

# Does corporate environmentalism have an influence on management accounting practices?

*A study of companies in environmental-sensitive industries*

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## **Abstract**

**Purpose** - This study aims to investigate whether there is an association between level of corporate environmentalism as well as perceived importance of including environmental aspects in the management accounting practices to achieve overall strategic goals and design of environmental-related management accounting practices.

**Methodology** - The conceptualization proposed by Banerjee (2002) was used to measure the level of environmentalism and two proxies suggested by Frost and Wilmshurst (2000) to measure the design of management accounting practices. A web-based survey was distributed and answers were collected from 111 Swedish companies active in environmental-sensitive industries.

**Findings** - The results show high significant correlations between environmentalism and the design of management accounting practices (Hypothesis 1) as well as between perceived importance of environmental-related management accounting practices in order to achieve strategic goals and management accounting practice design (Hypothesis 2).

**Originality** - This is one of the first studies examining the association between environmentalism and design of management accounting practices. It contributes to the research field since previous research regarding this relationship has been limited.

**Keywords** - Corporate environmentalism; strategy; management accounting practices.

**Paper type** - Master thesis, business administration.

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## 1. Introduction

Companies' concern for environmental issues and performance or profitability has traditionally been seen as contradictions (Friedman, 1970; Porter & van der Linde, 1995). Contemporary research however, has noted that development of environmental-related management accounting practices is needed to attain potential benefits that can emerge from less negative impacts on the environment (Henri & Journeault, 2010; Melnyk, Sroufe, & Calantone, 2003; Epstein & Roy, 2001). This can for example be expressed in cost savings (Schroeder & Winter, 1997), competitive advantage (Porter & van der Linde, 1995), higher stock price due to the reduced risk (Feldman, Soyka, & Ameer, 1997) and the ability to deliver better products and services (Sroufe, Curcovic, Montabon, & Melnyk, 2000). In addition, Banerjee (2001) shows that it is possible to offer top quality products and be environmentally conscious at the same time.

Environmental issues have received increased attention in research over the last few decades (Aragón-Correa, Hurtado-Torres, Sharma, & García-Morales, 2008; Banerjee, 2002; Epstein & Roy, 2003; Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009). Examples from a business perspective are environment-conscious consumer behaviour, increased governmental pressures and changes in environmental regulations, international environmental agreements and certification standards such as the International Organization of Standardization (ISO) 14000 and industry environmental management practices (Porter & van der Linde, 1995; Banerjee, 2002; Sroufe, 2003; Henri & Journeault, 2010; Wu, 2008). These changes taken together have serious strategic implications for companies in all industries around the world (Banerjee, 2001; 2002). However, some industries have been shown to be more sensitive to environmental issues than others. These include manufacturing (Banerjee et al., 2003; Henri and Journeault, 2010), chemicals, pharmaceuticals, utilities (Banerjee et al., 2003; Banerjee, 2001) and mining and resources (Frost and Wilmshurst, 2000). A number of studies have suggested that managers perceive the environment more as a strategic issue rather than a moral or ethical concern (Aragón-Correa, Matías-Reche, & Senise-Barrio, 2004; Banerjee, 2001; 2002; Sharma & Vredenburg, 1998; Sharma, 2000). Firms can integrate environmental strategies at different levels of the organization (Banerjee, 2001). For example, environmental strategies at the corporate level may involve developing cleaner technologies, green markets and integrating green business portfolios. Corresponding actions at the business/marketing level may be new product development, changes in the process design and technology development (i.e. pollution prevention and waste management).

Henri & Journeault (2010) argue that increased demands for environmental effectiveness from different stakeholders have led organizations to integrate environmental issues into their management control systems. This integration is termed eco-control. They follow (Simons, 1987; 1990) definition of management control systems and define eco-control as the “formalized procedures and systems that use financial and ecological (environmental in this study) information to maintain or alter patterns in environmental activity”. Other scholars have used similar concepts, albeit with different terminology (Frost & Seamer, 2002; Sroufe, 2003)

Some research in the field tries to describe corporate approaches to the environment and their relationship to strategy (Argón-Correa, 1998; Banerjee, 2002; Hart, 1995). Others examine the antecedents of environmental strategy and how it varies among different- and in specific industries (Banerjee, Iyer, & Kashyap, 2003; Buil-Carrasco, Fraj-Andrés, & Matute-Vallejo, 2008; Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009; González-Benito & González-Benito, 2006; Wu, 2008). Another category of studies explores the relationship between firms’ environmental strategy or environmental management control systems and firm performance (Aragón-Correa, 2008; Klassen & McLaughlin, 1996; Melnyk, Sroufe, & Calantone, 2003). The fact that there is a relationship between strategy and management accounting has been argued by several researchers in contemporary studies (e.g. Dent, 1990; Simons, 2000; Samson, Langfield-Smith, & McBride, 1991). Yet, research regarding the relationship between environmental orientation/strategy and environmental-related management accounting seems to be fairly limited. This link is important since it is commonly the case that companies must serve the interest of the environment in order to thrive and even survive (Adams & Frost, 2008) and that companies must integrate environmental issues into the management accounting practices (MAPs) to successfully implement an environmental strategy (Epstein 1996b). Frost and Wilmshurst (2002) studied industry sensitivity as a factor associated with the adoption of environmental-related management accounting practices. They found that “the adoption of management accounting procedures does not appear to be driven solely by environmental sensitivity of the industry” and argue that further research is needed to identify why firms adopt environmental-related MAPs. Hence, the current study analyses companies in environmental-sensitive industries and suggests that the design of environmental-related MAPs is driven by environmental orientation/strategy as well as perceived importance of considering environmental aspects in the MAPs. Environmental-related MAPs can be categorized in two groups; standalone MAPs and inclusion of environmental aspects into existing MAPs where the inclusion is described as an initial step, followed by stand alone MAPs (Frost and Wilmshurst, 2002). Consequently, stand alone environmental-related MAPs is here viewed as more sophisticated and

associated with first, a higher level of environmentalism, and second, greater perceived importance of considering environmental aspects in the MAPs.

