that are expended in connection with the consumption of materials, energies and water as well as in connection with waste generation and disposal. Such costs are referred to *environmental costs* and belong to the group of operating expenses. EMA is focused on the identification, analyzing, management and reduction of environmental costs through measures that bring positive economic effects to the company on the one hand and have positive impact on environment on the other hand. [6]

The theories of economics consider costs as a decrease of economic profit that is either demonstrated by decrease of assets or increase of liabilities - at the end such situation leads to the decrease of equity (owned capital of the company). But the costs do not only mean the decrease of economic profit of a company – they include much more other factors such as taxes, fees, fines and penalties, shortages and losses, costs on representation, etc. For the examination of the costs from the management accounting point of view, one of the most important things is their *purposefulness* (they must be expended for some purpose and must be reasonable and adequate considering the result of the action) and *practicality* (the purpose of all costs expended should be the achievement of a specific result such as product, work or service). [8]

Environmental costs of company – from the environmental management accounting point of view - comprise of two basic elements:

- 1) costs expended on the environmental protection – i.e. costs relating to corporate activities aimed at *mitigation*, possibly also *elimination* (as a preventive measure) or *compensation* of already experienced negative impact of the company on environment (elimination of negative effects – contaminated waste water, pollutant emissions, redevelopment and sanitation activities or prevention measures/ actions),
- 2) costs expended on corporate activities having negative impact on environment and costs resulting from the existing damage to environment caused by the company (sanctions, penalties).

Total environmental costs of a company are the costs that directly affect the company's budget and are identifiable and quantifiable.

- ad 1) Company costs on environmental protection cover all the costs and expenses on the measures and actions aimed at environmental protection, relating to prevention, mitigation of impacts and elimination of risks, control and registration of environmental aspects as well as other expenses and costs on disposal, adaptation and sanitation – e.g. fee for waste deposition in a yard, for collection, sorting and disposal of waste, for the use of sewer network etc. [1, 2]
- ad 2) Costs relating to the environment deterioration, including costs on wasted material that did not pass into the product and is therefore considered as non-product input (just as the relating wasted labor or wasted production equipment capacities) and also penalties and sanctions that were imposed due to some damage to environment. All the wasted inputs signalize inefficiency of production and must be considered in the environmental

costs calculation. This group of costs further cover expenses compensated by the company on the basis of a rule “the one who caused the damage must pay for it”, such as sanctions and penalties for the environmental damage and deterioration. [1]

In the company practice it is necessary to identify all the significant environmental, cost or revenue items such as:

- costs relating to handling and disposal of solid waste, waste water and air emissions;
- costs of environmental care and prevention of pollution;
- prices of wasted material contained in a non-product output (appraised using acquisition prices or actual factory costs);
- costs of processing of non-product output (labor costs, depreciation of machinery and equipment as well as other costs wasted for non-product outputs),
- fines and sanctions for air pollution or waste water spills,
- environmental revenues.

### **2.1 Environmental revenues**

This category is hardly identifiable. It covers revenues from material recycling as well as incomes from sale of recyclable waste, subsidies and other supports relating to environmental issues as well as all revenues entered in accounting books on the basis of objective or time-related association with other environmental costs. Environmental revenues also cover all returns and earnings attributable to environmental costs and spending. [2]

Environmental costs and revenues must be allocated to particular elements of the environment, such as:

- air and climate protection,
- waste water treatment and disposal,
- solid waste treatment and disposal,
- protection and sanitation of soil, underground and surface water,
- elimination of noise and vibrations,
- radiation protection,
- other environmental activities and measures.

All environmental costs as well as revenues of each company may be monitored either for the whole company or by individual internal departments, processes or operations. The Act No. 563/1991 Coll., on Bookkeeping defines the structure of the system of accounts in the field of costs. As EMA is a voluntary tool, the allocation of costs to individual analytical accounts is optional and depends on internal rules and needs of the company management. [2]

## **3 EMA use in practice by enterprises in the Czech Republic**

The following section brings the analysis of the current state of use of EMA by selected types of enterprises in practice. Various enterprises were subject to analysis from relatively wide area covering the regions of Liberec, Ústí nad Labem, Hradec Králové, South Bohemia region and Prague. The required information was obtained by means of a simple questionnaire that was distributed to students of the first class of consequential studies in the field of business economics in the Technical University of Liberec. In total 51 students – representatives of the

business practice – returned back the filled-in questionnaire. Though this number is relatively low, because of the geographical distribution of enterprises subject to analysis we may consider the collected results as acceptable. The obtained information was sorted and analyzed based on the predetermined criteria. The results were then organized in transparent tables and completed by visual graphs and comments.

