

THEORETICAL ASPECTS OF THE MONITORING OF ENVIRONMENTAL ACTIVITIES BY MANAGERIALS OF ENTERPRISES

Martina Černíková

Technical University of Liberec
Faculty of Economics
Department of Finance and Accounting
Studentská 2, 461 17 Liberec 1, Czech Republic
martina.cernikova@tul.cz

Abstract

Environmental protection is one of the tasks defined by the concept of sustainable development. Governments of developed countries, implementing the complex of environmental instruments into the economic environment, support environmental sustainability. Therefore, a partial internalization of negative externalities is reflected in business costs of enterprises - polluters. A significant part of addressing this issue is also the approach of business entities. For the decision-making processes in the field of environmental protection managers of enterprises may use standard information tools, especially accounting modules. For the reflection of environmental activities of enterprises it is particularly necessary to explore the potential of financial accountancy to capture these effects. With the information obtained from the financial accountancy it is not only possible to prepare sets of financial indicators, but also to generate complex indicators that are integrating both the economic and environmental viewpoint.

Introduction

The second and the third turn of the millennium brought significant changes in many areas of human existence, including the environment. Advancing globalization has intensified the interdependence of the environment, economy and social conditions in accordance with the requirements of sustainable development. The Czech Republic as a member of the European Union has been implementing requirements and provisions of international institutions and the Community in its legislative since May 2004. The current state environmental policy aims to maintain and if possible improve the environment for the well-being of future generations of the Czech population. Key factors in this process is not optimally set environmental policy of the state, but mainly an effective reflection of this policy in the economic behavior of each entity.

The issue of environmental protection is always associated with the existence of negative externalities. The theory of externalities has been discussed by renowned economists from the first half of the last century. [1] R. Coase in his article "The Problem of Social Costs" [2] developed a comprehensive concept of externalities and the need for state regulation, provided that the interested parties (polluter and injured party) have the opportunity to negotiate with each other and also highlighted the issue of transaction costs associated with this. One of the main causes of externalities is imprecisely defined property rights [3]. National governments are at least partially trying to implement these externalities through a range of environmental instruments into the business costs of enterprises – polluters.

Environmental protection is currently devoted an increasing attention and two basic dimensions of this issue can be followed. At the macroeconomic level, it is possible to examine the environmental policy of the state, on the microeconomic platform; it is possible

to analyze business activities leading to the strengthening of the environmental profile and active relation to environmental protection.

1 State environmental policy

The state implements a variety of environmental instruments into the economic environment by which negative externalities are at least partly transported into business expenses. [4] This process is reflected in an increase in prices of a particular product, reducing the interest of consumers and, consequently, reducing the environmental burden. [5]. In European countries the regulatory system of environmental protection is primarily based on normative measures which are supposed to influence the behavior of polluters, their control and possible sanctions (fines, penalties) for a failure to comply with specified conditions. These tools are environmentally effective, but with a number of shortcomings. [6] In recent years, there has been an increase in the importance of economic instruments in environmental protection. Economic instruments are based on an indirect influence on the behavior of economic agents which harm the environment. Each entity may decide whether it is financially advantageous for them to incur some costs to mitigate environmental harm or harm the environment and pay for it through fees or taxes. [7] In recent years, voluntary approaches of enterprises to environmental issues have become increasingly important. They support the strategy of preventive approaches by undertakings required of the legislative framework to reduce the negative impacts of its activities on the environment, strengthen their market position, enhance competitiveness and reputation of the company. This leads to a fundamental change in the perception of environmental issues. [8]

Enterprises polluting environment by their activities internalize the resulting negative externalities to their costs through environmental instruments implemented in the economic environment of the state, but also in the context of voluntary activities in the field of environmental protection. These processes should take place with regard to the efficiency of achieved changes, i.e. improving the environment. An important unknown variable in this process, however, is whether we can define the effectiveness of the state environmental policy and in particular, how accurately to measure the environmental impacts of individual enterprises – emitters and effectiveness of their volunteer activities to reduce pollution. [9] Precisely quantified actual costs associated with the environment would enable the company to define its specific environmental profile – reveal their strengths and weaknesses in this area and positively influence their relationship to the environment with the help of partial analyzes, such as monitoring the development trend in time, comparing its own environmental profile with the competition, differentiating effective products not only from economic but also from an environmental perspective. Such information could be useful for investors, banks and other interest groups if externally generated. Last but not least, in the context of a defined level of risk of environmental pollution the value of the company and its market position can be influenced. [10]

2 Environmental activities by managements of enterprises

Contemporary management of a company, thus, has a huge potential impact on the environmental profile of the company. At the same time, it is crucial to address the question of what tools are available in the company management to accurately define environmental problems and their quantification. [11] The basis for this research is an enterprise information system, especially drawing on financial and managerial accounting modules. For the implementation of voluntary environmental activities of enterprises, the European Union introduced the Environmental management accounting (EMA) [12]. This methodology allows

the company to monitor, manage and gradually reduce the impacts of their activities on the environment.