The remainder of this thesis is organized as follows. The next section describes the theoretical concepts used in the study and is followed by section three which discusses the research methods used. Section four presents the results from the study. Lastly we have a concluding discussion of the implications of the study and provide suggestions for future research in the topic.

## **2. Theoretical framework & hypothesis development**

### **Definition of constructs**

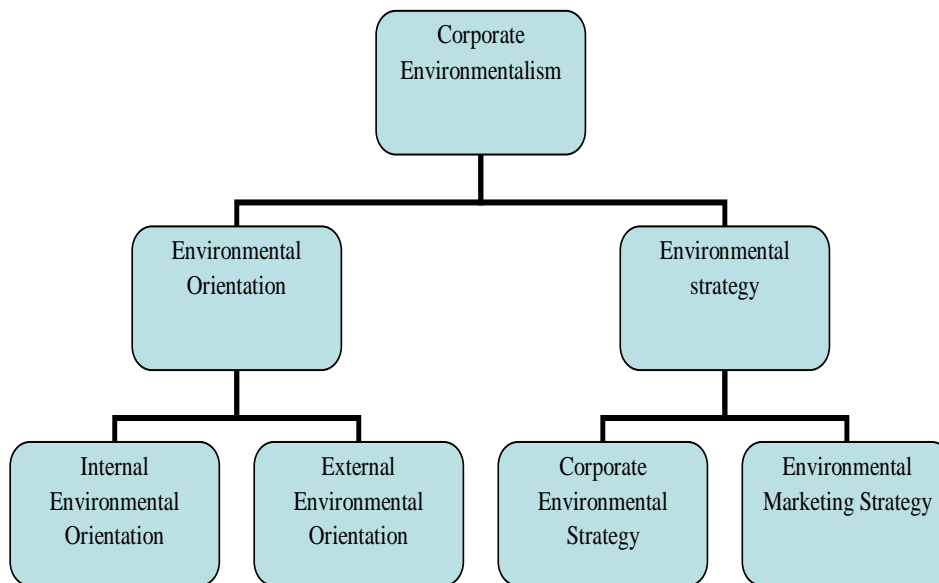
The definition of environmental strategy in this study includes more than just the corporate and business strategy of the firm. It also comprises management philosophies embodied in practices and programs used to integrate environmental issues in business strategies and operations (Perego, 2005). This overall construct is termed environmentalism (Banerjee, 2002).

### **Corporate environmentalism: a definition**

Corporate environmentalism contains two themes, environmental orientation and environmental strategy (Banerjee 2002). The first theme involves the firms' attitudes towards the environmental problems that arise along the value chain. The value chain is here described as all activities conducted, from development and manufacturing to consumption and service. The latter theme reflects the integration of environmental aspects in the firms' strategic planning process (Banerjee, 2002). The construct is illustrated in figure 1 and is further explained below.

*“Corporate environmentalism is the organization-wide recognition of the legitimacy and importance of the biophysical environment in the formulation of organization strategy, and the integration of environmental issues into the strategic planning process”*

Banerjee (2002 p.181).

**Figure 1.**

### ***Environmental Orientation***

Environmental orientation involves recognizing the firms' overall responsibility towards the environment. This understanding includes not only the impact the firm has on the environment but also the need to minimize it. It is related to the concept Corporate Social Responsibility since it encompasses corporate values and showing respect towards stakeholders (Banerjee, 2002; Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009). The planet is here seen as the ultimate stakeholder. Banerjee (2002) divides environmental orientation into two sub-themes:

#### **Internal environmental orientation**

This sub-theme is naturally internally focused and consists of organizational values and ethical behaviours across all levels in the hierarchy of the firm. It explains the environmental ideals in the firm and is often expressed in an environmental mission statement in annual reports (Banerjee 2002; Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009).

#### **External environmental orientation**

The external theme focuses on the perception of external stakeholders and the need to respond to their interests and demands. The sub-theme describes the need for a positive company image, practicing sustainable development and having a responsibility towards the society and future generation by protecting the environment (Banerjee 2002; Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009).

### ***Environmental Strategy***

Environmental issues can be integrated in the firms' strategic planning process. Environmental strategy reflects the degree of this integration at different levels of the organization. There are several strategic actions which may be subject to environmental concerns. These involve: new product development, location of manufacturing plants, R&D investments and technology development, concerning pollution prevention and waste management as well as product and process design (Banerjee, 2002). Environmental strategy is further divided into the two following sub-levels:

#### **Corporate environmental strategy**

Corporate strategy illustrates the decisions about what business the firm should be in and how to manage the different business units (Porter, 1996; Simons, 2000). Fraj-Andrés et al (2009) uses Banerjee's (2002) framework and describes corporate environmental strategy as involving decisions about new market entry, the adoption of more environmentally friendly technologies, new plant location and R&D and innovation investments. Corporate environmental strategy also deals with business portfolio management and market targeting decisions (Banerjee, 2001).

#### **Environmental marketing strategy**

Environmental marketing strategy on the other hand involves decisions at the business and functional levels of the firm (Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009). Here, parallels can be drawn to Porter's (1996) term business unit strategy. He describes this as dealing with how to compete in the market place to create competitive advantages. Hence, the objective of an environmental marketing strategy is to satisfy the environmentally aware customer segments needs and demands of greener products and services. This can be accomplished by for example redesigning products, packaging or the distribution channels to minimize their environmental impact. Using ecological messages in advertising and form strategic alliances with environmental organizations are other methods to satisfy this segment (Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009).

### **Management accounting practices: a definition**

To clarify the sometimes ambiguous terminology of concepts such as management accounting systems (MAS) and management control systems (MCS) we will use the definitions emphasized by Chenhall (2003). MAS is the systematic use of management accounting practices (MAPs) such as budgeting and product costing, whilst MCS further include less formal controls such as personnel control or clan control. Since the main focus has been on formal control in empirical studies of MCS and strategy (Langfield-Smith, 1997) management accounting is better suited for this thesis. The definition of MAPs is in line with the definition of MCS by Simons (1990)

as formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities.

