

EUROPRENEURSHIP & SUSTAINABILITY

Scientific editors

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Alexandra Borges
Janusz Rosiek



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The relevance of environmental accounting. An implementation proposal in the automotive sector

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Abstract

The awareness of society about environmental problems has led companies to engage in corporate social responsibility (CSR) strategies worldwide. CSR strategies imply the inclusion of the environmental dimension in decision-making processes. Non-financial reporting and environmental accounting are fundamental in providing information on companies' CSR goals, performance, and strategies. Environmental accounting is a strategic and relevant tool in dealing with environmental issues. In this context, it is important to have comparable information for companies' stakeholders, public opinion, and society. In this book chapter, we analyse the evolution of environmental accounting over the years and the process of implementation of an environmental accounting system in an automotive company. We also develop a proposal for the implementation of an environmental accounting system with the main procedures to be followed. Our results highlight the need of knowing in detail the specificities of the productive activity of the company, the human resources, and the information system. The incorporation of environmental issues in the companies' strategy and their reporting through new formats, provides valuable information on companies' environmental awareness and commitment.

Keywords: Environmental Accounting; Corporate social responsibility; Implementation project, Automotive industry

1. Introduction

The growing environmental awareness of society over the last decades required companies to act in accordance with the sustainable development paradigm. This type of development implies a difficult balance between environmental protection and economic development (Jones & Solomon, 2010).

The incorporation of environmental issues into the companies' strategy and their reporting practices either through traditional financial statements or through new forms of reporting, provides useful information on how companies relate to the environment. In this context, the topic of Corporate Social Responsibility (CSR) is particularly relevant. Companies are seen as entities of an economic nature, but also with a social responsibility towards society.

The development of environmental accounting was due to several factors, namely the high demand in the financial markets for companies' environmental information, the increased adoption of sustainability-oriented strategies, and the research effort carried out by academics. This evolution took place alongside the development of a legal framework with increasing requirements in this subject (Aurelia-Aurora & Sorina-Geanina, 2012). Environmental accounting aims to highlight the financial position with an environmental impact and to include environmental performance in the assessment of the company's performance. The main purpose of environmental accounting is to create conditions for information users, internal or external to the organisation, to be able to make predictions regarding its environmental performance. Measurement and disclosure make visible what was previously invisible and allow capturing the hidden attributes of the business activity (Jones & Solomon, 2010). This allows more informed and efficient decision-making (Aurelia-Aurora & Sorina-Geanina, 2012).

Accordingly, this work analyses a company in the automotive sector and presents a proposal for the implementation of an environmental accounting system. This proposal contains a subdivided accounting plan, a Balance Sheet, and an Income Statement with environmental results. The aim is to contribute to a more practical accounting perspective in addressing environmental issues. Much of the work in this area is based on secondary data, adopting a perspective far from the reality of companies (Deegan, 2017). Therefore, this work intends to adopt a perspective close to the business reality, developing a framework for the implementation of an environmental accounting system at the company BorgWarner Emissions Systems Portugal through the definition of guidelines, principles, and procedures, according to the specificities of the automotive industry and

the requirements of the *Norma Contabilística e de Relato Financeiro* (NCRF – Accounting Standard for Financial Reporting) 26 – *Environmental Matters*. It is also intended to contribute to a better understanding of this standard by showing how it can be implemented in a specific company.

This chapter presents a literature review on the evolution of environmental accounting in the next section. Then, we describe the methodology used in this research and present the company BorgWarner Emissions Systems Portugal. In section 4, we present the proposal for the implementation of the environmental accounting system, as well as the Balance Sheet and the Income Statement with environmental information. Finally, the main conclusions, recommendations, and suggestions for future research are outlined in section 5.

2. Literature review

Society has been developing an increasing concern with caring for and preserving the environment. This concern led to the current model of sustainable development. Sustainable development seeks to meet the needs of the current generation without compromising the ability of future generations to meet their own needs (WCED, 1987). Companies (particularly manufacturing companies) have focused on this issue, either because of the imposed regulations or because of the pressure they suffer from environmentalist groups and associations. Numerous scientific areas are involved in this theme, including accounting. Accounting proves to be essential for dealing with environmental problems, as it satisfies the need for quantification, registration, and reporting on the damage caused to the environment, and helps define the necessary preventive or corrective actions (Gomes, 2010).

