

CURRENT STATE AND EVOLUTION PERSPECTIVES FOR MANAGEMENT ACCOUNTING IN THE ENERGY SECTOR BY IMPLEMENTING THE ABC METHOD

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*Based on a controversial issue, namely determining and controlling costs in the energy sector, the present study falls within the scope of management accounting and control. This scientific approach was initiated as a result of personal research concerns in the area of accounting, starting from the need to know and quantify costs in a sector of the economy that is less exploited. The main objective of this scientific approach is to address the evolution of the energy sector in a national and international context, in terms of economy and finances, with the aim to underline the need to organize and conduct management accounting in this sector. We will present a few particularities of the energy system, the current status of implementation of a medium and long term strategy aimed at developing the energy sector, as well as the need to adopt modern costing methods in this sector, which ensure operative cost control and performance growth of the entities that operate in this sector. Information on the reviewed topic was conducted by studying the national and international literature in the field, by analyzing the associated legislation, by consulting specialized web-sites and various articles in the database. The main research methods used in this scientific approach were **analysis** and **synthesis**, and qualitative research was the type of used research. The results of the research will materialize in providing the necessary conditions for designing an econometric model for implementing the ABC method, the conceptual and ideological delimitation of the ABC method, the deepening of the positive and negative aspects that the implementation of the Activity Based Costing involves. The major implication for the researched field is ensuring success for the implementation of a modern costing method in the energy sector, underlining the shortcomings of the traditional costing methods. The added value of the paper consists in conducting a rigorous study of the current state of an overlooked sector of global economy and shaping trends in the evolution of energy costing.*

Keywords: energy sector, strategy, costing method, activities, operative control

JEL classification: M40, M41

1.Introduction

The purposes of this research are to study, present and adopt a modern costing method for production in the energy sector, starting from the specific of the entities that operate in this sector. The characteristics of the energy sector, such as: extended periods of implementation for various sectorial policies, achieving strategic objectives, the large capital requested for the development of this sector, the need to achieve production at the same time with consumption, and others, require the existence of **medium and long term strategies** aimed at developing the energy sector. These characteristics require organizing and conducting an efficient management accounting in terms of costs.

To achieve this goal, we will propose the implementation of the ABC method (Activity Based Costing) whose targets include: revealing the causes that lead to choosing the activity based costing method; the reorganisation in cross-section of the entities where the method will be implemented by taking into account the organizational and technological features of the production in the energy sector; developing the account system used to reflect consumption and activity costs, which is specific for entities in the energy sector; drafting specific documents that match the needs of evidence, analysis and control, and highlighting the links between them; the

contribution of the activity based costing method to the development of the methodological and informational support in entities from the energy sector.

2.The energy sector in national and international context

Energy represents an indispensable product, having high economic, social, strategic and political value. The general objective of any implemented strategy in the global energy sector consists in meeting the energy needs both now and on the medium and long term, at an appropriate price for the modern market economy and complying with a good living standard, in conditions of quality and safety of power supply, but especially by complying with principles of sustainable development.

Forecasts indicate an economic growth that will generate increased energy consumption. In the context of these evolutions, it is estimated that the total energy demand for 2030 will be higher by 50% than in 2003, and the demand for oil will increase by 46%. Other equally gloomy previsions refer to the global oil reserves that could last until 2040 at the current rate of consumption, natural gas reserves would ensure consumption until 2070, while coal reserves are ensured for the next 200 years.

The International Energy Agency (IEA) and the World Energy Council (WEC) claim that for the next decade, the primary energy consumption structure will see an increase of the share of renewable sources, but also of natural gases. Furthermore, it is estimated that a quarter of the primary energy needs will still be covered by coal.

The lack of refining capacities, the tendency of some countries to increase their energy stocks in order to cope with the crisis, the increase of the energy demand combined with geopolitical factors have determined the growth of crude-oil prices, which further determined a increase of prices for natural gases. All these factors led to the reorientation of energy policies in countries that import energy, in terms of increasing focus on renewable energy sources and improving energy efficiency.

In modern times, Europe was the true centre of the world. It was the continent which was always at the helm of the development process.