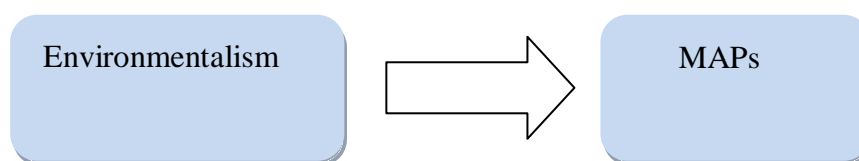
The MAPs included in this thesis are limited to product costing, capital budgeting, budgeting, performance measurement systems (PMS), internal accounting, transfer pricing systems, target costing and incentive systems.

### **Hypothesis development**

Contingency-based research has used different explanatory variables to explain the design of MAPs and it is widely accepted that the choice of appropriate MAPs depends on the unique situation of the firm (Gordon & Miller, 1976; Heyes, 1977; Waterhouse & Tiessen, 1978; Otley, 1980). Focus in early research has mainly been on factors such as external environment, technology, national culture, firm size and structure (Chenhall, 2003; Ittner & Larcker, 2001). Contemporary research has focused more on an additional variable; strategy, both explicitly and in combination with other variables (e.g. Fisher, 1995; Langfield-Smith, 1997; Chenhall, 2003) and it has been suggested that MAPs should be designed to support the strategy of the firm (e.g. Dent, 1990; Simons, 1990; Samson, Langfield-Smith, & McBride, 1991). Although research on strategy as an explanatory variable influencing MAPs has been widely documented, the research on the relation between corporate environmentalism or environmental strategy and MAPs has been scarce.

Even though environmentalism is merely about compliance for a lot of companies (Avila & Whitehead, 1993) it has been observed that a growing number of companies are moving beyond regulatory compliance making it a more central role in the strategic process (Epstein, 1996b; Reinhardt, 2000). Senior executives have realized that to implement an environmental strategy it is necessary to integrate environmental issues into the MAPs such as PMS and incentive system (Epstein 1996b) and Perego and Hartmann (2009) found that a more proactive environmental strategy is associated with a more sophisticated environmental PMS. This suggests that there is a positive association between environmentalism and MAPs (Figure 2).

**Figure 2.**



Frost and Wilmshurst (2000) identify two steps in the development of environmental-related MAPs. An initial step is the inclusion of environ-

mental aspect into the existing MAPs and a second significant step is stand alone environmental-related accounting practices. In other words, managers can either include information about environmental objects into their existing accounting practices or design separate accounting practices that undertake specific environmental objects in the design of environmental-related MAPs. It is assumed in this thesis that stand alone accounting practices is associated with more sophisticated environmental-related accounting practices whilst inclusion is seen as slightly less sophisticated. Based on the previous arguments, we hypothesize the following:

*H1. Environmentalism has a positive influence on the design of management accounting practices for environmental objects, such that a higher level of environmentalism is associated with more sophisticated environmental-related management accounting practices.*

It is important to note that it is not simply the existence of appropriately designed MAPs that enables a company to support a certain strategy, but also the perceived importance from key decision makers of the MAPs impact on the strategic goals (Langfield-Smith, 1997). The reason why firms design environmental-related MAPs could simply be a result of meeting regulatory compliances or to meet the pressure from various stakeholders in order to achieve legitimacy (Frost & Seamer, 2002), and not necessarily because it is perceived as important to achieve overall strategic goals. Hence, it is necessary to examine this relationship by studying the association between perceived importance of addressing environmental issues in the MAPs in order to achieve overall strategic goals and MAP design.

*H2. Perceived importance of taking environmental aspects into consideration in the management accounting practices to achieve overall strategic goals has a positive influence on design of environmental-related management accounting practices, such that a higher level of perceived importance is associated with more sophisticated environmental-related management accounting practices.*

### **3. Research methods**

#### **Survey process & sample selection**

The underlying presumption to the choice of industries to include was based on previous studies where environmentally sensitive industries, or industries with high environmental impact, have been identified or examined. These industries include manufacturing (Banerjee et al., 2003; Henri and Journeault, 2010), chemicals, pharmaceuticals, utilities (Banerjee et al., 2003; Banerjee, 2001) and mining and resources (Frost and Wilmshurst, 2000). Furthermore, Frost and Wilmshurst (2000) point out that firms oper-



ating in these industries tend to work more with environmental issues. Bouwens & Abernethy (2000) argue that the company size has implications for the presence of sufficiently developed formal MAPs. In addition, Merchant (1981) show that larger firms use formal control to a greater extent than interpersonal control. Both number of employees and annual turnover was used as size criteria of the sample. According to the European commission, large companies are defined as having more than 249 employees and an annual turnover of more than 50 million euro. However, an annual turnover of more than 50 million euro made the sample too small and the number was decreased to \$20 million. Sharma (2000) argues that companies with an annual turnover below \$20 million have neither the resources nor the motivation to go beyond regulatory compliance to environmental issues. Lastly, we excluded companies with more than 5000 employees (nine companies) since it was assumed that a few respondents would have difficulty in overseeing several MAPs and the environmentalism in those companies. Hence, the number of employees in the companies studied was between 250 and 5000 and the annual turnover was more than 150 million Swedish kronor (approximately \$20 million). A database provided by the Gothenburg University Library called Affärsdata was used to identify companies with the desired criteria. To identify companies in certain industries SNI codes were used, which is a Swedish industry classification system based on the European NACE standard (SNI codes included: 05-08, 10-17, 19-32 and 35). This resulted in a survey population of 339 Swedish companies. However, 7 companies were excluded due to recent bankruptcy or if the activity in the relevant industries only was an insignificant part of their total operations. The actual survey population consisted of 332 firms which all met the survey population criteria.

### **Email distribution & online questionnaire**

To find respondents with knowledge about the MAPs and environmental orientation within the firms we first contacted the companies by phone. The respondents' titles varied in different companies and included CEOs, CFOs, business controllers and environmental controllers. When a respondent lacked a holistic view of the MAPs and environmental orientation/strategy they were asked to consult a second or third colleague (e.g. environmental controller and CFO) to assure that correct answers were collected (Frost and Wilmshurst, 2000) An email was sent directly to the respondents with an introduction to the study and a link to the online survey. To avoid invalid responses we ensured the respondents that our intentions were of a non commercial purpose and that no answers could be tied to individual companies in the study. A reminder was sent to non-respondents emphasising the importance of their participation. The information was collected using the online survey tool Survey Monkey, one of the world's leading provider of

web survey tools. Out of the 332 respondents, answers were collected from 111 giving a response rate of 33,4 percent. The data was then analyzed using STATA (cf. section 4, Results).

