

Facilitating a greener environment through Management Accounting

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Abstract

Worldwide natural resources such as coal and water are becoming scarcer each year. Individuals as well as companies need to use natural resources sparingly and responsibly, and decrease waste production. It is not only about the usage of resources, but also about the waste that occurs as a result thereof. Management accounting improves decision-making as it communicates decision-relevant insight and analysis to every decision-maker in a company, focussing on their social and environmental duties. The annual statements on the websites of the Top 10 South African companies in 2014 were analysed and compared to 2012, 2008, and 2003. A 'Word cloud' was created for each year based on sixteen key words to determine whether awareness grew with regard to for instance sustainability and the environment. This paper is conceptual and exploratory in nature as it highlights the demand on natural resources as well as the steps that can be taken to minimise the impact on natural resources. Companies seem to become more aware of what they do to the environment and would like to take action where ever they can in order to be acceptable to investors. In the early 1980s companies did what is referred to as call "green washing" to comply with legalities. However it seems that this has now changed to a true awareness and "green" companies are becoming more and more competitive due to their truly environmentally friendly activities. In order to assist companies to become even more aware of waste and their environmental responsibility, they may need to be made more aware of the use of management accounting tools such as Activity Based Costing (ABC) and Material Flow Cost Accounting (MFCA) simultaneously.

Keywords: Environmental management accounting (EMA), Material Flow Cost Accounting (MFCA), environmental efficiency, Activity Based Costing (ABC), water footprint, energy, carbon, waste.



Source : http://www.cfoinnovation.com/sites/default/files/field/field_images/story/money_and_environment.jpg

Introduction

With environmental resources getting depleted saving the environment should be a critical priority in every company. In 1987 the Brundlandt Commission (Brundlandt report 1987) coined sustainable development as development that “meets the needs of the present generation without compromising the ability of future generations to meet their own needs.” Sustainable development encompasses economic, social and environmental development and the reporting thereof. Furthermore Deegan (2007) argues that companies viewed environmental reporting when it started in the early 1990s as compliance with laws and regulations. It was also viewed as an advertising instrument and a way to show to the world that they had a license to function in the business world (Herzig & Schaltegger, 2006). This idea was reiterated by Hopwood (2009) when he indicated that companies which are not extensively sustainability driven in their actions may reflect “green washing” rather than real reporting of their activities. Deegan continues to state that the industries and companies which were the so called polluters were more eager to publish these reports, attempting to legitimise themselves. However, when reporting information with the wrong intention, users of annual reports may be misinformed.

Although a number of companies followed the route of reporting for legitimisation, internal transparency through the use of environmental management accounting increased due to the motivation of improving efficiency and reducing costs (Kamp-Roelands 2013). She continues to state that the use of natural resources, the reduction of emissions to the air, water, and soil, as well as the reduction of waste in relation to costs also became more transparent. Hence, in order to reduce cost and waste, management accounting tools may need to be employed and

facilitate the necessary growth of investor numbers and profit of a company. CGMA (2014) further reiterates that stewardship builds trust and therefore the active management of relationships and resources is needed to protect the financial and non-financial assets, reputation, and value of a company. Companies have the need to gain shareholder value and a competitive advantage. To achieve this, van Berkel (2003) argues that companies need to promote themselves in the competitive environment as sustainable and they therefore need to minimise the use of natural resources such as material, energy and water and at the same time create less emissions and waste. In order to minimise the use of natural resources, waste and emissions, management accounting tools such as Activity Based Costing (ABC) and Material Flow Cost Accounting (MFCA) may play a vital role.

To support the measurement and reporting of growth, especially green growth, frameworks from entities such as the Global Reporting Initiative (GRI 2012) and the International Integrated Reporting Council (IIRC 2013) were developed. The GRI (2013a) has also developed a new set of guidelines, the G4 Sustainability Reporting Guidelines to assist companies with sustainability reporting. The G4 reporting guidelines increase the usability of dialogue with all stakeholders of a company. Since companies want to gain support from their investors, the application of different reporting frameworks might assist them.