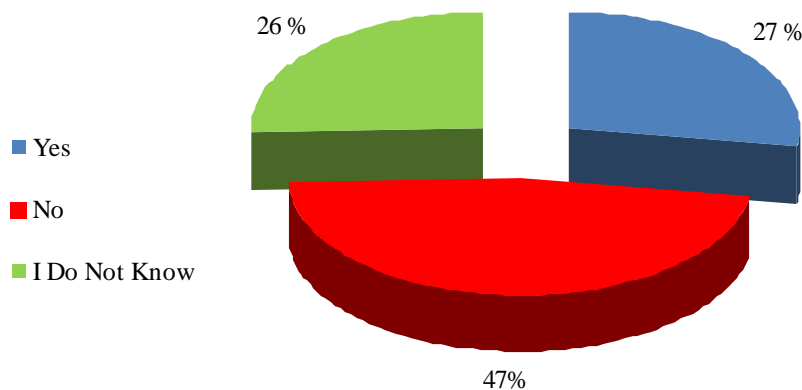
Table 1 brings answers to the general question – whether the enterprise makes use of the environmentally focused internal accountability. The results obtained acknowledged my presumption – in most of enterprises (24 enterprises, i.e. 47%) EMA has not been implemented so far. Answers “YES” or “I DO NOT KNOW” were represented almost equally (13-14 enterprises, about 25-27%). It is highly probable that this result is affected by considerably high financial spending associated with the implementation and use of EMA in practice as well as the necessity of recruitment and assignment of skilled professionals well trained in the field of environmental protection which many companies simply cannot afford.

**Tab. 1:** Share of enterprises using environmentally focused internal accountability

ANSWER	NUMBER	%
Yes	14	27.45
No	24	47.06
I do not know	13	25.49
<b>Total</b>	<b>51</b>	<b>100.00</b>

Source: Own elaboration

The results in Table 1 are visually presented in Figure 1.



Source: Own elaboration

**Fig. 1:** Share of enterprises using environmentally focused internal accountability

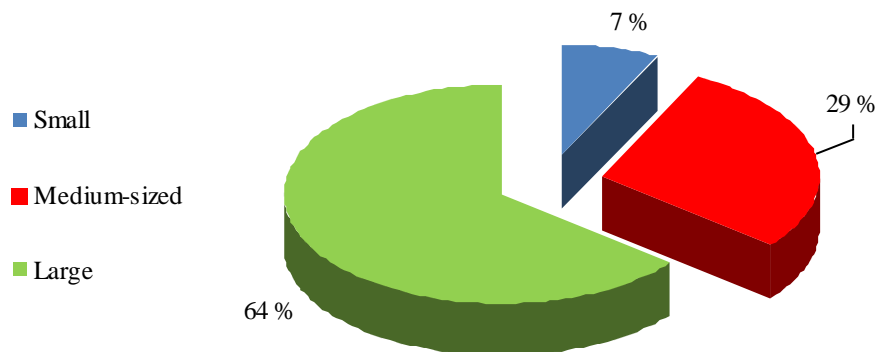
Only those enterprises that are using the internal accountability aimed at the environmental protection were analyzed further. They were distributed into three categories – small, medium-sized and large. The results again acknowledged my expectations – this accounting subsystem is mainly used in large companies, whereas in small companies it is used at the least. Individual values are covered in Table 2.

**Tab. 2:** Size of enterprises using environmentally focused internal accountability

SIZE	NUMBER	%
<b>Small</b>	1	7.14
<b>Medium-sized</b>	4	28.57
<b>Large</b>	9	64.29
<b>Total</b>	14	100.00

Source: Own elaboration

The results in Table 2 are visually presented in Figure 2.



Source: Own elaboration

**Fig. 2:** Size of enterprises using environmentally-focused internal accountability

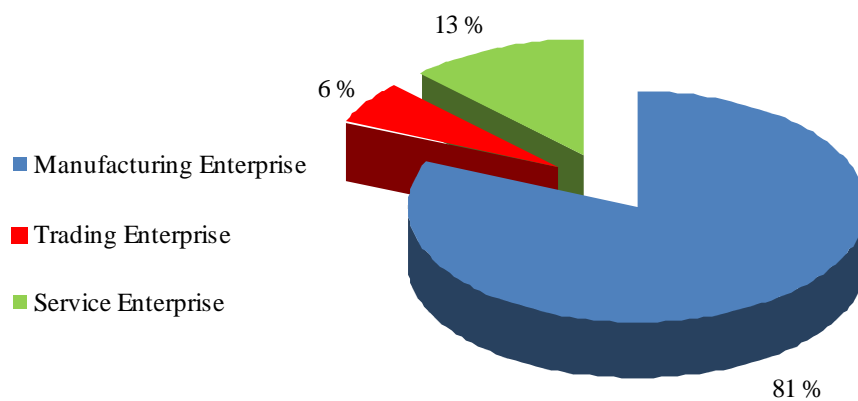
The next question the respondents were asked in the questionnaire was about the branch the enterprises make their business in. For some enterprises two branches were mentioned which is reflected in the resulting values. From the results it is obvious that the environmentally focused internal accountability is mainly expanded in industrial companies in contrast to agriculture and building industries having no representative at all. Summarization of the results obtained can be found in Table 3.

