ENVIRONMENTAL PERFORMANCE OF COMPANIES IN THE IRON AND STEEL INDUSTRY. ACCOUNTING ISSUES

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Abstract:
Iron and steel industry is a sector of great importance in the development of a country's economy due to the close relationship that it has with many other industries. Iron and steel industry is an industry that uses large amounts of material and consumes a lot of energy. In this context, achieving environmental performance and its management is a major issue. Accounting provides a number of tools to realize this. The paper aims to show how the accounts can become a means of measuring and managing environmental performance of companies in the iron and steel industry.

Key words: *iron and steel industry, environmental performance, accounting, management*

JEL classification: M 40, M 41

1. INTRODUCTION

The industry fulfils the role to ensure products to all sectors of the economy and to the current needs of the population. The industry is divided into branches and sub-branches. Depending on the materials used and the specific technological process to obtain finished products industry is divided into industries, metallurgy is one of those branches.

Metallurgy industry consists of two main branches:

- Ferrous metallurgy industry: it is characterized by the fact that the final products are made from iron. Main industry sector is iron and steel industry, the steel products produced from iron ore or waste containing iron.
- Ferrous metallurgy industry: This sector includes primary and secondary processing of a large quantity of non-ferrous metals. The main non-ferrous products are aluminium, copper, zinc and lead.

Iron and steel industry is a sector of great importance in the development of a country's economy due to the close relationship that it has with upstream industries (mining, refractories, ferroalloys) and downstream industries (automotive, shipbuilding and manufacturing household appliances, canning industry and the equipment industry and many engineering-based industries). There is also a close connection between the steel industry and utility projects and services such as water and sanitation projects, which used steel pipes; oil and gas sector which consumes usually large amounts of steel tubing drilling.

2. IRON AND STEEL INDUSTRY IN THE WORLD

Worldwide, the average use of steel per inhabitant has steadily increased from 150 kg in 2001 to 215 kg in 2011. Countries like India, Brazil, South Korea and Turkey have reached in the last 40 years among the top 10 steel producers worldwide.

Thousands of years ago, when man discovered iron ore, then it appeared in an early form steel industry and since then it has evolved and developed into the state it

remains today. According to the statistical report for 2010, the International Iron and Steel Institute (IISI) [8], China is the world leader in the production of iron and steel, 520 million tons annually, while Romania produces 3.9 million tonnes per year, the 26th place globally and Libya only has a production of 70 000 tonnes per year.

In the table below, there are the top ten steel producing countries in the world in 2011:

Table 1. The top ten of states which produced iron in the 2011

No.	Country	Quantity (thousands of tons)
1.	China	629.693
2.	Japan	81.028
3.	Russia	48.120
4.	South Korea	42.218
5.	India	38.900
6.	Brazil	33.243
7.	United States	30.233
8.	Ukraine	28.867
9.	Germany	27.795
10.	Taiwan, China	12.940

Source: the processing of the author based on data published by the World Steel Association

The world of crude steel production increased from 851 megatonnes (Mt)[1] in 2001 to 1,548 megatons in 2012. For comparison, the production was 28.3 million tonnes in 1900.

Major steel producing countries in 2012 are shown in the table:

Table 2. The top ten of states which produced steel in the 2012

No.	Country	Output (megatons)
1.	China	716,5
2.	Japan	107,2
3.	United States	88,6
4.	India	76,7
5.	Russia	70,6
6.	South Korea	69,3
7.	Germany	42,7
8.	Turkey	35,9
9.	Brazil	34,7
10.	Ukraine	32,9

Source: Data released by the World Steel Association

Romania ranks 35 in the rankings with a production of 3.8 megatons of steel in 2012.

Ranking steel producing companies are dominated by ArcelorMittal group with significant activities in Romania by mills in its possession. As expected given top steel producing countries, most of the top ten companies are from China and Japan.

As one can see in table 3, ArcelorMittal is worl leader in steel production, followed at far distance by Hebei Group and Baosteel Group. ArcelorMittal has operations in Romania too.