The Chartered Global Management Accountant (CGMA, 2014) views a sustainable company as one that over the long run attains economic performance while at the same time they are generating a constructive value for society and minimising their environmental impact. They furthermore state that through the responsible planning and management of resources, the availability is secured for future generations. Sustainable companies strive towards economic

growth and therefore the OECD (2011) describes the promotion of economic growth and development that will safeguard natural resources and environmental services as Green Growth. Investment and innovation are responsible for sustained growth and the development of new economic opportunities. Innovation and substitution employed by companies away from scarce environmental resources will assist them to become more “green”.

Hart (2010) agrees when he emphasise that companies play a major role in the movement towards green growth. Hence, companies may need to be aware of their role in the sustaining of growth, innovative products, and ways to safeguard natural resources, all of which might be achieved through the use of management accounting tools.

The sustaining of growth and sustainability reporting can hardly be viewed separately. According to the Global Reporting Initiative (2013b) the most popular used indicators of sustainability reporting in relation to the environment are:

- greenhouse gases;
- direct energy consumption;
- fines and sanctions for non-compliance with environmental laws and regulations;
- indirect energy consumption; and
- water usage.

Hence, the use of management accounting to facilitate a greener

environment will deal with water usage, emissions, and energy consumption. Companies need high quality information to support them in their decisions towards becoming greener growing companies.

Management Accountants have a vital role to play in a company’s decision-making according to CGMA (2014:5) as they “communicate decision-relevant insight and analysis to every decision-maker in the organisation, while being alert to the organisation’s social and environmental duties.” This is also achieved through discussions with the decision-makers with regard to their needs to ensure that the most relevant information is sourced and analysed.

The complexity of the challenges with regard to saving the environment and the all the stakeholders involved are explained in Figure 1.