**Tab. 3:** Branches in which the enterprises use the environmentally focused internal accountability

BRANCH	NUMBER	%
<b>Industry</b>	13	81.25
<b>Agriculture</b>	0	0.00
<b>Building industries</b>	0	0.00
<b>Trade</b>	1	6.25
<b>Services</b>	2	12.50
<b>Total</b>	16	100.00

Source: Own elaboration

The results in Table 3 are visually presented in Figure 3.



Source: Own elaboration

**Fig. 3:** Branches in which the enterprises use the environmentally focused internal accountability

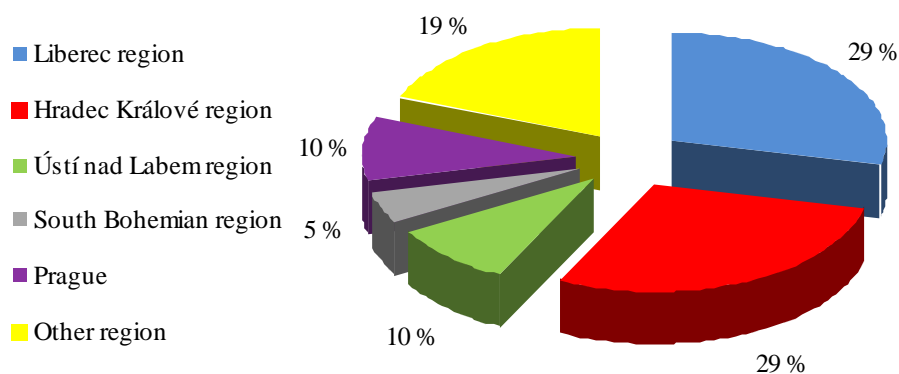
The purpose of the next question was to determine the area the enterprises that make use of the environmentally-focused internal accountability operate in. From the answers obtained it is clear that some of the enterprises in the analyzed sample have extended scope of action (covering multiple regions). The summary of answers is documented in Table 4.

**Tab. 4:** The area the enterprises using the environmentally focused internal accountability operate in

AREA (REGION)	NUMBER	%
<b>Liberec region</b>	6	28.57
<b>Hradec Králové region</b>	6	28.57
<b>Ústí nad Labem region</b>	2	9.52
<b>South Bohemian region</b>	1	4.76
<b>Prague</b>	2	9.52
<b>Other regions</b>	4	19.05
<b>Total</b>	21	100.00

Source: Own elaboration

The results in Table 4 are visually presented in Figure 4.



Source: Own elaboration

**Fig. 4:** The area the enterprises using the environmentally focused internal accountability operate in

## Conclusion

Environmental management accounting is a very important but still only a voluntary tool of environmental policy. Its implementation in practice brings both environmental and economic benefits covering the elimination or mitigation of negative impacts of the company activities on environment, more efficient use of materials and energies as well as improved economy of the implementing company, especially higher profitability. By contributing to improved use of materials and energies EMA helps to reduce consumptions of economy sources and allows to achieve better results. It gives an opportunity to thoroughly monitor, evaluate and manage environmental costs of a company, thus facilitating the fulfillment of legislative requirements applicable to environmental protection. In general EMA may increase the overall efficiency of company management and mitigate negative effects of company business on environment. [2]

Companies that do their best to behave responsibly in the field of environmental protection and to achieve the desired level of their environmental profile should benefit from the environmental management accounting system as an efficient tool for their internal management. Here are some benefits of EMA implementation:

- 1) more efficient use of materials and energies as inputs to business processes, resulting in reduction of operating expenses and improvement of general economic situation and performance;
- 2) development and designing of products, services and processes that are environmentally friendly (thus improving image and credibility of the company and also its competitiveness in the market);
- 3) identification and accurate quantification of those costs from the total expenses of the company that pertain to the environmental issues and activities (both the costs expended on the environmental protection as well as costs of environmental fees, fines and sanctions),
- 4) achieving the harmony between the company activities and the applicable environmental rules, regulations and environmental legislation.