[1] 1 megatone = 1.000.000 tones

Table 3. The top ten of states which produced steel in the 2011

No .	Company	Quantity (megatons)
1.	ArcelorMittal	97.2
2.	Hebei Group	44.4
3.	Baosteel Group	43.3
4.	POSCO	39.1
5.	Wuhan Group	37.7
6.	Nippon Steel	33.4
7.	Shagang Group	31.9
8.	Shougang Group	30.0
9.	JFE	29.9
10.	Ansteel Group	29.8

Source: the processing of the author based on data published by the World Steel Association

3. IMPORTANCE OF IRON AND STEEL INDUSTRY FOR GLOBAL ECONOMY

Iron and steel industry has an impact on other industries, providing employment opportunities, not limited to their own needs, but also extends to the downstream and upstream industries. The industry has more than two million employs around the world, plus another two million people that work for contractors and four million people from supporting industries. Enterprises in metalworking industry are a significant part of the EU economy and one of the main employers in union. Metalworking industry is an important part of EU manufacturing industry and exceeds the performance of most other products.

The European Commission estimates (2010) that "the EU metalworking sector represents 10% of total value added and manufacturing industry,and at the same time 7.5% of products of this industry. The sector of steel and basic metals represents about 5% of the manufacturing industry. "

Of the following situations is observed that there is a direct link between iron and steel production volume and economic development. China, which is in the process of economic development, dominates the top producers of iron and steel. Iron and steel industry has significant impact on the natural environment through emissions and water pollution. In the Figure 1 is schematized the life cycle of steel products.

It is noted that steel is recycled at the end of life products. According to the World Steel sectors, steel recycling rates are estimated [8] as follows: 85% automotive, 90% and 50% for cars and household appliances. The amount of energy required to produce one ton of steel decreased by 50% in the last 30 years. Currently, 97% of steel products can be reused.

In the structure of any developed market economies are found both SMEs and large enterprises. Between the two groups there is a strong complementary relationship. Steel companies divided according to the size and specific technological process large and small.

Within large enterprises menus entire technological process, from raw materials as minerals, as they are extracted from nature, until the finished product. For small businesses to obtain steel raw material is the waste from various sources such as scrap metal. Unlike small businesses, large enterprises use only partially scrap as raw material. Reuse scrap reduces the impact of the industry on the environment.

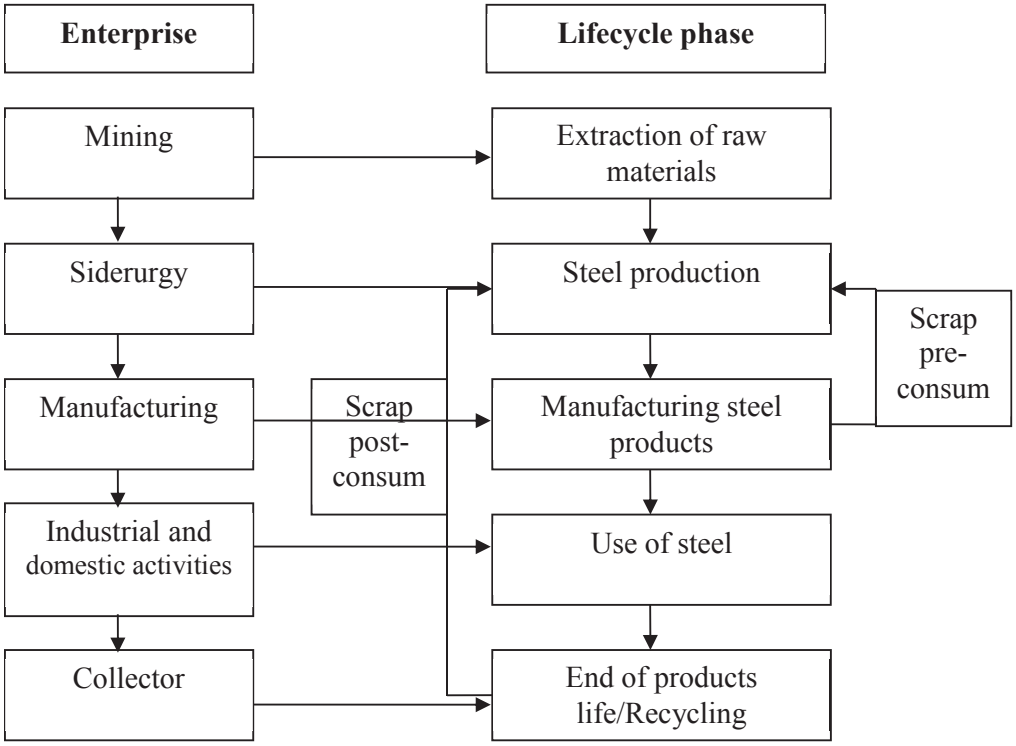

Figure 1. The life cycle of steel products
Source: prepared by author

4. ACCOUNTING SOLUTIONS FOR MEASURING AND ENVIRONMENTAL PERFORMANCE MANAGEMTNUL

Iron and steel industry is an industry that uses large amounts of material and consumes a lot of energy. In a document [6] of the Ministry of Environment of Romania stated that "more than half of the amount entered in the process comes out as waste gas and solid waste / by-products. Most relevant emissions are those in the air ".