Source: <http://employmentagencyoflongisland.com/images/green-jobs.jpg>

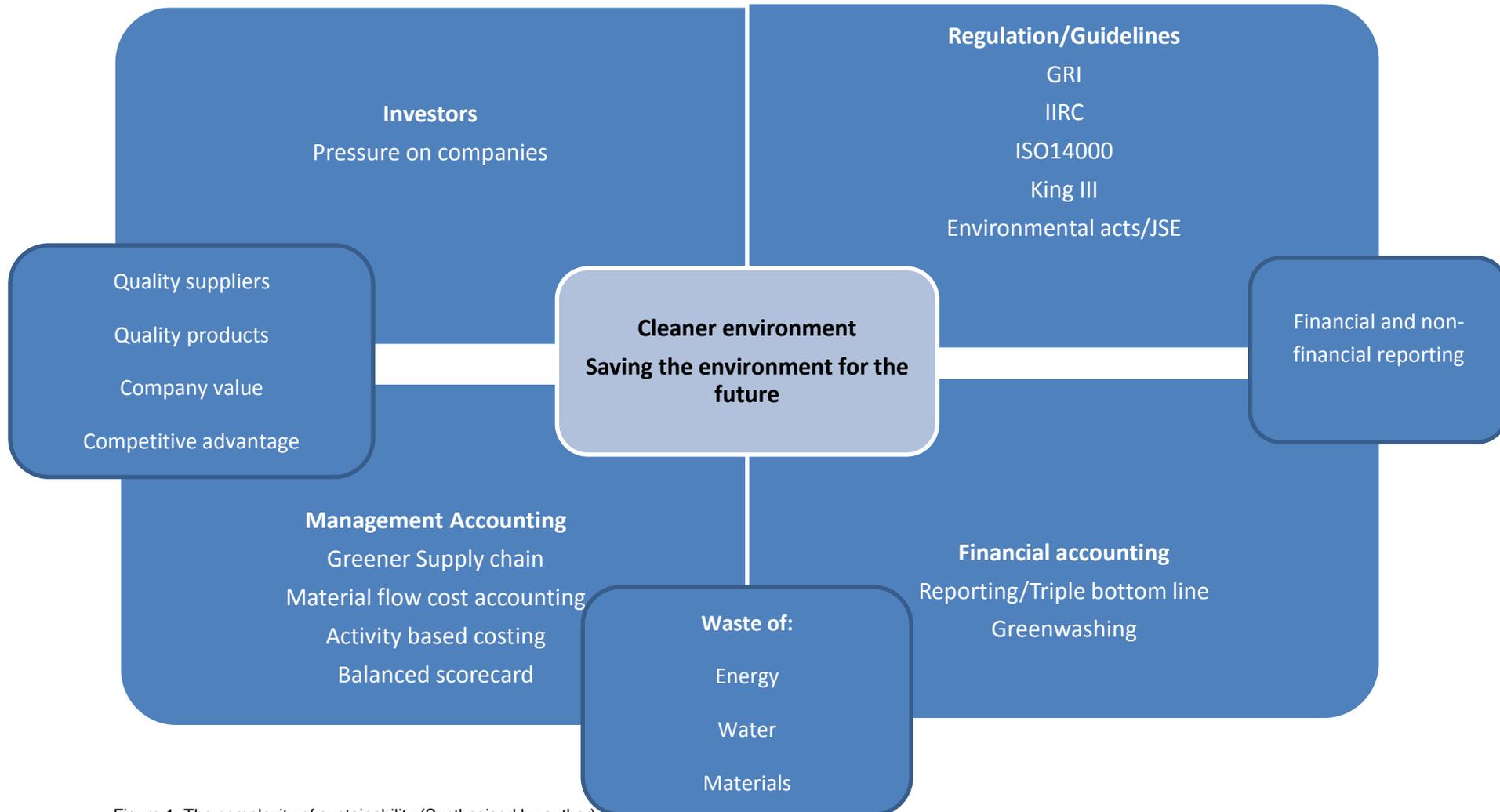


Figure 1: The complexity of sustainability (Synthesised by author)

Figure 1 is an indication that the issue of sustainability is very complex and will involve teamwork inside and outside companies to achieve sustainability. The remainder of the paper follows: In the following section an overview of the literature is performed based on the current status of environmental reporting, followed by the research questions. This is followed by a section of facts and figures where the decrease of water availability, the consumption of energy and carbon dioxide emissions are illustrated and the analysis of the annual reports of companies using a word cloud based on 16 key words. A description of how management accounting tools such as Activity Based Costing (ABC) and Material Flow Cost Accounting (MFCA) can assist companies to become greener are given before the paper concludes with conclusions and possible future research.

The current status

When sustainability reporting started this activity was done by either the sustainability or the public affairs department. This has now changed as the Chief Executive Officer (CEO) started to realise the responsibilities in this regard and the Chief Financial Officer (CFO) is also becoming more involved (Kamp-Roelands 2013). The idea that sustainability is of significant importance to a business and vital for future growth is now more perceived as important by a growing number of companies (Accenture 2012). Eccles, Ioannou and Serafeim (2013) analysed 180 companies from the USA for the period 1993-2010. According to their results companies which employed integrated environmental accounting and reporting since some 20 years ago, are outperforming their organisational counterparts. This is emphasised by Kuo and Chen (2013) when they state that environmental sensitive companies can benefit more from new market opportunities arising from an increased demand for green products and services.

Investors also became more involved in the development of corporate reporting guidance on sustainability. The major user group for this type of reporting are investors as identified by the International Integrated Reporting Council and input are provided for the framework by a separate investor group (IIRC 2013b). The European Federation of Financial Analysts Societies (EFFAS 2010) issued guidelines for indicators on environmental, social and governance which is relevant for the evaluation of corporate performance. Investors want to see growth on their returns and may therefore want to assist in the development of the reporting process.

Investors and other stakeholders are to be informed through reporting of the sustainability and impact environmental of the products and services, and their awareness should also be raised. According to Schönbohm and Hofmann (2012) stakeholder involvement plays an important role and can be viewed as a critical success factor and trust and credibility are also increased. However, consumers may become more sceptical on the environmental impact of the products they buy and therefore the reporting should be transparent enough to enable stakeholders to see that it is not just green washing. Some companies do not only report information in their annual reports, but they are also increasingly indicating the calculations down to a product level which assist consumers to make informed decisions (Kamp-Roelands 2013). Hence management accounting tools might assist in the need for more detailed information.