The implementation of the environmental management accounting system also means a reporting obligation for companies. Such an obligation is based on the amendment of the Act No. 563/1991 Coll., on Bookkeeping, which came into force on 1. 1. 2004. In accordance with this amended act companies are obliged to include information about their activities focused on environmental protection in their annual reports. There are more and more large companies that are even releasing separate environmental reports. The problem is that the structure of these reports is not mandatory and therefore it may be quite difficult to compare individual reports in order to get a better insight in the actions and measures adopted by a specific company in the field of environmental protection. [2]

Environmental management accounting is quite important and valuable source of information for decision-making processes in a company. It contributes to reduction of operating costs and helps to achieve better overall results of company management. It also allows more efficient management and control over environmental costs of each individual company. EMA implementation helps to improve company image and makes it more competitive. Also it facilitates fulfillment of the applicable legislative requirements aimed at the protection of environment and allows to mitigate the negative effects of company activities on environment.



## Literature

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## ENVIRONMENTÁLNÍ MANAŽERSKÉ ÚČETNICTVÍ JAKO MODERNÍ NÁSTROJ VNITROPODNIKOVÉHO ŘÍZENÍ

Význam ochrany životního prostředí a zároveň stále větší nároky trhu i veřejnosti kladou na výrobce stále větší požadavky. K ochraně životního prostředí jsou používány různé zákonné i dobrovolné environmentální nástroje. Důležitou součástí vnitropodnikového řízení nákladů v současných podmínkách se stává zavádění jednoho z dobrovolných environmentálních nástrojů, který může být implementován do podnikového informačního systému, nástroje pro environmentální manažerské účetnictví (EMA). EMA eviduje a zúčtovává náklady, které vznikají v důsledku působení podniku na životní prostředí. Umožňuje manažerům podniku přesně zjistit, jaká část celkových nákladů podniku je spojena s problematikou životního prostředí. Na podkladě zjištěných údajů je možné provádět rozhodnutí managementu o realizaci environmentálně zaměřených opatření, která povedou k růstu efektivnosti podniku a ke snižování negativních dopadů činnosti podniku na životní prostředí.

## ENVIRONMENT-MANAGER- RECHNUNGSWESEN ALS MODERNES INSTRUMENT INNERBETRIEBLICHER LEITUNG

Die Bedeutung des Umweltschutzes sowie die ständig steigenden Ansprüche des Marktes und der Öffentlichkeit stellen an die Produzenten immer größere Anforderungen. Zum Umweltschutz werden verschiedene gesetzliche und auch freiwillige Environment-Instrumente verwendet. Zu einem wichtigen Bestandteil der innerbetrieblichen Kostenverwaltung wird die Einführung eines der freiwilligen Environment-Instrumenten, das ins betriebliche Informationssystem implementiert wird, Instrument um das Environment-Manager-Rechnungswesen (EMA). Das EMA evidiert und berechnet Kosten, die in Folge der Einwirkung des Unternehmens auf die Umwelt entstehen. Es ermöglicht den Managern des Betriebs genau festzustellen, welcher Teil der Gesamtkosten mit der Umweltproblematik in Verbindung steht. Auf Grundlage der festgestellten Angaben können von Seiten des Managements Entscheidungen über die Realisierung von umweltbezogenen Maßnahmen getroffen werden, welche zum Wachstum der Effektivität des Betriebs sowie zur Senkung negativer Auswirkungen der Betriebstätigkeit auf die Umwelt führen.

## ŚRODOWISKOWA RACHUNKOWOŚĆ ZARZĄDCZA JAKO NOWOCZESNY INSTRUMENT ZARZĄDZANIA PRZEDSIĘBIORSTWEM

Znaczenie ochrony środowiska oraz coraz większe wymagania rynku i opinii publicznej stawiają przed producentami coraz większe wyzwania. Do celów ochrony środowiska stosowane są różne prawne i dobrowolne instrumenty środowiskowe. Ważnym elementem zarządzania kosztami w przedsiębiorstwie staje się obecnie wdrażanie jednego z dobrowolnych instrumentów środowiskowych, który może zostać wprowadzony do systemu informacyjnego przedsiębiorstwa, instrument środowiskowa rachunkowość zarządcza (EMA). EMA ewidencjonuje i księguje koszty, które powstają w wyniku oddziaływania przedsiębiorstwa na środowisko. Umożliwia menadżerom przedsiębiorstwa dokładne stwierdzenie, jaka część ogólnych kosztów przedsiębiorstwa związana jest z aspektami środowiskowymi. W oparciu o stwierdzone dane można podejmować decyzje w zakresie realizacji działań środowiskowych, które przyczynią się do wzrostu efektywności przedsiębiorstwa oraz do ograniczenia negatywnych skutków oddziaływania przedsiębiorstwa na środowisko.