

## Environmentally oriented accounting and issues of ensuring software

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### **Abstract**

*In the article, the authors focus on the following three thematic areas:*

- 1. the importance of environmental information to enterprise management, which are contained in the international legal standards and highlighted the international environmental conferences,*
- 2. the analysis of the current state of ensuring software for environmentally oriented accounting and the issue of valuation input data,*
- 3. the possibility of greening costs and revenues in the accounting – in particular through the code list.*

*In the conclusion, the authors point out recommendations, necessary for implementation of environmentally oriented accounting into practice enterprise as a tool for ensuring information to management activities.*

**Key words:** *code lists, enterprise management, ensuring information, environmentally oriented accounting, greening of costs and revenues, software, valuation of input data*

### **JEL Classification**

*M41, M21, Q56, C87*

### **1. Introduction**

One of the most significant trends of the current development is the greening of all areas of public life. This raises the need for changes in indicators of market regulators to take into consideration the environmental component of development. In this context, the importance to review the interdependence and interconnectedness of economic and ecological processes and also in the accounting system (Barinova, E. E., 2014).

Awareness of the importance of the ecology is continued the necessity of spending to protect and regenerate the environment. This indicates the need of the environmental accounting. Managerial decisions should be taken into consideration not only an interests of the enterprise but also the general social and economic challenges in the protection of air, water, soil resources and human health. This requires good information of the environmental accounting. The environmental accounting is including the records of environmental costs, environmental liabilities and environmental reporting (Chkhutiashvili, L. V., 2014).

Environmental management accounting represents a combined approach, which combines information on material and energy flows (expressed in physical units) and information on the costs and revenues (expressed in monetary units) with a view to increasing efficiency of saving material, reducing the environmental impact of the enterprise and reducing the costs of environmental protection (Durdiak, M. & Gondáš, J., 2011).

After 2010, in the framework of the enterprise reporting have been discovered a new direction - integrated reporting. An integral part of integrated reporting is reporting of sustainable development (Global Reporting Initiative, 2013).

The reporting of sustainable development is a process, which is closely connected to setting objectives, measuring performance and managing change towards a sustainable global

economy. This is a combination of long-term profitability with social responsibility and responsible attitude to the environment (Hyršlová, J. & Kubáňková, M., 2015).

The need to measure and manage the impacts of activities on society and the environment are resulted from economic globalization, global governance, closely related to the exploitation of natural resources and energy consumption, the climate changes and biodiversity, the threats to global security, demography and migration (Jasch, Ch., 2015).

Quality solutions of environmental protection require the establishment of a comprehensive enterprise information system, which should be the results of environmental monitoring connected to the economic system, and which should fully ensure the management of environmental accounting (Látečková, A., 2006).

**The key objective of the article is:**

1. to point out the importance of environmental information in an enterprise management,
2. to analyze the status of the current state of ensuring software for environmentally oriented accounting,
3. to present the proposal of the authors for the greening of the structure of costs and revenues in an accounting.

## **2. Data and Methodology**

**The source material** for writing the article was acquired:

- through the authors conducted research in the selected enterprises in the Slovak Republic,
- through the study of professional and scientific Slovak and foreign literature sources,
- through own work aimed at formulation of proposals for greening accounts of costs and revenues in an enterprise.

The source material was processed by **the methods** of controlled conversation with managers of selected enterprises, selection, comparison, tabular and graphical data processing, method of analysis and synthesis.

## **3. Results and Discussion**

### ***3.1 Importance of environmental information in enterprise management***

Monitoring the impact of enterprise activities on the environment are required an adequate management system – oriented environmental management. Environmentally oriented management is required appropriate environmental oriented information system, an important part of which is environmentally oriented accounting.

For the coordinated introduction of environmental management are used mainly two important international standards:

- International Standards ISO 14001,
- Environmental management system and audit EMAS (Eco-Management and Audit Scheme) applicable in the European Union.

The acceptance of both norms is voluntary for the enterprise. The importance of its implementation is a result of several factors, eg .:

- one of the conditions for the entry of enterprises to the European Union markets is ecological certificates of final products and all of its sub-components,
- direct payments to farmers under the Common Agricultural Policy of the European Union are also subject to observance of legislation regarding the environment,
- in certain countries, the introduction of environmental management system is taken into consideration, for instance by the insurance company, reducing taxation, providing of soft loans and leading to a decrease of charges for environmental pollution.

All this leads to an increase in competitiveness, because enterprises with established ISO or EMAS are in a better position, more confidence on the market and cease to be a potential environmental threat to its surroundings.