CSR is profoundly related to environmental accounting. Companies are expected to assume this kind of responsibility and voluntarily integrate social and environmental concerns into their operations and interaction with stakeholders. CSR is understood as the companies' commitment to improving economic, social, and environmental well-being through their business practices. Currently, more than a moral obligation, CSR is a strategic imperative with consumers rewarding socially responsible companies (Baskentli et al., 2019). Social responsibility is increasingly important for organisations, with an impact on their objectives, strategies, and identity of the company (Monteiro & Guzmán, 2009).

Environmental accounting provides useful information for companies fully embrace CSR practices. It aims to provide information on the financial impact

of environmental aspects through the company's annual accounts (Ramos et al., 2007). It constitutes a well-defined research area that has evolved since the 1970s, that explores the relationship between accounting, organisation, and society (Eugénio et al., 2010). In the 1990s, the first environmental reports began to appear. Because of the increasing importance of sustainability, environmental legislation became stricter, and the financial sector began to demand detailed environmental data on companies.

The implementation of environmental accounting allows, for example, to identify, estimate, allocate, and reduce environmental expenses, control of the use and flow of energy and materials, improvement of the efficient use of natural resources, more accurate and detailed information on actual expenses and, even, improve the company image (Kraemer, 2006). However, the elaboration and dissemination of environmental information face several difficulties, due to the lack of standardized definitions.

Portugal, as other European countries, began to address the issue of environmental accounting at the end of the 1990s. Several EU countries adopted the European Commission (EC) Recommendation of 2001, which promoted greater harmonization regarding the disclosure of environmental matters in annual accounts and in the management reports of the companies. In Portugal, due to this recommendation, the *Comissão de Normalização Contabilística* (CNC – Accounting Standards Board) approved, in 2002, the *Diretiva Contabilística* (DC – Accounting Directive) 29 – *Environmental Matters*. In 2010, with the implementation of the *Sistema de Normalização Contabilística* (SNC – Accounting Standardization System), the environmental issue became regulated by the NCRF 26 – *Environmental Matters*.

The NCRF 26 prescribes the criteria for the recognition, measurement, and disclosure of expenditures of environmental nature, environmental assets, liabilities, and risks, resulting from transactions and events that affect, or are likely to affect, the financial position and results of the reporting entity. This standard identifies the type of environmental information that should be disclosed, regarding the entity's attitude towards environmental matters and the entity's environmental performance, insofar as they may have consequences for its financial position. According to NCRF 26, expenditure of an environmental nature includes expenditure on measures taken by an entity to prevent, reduce or repair damage of an environmental nature resulting from its activities and excludes expenditure that may produce beneficial effects on the environment, but whose main objective is to respond to other needs. Regarding environmental expenses, these relate to goods or services used in the production of other goods or services of an environmental

nature. In this context, there are some specific situations in which the expenditure must be considered as a year expense, namely expenses with waste treatment, repairing damage that occurred in previous years, environmental expenses of administrative nature, and expenses with environmental audits.

Environmental assets are all assets and rights owned by companies that have the capacity to generate economic benefits in future periods and that aim at environmental preservation, protection, and recovery (Ribeiro, 2006; Tinoco & Kraemer, 2011). Revenues or benefits of an environmental nature are the “quantifiable economic benefits obtained by the company as a direct and identifiable result of the implementation of measures whose main objective is to avoid, reduce or repair the negative environmental effects of its activities” (Gaspar, 2003, p. 144). Environmental liability is an obligation of the company arising from duties or responsibilities for preservation, recovery, or environmental protection (Ferreira, 2000; Kraemer, 2011).

According to NCRF 26, environmental matters must be disclosed in the Management Report and Notes to the Financial Statements, to the extent that they are materially relevant to the assessment of the financial performance or financial position of the entity. Thus, the Management Report must include a description of all matters relevant to the performance and financial position and prepare an accurate and clear analysis of the evolution of the business and the situation of the company. The Notes should include all qualitative information regarding the amounts included in the Balance Sheet and Income Statement (NCRF 26).