However, it should keep in mind that steel is the main material used to make green energy, be it solar energy, wave or wind. All the steel that was made in the last 150 years can be recycled today at 100% and used to make new products.

Traditionally the company's performance has been reflected through account profit or loss (economic performance). In recent decades, however, emphasized the social role of business and increased importance of environmental issues. Under current conditions, in addition to economic performance, companies should also take into account social performance (acting in a socially responsible way) and environmental performance (to minimize the environmental impact of economic activity). These three aspects are fully integrated in the concept of triple performance ('triple bottom line "), which was created in 1994 by John Elkington. He is the founder of a consulting practice in the UK called SustainAbility (Durability). Elkington has supported the idea that companies should prepare three lines of performance:

- the first is the traditional measure of corporate profits - line profit or loss account;
- the second account is the line "people" of a company - a measure in some form of socially responsible as an organization was in its work;
- the third is line account "planet" of the company - a measure of how environmentally responsible was the company.

Thus, the Triple Bottom Line (TBL) consists of three P: profit, people and planet and is designed to measure financial performance, social and environmental development of the company over a period of time.

C. Iacob and M. Ţaicu (2012) believe that „there is a close interdependence relation between the three types of performance - economic and financial, social and environmental. Thus, obtaining economic performance allows the company to invest more to solve problems related to social and environmental areas, and obtaining performance in these two areas can lead to increased economic performance".

For measuring and managing environmental performance, companies can implement environmental management accounting. Environmental management accounting is generally defined [5] as the identification, collection, analysis and use of two types of information for internal decision-making:

- Physical information on the use, flows and destinations energy, water and materials (including waste);
- Monetary information on environmental costs, earnings and savings.

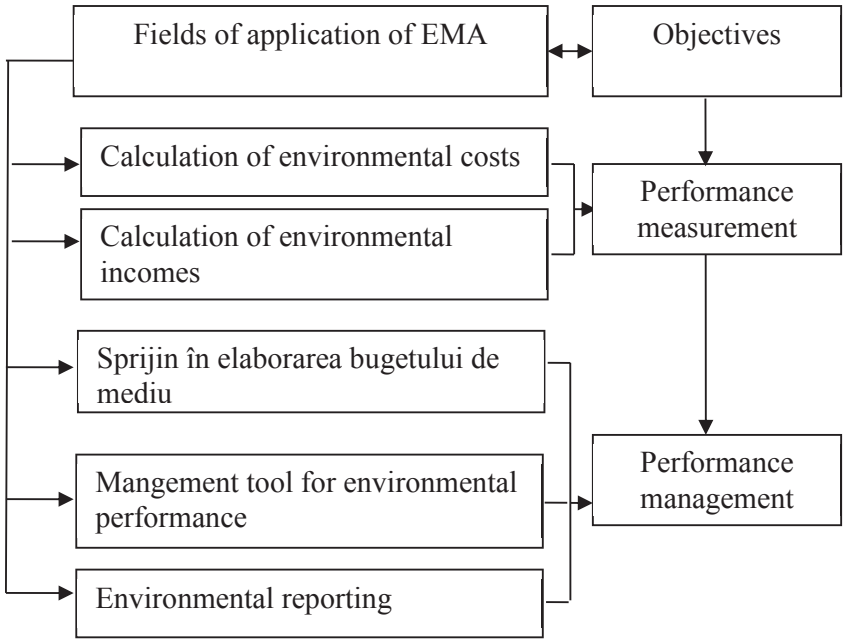

Figure 2. Scope and objectives of environmental management accounting
Source: prepared by author

In my opinion, environment management accounting can be successfully implemented in companies in the iron and steel industry.

5. CONCLUSIONS

Steel is today one of the materials most sold in the world are used in automotive, railways, building, etc.. We appreciate that a balance between profitability and competitiveness is not an easy task for steel producers. Achieving this goal requires careful control in terms of fuel consumption, enterprise resource management, efficiency, productivity and quality.

EMA implementation brings a number of benefits both for the organization implementing process and government. To ensure sustainable development of the company, implementation and continuous improvement of environmental management accounting is essential.

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