Environmental Strategy and Competitiveness

An examination of the Swedish construction industry

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Abstract

The purpose of this thesis is to study how the process of introducing an environmental strategy has led to competitiveness in the Swedish construction industry. Previous research in the area indicated that there was insufficient empirical evidence in the field and this study hopes to increase the empirical understanding for the relation between the concepts.

Research conducted was of qualitative nature and the semi-structured interview was used to gather information from Sweden's three largest construction companies. Managers from the environmental department in the three companies were chosen as respondents and their views on the company's environmental strategy was formed and its relation to competitiveness was captured.

The results of the study reviled that the companies have not had a clear relation to competitiveness when developing their environmental strategies and consequently have found it hard to differentiate themselves for their competitors. It was also found that the environmental strategy mainly developed through the pressure of external forces and that there was a lack of internal initiative to include elements of competitiveness into the strategy.

Key words: Competitiveness, environmental strategy, environmental differentiation, eco-efficiency.
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Chapter 1: Introduction

This chapter introduces the topic of this paper and provides a discussion that links the important concepts of the paper together. It also defines the problem and describes the purpose of the paper.

1.1 Problem introduction

In recent years, environmental problems have received much attention in both society and the business world (Breeman, 2009). The academic community has also directed their attention to this problem. Concepts like environmental strategy, sustainable development, and environmental differentiation have emerged, aimed at guiding businesses in their environmental initiatives. Looking closer at Sweden, it is a country that over the past few decades has seen a big change in how firms conduct their business. Swedish firms are now actively engaging in environmental issues, in many instances exceeding what government regulation requires (Svenskt Näringsliv, n.d.). Many industries have adapted their corporate strategy in an environmental direction; among these are the transportation, food and drink, and fashion-industry (Edwall, 2008, Aspevall, 2009, Ostrom 2003).

The environmental issues continue to grow and there is a consensus in the scientific community that the climate is changing (Oreskes, 2004). Firms today also believe in the underlying principle that the earth is no longer healthy and those companies feel that curing earth’s problems will lead to opportunities to make money (Reinhardt, 1999).

It has been argued that focusing on environmental issues conflicts with business performance and that ignoring such issues will increase competitive advantage (Lash and Wellington, 2007). The relationship that environmental sustainability has strategically on a firm’s competitiveness and business performance have not been given much attention by the academic community until recent years (Yu-Shan Chen, 2006). However, findings from researchers such as Eiadat (2008) have found that there is a positive correlation between environmental involvement and business performance; arguing environmental involvement can actually increase profit and firms choosing not to adapt are left worse off. This is indicating that the view on environmental issues and strategies are changing. It has gone from being seen as a problem as Lash and Wellington (2007) describe it to a business opportunity as is suggested by Reinhardt (1999); a move that has been said to be the result of external pressures from governments, customers, employees, and competitors (Berry, 1998).

Choosing to follow a strategy that does not undermine the competitiveness of the company is vital to any initiatives made with an environmental focus in mind. Different industries will establish different strategies for gaining a competitive advantage from environmental initiatives considering the structure of the industry where they are acting, and their role within the industry (Reinhardt, 1999). The construction industry for
instance, may not have the same premise for what brings economic benefits as other industries such as car manufacturing. Taking into consideration circumstances (customers, competitors, level of technology) that make economical benefit possible for one company, but may not for another. The previous research indicates that there is a lack of empirical understanding in regards to the relation between environmental strategies and competitiveness (Lützkendorf and Lorenz, 2005). Therefore, it is interesting to explore the forming of the firm's environmental strategy and its relation to competitiveness within the construction industry in Sweden.

1.2 Problem Discussion

In the past few years the construction industry has seen a pivotal change toward environmental sustainability strategies stemming from governmental regulation and an increase in customer demand (Ofori, 2003). The way environmental strategy can change over time has been seen in how materials are being exchanged for less hazardous and less resource demanding, how they tend to conserve and reduce energy usage, and the efforts made in the recycling of materials made this a good industry to study. It is also worth noting that the authors believe this to be an interesting study to others, given the numerous external entities that influence the strategies of construction. For example, the regulations of the government, employees, and customers to a large extent promote change (Reinhardt, 1999).

When trying to identify a relation between the environmental strategy of an industry and its competitiveness, looking at the introduction of this strategy becomes interesting. The factors that influenced how the strategy was formed give important background information, describing why the strategy was formed the way it was and whether there was any relation to competitiveness in the process. During previous research it became clear that the environmental strategies in the construction industry are mainly making changes that are referred to as incremental change. Authors such as (Neal, 1995) define it as "tending to make minor modifications to the current system" (p.48). It is a relevant observation since it further suits the purpose of the study since it means that changes are made over time, making it clearer to find the factors that influenced the formation of the strategy.