The energy sector represents, at EU level, a major economic and geopolitical factor. EU is the second energy market in the world. Currently, it imports over 70% of its oil and almost 45% of its gas, and this dependency could reach 90% for natural gases and almost 100% for oil by 2030. Although the European Union has tried to reduce energy consumption and to promote renewable energy, its dependency to global suppliers of fossil fuels is increasing. EU is the world's largest importer of energy and the second consumer, being dependent on gas supplies from Russia (24%), Norway (15%) and Algeria (11%). While the energy consumption of European Union members is going upward, it is estimated that by 2015 only 30% of the need for natural gases will be covered from own sources.

In order to ensure energy sustainability, competitiveness and security, the European energy strategy project, called **A European Strategy for Sustainable, Competitive and Secure Energy**, establishes the main courses of action for the European Union:

- diversity of energy sources;
- strengthening solidarity between member states and ensuring the energy flow by revising the legislation regarding national gas and oil stocks;
- developing a joint external policy for all the EU states and building a protection infrastructure of the energy system.

Romania, a member of the European Union, is in a particular situation. Because the energy sector represents the main contributor to environmental pollution and climate changes, our country must meet a double requirement: on one hand, the high standards of the European Union regarding

energy and its impact on the environment, and, on the other hand, Romania has to correct its own deficiencies in the energy sector.

Because it is a member of the European Union, our country has to comply with the **Integrated strategy on energy and climate changes**, adopted in March 2007 by EU, which had the strategic objective to reduce emissions of greenhouse gases (especially CO₂) by 20% by the year 2020, taking into account the limitation of the global warming effect to only 2 Celsius degrees more than the temperatures in the preindustrial age (the energy sector contributed with 80% to the total volume of emissions). Another target of the European Union was to reduce energy consumption by increasing energy efficiency by 20% by the year 2020.

Romania “*has a wide range of primary energy resources, but they are reduced in quantity: crude-oil, natural gases, coal, uranium ore, as well as an important potential of renewable energy that may be capitalized*”

(Official Gazette of Romania 2007: 4).

The priorities of the energy industry in our country involve *energy efficiency* (the Romanian energy industry is the most energy-intensive in the European Union, with a potential to reduce energy losses of about 30-35% of consumed primary resources, half of them being imported), *co-generation and district heating* (approximately 70 towns in our countries need modernization, because the total energy losses in urban systems are high), *the energy production capacities are old and unreliable*.

In addressing the development of the energy sector, in Romania was considered the need to create structures that will adapt to the sole European market, where national markets gradually lose their traditional borders and become an integrated part of the common market.

In conclusion, improving legislation in the field, modernizing and privatizing the production sector, improving the electric energy markets, electrifying the rural area, reducing environmental pollution, stimulating research, bringing development and innovation in the field are only a few important priorities of the energy sector in our country.

Starting from the expression “energy is not expensive, but its lack is”, we may state that in Romania the following decades will be dominated by the challenges of developing an energy efficient and competitive economy, with low carbon emissions and energy security.

3. Research methodology

Information on the reviewed topic was achieved by studying national and international literature in the field, by analyzing the associated legislation, by consulting specialized web-sites and various articles in the database. The main research methods used in my scientific approach were *analysis* and *synthesis*, and qualitative research was the type of used research.

4. The need to organize management accounting in the energy sector

The managerial information is used by the management factors of the economic entity as a product of management accounting. Sometimes, “*the information is credible, but irrelevant. Other times, it is relevant, but it’s not credible. In both cases, it is not useful*”(Briciu et al. 2009: 12).

Being regarded as a “*specific method of processing accounting information*”(Pântea and Bodea 2008: 16) management accounting aims to know the costs of various functions of the entity, to ensure the assessment basis for its produced goods, to explain the obtained results and to establish forecasts. Reaching all these objectives requires the adoption of a proper costing method.

The main dysfunctional elements that characterize the energy sector in our country are related to: energy prices, which are kept low for reasons of social protection; high energy losses on the

entire stream, from primary resources to energy use; maintaining state property in the production sector, with multiple adverse economic consequences; old and inefficient equipments that need high investments; an unstable and unattractive legal framework; high level of pollution, etc.

In terms of accounting, one of the pressing needs in this system is organizing and conducting a management accounting by implementing modern costing methods, capable to facilitate the calculus of performance.

The permanent evolution of the global business environment has generated the permanent adaptation of management accounting to current requirements. The evolution perspectives of these two has manifested under the mark of being open to change, this being one of the most important features that globalization has brought to management accounting and control.