According to Schönbohm and Hofmann (2012) world-wide growth in the reporting of data with regard to economic, environmental, and social issues, has increased not only in the number of reports but also in quality. KPMG (2008) indicates that the most common reasons for reporting as: ethical motives, economic reasons and reputation and lastly brand issues.

Research questions

The research questions are:

- Which scarce natural resources are becoming a concern worldwide?
- To what extent are companies aware of their responsibility to conduct greener business?
- Which management accounting tools could be used by companies to move towards a greener environment?

Facts and figures

The usage of scarce resources such as water and energy is becoming a worldwide concern. Waste and pollution are also role players in the gradual destruction of nature. Figures 2, 3 and 4 indicate the impact on our scarce environmental resources. In Figure 2 the decrease in water availability per capita is extrapolated to the year 2025.

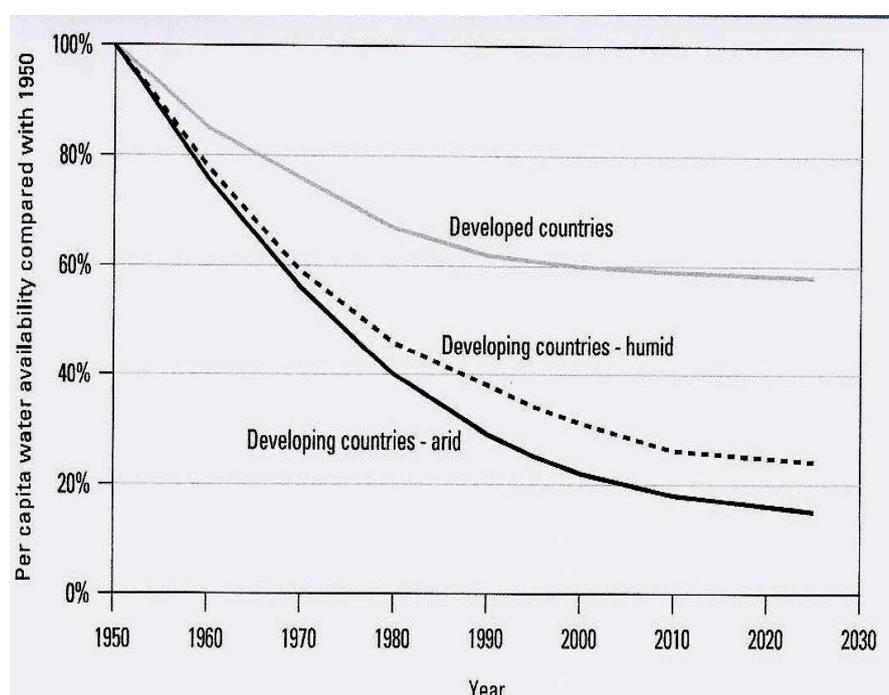


Figure 1: Water availability continues to decline in developing countries (Source: Pitman (2002))

Figure 2 does not paint a promising picture and shows once more why individuals as well as companies should be aware of their water footprint especially since water is becoming scarcer each year. According to the United Nations (UNwater 2013) 1800 million people will be living in countries or regions in 2025 where an absolute water scarcity will exist

and two-thirds of the population of the world will live in water-stressed conditions.

In Figure 3 the per capita consumption of energy also indicates an increase and the more extensive demand on another scarce resource.