The prevailing perspective among business people in sustainability issues is called weak sustainability, a view of sustainability that advocates a substitution between economical value and natural or environmental resources in order to maintain sustainability (Goodland, 1995). This view allows a degradation of natural resources. For example, depleting mineral reserved to create other types of capital in factories and has, therefore, been rejected by authors such as Beckerman (1994).

The strong sustainability position does not believe in substitution to the same extent, and considers that both nature and the economy should be sustained and that one cannot be sustained without the other (Goodland, 1995). Adopting this view could inspire managers to do more than just what is regulated and in the process find that there are economic incentives to investing in environmental initiatives as well. As mentioned earlier, it seems as though this is where the reality is heading, where more and more
industries such as the transportation and food and drink industry are adopting more proactive responses.

The proactive response indicates that businesses believe that there is something to gain from getting involved in environmental issues, such as: reduced costs, increased profits, improved corporate image or product differentiation (Reinhardt, 1999). There can be many ways to achieve these advantages. A strategy that has been frequently used is effective use of resources through creating less waste and pollution. This process tends to incorporate mostly incremental changes (relative changes) and is called eco-efficiency. Eco-efficiency is the possibility of making economical value, i.e. goods and services, while lessening negative impacts on the environment and reduced consumption of natural resources (De Simone, 1997). The strategy involves a variety of different measures that can be undertaken to improve the eco-efficiency of a firm. Examples of actions that could fall under this strategy are reducing material and energy usage in the production process, less harmful emissions, the use of recyclable and renewable resources. However, this process should be tempered with the reality that eco-efficiency is still wasteful and a poor form of sustainability, where a shift toward eco-effectiveness would be ideal (Dyllick, 2002). Eco-effectiveness is a stronger version of eco-efficiency where business solutions should be life sustaining, restorative, regenerative, and efficient (Young, 2006). However, eco-efficiency has become the standard in the industry today (Young, 2006).

The competitiveness of a firm represents any asset it possesses whether its tangible or not to gain an edge or align itself on the same level as its rivals. Companies utilize the resources at their disposal to remain competitive. Firms leverage their competitive advantage, which can be in the form of many things (i.e. proprietary knowledge, core competencies, low cost, differentiation, etc.) to increase competitiveness (Porter 1980: Hart 1995).

To gain a competitive advantage, Porter (1980) has identified two ways of doing so, differentiation and the other being cost leadership. Cost leadership, which is not generally associated with environmental strategies since this type of strategy tends to lead to more expensive products, is therefore less relevant to this paper and will not be studied in detail. Differentiation on the other hand comes from providing a product that is distinct from other offerings and is better tailored to the needs of the consumer. Companies have been using environmental performance as a way to differentiate their product in an effort to gain a competitive advantage over their rivals (Roy 2001, p. 339). Product differentiation can be a source for competitive advantage and does so by creating more value, which in turn leads to the possibility of charging a price premium or higher legitimacy among stakeholders. This differentiation can in turn be related to environmental initiatives as a way to facilitate the differentiation. Environmental differentiation is a strategy that allows the company to acquire potential benefits from environmental initiatives. The challenge is to find out what the relation between these strategies is when trying to be competitive, specifically in the construction industry.
## 1.3 Research Question

Given the relatively recent focus of academics to explore the relationship between environmental strategy and competitiveness, there are certain areas that have been explored less. The previous research has indicated that there is a gap in empirical evidence, where additional empirical research would provide more insight into the link between environmental strategy and competitiveness. This paper will contribute to the empirical evidence in the field by answering the following research question:

- How has the introduction of an environmental strategy led to competitiveness within the construction industry in Sweden?

## 1.4 Purpose

The purpose of this study is to find out how the introduction of an environmental strategy has led to competitiveness in an industry where they have chosen to follow an environmental strategy. For this we have chosen to look at three of Sweden's largest construction companies. The goal will be to study how the environmental strategy has been formed and how it has led to competitiveness on the market. Differentiation has been identified as having an impact on competitiveness and it will therefore be relevant to find out to what extent the construction industry has used this to increase its competitiveness. The paper hopes to add to the empirical evidence in the area and to provide a better understanding of the relationship between the concepts in this specific industry. Not only will it be interesting from an academic perspective, but might also interest the construction industry in Sweden.