In the context of macroeconomic phenomena, such as: stagnation of economic activity, increased global competition, inflation and environmental turbulences that considerably increased the vulnerability of entities, management accounting and control are forced to intervene to enable work in optimum conditions and operational decisions. Reducing this vulnerability may be achieved by increasing the reaction of the entity through the implementation of an information system capable to signal these “dangers”, but also by improving the entity’s competitiveness through the adoption of a reliable information system.

Starting with the 1990s, the issues of management accounting and costing have started to be approached separately, the basic approach being “*a costing method like full costing, doubled by a booking technique specific for accounting, using Class 9 of accounts – Management Accounts – stipulated in the regulations issued by the Ministry of Public Finance*” (Dumitru and Calu: 31). Over the next two decades, in Romania, the issue of management control has started to take shape in close relation to management accounting. The more prominent manifestation of the role of management accounting as an information tool of management has led to adopting and using on a wider scale the notion of management accounting.

Currently, there are a number of factors that influence the organization forms of management accounting. These factors are numerous and are related to the specific of the technological process, to the functional and operational structures of the entity, to the full or partial interference of the management accounting’s objectives in assisting the decision-making process, to the flexibility or rigidity of using one or another system of accounts to reach these objectives.

Under the influence of these factors, the specialized literature shaped two models of organization of management accounting (a dualistic model and an integrated model) that resulted in four organization concepts for management accounting (the concept of single-entry bookkeeping, the integral organization concept, the dualistic concept and the modern concept of organizing management accounting). **The basic components** of management accounting organization are: “*costing, budgeting and conducting a rigorous budgetary control, writing reports of internal information necessary in assisting the decision-making process, the control of activities and performances of the entity based on the concept of efficiency of the responsibility centres within the entity*” (Fătăcean 2009: 43).

The delimitation of these components is associated with clipping the entity into responsibility centres. The cross-clipping of the entity complies with the logic of purpose and cooperation in order to describe the object of the actions that are determined internally for the organization process. This new way of practical organization achieves the connection between strategic objectives and their materialization into actions, “*the clipping of the enterprise, seen as an accounting entity, into analysis centres that are considered accounting sub-units is the most important stage in implementing a costing system, upon which the reality, accuracy and exactness of the registered information supplied by management accounting depends*” (Pântea and al. 1993: 64).

5. Adopting Activity Based Costing in the energy sector

Management accounting as an end in itself has the obligation to meet the informational requirements enunciated by the managers of the entity, but satisfying these requirements depends on the chosen calculation method and on the percentage at which this method is orientated or not towards the principle of efficient management of the activity.

In terms of costs, the efficiency of the information become essential for the efficiency of the production process because any information that is not useful on time will lose ground and its use value, and therefore, the work consumption necessary to obtain it is wasted. The goal of applying the activity based costing method is to enable reception of efficient information, efficiency that should reach a point where any unsaved expense will be tracked down before it even occurs.

Activity based costing represents one of the latest advancements in the area of costing.

“The origin of the activity based costing method is found in US literature in the paper *“The Hidden Factory”* written by Jeffrey G. Miller and Thomas E. Vollman, which subjects to critical analysis the sectors generating indirect costs” (Caraiani and Dumitru 2005: 225). The two authors have examined with great accuracy the places where indirect costs occur, concluding that it is very important to assign a decisive role within cost control to the development of a more detailed model for the causes of these costs. They didn't insist on creating a new system for determining costs, but they insisted only on detailing the occurrence of indirect costs and the measures that should be taken when clarifying the causes that contributed to the recording of negative deviations of indirect costs.

Applying the ABC method in the energy sector provides enhancement of the classification of costs not only in terms of their economic nature, but especially in terms of destination, and creates bigger analysis opportunities on three categories of activities: production, transport and supply.

Accounting of environmental costs may be partially considered as a special application of the ABC method. It is successfully applied to monitor the use and allocation of material, financial and energy resources based on the life cycle of the products. *“Applying the ABC method to determine environmental costs requires identifying the costs related to the environment that are normally attributed to the common centres, which involve environmental costs, and the environmental costs hidden in indirect costs”* (Be□ianu 2008: 350).

Activity based costing represents only one of the ways in which environmental management accounting is integrated into the business. One of the major advantages of using the ABC method to assess environmental costs is that it may be used to integrate environmental costs within the strategic management process, thereby incorporating environmental issues within the strategic objectives of the entity's life.