### **Measures of constructs**

The questionnaire language was Swedish since it was assumed that it would give a higher response rate given that the respondents were native Swedish speakers (Perego, 2005). The translation of the items was important and therefore validated by our tutors. To avoid answers regarding parent- or sister companies we asked respondents to answer the questions in terms of the limited company they represented (see Appendix).

### **Corporate environmentalism**

To measure the environmental orientation/strategy of the firms we have considered several constructs. One of the options was the concept of proactive vs. reactive approaches to the environment based on the dimensions proposed by Miles & Snow (1978) entrepreneurial, engineering and administrative (Aragon-Correa, 1998). Another option was the reactive, pollution prevention and environmental leadership typology with a stakeholder perspective (Buisse & Verbeke, 2003). In this study however, we wanted a more comprehensive scale including, not only actions related to the strategy, but also the firms overall direction towards protecting the environment. Instead we adapted the concept of ‘corporate environmentalism’ proposed by Banerjee (2002) and later Banerjee et al. (2003) which consisted of four underlying constructs (internal/external environmental orientation and Corporate/marketing environmental strategy focus). The measurement construct has been validated for the consumer product sector (Buil-Carrasco et al., 2008) and further validated for industrial firms (Fraj-Andrés et al., 2009). In these studies, the authors try to explain why firms are environmentally oriented and develop environmental strategies using the factors social concern, environmental regulation, competitive advantage and management commitment. The underlying definition to this construct comprises the different approaches in the previous mentioned studies and combines proactiveness/reactiveness, stakeholder theory, importance of environmental issues and integration of environmental issues into the strategic planning process (Banerjee 2002; Fraj-Andrés et al., 2009).

We extracted the measurement construct of internal/external environmental orientation and corporate/marketing environmental strategy, which together constituted the concept corporate environmentalism (Banerjee 2002). For internal environmental orientation (IEO), four items that referred to importance of environmental preservation and diffusing such values and beliefs throughout the company was used. The four items assessing manage-

rial perceptions of environmental issues related to the company's financial situation and stakeholder demands were used to capture external environmental orientation (EEO). The corporate environmental strategy (CES) scale had five items measuring the degree to which environmental concerns were included in the firm's strategic planning process. To measure environmental marketing strategy (EMS) we used three items related to the extent to which product-market decisions were influenced by environmental issues. All items used seven point Likert-type scales where 1="strongly disagree", and 7="strongly agree". These constituted the first part of the questionnaire (see Appendix).

### **Management accounting practices**

To measure the degree of sophistication of MAPs two proxies were used. The first one regarded stand alone environmental-related MAPs and the second considered the inclusion of environmental objects within existing MAPs (Frost & Wilmschurst 2000). Environmental objects were defined as waste, energy usage, recycling, returnable packaging/containers, pollution and land remediation (Frost & Seamer, 2002; Frost & Wilmschurst, 2000).

To find support for hypothesis two, an additional proxy was used to address the perceived importance of environmental issues in management accounting practices to achieve overall strategic goals and objectives.

Only formal MAPs were included since empirical research that studies MCS and strategy focuses primarily on formal control (Langfield-Smith, 1997). The choice of MAPs to measure as well as the explanations given to the respondents was based on Ax, Johansson, and Kullvén (2009). Several practices included in the study have been identified in environmental contexts; product costing, capital budgeting (Frost & Wilmschurst, 2000) budgeting system, performance measurement (Frost & Wilmschurst, 2000, Henri & Journeault, 2007) and incentive systems (Henri & Journeault, 2007). In addition, target costing, transfer pricing, and internal accounting were added. The practices included are frequently mentioned in management control system- and management accounting research (Shields, 1997).

This part of the questionnaire was divided into eight sections where each section represented a management accounting practice. All sections consisted of four items where the first item concluded whether the company used the practice and item two to four were based on the three proxies aforementioned. The second item described the stand alone proxy and the third described the inclusion proxy. Items two and three used multiple choice questions limited to "yes" or "no" and the third item used a seven point Likert-type scale to measure the perceived importance of considering environmental aspects in the management accounting practices to achieve

overall strategic goals and objectives. In order to compound item two and three to a single measure for the sophistication we coded the “yes” or “no” answers on a three point scale where 3=stand alone practices for environmental objects, 2=inclusion of environmental objects into practices and 1=none of the previous mentioned. This made it possible to investigate if there was any support for hypothesis one. Appendix 1 shows the questionnaire used to measure the constructs.

Even though the construct has been validated for the industrial sector we performed a Cronbach’s alpha test to combine the items into the construct of environmentalism. In addition, a Cronbach’s alpha test was performed for each of the sub-themes. When performed for environmentalism we found a high reliability ( $\alpha=0,9188$ ). Similar levels of reliability were found for three of the themes, internal orientation ( $\alpha=0,9241$ ), corporate strategy ( $\alpha=0,8746$ ) and marketing strategy ( $\alpha=0,8852$ ). External orientation ( $\alpha=0,6563$ ) on the other hand, was not reliable enough ( $\alpha \geq 0,7$ ) to combine the underlying items into one construct (Nunnally & Bernstein, 1994). However, previous studies have combined constructs with an alpha close to 0,7 (0,62) (Henri, 2006) which implies that it is feasible.

## **4. Results**

The hypotheses of this thesis suggested that there should be an association between the degree of environmentalism and the MAP sophistication as well as importance of environmental-related MAPs and level of MAP sophistication, since it was assumed that environmentalism and importance have an impact on the design of environmental-related MAPs.

The remainder of this section is organized as follows. First, descriptive statistics is presented. Second, the result of the association between environmentalism and the sophistication of each practice is reported and discussed. Finally, hypothesis two is tested.