Focus in the paper is on environmental strategy, what it consists of within the companies and how it was created. Environmental sustainability should be seen as an internal component that determines how serious the companies are about the environment and ultimately the extent to which the environmental strategy is developed. Eco-efficiency should be seen as a way to describe a part of what the environmental strategy looks like and environmental differentiation is a way in which the strategy can lead to competitive advantage and ultimately competitiveness for the company.

## 1.5 Scope

The focus of this thesis is how the process of introducing environmental strategies has led to competitiveness within the Swedish construction industry. The initial direction of this paper started out as an idea of studying the correlation between an environmentally sustainable strategy and business performance in very broad terms. Since both of the concepts can have a variety of definitions, the topic had to be narrowed down and specific aspects from the two concepts needed to be chosen for further analysis. Therefore, this study will look at the formation and development of environmental strategy and its relation to competitiveness. It will touch upon underlying factors like
sustainability, eco-efficiency, and differentiation that are relevant to environmental strategy and competitiveness. The reason for choosing the construction industry is that it is an industry that has a great impact on the environment, and it would provide several interesting revelations about environmental strategy.

The choice of using Sweden's three largest construction companies was not done arbitrary, but with the intention of using companies with well-established environmental departments, to be able to better gauge the relationship between environmental strategy and competitiveness. The larger companies also have departments that cater to student inquires in company operations, which helped significantly with gaining access to essential research. Some of the companies chosen have international operations that could have global implications, but this is not the intention of the paper. The focus of this paper is limited solely to the Swedish construction industry. This led to the decision to look at NCC, PEAB, and Skanska.

Environmental strategy and competitiveness are interesting to study in the construction industry given the difficulty in distinguishing one construction from another without focusing on lower costs. Therefore, this thesis will only discuss low cost in a brief, topical manner. This thesis is more concerned with topics like environmental differentiation and sustainability issues because the aforementioned issues are providing a unique opportunity to separate construction companies from each other.
Chapter 2: Research strategy

This chapter provides the reader with information regarding how the choice of subject has been made, what perspective the paper is written from, how the authors view knowledge and information, as well as the role of secondary information in the paper.

2.1 Choice of subject and perceptions

The attention given to environmental issues is seen by the authors as an opportunity to investigate such matters in relation to previous studies in the field of economics. Because of possible future involvement in companies with environmental strategies and possibly even a position as an adviser or consultant on these issues, as well as a general interest in environmental issues the choice of topic was made. To get an idea of where environmental strategies are leading companies, in terms of competitiveness the further narrowing of the topic was made clear. The result of our paper could provide the authors with a clearer view of the future potential of green businesses increasing the interest for the topic.

The authors knew many of the models explaining competitiveness and how to gain it from the background of their studies, something that would prove helpful in the search for secondary data. However, there was little knowledge in the field of environmental strategies and relation to competitiveness. There was a mutual presumption that environmental sustainability will only increase in its importance for the business world and that companies who are choosing not to adapt will be left worse off in the long run. There was, however, the notion that aligning your company with a green strategy is closely related to an increase in cost of production and that the payoff would come at a later stage. There was little prior knowledge about how specific changes in strategy related competitiveness in different ways. No particular knowledge or ties to the construction industry prior to working with this paper existed either. While it is an industry that in many ways affects us all, there was no great interest in the industry per se. The choice of industry was made with the purpose of the paper in mind, and choosing an industry that clearly illustrated the concepts relevant to this paper was important.

The choice of subject was made without any outside influence; thus, the authors are not writing on behalf of any employer or principal. The paper will rely on gathered primary, as well as secondary-data and an interpretation of the gathered information in the hope that it can provide us with the information needed to answer the research question.
2.2 Perspective

Due to the fact that the purpose of this paper is to study businesses that have chosen to follow an environmental strategy, the perspective of the paper will be from a business point of view. This means that the main focus is on what benefits there is to a company to follow an environmental strategy, its impact on the environment will be discussed more as a consequence of the implemented strategy. The paper looks to provide the reader with value from a business perspective and should not be seen as a guide to what a company can do to have the greatest positive effect on the environment. By studying how the introduction of an environmentally sustainable strategy has led to competitiveness in the selected industry the authors hope to provide the reader with valuable information that can guide and suggest how these types of choices into environmental strategy can be done in particular industry of construction.