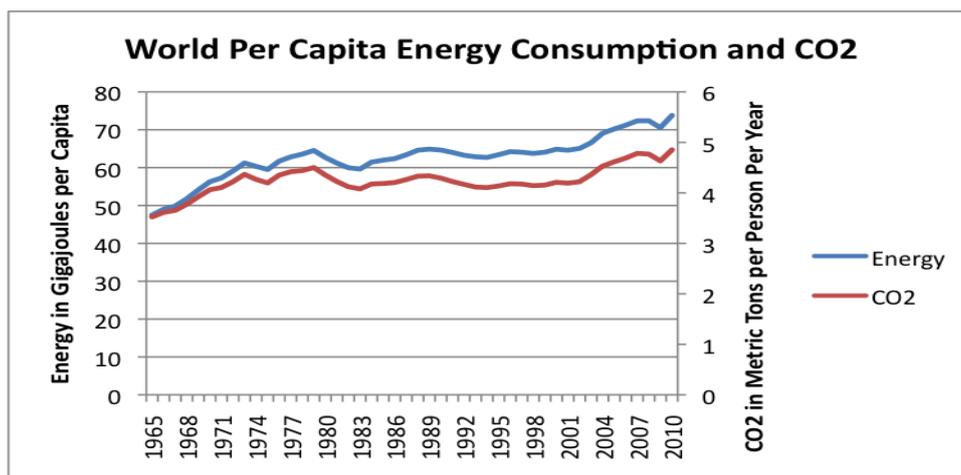


Figure 2: Per capita energy consumption and CO² (Source [Http://www.Ourfinateworld.com](http://www.Ourfinateworld.com))

As energy consumption increases, so does the presence of CO₂ in the atmosphere resulting in the pollution of the air that is inhaled.

Lastly, the carbon dioxide emissions from fossil fuel burning are also on the increase. This is presented in Figure 4

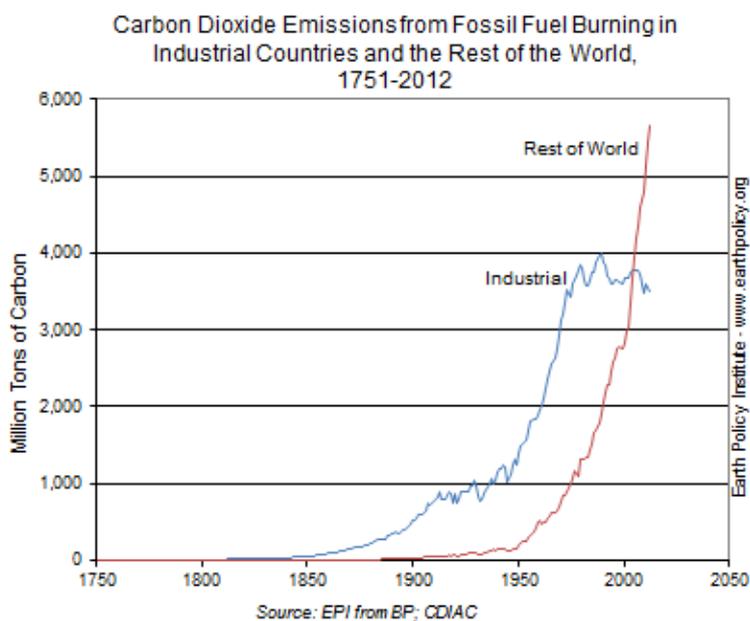


Figure 3: Carbon dioxide emissions from fossil fuel burning (Source: EPI from BP, CDIAC 2013)

With the availability of water decreasing, the CO₂ and carbon dioxide presence in the atmosphere increasing, the

environment is under direct threat and new and innovative ways need to be developed to preserve the earth.

In Figures 2, 3 and 4 and the discussion surrounding the figures the first research question: "Which scarce natural resources are becoming a concern worldwide?" was answered.

To show the increased awareness of companies of sustainability and responsibility towards scarce resources, the annual reports and sustainability reports of the top ten companies of 2012 listed on the Johannesburg Stock Exchange (JSE) were analysed for the following keywords: sustain, sustainability,

environment, waste, water, carbon, energy, scarce, footprint, earth, ozone, GRI, King, sustainable, recycle and recycling. The companies in Table 1 were indicated as the top 10 companies listed on the JSE in 2012 according to market Capitalisation (Business Monitor International 2013).

