

ENVIRONMENTAL ACCOUNTING – PRINCIPLES AND MAIN CHALLENGES FOR FINANCIAL MANAGERS

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Abstract

Over the past 20 years, pollution issues have become more and more important, and hence the need to take action to limit its harmful effects.

An increasing number of businesses submit non-financial information about their activity in their financial reports which therefore requires that this kind of information be checked to ascertain its authenticity.

The aim of the current paper is to summarize some basic issues of environmental accounting and to outline the challenges for financial managers ahead of it. The choice of the topic is justified by the increasing relevance of environmental accounting and reporting of non-financial information, as well as the placement of environmental protection and the transition to circular economy within the priorities of the European Union.

Under the current circumstances, environmental accounting and disclosure of non-financial information should henceforth be seen as an integral part of modern accounting and reporting, not as side and non-mandatory activities.

For this purpose, a review of international trends and policies in these areas will be presented, mainly covering UN and EU documents as well as some international standards for reporting non-financial information.

Key words: *environmental accounting, circular economy*

INTRODUCTION

Modern economic development is based on the use of natural resources, their processing into different types of products which, when used, are mostly disposed of in the form of waste. Unfortunately, this waste is largely unprocessed, that is, the economy follows a mostly linear rather than circular model, which implies the recycling of discarded waste and its return to the production cycle. As a result, a number of negative phenomena have been observed in the world over the last 20 years, which are undoubtedly the result of anthropogenic activity - increasing environmental pollution (due to the accumulation of non-processed waste), abrupt and, in some cases, detrimental climate change. Governments in the world leading economies, within international governmental organizations such as the United Nations (UN), are discussing these phenomena and looking for ways to overcome their harmful effects both on the world economy and on the quality of people's lives. In order to be able to meet the challenges of today's fluid business environment, as Asenov highlights it is of increasing importance to evaluate an array of factors which affect its development and to come up with assessments and forecasts with different time span [1, p. 15]. This understanding is currently gaining speed. Kitanov stresses that "While financial performance is tangible and can be clearly presented, its principles transparent and in most of the cases non-negotiable, non-financial performance proves to be much more difficult to measure, evaluate and therefore present." [2, 153].

As a result of the numerous negotiations and initiatives, policies have been developed at both macro and micro level, affecting the economies as a whole, and the different economic sectors. There is a growing need to extend the scope of circular economy to the ultimate replacement of the linear model. This is the proclaimed policy of the European Union (EU) and of China that have adopted specific targets for their economies in this direction and have put the circular economy among its main priorities in the medium term. As Dobрева stresses, change needs to be internally undertaken, and

internal transformation needs to be done in tight collaboration with the external environment [3, p. 339] in order for quality shift in the way business operates to be achieved.

However, in order to be able to implement this policy, it is crucial to have the necessary data on the way the economy operates both at macro and micro level. This would not be possible unless appropriate accounting standards exist for the impact of individual business and state activities on the environment. In a number of instances, as Dobрева points out, efforts in this direction are cost-neutral and can become a source of competitive advantage for companies, operating in various economic sectors [4, p. 582]. Also, as Dimitrov highlights though within a different paradigm, not only financial quantitative indicators are important for the evaluation of a company, but also quality performance indicators [5, pp. 136, 137].

The necessity to track and manage the environmental changes that materialize both in the biosphere pollution and in a variety of climate changes raises the need to create and apply standards and rules in accounting that provide adequate information about this important question.

In a globalized world in which the existence of any country independent of the rest of the world is virtually unthinkable, producing international comparisons, as well as generalizing information at world level, is a must in the effort to eliminate environmental pollution. That is why global intergovernmental organizations - the UN, the World Bank (WB), the International Monetary Fund (IMF), the EU, the Organization for Economic Cooperation and Development (OECD) are the forums within which the main debate on the nature and the characteristics of environmental accounting, including rules that are valid for the whole world, is taking place.