The ABC method is not limited to providing more relevant and accurate informational costs than traditional approaches. In this new approach, costing is still considered a significant management tool, but isn't an end in itself. The aim isn't to influence the level of costs (such as the cost method of cost centres) but rather to allocate an efficient action on activities, which determines costs. *“People can't manage costs, they can only manage the activities that determine costs”* (H.T. Johnson). Therefore, a new dimension was given to the ABC method: Activity Based Management (ABM). A simple calculating feature is not the main element of the method, but adding strategic and managerial dimensions increases it.

Among the modern methods of calculation, Activity Based Costing asserted as one of the new strategic initiatives in business, being considered by experts an innovation in cost management. It is only one of the refining methods of the cost system, *“it is not an entirely new or original method, it is not a perfect management tool, but it seems to solve in a satisfying manner for the enterprise the limits of the traditional cost system”* (Albu and Albu 2003: 158).

Following research conducted by specialists in the management accounting field, the next causes of processes' costs have been identified: the deficiencies of costing systems for contemporary costs, the diversification of the information demand for management and changes in the strategic position of the company.

We are practically dealing with two types of activities: *“on one hand, activities that can be attached to products, called **primary or main activities** (are the ones used outside the entity, either by a product or a different entity; they express the main mission of the entity, but they don't necessarily have a direct relation with the products that may be support activities) [...]; on the other hand, we are considering activities that the entity carries out in conjunction with main activities, as their support. They are called secondary activities and are not related to products”*(Bouquin 2004: 184).

Activity Based Costing was perceived as an alternative to the traditional accounting systems, having a production system organized like a set of activities. Managers were asked to consider first the resources consumed by different activities, and only afterwards to allocate costs to products. Practically, the ABC method is based on the cross-section clipping of the entity. The method became known as a cost measuring process of operations with the help of: analyzing the costs' elements, determining performances based on activities, measuring production and functional costs.

The ABC method *“provides two ways to reduce costs: it helps identify the opportunities of real reduction of costs (with the help of cost inductors) and furnishes simulations of the impact of cost reduction”*(Dumitru and Calu 2008: 186).

Once an entity decides to implement the ABC method, it must determine the level of informational details that it wants to collect and put at the disposal of management, knowing that more accurate information is much more expensive. To a certain point, the additional detail is not worth it. Cokins, Stratton and Helbling provide a useful focus on implementing the ABC method and discuss these issues. For example, the entities will have to pay attention especially to expensive resources, to resources whose consumption varies depending on the product and to resources whose demand models are not correlated to traditional allocation standards.

The ABC method *“is more than a simple cost allocation tool, it can also be a tool to control the activities of a business in order to optimize the allocation of resources”*(Mendoza and al. 2009: 167).

The hypothesis of the ABC method is that the careful analysis of activities should lead to the identification of relationships that maintain several products. Activity Based Costing rejects imputations in cascade and seeks to maintain relations between costs and the causes behind them. For this reason, the costing method believes that each entity producing directly productive activities ensures peripheral activities also. *“To gain a better understanding of the company, we look first at a measurable volume unit or at the activity that serves as cost-driver”*(Meigs and al. 1996: 955). Thus, we establish for each product a list of directly consuming activities and of those that they generate.

6. Conclusions

The improvement of management accounting in the energy sector requires adopting budgetary methods and techniques, monitoring and costing that allow simplicity, efficiency, economy, anticipation, accompanied by higher quality of the obtained results. The value created by improving costing techniques and methods in the energy sector should largely compensate the used or consumed resources.

One of the most important contributions of Activity Based Costing is that it repairs the weaknesses of traditional production costing approaches. Although the ABC method was quickly accepted, there were still a variety of opinions regarding its efficiency. Over time, by stimulating

the adoption of this method, literature presented a series of factors with influence over the effectiveness of this method, particularly financial factors. The results of the study confirmed the benefits of the ABC method when it is used in parallel with other strategies and when it is implemented within entities with complex activities, where costs are relatively important. Currently, we are talking about successfully applying the ABC method for environmental costing. The managers of entities believe that, in general, environmental costs are not significant for the functioning of their business, but they ignore that some production costs, especially in the energy sector, have an environmental component also.

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