### **Descriptive statistics**

As reported in Table I the vast majority of the respondent companies used product costing, capital budgeting, budgeting, PMS, internal accounting and incentive systems. Transfer pricing was used to a lesser extent whilst target costing was only used by 49,5 percent of the companies ( $n=55$ ). For each management accounting practice we categorized the firms using stand alone environmental accounting practices (Stand alone), only inclusion of environmental issues into existing accounting practices (Included) and none of the above (None).

**Table I** - Descriptive statistics of dependent variables

<i>Variable</i>	n (valid obs.)	Stand alone*	Included	None
ProCost	111	66	13	32
CB	110	66	22	22
Budget	109	49	31	29
PMS	105	78	6	21
IntAcc	107	74	9	24
TP	78	23	11	44
TC	55	31	5	19
InS	91	24	5	62

*Note:*

\*Companies that used both stand alone and included were allocated to the stand alone column.

## **Environmentalism and design of MAPs**

To test for an association between the level of environmentalism (ENV) and the sophistication of various management accounting practices ordinal probit regressions were undertaken. This was first tested for corporate environmentalism with each of the practice (Table II) and later tested for each of the four underlying themes of environmentalism with each practice (Table III-VI).

Significant associations were found between level of environmentalism and stand alone environmental-related product costing (ProCost), capital budgeting (CB), budgeting (Budget), performance measurement systems (PMS), internal accounting (IntAcc), transfer pricing (TP) and incentive systems (InS). All associations were significant at the 0.01 level. The only practice where a significant association was not found was target costing (TC). One explanation for this occurrence may be that target costing is a relatively new practice and that there is a low adoption rate (Joshi, 1999) as shown by the low frequency of use in the sample (Table I).

The results show that companies with high level of environmentalism design stand alone environmental-related MAPs to a greater extent than companies with lower level of environmentalism. It also implies that the level of environmentalism is not only associated with stand alone practices but also the inclusion of environmental objects in current practices, although, with a lower level of environmentalism. The results provide evidence for hypothesis one.

**Table II -**

Corporate environmentalism		Management accounting practices design						
Factors	ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
ENV	Coef. 0.613** P> z  (0.000)	0.426** (0.000)	0.355** (0.003)	0.764** (0.000)	0.400** (0.004)	0.418** (0.005)	0.069 (0.742)	0.539** (0.001)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

Furthermore the results show that the strongest association is between environmentalism and performance measurement systems. This supports previous results of the alignment between environmental performance measurement systems and environmental strategy (Perego and Hartmann, 2009). Since PMS should be design to support the strategic orientation (Simons, 2000) the findings are not unexpected. Strong positive correlations were also found between environmentalism and incentive systems, product costing and capital budgeting. There is a linkage between PMS and incentive systems given that the rewards are often based on performance measures. As Epstein (1996b) reported, managers needed to tie incentives to the environmental performance in order to implement the environmental strategy.

Numerous companies are also realizing the need to measure environmental costs, for instance through their product costing and capital budgeting, in order to develop and implement environmental strategy (Epstein, 1996a). This is supported by the strong correlation for product costing and capital budgeting.

The overall construct of environmentalism is assumed to have an impact on the sophistication of all practices except target costing. But which underlying theme is supporting this association is still unknown. That is why each theme will be analyzed separately.

### **Internal Environmental Orientation**

When analyzing the association between the level of internal environmental orientation (IEO) and the sophistication of the practices we found several significant correlations. At the 0.01 significance level we found correlations with product costing, capital budgeting, performance measurement systems and incentive systems and at the 0.05 level, budgeting and transfer pricing. An interesting observation is that a significant association with internal accounting only occurred at the 0.1 level. We found no significant correlation with target costing.

**Table III -**

Internal Environmental Orientation		Management accounting practices design							
		ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
IEO	Coef.	0.297**	0.294**	0.238*	0.470**	0.191	0.301*	- 0.060	0.340**
	P> z	(0.002)	(0.002)	(0.010)	(0.000)	(0.065)	(0.013)	(0.691)	(0.006)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

### External Environmental Orientation

Positive correlations were found between external environmental orientation (EEO) and product costing and capital budgeting (at the 0.01 level). When analyzing the associations at a significance level of 0.05 we found that budgeting, performance measurement and transfer pricing positively correlated with EEO. This theme had almost the same low significance in the correlation with internal accounting as IEO and no significant correlation with target costing. The association with incentive systems however differed and was only significant at the 0.1 level. This suggests that firms with a high external environmental orientation do not reward employees based on environmental performance to a higher extent than those firms with a lower external environmental orientation.

**Table IV -**

External Environmental Orientation		Management accounting practices design							
		ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
EEO	Coef.	0.535**	0.331**	0.224*	0.301*	0.221	0.277*	- 0.009	0.216
	P> z	(0.000)	(0.003)	(0.032)	(0.017)	(0.069)	(0.029)	(0.955)	(0.083)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

None of the sub-themes of environmental orientation had any significant correlation (at the 0.05 level) with internal accounting. This was unexpected since it is often linked to budgeting. On the other hand there were tendencies for an association (0.1 level) and the correlation was almost equally as strong. The strong association between environmental orientation and PMS for both sub-themes strengthen prior research on the association between the

concept of corporate social responsibility and PMS (Bradgon & Marlin, 1972; Bowman & Haire, 1975; Parket & Eibert, 1975).

### Corporate Environmental Strategy

When testing for the association between corporate environmental strategy and the design of MAPs we found a positive correlation for product costing, capital budgeting, budgeting, performance measurement system, internal accounting and incentive systems at a significance level of 0.01. Transfer pricing correlated with CEO at a significance level of 0.05 and target costing had no significant correlations.

**Table V -**

Corporate Environmental Strategy		Management accounting practices design							
		ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
Factors									
CES	Coef. P> z	0.435** (0.000)	0.281** (0.005)	0.260** (0.008)	0.669** (0.000)	0.384** (0.001)	0.305* (0.013)	0.194 (0.265)	0.531** (0.000)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

### Environmental Marketing Strategy

The results for environmental marketing strategy were slightly different from those for CES. Whilst CES was representative for the overall construct of environmentalism, EMS lacked significant correlation with both budget and internal accounting.