ENVIRONMENTAL ACCOUNTING. BASIC SPECIFICITIES.

In terms of its scope, environmental accounting is divided into three types:

- business,
- national and
- global (international).

Business accounting aims to reflect the company's activities that are relevant to the environment. It examines the different types of costs the company incurs for the environment, the possible damage it generates through its activity, and the possible indirect benefits that its activities have for nature [6].

In addition, business accounting is divided into corporate environmental accounting and financial environmental accounting. In particular, corporate environmental can be defined as "identifying, collecting, analyzing and using two types of decision-making information within the firm:

- 1) data on the physical use of energy, water and materials, including waste, and
 - 2) the monetary expression of spending, saving and accumulation of funds related to the environment.
- On the other hand, the main task of financial environmental accounting is to provide financial information to interested parties outside the company about the company's activities related to the environment.¹

For national statistics purposes, national environmental accounting practically summarizes both the data provided by companies applying the principles of corporate environmental accounting and the data available to the state regarding the performance of its businesses. International Environmental Accounting is a specially designed accounting methodology for reporting and tracking global environmental issues. The application of this methodology is aided by the advance in digital technologies. However, we should remember that, as Zlatinov stresses, unfavorable economic

¹ See the analysis in "Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003" (PDF). United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development and World Bank.

environment could offset considerably positive effects of digitalization of economy and turns into a challenge for its successive transition.” [7, p. 153].

SYSTEM OF ENVIRONMENTAL ECONOMIC ACCOUNTING (SEEA). NATURE, FEATURES AND APPLICATION

The System of Environmental Economic Accounting (SEEA) is designed to establish internationally accepted standard concepts, definitions, classifications and accounting rules that are valid for all countries. Uniform rules make it easier to manage global environmental efforts and make international comparisons possible. By its very nature, the SEEA follows the approach taken in the System of National Accounts (SNA). All concepts, classifications, definitions and terms are compatible with the SNA. The aim is to facilitate the integration of environmental into economic statistics.

Historically, the creation of the SEEA began after the so-called “Agenda 21” was adopted at the UN Conference in Rio de Janeiro in 1992. This agenda justifies the need to set up a program for the development of national statistical data systems both in the field of economics as well as in the field of ecology. It emphasizes the importance of keeping statistics in an integrated form, i.e. covering both sides of different activities within the economies of individual countries.

This concept is in contrast to the dominant paradigm until recently that statistics should only reflect activities that have a direct and visible economic outcome. Recognizing the importance of protecting the environment, which naturally leads to the understanding that environmental issues have value, leads on its part to the understanding of the need to create and track environmental statistics as well. As a result, a National Accounting Handbook (Manual) presenting the idea of integrated environmental and economic accounting was developed in 1993. Following numerous reviews and opinions of experts from all over the world who have been involved in compiling this manual and in tracing its adequacy, ten years after its creation, in 2003 a second version has been released.

It turns out that the integration of environmental and economic statistics raises many issues that are complex, there is insufficient experience at national level for them, and therefore the UN Statistical Office organized a special committee of environmental and economic accounting experts in 2005. This committee is composed of representatives of national statistical offices as well as international agencies. Their main tasks are to revise the version of the 2003 Manual and to establish a statistical standard to be used for the purposes of official statistics. A Committee of Environmental and Economic Accounting Experts has also been set up to coordinate the process. During the work of the committee, opinions were also gathered by the national statistical offices and various international organizations, as well as on the website of the UN Statistical Office where different opinions were published for discussion, which instigated comments and remarks from around the world.

In the run-up to this debate, in 2012, in the main document of the United Nations Conference on Sustainable Development, known as Rio + 20, again held in Rio de Janeiro, a clear recommendation has been made to bring together data and information on social and environmental aspects of human activity, so that governments at all levels have full information on the repercussions from the existence of business activities and thus take adequate decisions.