2.1 Presentation of environmental information within the framework of accounting modules

The main point of the environmental management accountancy is the definition of costs the enterprise spends for the environmental protection. Such costs especially include the 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, resp. the depreciation of long-term assets and also waste water, emissions etc. All the wasted inputs signalize inefficiency of production and must be considered in the environmental costs calculation. [13] Categories of environmental costs and revenues defined for the purposes of EMA may be defined from the various data sources of the company information system. For the presentation of these data the subsystem of both the managerial and the financial accountancy (adapted for environmental purposes) may be used.

The potential of a financial accounting module, which primarily provides information to external users, is not yet fully exploited in this area. This module is usually neglected for monitoring environmental activities, although it is the only one that enables the public to see the enterprise economic activities, is stipulated by legislative regulations and the results for a certain period are reported in obligatory statements published on the official websites of the respective institutions.

The potential for the monitoring of environmental aspects for the purposes of company management is hidden both in the adaptation of the managerial accounting to provide the relevant environmental information and also in the field of financial accounting. This module must be adapted to current requirements for the monitoring and control of environmental elements. Also interconnection of both modules is possible. Their common potential with regard to the monitoring of environmental information is shown in Table 1. The first column of the table identifies environmental costs the enterprise should track, whereas the second column suggests how these costs are covered by the managerial accounting module. The last column shows an option for the presentation of the same costs in the financial accounting module.

In the managerial accounting module the analyzed environmental costs are usually hidden in the indirect costs of the company. At first it is therefore necessary to identify the costs and to allocate them properly (to relevant operation or internal department). In the financial accounting these costs should be recorded under individual accounting groups on separate analytical accounts. In this way the costs on wasted materials, energy as well as on the non-productive waste considered as consumption of materials that never turned into a final product. Using these analytical accounts it is then relatively easy to accurately quantify the amounts of individual environmental costs.

To a certain extent, the financial accounting module carries the potential for providing a relatively detailed overview of the environmental activities of the company, although it might entail a number of problems (identification of individual items, the valuation of these items and incorporation into the existing accounting schedule). Quantification of environmental information in the accounting of all items monitored provides more quality data for decision-making processes of managers in terms of the financing of environmental activities and creating long-term environmental business strategies. Enterprises in the EU should prepare their financial statements with regard to the recommendation of the European Commission, which is based on the legal framework of the European Communities in the field of the

environmental pillar of sustainable development. [14] The document emphasizes the importance of environmental information for the public – users of the information about the enterprise have the right to obtain not only financial data, but also get some insight in the environmental behavior of the enterprise. Identification, monitoring and evaluation of their own environmental activities is a prerequisite for the advanced approach of enterprises to this issue.

Tab. 1: Sources of data provided by accounting modules for the purpose of monitoring of environmental actions

Identified environmentally problematic inputs and outputs of production (in physical measurement units)	Information from managerial accounting – calculation classification of costs:	Information from financial accounting - records kept within the accounting group:
Inventory (kg)	direct costs, indirect costs	11 – Materials 50 – Consumed purchases (consumption of materials)
Energy (kWh)	indirect costs	50 – Consumed purchases (consumption of energies)
Water (cubic meters)	indirect costs	50 – Consumed purchases (consumption of energies)
Products (kg, pieces)	cost unit	61 – Difference in own produced stocks
Waste (kg)	indirect costs	11 – Materials 50 – Consumed purchases (monitoring of waste and costs on waste disposal)

Source: Author's own work

According to the Commission's recommendation, enterprises should link financial information with the environmental information in their accounts, if it is relevant for company's economic result or its financial situation. Costs, revenues, liabilities and risks relevant to the environment should be identified, evaluated and published in the financial statements (attached or in annual reports). Appendix to financial statements should include a description of the methods used to measure the various environmental impacts, costs related to the environment should be specified in detail, as well as provisions (or liabilities) generated in connection with environmental issues.