**Table VI -**

Environmental Marketing Strategy		Management accounting practices design							
		ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
Factors									
EMS	Coef. P> z	0.365** (0.000)	0.229** (0.006)	0.096 (0.215)	0.262** (0.007)	0.026 (0.764)	0.246* (0.017)	0.190 (0.130)	0.240* (0.016)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

### Importance of Management accounting practices

Since the existence of appropriate MAPs is not sufficient to establish that MAPs supports the strategic objectives of the firms, we tested for an



association between perceived importance of including environmental aspects in MAPs to support overall strategic goals and MAP design. To test for this association ordinal probit regressions were undertaken and the results of the analysis are reported in Table VII.

The results indicate that there is a significant correlation (at the 0.01 level) between perceived importance and design for all practices which provides support for hypothesis two. It is however noted that it is perceived as important to take environmental aspects into consideration in TC for firms with more sophisticated TC which is somewhat odd considering prior results where no significant correlation was found between level of environmentalism and the design of TC.

**Table VII -**

		Management accounting practices design							
Factors		ProCost	CB	Budget	PMS	IntAcc	TP	TC	InS
Importance	Coef. P> z	0.530** (0.000)	0.402** (0.000)	0.538** (0.000)	0.687** (0.000)	0.581** (0.000)	0.748** (0.000)	0.718** (0.000)	0.488** (0.000)

*Notes:*

\*Correlation is significant at the 0.05 level

\*\*Correlation is significant at the 0.01 level

## 5. Discussion, conclusion and suggestions for future research

The objective of this thesis, as reflected in the hypotheses, was to examine whether corporate environmentalism and perceived importance of environmental-related management accounting practices would influence the design of MAPs.

The results confirmed that there was a positive significant relationship between corporate environmentalism and the sophistication of almost all management accounting practices included in the study. This suggests that companies with high environmentalism design a wide spectrum of different environmental MAPs and that these companies often design stand alone practices regarding environmental objects. In other words, to support the environmentalism of the firm, the company needs to make environmental issues visible in different MAPs and thus in different parts of the organization.

The results did not show any major difference in the relationship between the individual dimensions of environmentalism and MAP design. This further supports the previous validation of the measurement construct

and suggests that if a company has a high level of environmentalism it becomes visible in all four dimensions. However, this limits the possibilities to draw some conclusions of how the different dimensions individually affect the design of MAPs. It can be argued that firms need a formal system to enhance their internal and external environmental orientation and support their environmental corporate- and marketing strategy. The formal MAPs enables firms to account for environmental impacts and act upon them.

The results also confirmed that there was a positive significant relationship between the perceived importance of including environmental aspects into management accounting practices to achieve overall strategic goals and MAP design. This suggests that environmental issues in management accounting have gone beyond regulatory compliance and legitimacy aspects and are now often integrated in the strategic process to enable companies to become more competitive. Environmental issues are in fact strategic issues which have been suggested in prior studies and the management accounting practices have to be updated and redesigned to support this strategic change.

Since this is one of the first empirical studies that try to describe the association between corporate environmentalism and environmental related management accounting practices there are still several avenues for future research in the field. Even if a positive association was found between environmentalism and design, specific design features can have an indirect effect on the use of MAPs (Perego, 2005) and the use features have a direct effect on the implementation of strategy (Simons, 2000). Therefore it would be interesting to investigate if similar significant correlations would be found between level of environmentalism and use of environmental-related MAPs.

As this thesis only investigates environmentalism in isolation it is suggested that numerous moderating variables (e.g. nationality, firm size and structure of the firm) should be used to investigate how they affect the relationship. A contingency variable that was not taken into consideration in the thesis was the autonomy of the firms. Consequently, this study does not analyze whether firms choice of management accounting practices is affected by a parent company or another institution. This type of forced selection may affect both the decision to adopt a MAP and the design of it. An examination of that relationship (quantitative or qualitative) may be an interesting field of study in the future. Furthermore, a qualitative study of how environmental firms use their MAPs to consider environmental aspects is another interesting approach since it makes a deeper analysis possible. There is also a need to replicate this study although with other accounting practices. This will capture a wider spectrum of management accounting.

Even though associations were found, the direction of this relationship is not established, hence, there is a need for longitudinal studies of the association.

Another limitation of this study is that it does not quantify the management accounting practices. For example some companies may have one or two stand alone environmental performance measures while others have several. It has been shown that alignment of environmental performance measures to strategy is best achieved through quantification and managerial sensitivity towards them (Perego and Hartmann, 2009). We suggest that future research includes this dimension. Here we would like to point out that size should be used as a control variable since it has been shown that it significantly correlates with the number of environmental performance measures (Perego and Hartmann, 2009).

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## Appendix

### Appendix 1 – Questionnaire

Syftet med studien är att kartlägga hur miljöarbetet styrs i olika företag i förhållande till strategisk inriktning. Frågeformuläret är uppdelat i två delar där den första syftar till att fånga upp miljöinriktning och miljöstrategi i företaget och den andra till hur företaget aktivt arbetar med miljö med hjälp av olika styrmedel.

Vi ber er svara utifrån det aktiebolag (juridiska enhet) där ni som respondent är verksam. Detta är vad som i frågeformuläret avses med företag.

#### DEL 1 – Miljöinriktning och Miljöstrategi

Första delen är utformad i fyra sektioner med ett antal påståenden för varje sektion. Påståendena graderas på en sjugradig skala där 7 representerar ”instämmer till fullo” och 1 ”instämmer inte alls”.

Vänligen indikera i vilken utsträckning följande påståenden överensstämmer med Ert företag.