To implement environmental accounting, it is necessary to create a structured process where all the concepts associated with the subject are defined and to adapt the company’s accounting system regarding environmental matters. Therefore, a case study will be carried out with the development of a proposal for an environmental accounting system applied to the automotive sector, specifically at BorgWarner Emissions Systems Portugal.

3. Research methods

The development of this proposal was based on a qualitative investigation using the case study methodology. According to Godoy (1995), the case study methodology defines that the object of this type of research is a unit that undergoes a deep analysis, aiming to obtain a detailed examination of an environment, an individual or a particular situation. According to Scapens (2004) for the elaboration of a study there are several phases: preparation; evidence gathering; evaluation

of the evidence; identifying and explaining patterns; case writing. The collection of evidence resulted from a combination of methods, which included interviews, document analysis and observation, with the aim of triangulating information (Vieira, 2009).

The case study was developed at BorgWarner Emissions Systems Portugal, a subsidiary of BorgWarner Inc Corporation, leader in clean and efficient technological solutions for combustion, hybrid, and electric vehicles. BorgWarner Emissions Systems Portugal, originally known as ENSA is dedicated to the automotive industry since 1967. It underwent a series of successive changes and was acquired by the BorgWarner Inc Group in 2010, with its integration in its Emissions Systems division. BorgWarner Portugal's is located at Lanheses, Viana do Castelo, since 2014, and its industrial activity is focused on the design and manufacture of components and modules for controlling emissions and conducting fluids for the automotive industry. The BorgWarner Group has a sustainability policy focused on the balance between economic progress, environmental quality, and social well-being. BorgWarner Portugal is aware of its responsibilities in terms of the environment and is committed to a proactive approach to promoting continuous improvement in this area.

The first phase of the research was the process of interviews with the accounting supervisor and the health, safety, and environment technician to obtain information about the environmental conditions of the company. The interviews carried out in this work are included in the typology of unstructured interviews because they only had a set of topics to be addressed. In the second phase, documents and archive records were consulted to gather additional information. Document analysis implies the use of content analysis. Additionally, we analysed the reports submitted to several institutions such as, for example, the National Statistical Institute. The third phase consisted of organizing and processing the information collected and, in the fourth phase, already in the proposal development stage, a second moment of interviews took place, with the purpose of presenting the first results.

It should be noted that, regarding the company's accounting system the company had implemented, there was no accounting environmental information in the company's financial statements. However, the company was interested in introducing the necessary changes to its accounting system to generate the environmental information required by the NCRF 26.

4. Proposal for implementing an environmental accounting system at BorgWarner

According to Eugénio (2011), and with the adaptations to the BorgWarner Emissions Systems Portugal conditions, the steps to implement an environmental accounting system are presented in Figure 1.