For external users of accounting, particularly the information from the financial statements is valid according to Czech accounting legislation. The scope and the method of preparation of financial statements are determined by decree. [15] In the structure of created financial statements, i.e. balance sheet and profit and loss, the information relating to the environment is not directly included. Any information relating to environmental assets, liabilities, costs and revenues are shown only implicitly, are included in general accounts and is not a standard part of the financial statements. The requirement for a fair presentation of financial position and business performance in terms of the absence or incompleteness of environmental information is disturbed and subsequently the data for a possible financial analysis reflecting environmental viewpoint are distorted.

2.2 Evaluation of environmental activities of enterprises

The system of evaluation of effective management of enterprises through financial analysis is based on the data generated by the financial accounting system, information is a source for calculating net profit, balance sheet profit and moreover, in recent years, economic added values. [16] Environmental problems may yet, in effect, significantly affect the financial results of enterprises. For this reason, the ways should be sought how to incorporate environmental questions into business accounting, report this information in the financial statements and respect identified environmental characteristics when examining the financial situation of enterprises using the indicators of financial analysis. [17]

Company do not work only with the basic structures of financial analysis, but their management bases its decisions on more complex indicators that describe the financial situation better. [18] Given that these categories are based on data reported in financial accounting, there is a close link between the quality of accounting data and explanatory power measured by indicators.

When it is possible to reflect environmental aspects in the system of company accounting modules, then the ways should be searched for to evaluate the environmental activities of enterprises using a system of environmental indicators. These indicators help companies to track the relation between environmental activities and their benefits and contributions. For the generation of various groups of indicators reflecting the economic activities of an enterprise it is necessary to define environmental costs on one hand and environmental benefits on the other hand. [19]

In the company the indicators of environmental intensity may be defined which can be characterized as a share of certain part in whole. In this way it is for instance possible to determine the share of recycled materials in the total consumption of materials, the share of environmentally-friendly products in the total production, the share of consumption of renewable sources of energies in the total energy input, the share of hazardous and recyclable waste in total waste generated etc. The outcome is a non-dimensional index or a percentage that facilitates interpretation of the results and helps the organization to aim at the improvement (or reduction) of the relevant share. The relation may be expressed as follows:

$$\text{Env}_i = \frac{\text{ME}_i}{\text{O}} \quad (1)$$

Env_i – indicator of environmental intensity,

ME_i – environmental i-characteristic of the monitored environmental activities,

O – suitable output variable (unit of performance, profit).

To determine the impacts of the enterprise environmental activities, certain indicators of environmental efficiency may be generated as well, based on the general scheme of efficiency (i.e. comparing outputs with inputs). Environmental efficiency indicators characterize relative reduction of material and energy inputs in relation to the increased reference indicator which may be profit, turnover, production of specific commodity etc. These indicators are generally structured as follows:

$$\text{Env}_e = \frac{\text{O}}{\text{ME}_i} \quad (2)$$

Env_e – indicator of environmental efficiency,

ME_i – environmental i-characteristic of the monitored environmental activities,

O – suitable output variable (unit of performance, profit).

These indicators allow for the comparison in particular time periods either in a single company or amongst multiple companies. Based on the information obtained weaknesses and negative trends may be discovered as well as potential opportunities for improvement in environmental activities of companies determined. This approach combining the economical and environmental viewpoint is known as so called “eco-efficiency”.

Conclusion

The conception of sustainable development is a framework for another conceivable development of human being on Earth. A fundamental aspect of sustainability is the fulfillment of goals covered by the three basic pillars of this idea: economic, social and environmental. The reflection of the process of sustainability is not only obvious in initiatives at the level of international institutes and communities, but it can be clearly seen in policies of individual countries, thus affecting life of each subject of society, i.e. both companies and individuals.

In the last decades the Czech Republic, as a lawful member of the European Union, generated many initiatives that improved the attitude of our country to the environmental protection. Within the framework of the state environmental policy the government bodies create and then implement into the business environment a comprehensive mix of environmental tools helping to at least partially transport the negative externalities into company costs. A crucial role in the environmental protection is played by individual activities of particular economic entities, especially the business enterprises that proceed actively in this area, are truly concerned in their environmental profile and make effort to contribute to the increased interest in the environmental protection within the whole society.

Company management should create such tools that will not only allow for the ongoing monitoring and registration of the environmental activities, but also for their analyzing and evaluation. This is where the existing accounting systems of each enterprise may give a helping hand as they may be adapted to allow for the efficient monitoring of individual environmental aspects. Managerial as well as financial accounting have potential for monitoring and control of environmental aspects as recommended by the European institutes. The current legislation of the Czech Republic does not deal with the environmental aspects in detail but it gives a sufficient space for the voluntary tracking and presentation of environmental activities by individual companies. The companies may generate multiple synthetic and especially analytic accounts for keeping records of environmental issues. Such information may be even included in annexes to the final accounts.