<b>1. Intern miljöinriktning</b>	Instämmer inte alls	1	2	3	4	5	6	7	Instämmer till fullo
A. I vårt företag gör vi en samlad insats för att varje medarbetare ska förstå vikten av att skydda miljön.	1	2	3	4	5	6	7		
B. Vårt företag har en tydlig policy som uppmanar miljömedvetenhet i varje del av verksamheten.	1	2	3	4	5	6	7		
C. Att värna om miljön är en högt prioriterad aktivitet i vårt företag.	1	2	3	4	5	6	7		
D. Att värna om miljön är en central värdering i vårt företag.	1	2	3	4	5	6	7		
<b>2. Extern miljöinriktning</b>									
A. Den ekonomiska framgången för vårt företag är inte beroende av tillståndet i den naturliga miljön. (R)	1	2	3	4	5	6	7		
B. Vårt företags ansvar gentemot kunder, aktieägare och anställda är viktigare än vårt ansvar att skydda och bevara miljön. (R)	1	2	3	4	5	6	7		
C. Att skydda och bevara miljön är avgörande för vårt företags överlevnad på lång sikt.	1	2	3	4	5	6	7		
D. Vårt företag har ett ansvar att skydda	1	2	3	4	5	6	7		

---

och bevara miljön.

---

### 3. Miljöstrategi på företagsnivå

A. Vårt företag har integrerat miljöfrågorna i den strategiska planeringsprocessen.	1	2	3	4	5	6	7
B. I vårt företag innebär kvalitet också att minska negativ miljöpåverkan hos våra produkter och processer.	1	2	3	4	5	6	7
C. I vårt företag gör vi allt för att relatera miljömålen till våra övergripande mål.	1	2	3	4	5	6	7
D. Vårt företag är engagerat i att utveckla produkter och processer som minimerar miljöpåverkan.	1	2	3	4	5	6	7
E. Miljöfrågor tas alltid i beaktning i vårt företag när vi utvecklar nya produkter.	1	2	3	4	5	6	7

### 4. Miljöstrategi på affärs-/konkurrensnivå

A. I vårt företag betonas miljöaspekter för våra produkter och/eller tjänster i våra annonser.	1	2	3	4	5	6	7
B. Vårt företags marknadsföringsstrategier för våra produkter och/eller tjänster har kraftigt påverkats av miljöhänsyn.	1	2	3	4	5	6	7
C. I vårt företag är produkt- och marknadsbeslut alltid påverkade av miljöhänsyn.	1	2	3	4	5	6	7

*Source:* Banerjee (2002)

## DEL 2 - Miljöarbete

Denna del av studien syftar till att urskilja hur miljöobjekt inkluderas i olika ekonomiska styrmedel samt hur viktigt det är att beakta miljöaspekter i syfte att uppnå företagets övergripande mål.

Även denna del är utformad i sektioner (5-12) där varje sektion innehåller fyra frågor (A, B, C, D). Frågorna A, B och C besvaras med "JA" eller "NEJ" och D genom gradering på en sjugradig skala där 7 representerar "i mycket stor utsträckning" och 1 "i mycket liten utsträckning". Vissa styrmedel kan ibland benämnas annorlunda i olika företaget och därför uppmanar vi respondenten att läsa under varje rubrik för en kort förklaring av respektive styrmedel.



En del begrepp används genomgående i frågeformuläret. Därför ges en kort förklaring av dessa begrepp.

**Miljöobjekt** kan avse avfall, energiförbrukning, återvinning, retur av emballage/behållare, föroreningar och marksanering.

**Övergripande mål** avser vad som är viktigt för Ert företag och inkluderar således alla strategiska mål (exempelvis ökad lönsamhet, ökad försäljning, ökad marknadsandel, ökad kundnöjdhet).

## 5. Produktkalkylering

*Innebär att man gör en sammanställning och fördelning av uppskattade eller konstaterade kostnader och/eller intäkter för ett visst objekt som exempelvis produkt, kund, tjänst, order, avdelning eller miljö. Exempel på metoder som används är självkostnadskalkylering, bidragskalkylering och ABC-kalkylering.*

---

A. Använder ni produktkalkyler i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 6.*

---

B. Upprättar ni eller planerar ni att upprätta särskilda kalkyler för kostnader relaterade till miljöobjekt (t.ex. kostnadskalkyl för avfall, kostnadskalkyl för energiförbrukning)? JA ( ) NEJ ( )

---

C. Inkluderar ni eller planerar ni att inkludera kostnadsposter relaterade till miljöobjekt vid upprättandet av kalkyler för andra objekt (t.ex. kostnadspost för avfall i produktkostnadskalkyl)? JA ( ) NEJ ( )

---

### Om frågorna B och/eller C besvarats med JA:

D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i era produktkalkyler för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7

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## 6. Investeringskalkylering

*En investeringskalkyl är vanligtvis en sammanställning av in- och/eller utbetalningar för ett visst objekt under dess ekonomiska livslängd. Vid investeringskalkylering antas således ett långsiktigt tidsperspektiv. Investeringar kan göras i syfte att reducera kostnader och därmed reducera framtida utbetalningar.*

---

A. Använder ni investeringskalkyler i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 7.*

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B. Upprättar ni eller planerar ni att upprätta särskilda investeringskalkyler för in- och/eller utbetalningar relaterade till miljöobjekt (t.ex. kalkyler för investering i avfallsreducering,

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kalkyler för investering i alternativa energikällor)?

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- C. Inkluderar ni eller planerar ni att inkludera kalkylposter relaterade till miljöobjekt i investeringskalkyler för andra objekt (t.ex. utbetalningar för energiförbrukning vid upprättandet av investeringskalkyl för maskin)? JA ( ) NEJ ( )
- 

**Om frågorna B och/eller C besvarats med JA:**

- D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i era investeringskalkyler för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7
- 

**7. Budgetering**

*Budgetering innebär en sammanställning av kostnader och intäkter/ in- och utbetalningar/ tillgångar och skulder för en kommande period (månad, kvartal, år) i olika typer av budgetar. Man skiljer på huvudbudget och delbudget. Huvudbudgetar anses mer övergripande medan delbudgetar är mer specifikt inriktade på olika områden av verksamheten. Exempel på huvudbudget är resultatbudget och likviditetsbudget. Exempel på delbudgetar är försäljningsbudget, inköpsbudget och personalbudget.*

---

- A. Använder ni budgetar i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 8.*

---

- B. Upprättar ni eller planerar ni att upprätta särskilda budgetar för miljöobjekt (t.ex. avfallsbudget, återvinningsbudget)? JA ( ) NEJ ( )
- 