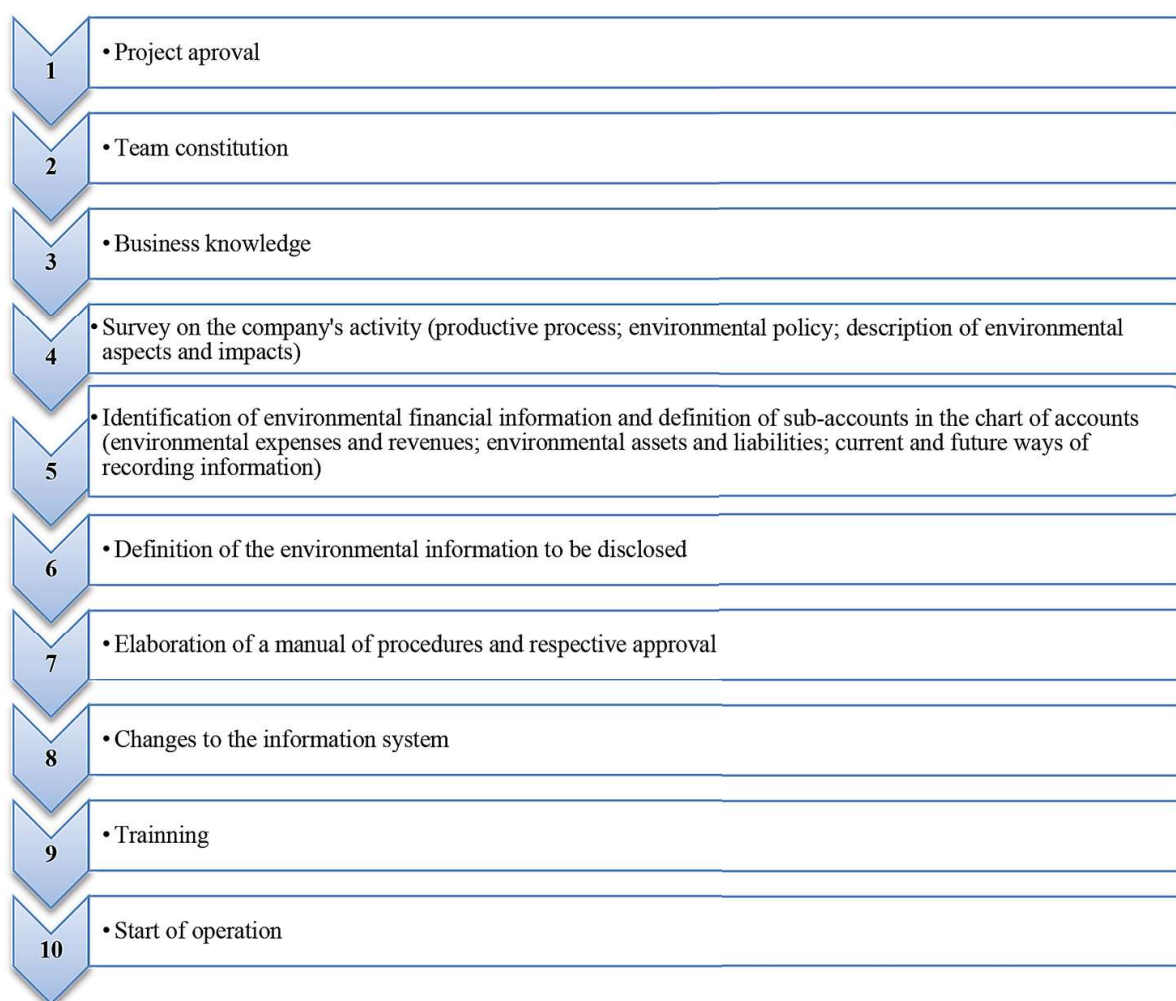


Figure 12.1. Implementation steps of the environmental accounting system at BorgWarner

Source: Based on Eugénio (2011) – Free adaptation.

Considering the aim of this study, the proposal was prepared for structuring environmental reporting accounts for Balance Sheet and Income Statement, with the identification of the environmental sub-accounts. This proposal was defined according to the accounts code used at BorgWarner.

The development of the proposal for the environmental accounting system is consistent with steps 4 and 5 presented in Figure 12.1. The project team with the functional interlocutors were interviewed to acquire knowledge on all the company's environment aspects, namely, environmental expenses and revenues; environmental liabilities and provisions; employees who perform functions related to the environment and current ways of recording each item in the company's information system.

The NCRF 26 recommends that entities consider the definitions of environmental expenses by *environmental domains*. However, the NCRF 26 does not define the content of environmental domains, contrary to the previous DC 29 that fully explained the information to be disclosed by environmental domains. Thus, the characterization of the environmental domains shown in Table 1 is based on the guidelines of DC 29 and on the identification of environmental components as suggested by Gomes (2010).

Based on the information collected in the interviews, the environmental components existing at BorgWarner were identified and classified by each environmental domain into environmental assets, environmental expenses, environmental liabilities, and environmental revenues (see Table 1).