Managers of enterprises should not only keep the environmental information in their accounting subsystems, but make use of various tools to process and evaluate this information further. For this purpose they can use the system of indicators allowing them to evaluate the environmental activities of their companies. Information generated by accounting system may be used for analyses of environmental intensity and efficiency in context with the so called eco-efficiency. On the basis of these outputs specific company environmental goals may be set and ways determined to meet such goals and to track the progress of their fulfillment.

Only enterprises that are economically efficient and considerate towards environment may compete and succeed in the epoch of the 21st century.

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TEORETICKÉ ASPEKTY SLEDOVÁNÍ ENVIRONMENTÁLNÍCH AKTIVIT MANAGEMENTU PODNIKŮ

Ochrana životního prostředí je jedním z úkolů definovaných koncepcí udržitelného rozvoje. Environmentální udržitelnost podporují vlády vyspělých států implementující do ekonomického prostředí komplex environmentálních nástrojů. Pomocí těchto nástrojů dochází k částečné internalizaci negativních externalit do nákladů podniků – znečišťovatelů. Nedílnou součástí řešení environmentální otázky je také přístup jednotlivých podnikatelských subjektů k této problematice. Pro rozhodovací procesy v environmentální oblasti mohou manažeři podniků využívat standardní informační nástroje, zejména účetní moduly. Pro reflexi environmentálních aktivit podniků je nutno zkoumat především potenciál finančního účetnictví zachycovat tyto jevy. Z informací poskytovaných finančním účetnictvím lze generovat nejen soustavy finančních ukazatelů, ale vytvářet také komplexní ukazatele integrující ekonomické i environmentální hledisko.

THEORETISCHE ASPEKTE DER BEOBACHTUNG ENVIRONMENTALER AKTIVITÄTEN DES FIRMANMANAGEMENTS

Der Umweltschutz ist eine der durch die Konzeption der haltbaren Entwicklung definierten Aufgaben. Die environmentale Haltbarkeit wird von den Regierungen hochentwickelter Staaten unterstützt, die einen Komplex environmentaler Instrumente ins ökonomische Umfeld implementieren. Mit Hilfe dieser Instrumente kommt es zu einer teilweisen Internalisation negativer Externalitäten in die Kosten der Unternehmen, d. h. der Umweltsünder. Untrennbarer Bestandteil der Lösung der environmentalen Frage ist auch der Ansatz einzelner Unternehmenssubjekte zu dieser Problematik. Für den Entscheidungsprozess auf environmentalem Gebiet können die Unternehmensmanager Standardinformationsinstrumente nutzen, besonders Buchhaltungsmodule. Für eine Reflexion der environmentalen Aktivitäten der Unternehmen ist es notwendig, vor allem das Potenzial der Finanzbuchhaltung zu untersuchen und diese Erscheinungen zu erfassen. Aus den durch die Finanzbuchhaltung gewonnenen Informationen kann man nicht nur Systeme von Finanz-Indizes generieren, sondern auch komplexe, den ökonomischen und environmentalen Gesichtspunkt integrierenden Indizes schaffen.

TEORETYCZNE ASPEKTY BADANIA ŚRODOWISKOWYCH PRZEDSIĘWZIĘĆ W ZARZĄDZANIU PRZEDSIĘBIORSTWEM

Ochrona środowiska to jedno z zadań określonych w koncepcji rozwoju zrównoważonego. Trwałość środowiskową wspomagają rządy państw rozwiniętych wdrażające w środowisko ekonomiczne wiele instrumentów środowiskowych. Takie instrumenty wspomagają częściową internalizację negatywnych efektów zewnętrznych w kosztach przedsiębiorstw – źródeł zanieczyszczeń. Nieodłącznym elementem rozwiązywania kwestii środowiskowych jest także podejście poszczególnych podmiotów gospodarczych do tego zagadnienia. W procesach decyzyjnych w zakresie środowiska menadżerowie przedsiębiorstw mogą wykorzystywać standardowe instrumenty informacyjne, w szczególności moduły księgowość. W celu oceny przedsięwzięć środowiskowych przedsiębiorstw należy badać przede wszystkim potencjał ujmowania tych zjawisk w rachunkowości finansowej. Z informacji wynikających z rachunkowości finansowej można generować nie tylko zestawienia wskaźników finansowych, lecz także tworzyć kompleksowe wskaźniki integrujące aspekty ekonomiczne i środowiskowe.