The introduction of an environmental management system is supported by the national legislation of individual countries – in Slovakia is mainly Act. 468/2002 Coll. on environmental management system and audit, which is connected to EMAS.

The mentioned legislative norms requires the introduction of environmental accounting indirectly. However, the introduction of environmental accounting requires financial legislation directly. The Act no. 431/2002 Coll. on the Accounting obliges from 1.1.2005 in § 20 to accounting entities with the audit obligation in the Annual Report and also information on the impact of its activities on the environment.

The importance of the issue of the introduction and use of environmental accounting is evident from the fact that its regularly engaged in international conferences accountants, organized by the International Federation of Accountants (IFAC), the Chartered Institute of Management Accountants (CIMA), the European Accountants Association (EAA), the European Management Accountants – (EMAA), EMAN (Environmental Management Accounting Network) and others.

Very interesting and useful information can be expected from the conference “Two Decades of Corporate Environmental and Sustainability Accounting. What has been achieved?”, which will be held in September 2016 in Lüneburg, Germany. In particular, the conference aims to summarise the achievements and provide an outlook for the future with regard to the next key topics in corporate sustainability accounting. More information can be found at <http://www2.leuphana.de/umanagement/projekte/eman/lueneburg-2016/>.

A great contribution to the development of theory and methodology of environmentally oriented accounting has also the UNO: The United Nations Environmental Programme (UNEP), United Nations Conference on Trade and Development (UNCTAD), the United Nations Commission on Sustainable Development (CSD), the Intergovernmental Working Group of Experts on International Standardization of Accounting and Reporting (ISAR).

The analysis of the environmental performance of the Slovak Republic carried out by the OECD, indicates information that should not be missed in environmental accounting in the Slovak enterprises - selected of analysis are mentioned serial numbers 10, 11 and 12 in the literature.

### ***3.2 Current state of ensuring software for environmentally oriented accounting***

Environmental accounting software may provide data which highlight both the contribution of natural resources to economic well-being and the costs imposed by pollution or resource degradation. Environmental quality of accounting information can have a substantial impact on the acceptance of management decisions. Environmental accounting software formulates environmental accounting information in order to optimize the cost of nature conservation,

increase the efficient use of material, waste reduction and elimination of waste, reduce the risk of business and the negative impact on the environment, acceptance of management decisions on environmental protection. The elimination of problems and maintain good environmental status are required adequate information to the internal and external enterprise environment. At the enterprise level of environmental information that are monitored in the environmental management accounting. This concerns in particular, information on environmental costs and revenues but also information about environmental assets and liabilities.

In Slovakia environmentally oriented accounting falls within the competence of the Slovak Chamber of Certified Accountants, the Slovak Union of Accountants, Slovak Chamber of Auditors and the Ministry of Finance. It should be stated, that currently the environmental accounting is not sufficiently addressed in Slovakia.

Currently on the world market, there are a several environmental management systems to monitor the environmental performance of small and medium-sized enterprises. However, the most important environmental information for management decisions are just information about environmental costs. The current accounting systems in an inappropriate way retrieve, record, track and evaluate environmental costs. Mostly are taken into consider only the cost of disposing of waste. However, the costs caused by the material waste or in the production of a waster are not taken into consider. Regarding the compilation of calculation, environmental costs are usually included in overhead costs and divided equally to all outputs.

For improving quality of environmental accounting software, input and output data should be based on the accounting information falling within the environmental costs and revenues. Considers it essential, that the enterprises have chosen the appropriate software, which provides reciprocal links of an accounting information on the environment and environmental management. Output data reflecting the more reliable results of monitoring environmental characteristics, which would be suitable for management decision-making (enterprise management). However, this type of software is difficult to recast and a valuation of input data in monetary units is also problematic. In the next part of this article we have proposed possible solutions.

### ***3.3 Possibility of greening costs and revenues in the accounting***

The structure of the costs and revenues is suitable to greening in accordance with the requirements of the environmental management system, which is implemented in the enterprise. It would be ideal, if the structure of costs and revenues have been enabled to compile certain reports in the accounting for environmental management.

In our opinion, one of the options to the greening of the structure of costs and revenues are adding environmental codes to specific environmental costs and revenues. Each costs and revenues can be characterized in ecological terms as environmentally positive, environmentally negative and, where needs, environmentally neutral too. We see two ways, how to present these environmental characteristics of costs and revenues in the accounting:

1. to present environmental characteristics right in the number of sub-account for costs and revenues. In the practice this would require a modification of the existing chart of accounts and possibly to expand the number of sub-account of at least one place in the practice,
2. to maintain the existing chart of accounts and develop the environmental code list. The relevant code would be allocated to existing sub-account of costs and revenues from environmental code list.