Table 12.1. Classification of environmental components by environmental domain and elements of the Financial Statements

Environmental Domain	Description/Rules of measurement and accounting treatment	Classification by elements of DF
Management of emissions to the atmosphere	• Combustion modifiers to reduce atmospheric emissions • Multi-channel ovens – Simultaneous burning of various fuels • Ovens with preheating system (standby) • Application of photovoltaic panels	Environmental assets
	• Monitoring of the air quality • Traffic monitoring • Maintenance of refrigeration equipment, heat pumps and fire protection systems • Less polluting fuels • Rental of alternative fuel storage equipment	Environmental expenses
Wastewater management	• Wastewater treatment station • Accountants • Water recirculation systems • Construction of the connection to the wastewater collector • More efficient taps and installation of flow meters • Permit for use of water resources for discharge of wastewater	Environmental assets
	• Cleaning of the septic tank	Environmental expenses

Environmental Domain	Description/Rules of measurement and accounting treatment	Classification by elements of DF
Waste management	• Cover for the waste park • Construction of areas for the collection and temporary storage of waste (waste park) • Containers for Solid and Urban Waste (MSW) • Ecopoints- containers for waste separation	Environmental assets
	• Rate for landfill of waste • Taxes of Waste Management Services • Disposal of harmful equipment and materials, identified or to be identified to comply with environmental legislation	Environmental expenses
	• Waste sales (cardboard, pallets, and scrap)	Environmental revenues
Protection of soil and water (surface and groundwater)	• Construction of spill containment systems (gutters for rain-water collection and soil sealing) • Chemical warehouse • Construction of areas for the collection and temporary storage of waste • Holding basins • Emergency kits • Fuel storage permit • License for use of water resources for abstraction of surface/ groundwater	Environmental assets
	• Contracting of soil decontamination services/ removal of accumulated waste • Monitoring of contaminated soils • Monitoring of the water quality	Environmental expenses
	• Repair of soil and water damage • Cleaning of spills (e.g. fuel and oil)	Liabilities of an environmental nature
Protection against noise and vibrations	• Noise and vibration reduction systems (acoustic barriers, silencers, shock absorbers) • Quieter equipment for noise reduction • Special noise permit	Environmental assets
	• Monitoring of environmental noise	Environmental expenses
Other areas of environmental management and protection	• Environmental monitoring studies • Sponsorships and environmental sponsorship actions • Environmental simulations • Insurance/financial guarantee under the Environmental Liability Directive • External environmental monitoring technician	Environmental expenses
	• Environmental monitoring technician • Cleaning team (related to environmental management) • Preparation of the Environmental Management Plan	Liabilities of an environmental nature
	• Reduction of the value of the environmental taxes paid	Environmental revenues

Source: Own elaboration.

Following the classification by elements of the financial statements, proposals for the Income Statement (Table 12.2) and Balance Sheet (Table 12.3) were prepared, and adjusted to the automotive sector, more precisely to the BorgWarner company.

Certain situations have been defined according to the specificities of the company.

Regarding the classification of expenses, the expenses associated with the Environmental Monitoring Technician were identified, which correspond to expenses with the wages of the company's personnel. Therefore, they are included in the *Personnel wages* account. In turn, the expense of the external Environmental Monitoring Technician must be identified as a specialized external service and must be included in the *Fees* sub-account.

In the Waste Management environmental category, environmental expenses include contracting specialized external services, which fall under the *Specialized work* sub-account. The cleaning of the pit is also carried out by an external service, registered in the sub-account *Cleaning, hygiene, and comfort*. Containers for Urban Solid Waste, Eco points, and Wastewater treatment station, when acquired, are recognized as assets and included in *Other tangible fixed assets* sub-account. If they are rented to external entities, the expense is recorded in the *Specialized work* sub-account. The monitoring identified, which is carried out by external services accredited for the purpose, must also be included in the *Specialized work* sub-account.

According to NCRF 26, recycling activities that respond, firstly, to technical needs or internal requirements of the entity must be excluded from the definition of environmental expenditure. As the purchased Eco points and containers for solid urban waste have waste management as their main objective, they must be considered environmental expenditures.

Regarding the item Insurance/Financial Guarantee, the cost of insurance under the Environmental Responsibility Directive is included in the Income Statement. As it is an expense for contracting an external service, it must be indicated in the *Insurances* sub-account.