Table 1: Top 10 companies listed on the JSE in 2012

Ticker	Name	Last Price	Market Capitalisation
JALSH Index			
BIL SJ Equity	BHP Billiton PLC	23783	1368828411904
BTI SJ Equity	British American Tobacco PLC	43085	839113703424
SAB SJ Equity	SABMiller PLC	35925	572294037504
AGL SJ Equity	Anglo American PLC	24335	338295750656
MTN SJ Equity	MTN Group Ltd	15516	292469637120
CFR SJ Equity	Cie Financiere Richemont SA	4762	273434034176
SOL SJ Equity	Sasol Ltd	34000	219274199040
NPN SJ Equity	Naspers Ltd	45507	187681554432
SBK SJ Equity	Standard Bank Group Ltd	11585	184504762368
KIO SJ Equity	Kumba Iron Ore Ltd	52400	168758722560

The annual and sustainability reports for the years 2003, 2008, 2012 and 2014 were analysed and are portrayed through the use of a word cloud in Figures 5, 6 and 7. A word cloud is a picture generated on the web (Wordle.net) from words that are

used in a document. The program counts the frequency with which certain words are used and then emphasise the words that are used more often in the document and therefore large words are the words that are most frequently used in specific documents.



Figure 4: Analysis of 2003's annual and sustainability reports (Source: Author own)

Environment and sustainability feature predominantly in the 2003 reports showing awareness of these issues. In Figure 5 water, waste and energy become more prominent and may be contributed to the

fact that companies are becoming increasingly aware that wasted water and energy are becoming more critical to manage.



Figure 5: Analysis of 2008's annual and sustainability reports (Source: Author own)

In Figure 7 carbon becomes more prominent as the word is now displaying more noticeable. This indicates that companies are reporting more on carbon emissions. However water now seems to

be of great concern in the reports as the size has now increased once more indicating that the word is used more frequently than in the previous reports.



Figure 6: Analysis of 2012's annual and sustainability reports (Source: Author own)

The analysis of the annual and sustainability reports revealed that companies are indeed aware of the environmental issues of water, energy, and sustainability. Therefore, if companies are made more aware of the management accounting tools that can assist them to manage costs and waste, the environment might be saved for a greener tomorrow.

Figure 8 has a new dimension. The use of nearly all the words has declined since 2012. However, the use of the word

sustainability has increased. This may be since as reported by Schönbohm and Hofmann (2012) sustainability reporting may have reached maturity for large companies. Sustainability according to CGMA (2014:51) is “the achievement of long-term economic performance while minimising environmental impacts and generating positive value for society.” It is therefore in the interest of all that sustainability issues are being addressed more and more.



Figure 7: Analysis of 2014's annual and sustainability reports (Source: Author own)

It is evident that companies became steadily more aware of their responsibility to conduct greener business since 2003, thereby giving an answer to research question 2.

Management Accounting to the rescue

According to Rapacioli (2014) the majority of Chartered Global Management Accountants (CGMAs) agree that their companies might in future expect them to provide more environmental and societal data. They further argue that management accountants are confronted with the non-existence of an instruction from their company or demand for this kind of data. Furthermore the management accountant can assist companies to bring aboard sustainable business practices by: raising sustainable business as a strategic issue, incorporating sustainability information and analysis into all decisions, collecting, analysing, and measuring environmental and social data; and lastly developing a reporting strategy and approach that integrates sustainability issues. It may therefore be a key role for management accountants to play in a company to rather assist with taking action than just mere reporting of the issues.

Traditional accounting systems do not provide the needed information therefore environmental management systems (EMS) and environmental management accounting (EMA) can assist companies to change knowledge into new realities and increase the effectiveness of interactions between business and nature in the

community (Staniskis & Statiskiene 2006). It is important for management to develop and implement EMA and the different tools associated with it to enable the production of much needed information (Starik & Rands 1995). Therefore, the role of management accounting tools ought not to be underestimated.

Holt (2009) indicated that environmental management accounting evolved since 1990. In 1990 CIMA sponsored research on "the Costs to Industry of Adopting Environmentally Friendly Practices." The first article in 1990 was called "Management Accounting for a Cleaner World" and in 1997 CIMA sponsored "Environmental Management: The Role of the Management Accountant." Therefore it is plausible that management accounting can facilitate a greener environment.