- C. Inkluderar ni eller planerar ni att inkludera miljörelaterade budgetposter i budgetar för andra objekt (t.ex. avfallskostnader i produktionsbudget)? JA ( ) NEJ ( )
- 

**Om frågorna B och/eller C besvarats med JA:**

- D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i era budgetar för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7
- 

**8. Prestationsmätning**

*Prestationsmätning benämns ofta som synonymt med mätning av nyckeltal eller KPI (Key Performance Indicators). Tanken är att lägga fokus på de aktiviteter som anses viktiga av företagets interna och/eller externa intressenter genom att mäta prestationer för dessa. Med prestationer avses vad som presterats eller vad som i framtiden ska presteras i finansiella likväl som icke-finansiella termer.*

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A. Använder ni prestationsmätt i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 9.*

---

B. Upprättar ni eller planerar ni att upprätta särskilda prestationsmätt för miljöprestationer (t.ex. energiförbrukning per maskintimme, procentuellt återvinningsbart material, förorening per produktionsenhet)? JA ( ) NEJ ( )

---

C. Inkluderar ni eller planerar ni att inkludera finansiella och/eller icke-finansiella aspekter av miljöobjekt i prestationsmätt för prestationer relaterade till andra objekt (t.ex. energikostnad per tidsenhet per aktivitet, kundtillfredsställelse med produkts energiförbrukning vid mätning av kundtillfredsställelse)? JA ( ) NEJ ( )

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**Om frågorna B och/eller C besvarats med JA:**

D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i era prestationsmätt för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7

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### 9. Internredovisning

*Den interna redovisningen innebär att man rutinmässigt samlar in, registrerar, bearbetar och rapporterar mer detaljrik och till viss del annan information om t.ex. kostnader, förbrukning, väntetid, utbildning och avfall än den som tas fram i den externa redovisningen. Det görs i syfte att erhålla ett bättre underlag för aktörer inom företaget (t.ex. företagsledning, avdelningsansvariga, resultatansvariga) vid beslutsfattande, uppföljning och planering*

---

A. Använder ni internredovisning i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 10.*

---

B. Upprättar ni eller planerar ni att upprätta särskild internredovisning för information om miljöobjekt (t.ex. kostnader för avfall och kostnader för energiförbrukning för olika företagsenheter)? JA ( ) NEJ ( )

---

C. Inkluderar ni eller planerar ni att inkludera miljörelaterade informationsposter i den interna redovisningen för andra objekt (t.ex. information om energikostnader vid redovisning av produktionskostnader)? JA ( ) NEJ ( )

---

**Om frågorna B och/eller C besvarats med JA:**

D. Hur viktigt bedömer ni att det är att beakta mil- 1 2 3 4 5 6 7

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---

jöspekter i er interna redovisning för att uppnå ert företags övergripande mål?

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### 10. Internprissättning

*Internprissättning innebär att företaget använder sig av interna priser mellan avdelningar och/eller aktiviteter. Detta görs för att generera ett värde för de prestationer utförda av den levererande enheten i form av en intäkt och följaktligen belasta den mottagande avdelningen med en kostnad.*

---

A. Använder ni internprissättning i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 11.*

---

B. Upprättar ni eller planerar ni att upprätta särskilda internpriser för miljöobjekt (t.ex. internpris för avfall, internpris för energiförbrukning)? JA ( ) NEJ ( )

---

C. Inkluderar ni eller planerar ni att inkludera kostnadsposter relaterade till miljöobjekt i er interna prissättning för andra objekt (t.ex. kostnader för återvinning i internpriser för produkter, kostnader för avfall i internpris för material)? JA ( ) NEJ ( )

---

### Om frågorna B och/eller C besvarats med JA:

D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i er internprissättning för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7

---

### 11. Målkostnadskalkylering (Target costing)

*Målkostnadskalkylering används främst vid utveckling av nya produkter och innebär att man redan i planeringsfasen fastställer kostnadsmål utifrån givna vinst- och/eller marknadsmål. Det innebär att man redan i tidigt skede kan undersöka möjligheter till kostnadsreducering samtidigt som olika kundkrav fastställs.*

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A. Använder ni målkostnadskalkyler i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen gå vidare till fråga 12.*

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B. Upprättar ni eller planerar ni att upprätta särskilda kostnadsmål för miljöobjekt vid utvecklandet av nya produkter (t.ex. kostnadsmål för avfall, kostnadsmål för föroreningar)? JA ( ) NEJ ( )

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C. Inkluderar ni eller planerar ni att inkludera kostnadsposter relaterade till miljöobjekt i er målkostnadskalkylering för andra objekt (t.ex. avfallskostnader inkluderas i produktionskost-)

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nader)?

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**Om frågorna B och/eller C besvarats med JA:**

- D. Hur viktigt bedömer ni att det är att beakta miljöaspekter vid er målkostnads kalkylering för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7
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**12. Belöningsystem**

*Belöningsystem innebär att individer eller grupp belönas finansiellt (t.ex. vinstdelning, bonuslön) och/eller icke-finansiellt baserat på prestationer. Det används i de flesta fall för att motivera medarbetarna att förbättra utförandet av uppgifter.*

- A. Använder ni belöningsystem i ert företag? JA ( ) NEJ ( )

*Om "NEJ", vänligen klicka på slutför.*

- B. Upprättar ni eller planerar ni att upprätta särskilda belöningsystem grundade på prestationer relaterade till miljöobjekt (t.ex. avfallsreducering, energiminskning)? JA ( ) NEJ ( )

- C. Inkluderar ni eller planerar ni att inkludera prestationer relaterade till miljöobjekt som del i belöningsystem grundade på prestationer gällande andra objekt (t.ex. energikostnadsreducering som en del av resultat per produktionsenhet)? JA ( ) NEJ ( )
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**Om frågorna B och/eller C besvarats med JA:**

- D. Hur viktigt bedömer ni att det är att beakta miljöaspekter i era belöningsystem för att uppnå ert företags övergripande mål? 1 2 3 4 5 6 7
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**Tack för din medverkan!**

**Huvudansvarig korrespondent**

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