Thus, in 2012 at its 43rd meeting, the UN Statistical Commission adopted the initial version of an international statistical standard for environmental and economic accounting, or so-called Central Framework – System of Environmental Economic Accounting. This framework is not mandatory for individual countries; they can start to implement it in parts, thus taking advantage of the flexibility that individual economic agents need because of the many specifics of environmental accounting.

The central framework is interdisciplinary in its essence. It covers a very wide range of information, with the aim of compiling economic statistics. This statistics is the result of the application of certain accounting principles for the submission of information by individual economic agents, so that the fullest possible impact on macroeconomic phenomena becomes gradually visible.

In general, contemporary understanding implies that the economic activities need to be reviewed and evaluated in terms of their environmental aspects. This principle is placed in the foundation of the central framework.

For example, the modern economy and the various economic processes as a whole cannot be considered without taking into account the trends in the use of natural resources and the extent to which they are available. It is difficult to talk about contemporary accounting and accountability without considering for example the environmental effects that are observed as a result of waste disposal or the importance of the carbon emissions generated by the different industries. As Dimitrov rightly points out, both quality and quantity factors are influencing the financial performance and the evaluation of a company [8, pp. 232-260, 270-296] and therefore they both need to be taken in equal consideration by the management team of the company.

Another important aspect is, which needs to be captured in accounting is the volume of economic activities that are carried out for some or other environmental purposes. This type of activity is becoming increasingly popular and will continue to grow in terms of volume in the future due to the aspirations of governments of all developed countries to manage the effects of economic activity on the environment, and this policy naturally translates into business activities.

The heart of the Central Framework reflects the desire to establish a systematic approach to the organization of environmental and economic information. This information should ideally cover, to the fullest extent, both assets and inventories, and the cash flows that are relevant to the analysis of environmental and economic performance of an organization. For this purpose, the Central Framework has used the accounting principles and rules of the National Accounts System. This brings together information about different areas of economic activities - water use, raw materials, energy, wood, soils, ecosystems. Particular attention is paid to accounting reflecting pollution and waste.

The central framework covers accounting practices and reporting in three main areas:

- physical flows of materials and energy within the economy and the environment;
- the accumulation of environmental assets and the changes in these accumulations;
- economic activities and transactions that are related to the environment.

The reporting follows the definitions of economic activities and the environment that are provided in the framework. Restrictions on accountability in terms of space and time are defined to ensure comparability of data from individual countries around the world.

CENTRAL FRAMEWORK SPECIFICITIES

Below some basic points of the Central Framework are presented.² Generally speaking, modern economic systems operate on the basis of the fact that certain products are produced within them, at the same time raw materials needed for this production are imported, and ready products exported from the economies. Also, some of the goods that are produced are consumed or accumulated for the purposes of future consumption within the particular country, and the unused portion is exported to the rest of the world. In this sense, accumulation is the storage of materials for future use, and acquisition is taking and possessing different types of products, such as machinery and equipment, for their use now.

For the purpose of statistical tracking, the economy is seen as a pool of stocks and flows. The main activities carried out within it can be defined as production, consumption and accumulation. From this point of view, the main limit for reporting is production. This is because, in practice, all goods and services that are produced exist within the economy. Flows between the economy and the environment are determined on the basis of whether they cross the production boundary.

² See System of Environmental-Economic Accounting 2012—Central Framework. UN, EU et al. 2014

The accumulation of economic assets makes the production processes possible. These accumulations are a source of wealth for individual economic entities, with some assets such as land, mineral resources, and water not being the result of economic activity, while others such as buildings, facilities, machinery are the result of production processes. Both, however, are involved in the production of various goods and services.

The economic value and the amount of assets of both types undergo changes over time. These changes are manifested in the different types of flows - monetary and material. Cash flows arise as a result of transactions (purchase or sale of land, buildings or other assets), and material assets arise during economic activities and represent the circulation of materials and resources in the economy.