2.3 Epistemology and ontology

The way one views the knowledge is influencing his way of conducting the research (Sauders, 2003). In the literature there are three main ways that the research process is seen: positivism, interpretivism and realism (Saunders, 2003, p 83). On one hand the positivists believe that the reality is out there and cannot be modified, thus, it can only be observed whether it is true or false, the interpretivists on the other focus on understanding the human behavior and that the reality is up to the researcher to interpret (Bryman, 2003). Realists believe that a reality exists and it is independent of human thoughts and beliefs (Saunders, 2003).

The purpose of this study is to find out how the introduction of an environmental strategy has led to competitiveness is in an industry where they have chosen to follow an environmental strategy; it implies discussions with people from different companies. In other words, it will mean interpreting their answers, and understanding their views after conducting the interviews. Based on Bryman’s (2007) suggestion that interpretivist research represents "the interpretation of that world by its participants" (Bryman, 2007:42) it seemed that this study was closer to the interpretivism approach. The research in this paper, as mentioned in the perspective is done from a business point of view.

Interpretivism is a well-established epistemological approach, and related to its focus is the ontological approach called constructionism (Bryman, 2007). Constructionism views the social phenomena as something that is constantly changing (Bryman, 2007). A further implication of such an approach is that the understanding is contextual and changes depending on the context; therefore, no "universal truth" exists (Bryman, 2003). Environmental strategies are changing frequently considering the new needs or developments in the field. The environmental strategy of a firm is dependent on a number of internal, as well as external forces and is changing with the forces influencing it. The introduction of a new strategy can be seen as a part of what
constructs the attitudes of the customer, or how the strategy influences the attitude that the customer has towards it.

### 2.4 Scientific approach

The research will rely on a literature review that will guide the process of data retrieval, as well as data analysis. It draws upon the findings of other authors to work as a guide to identify the empirical gaps and areas that need to be researched further. The literature review will also legitimize the way in which the research is conducted; it guides the authors in the designing of the interview guide since it can be based on relevant theory. In doing this, the authors seek to expand the existing empirical findings by adding further studies and lay the foundation for more research in the area. This reasoning indicates a rather deductive approach (Malhotra, 2007).

A deductive approach develops the topic based on a "well-developed theory" framework (Malhotra, 2007:160). It involves the forming of one or multiple hypothesis that are then being tested through some type of empirical inquiry and then often retested along the way to validate the research (Saunders, 2003). The authors recognized that there were parts from the deductive approach that correlated with the way in which the research had to be conducted, but also that there were parts that did not match. In this paper, no hypothesis was stated since the purpose of the paper is not to test, revise or develop any theory, but rather receive answers from a research question that could be more explanatory (Bryman, 2008). We view our research question to be more open than a hypothesis could be. The research question can be viewed in a broader perspective and it can focus on finding answers and analyzing them rather than the hypothesis that can be only be accepted or rejected. Furthermore, by using a research question the authors had the opportunity to find more detailed answers and more valuable information was acquired. In this way the thesis increased its reliability and validity to the answers.

Furthermore, characteristics that the thesis has in common with the deductive approach is the aim of explaining the relation between certain aspects, in this case how the environmental strategy relates to competitiveness.

### 2.5 Secondary information

In order to better conduct our research, we needed to rely on a set of secondary information. Its purpose for this paper is to identify what parts in the field where previously studied. There was a clear indication that environmental differentiation, as a means to gain competitive advantage had not been given much attention, that empirical data was still scarce, and that many perspectives remained unexplored. Furthermore, the literature provides us with useful knowledge in the fields of research, competitive advantage, environmental differentiation and helps in the designing of the interview guide and also the interpretation and analysis of the data. Understanding the concepts is vital when looking for possible links between them and lays the foundation for the way in which the research of this paper will be conducted.
Secondary information is a cumulative concept that includes such information that has been collected for other intentions than the use in the problem at hand (Malhotra, 2007). The major part of secondary information used in this paper was academic literature in the form of articles and books. This is widely considered to be the most reliable source of information (Malhotra, 2007). Bryman (2003) talks about authenticity and refers to the scientific articles as the most trustworthy and accurate type of secondary information. Other examples of secondary information used in this paper are news articles and corporate information gathered from the Internet.

2.6 Literature search

The literature review consists of relevant theories found in books and journals in the field of business, strategy, management, environment and other papers, books and reports that were relevant for the study. Information about the construction companies were gathered from various sources such as reports, case studies and information published on corporate websites.

The collection of literature was done using Umeå University Library's collection of databases and more specifically Business Source Premier and Emerald full text. Search terms most commonly used were: environmental differentiation, environmental strategy, Porter’s five forces, competitiveness, eco-efficiency and incremental change. Further sources were found by looking at what literature had been used by the authors of our initial search.