Regarding the classification of revenues, in the *By-products, waste, residues and scrap* sub-account is included all revenues from sales of waste, specifically from the sale of certain waste, by type, such as iron, steel, plastic, and cardboard. These are paid by the waste management operator.

There are other revenues, in the form of reduced expenses, such as paper consumption, which are not recognized as revenues but are monitored and considered for management purposes.

It should be noted that the purchased equipment can be sold. If this happens, the value of the gain or loss must be recorded in the *Gains/Losses Disposals* sub-accounts.

A proposal for environmental revenues and gains, and expenses and losses is presented in Table 12.2.

Table 12.2. Proposal for Revenues and Gains and Expenses and Losses sub-accounts – Income statement

Environmental expenses and losses	Environmental revenues and gains
Costs of goods sold and environmental materials consumed	Sales
Raw materials, subsidiaries, and consumption	By-products, waste, waste, and scrap
Raw Materials	Sale of waste for recovery (cardboard, pallets, and scrap)
Environmental materials consumed	Provision of services
Environmental external supplies and services	Secondary services
Specialized work	Environmental services
Environmental specialized work	Operating subsidies
Environmental audits	Operating subsidies for environmental reasons
Environmental Consulting	Reversals of provisions
Environmental projects	Provisions for landscape and environmental recovery
Supervision of environmental projects	Provisions for ongoing legal proceedings concerning the environment
Landscape and environmental recovery	
Environmental monitoring	Supplementary revenues
Ambient noise	Studies, projects, and technological assistance
Environmental vibrations	Environmental studies and projects
Contaminated soils	Royalties
Air quality	Royalties for the use of environmental technology
Water quality (surface water and groundwater)	In subsidies for investments
Traffic	In subsidies for environmental investments
Other environmental specialized work	Gains in inventories
Advertising	Environmental stocks
Advertising and environmental advertising (newspapers/ magazines about the environment)	Others
Fee	Corrections for previous years
Fees to environmental auditors	Corrections to previous exercises for environmental issues

Chapter 12

Table 2 (continued)

Materials	Tax refund
Books and technical documentation	Environmental taxes
Preparation of the Environmental Management Plan	
Insurance	
Insurance Responsibility and Multirisks	
Environmental insurance (under the Environmental Liability Directive)	
Litigation and Notary	
Litigation and notary for environmental issues	
Cleanliness, hygiene, and comfort	
Cleaning for the protection of the environment	
Personnel expenditure	
Staff remuneration	
Personnel assigned to environmental tasks	
Environmental Monitoring Technician	
Cleaning crew	
Other expenditure on personnel	
Personnel assigned to environmental tasks	
Environmental training	
Environmental accessories	
Impairment losses	
Provisions	
Taxes	
Environmental taxes	
Ongoing legal proceedings	
Ongoing legal proceedings due to environmental issues	
Accidents at work and occupational diseases	
Occupational accidents and occupational diseases due to environmental issues	
Other provisions	
For landscape and environmental recovery	
Taxes	

Other taxes	
Green taxes	
Corrections from previous exercises	
Corrections from previous exercises on environmental issues	
Donations	
Donations to environmental protection institutions	
Inventory losses	
Stock losses caused by environmental damage	
Fines and penalties	
Fines and penalties for non-compliance with environmental legislation	
Environmental offenses	
Other extraordinary expenses and losses	
Resulting from environmental claims	

Source: Own elaboration.

The proposal of Table 12.2 had as a starting point the Income Statement used by the company, which follows the SNC principles, with an adaptation, to present the expenses and revenues of environmental nature.

Regarding licenses and authorizations, there are two possibilities for their recognition. They can be considered environmental expenses and be evidenced in the income statement. However, the NCRF 26 defines that when licenses and authorizations are acquired and, in addition, meet the criteria for their recognition as an asset, they must be capitalized and amortized during their expected useful economic lives. In this case, and if they constitute intangible assets, licensing expenses are included in the Balance Sheet, in the *Industrial property* sub-account.

Table 12.3 presents the proposal for accounts for the company's environmental assets and liabilities.