The only objective way to consider, account for, and hence manage environmental assets and flows (we will call them environmental assets and streams) is the holistic one. When considering what assets should be classified as ecological or environmental, this category should include all types of natural resources - both living organisms and various other natural resources. When we talk about streams, we have to look at all the environmental resources that are used in the production processes, and they are being processed and incorporated into different goods.

The Central Framework focuses on a very important issue - the use of physical measures to account for material and energy flows that remain within the economy and those that go beyond its borders. These streams are called physical streams, i.e. the environment assets coming to the economy should be taken into account as natural resources, such as the flow of mineral resources, wood, water, solar energy towards the various production processes. These resources are used in different ways in the economy and, as a result, the individual goods that are used within the economy are created. Or, in other words, the natural resources, on the one hand, represent a kind of raw material for the production of different economic sectors. As a result of the movement of these flows, accumulations of material assets also occur.

On the other hand, the reverse process is also observed. Some flows flow from the economy and go towards nature and the environment. These streams are, in fact, the various types of waste that are formed as a result of economic activities. They include, for example, carbon and other harmful emissions, backwater, solid waste of all kinds.

The use of natural resources for the purposes of the economy leads to changes in the stock of environmental assets, and this change is in fact the source of the goods subsequently created as a result of the production processes. In the Central Framework, special attention is paid to recording changes in inventories and flows of natural resources, both in physical and in monetary terms.

Another important feature of the treatment of environmental assets in the Central Framework is their consideration within two main aspects. The first considers each environmental asset individually, as part of the environment, of nature, that acts as raw material or provides space for various economic activities. Such are land, water, wood. They provide resources for economic activities and contribute to the creation of material goods that have specific monetary values. In this consideration of environmental assets, no attempt is made to assess the intangible benefits of them, emphasis is placed on their materiality.

The second aspect seeks to capture and reflect the intangible benefits the economies and society actually generate for themselves as a result of taking advantage of the different environmental assets as well as the interactions of environmental assets among them beyond the economy. This aspect is dealt with in detail in a separate document accompanying the Central Framework devoted to experimental ecosystem accounting. The ecosystem definition, as defined in the UN Convention on Biological Diversity, is as follows: "Dynamic complex of plants, animals and micro-organisms and their environment that interact as a functional unit". Ecosystem accounting addresses living organisms within their surroundings, seeking to reflect their interactions, or, as is seen in a particular type of interaction, the "services" they provide to each other. These interactions or services are categorized into three main groups:

1) Delivery of services; an example in this respect is the supply of wood on the part of the forests;

- 2) Regulatory services covering effects related to transformations - an illustration of this is the ability of forests to act as converters of carbon dioxide into the atmosphere;
- 3) Cultural activities from which some benefit arises, such as the pleasure that visitors experience in a park.

It can be summed up that while the latter two types of "services" create intangible benefits as a result of the existence and use of environmental assets, the first type has direct impact on the creation of material benefits - the wood that comes from the logging has a clearly identifiable monetary value that brings economic benefits to the economic operators concerned. In this context, the degradation of ecosystems leads to a reduction in the benefits from the "services" created within their frameworks, including the material ones.

Tracking the effects of ecosystem-based changes in environmental accounting, and in particular ecosystem accounting, makes it possible to manage economic activities more comprehensively, since it provides prerequisites for a more complete assessment of the actual effects from them.

A further major issue addressed by the Central Framework is the accounting for the costs of environmental activities. The objective is to monitor the monetary implications of these activities and, by using various indicators specifically designed for this purpose, to analyze the effectiveness of these activities from an economic and social point of view. Examples of such activities are diverse: the creation of treatment facilities, the use of resources for research aimed at solving specific environmental problems, environmental actions, the production of environmental goods and services of all kinds, etc. When there is evidence of their value, conclusions can be drawn whether these actions are successful or not, in which areas it is necessary to seek improvements, where the problem areas are. For this purpose, environmental activities are reflected in the so-called functional accounts, such as accounts for environmental protection costs.