The proposed options are presented in table 1.

**Tab. 1: A proposal for consideration of environmental characteristic of selected costs and**

**revenues**

Number and term of main account (type of cost and revenues)	1. option Environmental characteristic as part of sub-account number	2. option Environmental characteristic as a code for sub-account number	
		an sub-account	an environmental code
<b>501</b> Consumption of material	501 xxx1 – Consumption of material with environmental certification	501 xxx	E1
	501 xxx0 – Consumption of material within production standards	501 xxx	E0
	501 xxx2 – Consumption of material over production standards	501 xxx	E2
<b>502</b> Consumption of energy	502 xxx1 – Consumption of energy from alternative sources – Consumption of bioenergy	502 xxx	E1
	502 xxx2 – Consumption of energy from sources of polluting the environment	502 xxx	E2
<b>518</b> Other services	518 xxx1 – Costs of wastewater treatment and air	518 xxx	E1
	518 xxx1 – Costs of waste disposal	518 xxx	E1
	518 xxx1 – The cost of rent for environmental equipment	518 xxx	E1
	518 xxx2 – Costs of elimination of environmental damage caused by enterprise	518 xxx	E2
	518 xxx1 – Costs of education about environmental protection	518 xxx	E1
	518 xxx1 – Costs of environmental audits	518 xxx	E1
<b>538</b> Other taxes and fees	538 xxx0 – Fees for environmental protection according to law	538 xxx	E0
	538 xxx2 – Fines for excessive environment pollution	538 xxx	E2
<b>551</b> Depreciation charge and amortization charge	551 xxx0 – Depreciation of machinery with the classic environmentally friendly technologies	551 xxx	E0
	551 xxx1 – Depreciation of machinery with no-waste and low-waste technologies	551 xxx	E1
	551 xxx2 – Depreciation of net book value of a discarded machine, which caused environmental damage	551 xxx	E2
<b>601</b>	601 xxx1 – Revenue from sold own products with environmental certificate	601 xxx	E1

Revenue from sold products	601 xxx0 – Revenue from the sale of ordinary own products	601 xxx	E0
<b>648</b> Other operating income	648 xxx1 – Revenues from the sale of recyclable waste	648 xxx	E1
	648 xxx1 – Income from material acquired free of charge with environmental certificate	648 xxx	E1
	648 xxx0 – Income from cash donations	648 xxx	E0

Source: own processing

Explanatory Notes:

E – environmental characteristic of costs or revenues

E1 – cost/revenue environmentally positive

E2 – cost/revenue environmentally negative

E0 – cost/revenue environmentally neutral

Meanwhile we stated only a basic breakdown of the environmental characteristics of costs and revenues, i.e. the breakdown at environmentally positive, environmentally negative and environmentally neutral costs and revenues. The creation of ecological codebook is planned in the future. After taking account of other environmental criteria, it will be included more numeric characters.

Assigning these basic environmental characteristics of costs and revenues will cause problems in practice if hitherto used sub-accounts contain mix of costs or revenues - for example environmentally positive and also environmentally negative. It is necessary to divide these sub-account for ensure unambiguous identification of environmental characteristics of costs and revenues.

**4. Conclusions**

Enterprise accounting system should be consistent with the current requirements of environmental management, it is necessary to innovate its content extension of the conventional accounting information on the environmental information and thus gradually develop the environmentally oriented accounting. In particular, it relates to information on costs and revenues, which requires the following:

- to review the accounts of costs and revenues in an enterprise, and adjust these accounts in order to record at least the most relevant types of environmental costs and revenues, such as environmentally positive, environmentally negative and environmentally neutral costs. We proposed the possible approach in an article in section 3.3,
- to pay attention to supplement the chart of the environmental characteristics of the main accounts, those types of costs that are identified as critical to national and international documents of environmental protection,
- to determine the types of assets and financial resources, that need to be monitored with increased attention, because they can lead to undesirable environmental costs. These types to monitor on special sub-accounts in the accounting and environmental reports.

It should be first conceptually solved the mentioned problems of greening accounting, outside an accounting software and then implement accepted the concept of adjusting the accounting

software so that it gradually becomes of software for processing of the environmentally oriented accounting. In our opinion, the accounting software modification is necessary to initiate systematic adjustment of the code list.

Ideal approach, would be the greening of the costs and revenues structure in the enterprise accounting system in accordance with the requirements of the enterprise environmental management, and to allow compiled in addition to the necessary financial statements and any statements for environmental management or part of these statements.

The necessity of greening the accounting software and searching the penetrations with software for environmental management are a challenge for enterprise IT experts and for software companies.

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