Table 12.3. Proposal for Assets and Liabilities accounts – Balance sheet

Assets
Investments
Financial investments
Other financial investments
Environmental financial investments
Tangible fixed assets

Chapter 12

Table 12.3 (continued)

Other tangible fixed assets
Environmental tangible fixed assets
Containers for Municipal Solid Waste
Ecopoints - containers for household waste
Compact WWTP
Emergency kits
Multi-channel ovens
Photovoltaic panels
Water recirculation systems Water recirculation systems
Chemical warehouse
Accumulated depreciation
Accumulated depreciation Environmental tangible fixed assets
Intangible assets
Development projects
Research and development of environmental projects
Permits
Environmental licensing
Special noise permit
Fuel tank licence
Authorization/ License to use Water Resources for water abstraction
Accounts receivable and payable
Other accounts receivable and payable
Other debtors and creditors
Coordinating entity of the licensing
Liabilities
Provisions
Environmental taxes
Environmental matters
Provisions for greenhouse gas emission liabilities
Landscape and environmental recovery

Source: Own elaboration.

The inclusion of the corresponding explanatory notes in the Notes to the Financial Statements results in a financial statement with great informative value and an excellent way of disclosing environmental financial information.

In addition, COM 2017/C215/01 suggests several environmental indicators that can complement the balance sheet information and demonstration of environmental results, namely: energy performance and waste management (e.g. recycling rates). The indicators presented next are calculated based on Sikora & Markiewicz (2021) (Equation 1) and Mendes et al. (2003) (Equation 2).

$$\text{Energy performance} = \frac{\text{Energy consumption}}{\text{Production (units)}} \quad (1)$$

$$\text{Recycling rate (\%)} = \frac{\text{Production of recycable waste}}{\text{Production of mixed solid waste}} \times 100 \quad (2)$$

5. Conclusion and recommendations

The growing demand for information on environmental business behaviour by society and the incorporation of environmental issues into companies' strategies has led to the development of environmental accounting.

Environmental accounting, either through traditional financial statements or through new forms of reporting, makes it possible to reveal how companies relate to the environment. However, the evidence of the environmental impact in the financial statements has been, until today, a complex process due to the inexistence of norms that clearly guide its implementation. Consequently, there is a need to standardize the information to be published, through an information management system that provides relevant information to investors, public opinion, and society so they can evaluate the situation and the environmental performance of companies (Burrit & Schaltegger, 2010).

In this context, this study aimed to develop a proposal for the application of an environmental accounting system in a company in the automotive sector, adopting a more practical perspective in approaching environmental issues. It should be noted that, for the preparation of environmental accounting, it is essential not only to know in detail the relevant information about the company's operation, but also to reconcile this information with the proposals for components and environmental domains referred to in the literature and in accounting regulation. The proposal includes Income Statement and Balance Sheet sub-accounts, which include the environmental components organised by environmental domains, to comply with the Portuguese standard on environmental matters, the NCRF 26.

The implementation of the proposed solutions is feasible, and it will provide useful information for the company's decision-making. The implementation of the proposal for the environmental accounting system will certainly add value to knowledge in this area.

A limitation of the research is the fact that the proposal is specific to the company analysed. However, this proposal represents a valuable initial step for the company to improve its accounting system in terms of CSR and it can also be a starting point for developing new proposals for other companies. Thus, as recommendations for future work, we suggest the development of proposals for environmental accounting systems in other activity sectors, particularly in environmentally sensitive sectors such as the paper industry, cement, and dyeing industries, and in sectors whose valuation of waste generated represents an important source of the company's revenues.