The Central Framework also provides for the reporting of various financial transactions relating to the environment, such as taxes, subsidies, grants, etc.

PRACTICES OF ENVIRONMENTAL ACCOUNTING IN THE EU

Regulation (EU) 691/2011 requires the use of European environmental accounts. The purpose of the regulation is to establish a standard for harmonization of data from individual EU Member States as well as from countries that have signed the Free Trade Agreement with the EU. The development of European environmental accounts was planned within the framework of the European Strategy for Environmental Accounts 2014-2018. European environmental accounts are compatible with the 2012 Central Framework. They are built on modules, the total number of which is currently six, some of them are used in practice. These modules cover the following topics:

- Atmospheric emissions. They take into account the emissions of the six greenhouse gases that are considered the most dangerous, one of which is carbon dioxide. In addition, seven air pollutants are covered. These accounts present the results of data from 64 polluting industries, as well as households.
- Material flows across the economy. They reflect the quantities of raw materials involved in economic activities, the accumulation of materials in the economy, and their return to nature. Natural raw materials are classified into 4 categories - biomass, metal ores, non-metallic minerals and mineral energy raw materials. Tracking results on this batch of accounts makes possible a variety of analyzes, such as the assessment of resource productivity, the material footprint of economic activities, the decoupling of economic growth from the extraction of natural resources,
- Energy flows. They take into account the energy flows from nature to the economy, within the economy and from the economy back into nature. An interesting feature is the reporting of energy flows by types on the one hand from the point of view of the source (mineral raw materials, water, biomass, etc.) and on the other - depending on the products and waste generated in the process, and on the third - depending on which the suppliers and the consumers are. The purpose of collecting information in these accounts is to enable different analyzes and models to be used to track and

manage productivity of the use of different types of energy, as well as to monitor energy efficiency. These accounts will become mandatory from 2017 onwards.

- Environmental taxes. This account group accounts for environmental taxes which is done within four broad groups: energy, transport, pollution and resources.
- Sector of environmental goods and services. These accounts reflect information on the production of goods and services that are specifically geared to environmental protection or resource management. Here 21 industries are covered. Through the information from these accounts, a variety of analyzes can be made about the growth of the green economy, environmental costs, green jobs, and more. The collection of information on these accounts is foreseen to become mandatory from 2017 onwards.
- Expenditure on environmental protection. This category of accounts mainly takes into account the costs incurred by individual economic agents for the purpose of protecting the environment. Collecting information on this category of accounts became mandatory from 2017 onwards.

In addition to these six groups, the EU is currently working on creating additional groups covering forestry and environmental subsidies and related transfers. The EU plans to develop and implement tracking accounts for various effects on ecosystems and waters. It is important that legislation is being developed in that direction, however compliance with it needs to be ensured. There are a number of factors, as Asenov points out, both internal and external to an organization, that lead to the occurrence of risks of non-compliance with certain regulations [9, p. 21] and the organizations as well as the regulators, need to seek ways to minimize those risks. As Dimitrov stresses, it is extremely important for investors to be able to evaluate the risks associated with his choices because investment decisions prove to be inappropriate as a result of incorrect risk estimation [10], and, as Kitanov points out, “investors place free financial resources...aiming at achieving a certain amount of return” [11, p. 332].

CONCLUSIONS

The need for environmental accounting will not cease, despite the many unexplained issues related to it, which make its application difficult in some cases to the extent of impossibility. On the contrary, this need will intensify in the future. This is because environmental protection is among the priorities of all developed and developing economies in the world and is an integral part of the policy of moving to circular economic model.

Prioritization is always associated with the need to specify goals for its implementation, and in order to achieve the goals having specific indicators is vital. Only the organizations' accounts can provide such indicators, as these accounts reflect in numerical form all the activities carried out by the economic agents.

This determines the exceptional relevance of environmental accounting as a new field in the accounting science and practice, as well as its particularly important role in the transformation of the linear economic model into a circular one.

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