The contribution of business activities to sustainable or green development and growth needs to be established. By establishing a monetary value for sustainability, polluting activities will be highlighted and in turn relevant decisions can be taken. For instance with Activity Based Management (ABM) that identifies activities which do not add value since they have a more extensive negative than positive impact from an economic, social and environmental focus, these activities can be reduced or even eliminated

(Moreno 2013). Therefore, EMA and the relevant tools may assist companies to reduce their environmental footprint by identifying negative activities.

Through the process of ABC and ABM negative activities may be reduced. According to Lindskog, Lundh, Berglund, Lee, Skoogh and Johansson (2011), companies are increasingly interested in reducing the environmental footprint of

their products and activities. ABC can for instance identify different environmental cost drivers and then the cost is allocated to a specific activity which, in the end allocates environmental costs to certain products thereby indicating the true cost of a product.

Căpusneanu (2008) did a study based on the role of ABC in green accounting and the results are displayed in Figure 9.

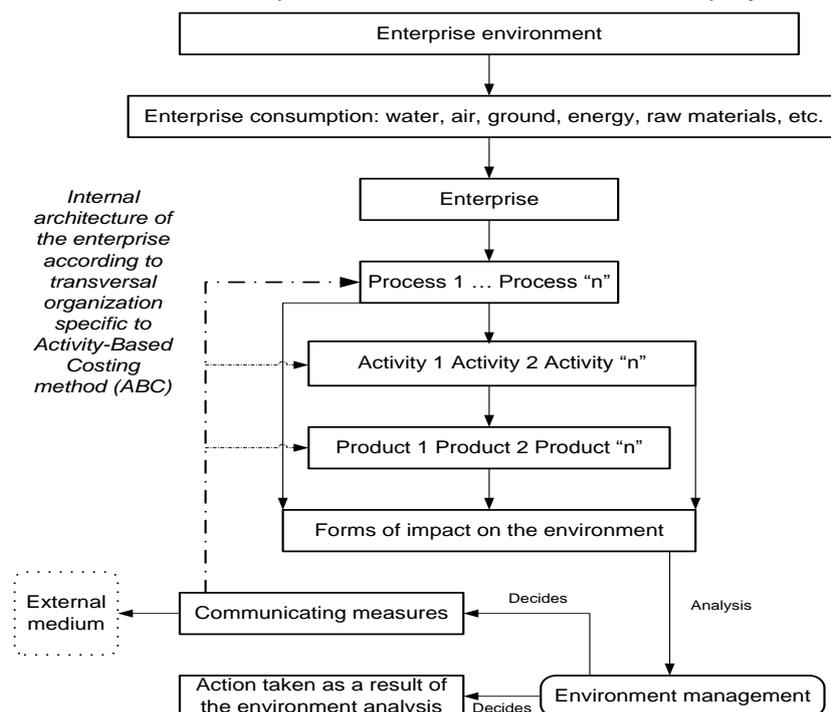


Figure 8: The environmental analysis according to the ABC method (Source: Căpusneanu (2008))

According to Căpusneanu (2008) ABC is a very efficient management accounting tool that identifies the true production costs and provides an incentive to improve continuing processes in the company or even re-engineering that is not necessarily established through traditional accounting systems and which don't disclose the environment costs. Eco-efficiency can be established through the use of ABC to reduce inputs such as materials, water, energy and non-product outputs such as waste and emissions (Almihoub, Mula & Rahman 2013). Furthermore, when companies can determine costs more accurately, it leads to improved decisions on management, cost savings, and

reporting initiatives (Drury 2008; Jasch 2009). CGMA (2014) furthermore argues that while cutting waste is important, value generation still needs to be enhanced. They also argue that waste should be identified and reduced on a sustainable basis. Hence, management accounting, more specifically ABC can assist companies with quality environmental decisions.