References

- Aurelia-Aurora, D., & Sorina-Geanina, M. S. (2012), *Perspectives of Environmental Accounting in Romania*, *Procedia - Social and Behavioral Sciences*, 62, 610-614.
- Baskentli, S., Sen, S., Du, S., & Bhattacharya, C. B. (2019), *Consumer reactions to corporate social responsibility: The role of CSR domains*, *Journal of Business Research*, 95, 502-513.
- Burritt, R. L., & Schaltegger, S. (2010), *Sustainability accounting and reporting: Fad or trend?*, *Accounting, Auditing & Accountability Journal*, 23(7), 829–846.
- CE, Comissão Europeia (2017), *Orientações sobre a comunicação de informações não financeiras (metodologia a seguir para a comunicação de informações não financeiras)*. Comunicação da Comissão, COM 2017/C215/01.
- NCRF, Norma Contabilística e de Relato Financeiro 26 (2015), *NCRF 26 Matérias Ambientais*. Retrieved from: http://www.cnc.min-financas.pt/Instrumentos_snc2016.html 22.05.2023
- Deegan, C. (2017), *Twenty five years of social and environmental accounting research within Critical Perspectives of Accounting: Hits, misses and ways forward*, *Critical Perspectives on Accounting*, 43, 65-87.
- Eugénio, T. (2011), *Contabilidade ambiental*, Caxias: Verlag Dashofer.
- Eugénio, T., Lourenço, I., & Morais, A. (2010), *Recent developments in social and environmental research*, *Social Responsibility Journal*, 6(2), 286-305.
- Ferreira, C. (2000), *Da Contabilidade e do Meio Ambiente*, Lisboa: Editores Vislis.
- Gaspar, M. J. (2003), *Contabilidade Ambiental na Empresa - O caso do sector elétrico*, Master's thesis in Environmental Management and Policies, New University of Lisbon.
- Godoy, A. S. (1995), *Introdução à pesquisa qualitativa e suas possibilidades*, *Revista de Administração de Empresas*, 35(2), 57–63.
- Gomes, D.R. (2010), *Contabilidade Ambiental – Aplicação dos princípios normativos e uma obra do Grupo Soares da Costa*, Integrated Master's Thesis in Environmental Engineering, Faculty of Engineering of Porto.
- Jones, M., & Solomon, J. (2010), *Social and environmental report assurance: some interview evidence*. *Account. Forum*, 34, 20–31.
- Kraemer, M. (2006), *Contabilidade Ambiental – Relatório para um futuro sustentável, responsável e transparente*. Florianópolis.

- Kraemer, M. (2011), *Contabilidade Ambiental como sistema de informações*, Revista Brasileira De Contabilidade, 133, 68–83.
- Mendes, P., Santos, A. C., Nunes, L. M., e Teixeira, M. R. (2013). *Evaluating municipal solid waste management performance in regions with strong seasonal variability*. Ecological Indicators, 30:170–177.
- Monteiro, S., & Guzmán, B.A. (2009), *Análisis de la información medioambiental divulgada en grandes empresas que operan en Portugal: período 2002–2004*, Portuguese Journal of Accounting and Management Journal, 7, 37–68.
- Ramos, S. T., Espinosa, P., Mesa, A., & López, K. (2007), *Evaluación de la contabilidad financiera y gestión medioambiental en empresas turísticas*, Teoría Y Praxis, 3, 173–185.
- Ribeiro, M. S. (2006), *Contabilidade ambiental* (2ed.), São Paulo: Atlas.
- Scapens, R. (2004), *Doing Case Study Research*, (in:) C. Humphrey, B. Lee (eds), *The Real Life Guide to Accounting Research: A Behind-the-Scenes View of Using Qualitative, Research Methods*, Elsevier Science, 257–279.
- Sikora, R., & Markiewicz, P. (2021). *A new approach to calculating energy performance indicators of road lighting*. Sustainable Cities and Society, 75, 103232.
- Tinoco, J. E. P., & Kraemer, M. E. P. (2011), *Contabilidade e gestão ambiental* (3ed.) São Paulo: Atlas.
- Vieira, R. (2009), *Paradigmas Teóricos da Investigação em Contabilidade*, (in:) M. J. Major, R. Vieira (eds), *Contabilidade e Controlo de Gestão. Teoria, Metodologia e Prática*, Lisboa: Escolar Editora, 11–34.
- WCED, World Commission on Environment & Development (1987), *Our Common Future: Report of the World Commission on Environment and Development*. Retrieved from: <http://www.un-documents.net/ocf-ov.htm#1.2>. 22.05.2023