Companies can gain a competitive advantage through saving on costs as well as minimising on waste. Furthermore energy and resource efficiency should be taken into account at product and production level. Material Flow Cost Accounting (MFCA) is concerned with the

assessment of inefficiencies such as waste, undesired by-products or products that need recycling (ISO/DIS 2011). MFCA treats waste and remnants as products or cost objects. Material losses are allocated proportionally to products in their mass ratio (Murata 1989). Therefore, waste in the form of material losses or undesired products may be identified and in so doing, the environment can be safeguarded from future damage.

A MFCA flow chart can provide an observable picture of, for instance energy,

waste materials, emissions, recycling materials which may lead to prompt decision making by management to minimise environmental damage (Shu & Zhao 2013). MFCA can trace both the flows of final products and emissions (waste) in processes and recognises emissions as a product. MFCA calls products the "positive products" and emissions the "negative products" (METI 2007). Figure 10 is an example of a flowchart of the waste created in a manufacturing process.

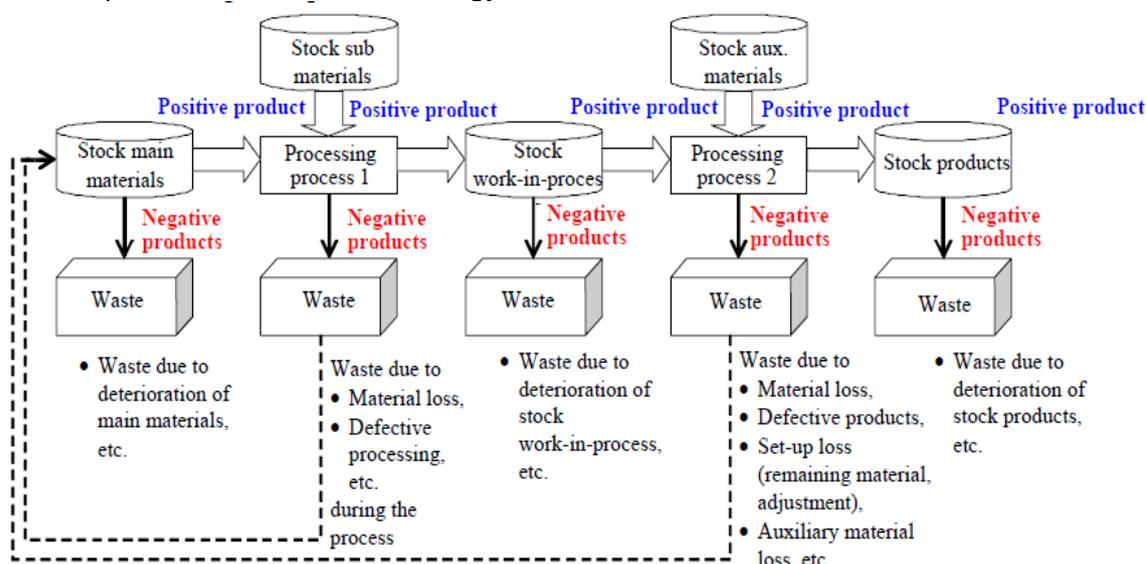


Figure 9: Flow chart of waste generation in a manufacturing process (Source: Meti 2007)

Therefore, by identifying the waste produced in the manufacturing process with the help of MFCA, the company may

be able to minimise their environmental impact.

In this section the use of ABC and MFCA were indicated as management accounting tools that could be used by companies to move towards a greener environment. This section therefore answered research question 3.

Conclusions

Our environment is endangered by the actions of companies and individuals. If companies do not start to employ much needed management accounting tools to assist them to manage cost, waste and emissions the fact that they are aware of their environmental footprint might be of academic interest. Further research needs

to be done to develop more tools and techniques to assist companies with the

management of their environmental footprint. Also the use of EVA and lean manufacturing can be explored as tools that can facilitate a greener environment. The use of management accounting tools in especially mining companies to facilitate

a greener environment will also be undertaken.

Future research

The Balanced Scorecard (BSC), one of Management Accounting's tools can also assist with the facilitation of a greener environment and may need to be explored further.

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