The authors previously knew a part of the theory, mostly related to competitiveness. These articles and books used in previous courses or during the writing of other papers were more relevant since these sources were perceived as reliable, as they have already been chosen by university professors in their courses. Furthermore, a set of guidelines was followed when choosing which articles to include in the literature review. One such guideline was that only peer-reviewed articles would be included, since these have undergone a quality review. Another guideline was to look for the initial founders of theories in the cases where this was possible. One way to ensure the recognition of the article among its peers was to look at how many times it has been cited. To do this, Google scholar was used, where it is possible to check the amount of times a specific article has been cited. For example, Porter's (1985) publication has been cited 7667 times, while Reinhardt (1998) has been cited 161 times. It became apparent that it was often the founders of theories and models that were high on these lists. This is not to say that it was the only criterion for which we based our choice of articles, and in some cases this did not have any bearing.

More case specific information that could not be found in any journal or academic article was found through the use of the Internet. Internet home pages as a source are generally considered untrustworthy since it often builds on other people’s subjectivity and do not always have a source for the information presented (Saunders, 2003). Nevertheless, some information is hard to obtain in another way and can be carefully

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collected by being aware of its limitations. An example of this is the gathering of corporate information. This information has primarily been gathered from the company’s corporate websites and their annual reports. It has, however, in various degrees been confirmed by the interviews with the companies.

2.7 Critique of secondary information and literature

It is of vital importance to have a critical mindset when collecting secondary information, or more accurately in the collection of any information that will be used in the study. The database at the Umeå University library ensures that articles downloaded from these databases have not been tampered with and are in their originative state. Data gathered from these sources were important to the paper and helped the authors in their analysis and forming of conclusions. For this reason it was very important that this information was reliable.

In contrast, the information gathered from web pages were not intended to be the basis for further analysis but rather for exemplifications and explanations such as the company overview in the beginning of the presentation of empirical findings.

Furthermore, some sources that might appear old such as Porter (1980), by looking to see if they are still being cited by other authors, can still represent a reliable source. A theory will not be updated as long as it is still relevant, even if slight modifications or extensions are available.
Chapter 3: Literature review

This chapter introduces the reader to the main concepts and theory that will form the base for the further research done in this study

The purpose of our study is to look at how the introduction of an environmental strategy has led to competitiveness. With the purpose of our research in mind, it is important to understand the principles of environmental strategy and competitiveness. A major principle of this study is strategic management theory, which can be used to explain competitive advantage and ultimately competitiveness. Given the environmental area of research to this paper, it is also important to apply competitive advantage to environmental strategy to gain an understanding of what parts that comprise the environmental strategy like sustainability issues involved. A focus of this study is on the differentiation aspect of competitive advantage, so environmental differentiation will be a necessary part of the literature review. Additionally, there a section detailing previous studies conducted in regards to the construction in general.

3.1 Strategy and Competitiveness

For the past several decades Michael Porter has penned the leading doctrine on the forces behind strategy and competition. There are multiple theories behind the role of competitive theories that have lead to two different schools of thought: the positioning school and the resource-based view (Porter, 1980: Hart, 1995).

The five forces model by Porter (1980) conveys the ideas of the positioning school of thought that a firm’s performance and competition is contingent upon externalities and the industry itself. This school of thought focuses on how a firm positions itself in the industry. It is therefore commonly referred to as the industry structure view (Porter 2008). Additionally, the structure of the industry also drives the performance and competition of the firms within the industry. The five forces include the threat of new entrants on the market, products working as substitutes, the bargaining power of suppliers and buyers, and rivalry among competing firms (Porter, 1980). These forces are at work within a certain industry and depending on the characteristics of that industry, certain forces are more powerful than others (Porter, 1980).
New entries to an industry with a desire to gain market share in a given industry increase the strain on prices, costs, and investments needed. However, individual companies can affect the power that the new entrants have in their industry. By creating barriers, a company can prevent or make it harder for new entrants to the market and avoiding new competition that has to share the profits in the industry. An interesting example of how to create a barrier is through differentiation. Differentiating your product can lead to increased customer loyalty, as well as the possibility for a price premium, both making it harder for competitors to compete. It is not only new entrants that the company has to compete with; competition from existing companies in the industry has to be dealt with as well.

Suppliers are also a source of competition for a firm, especially if they are a powerful supplier. These suppliers can charge higher prices, limit quality or service, and transfer costs to the industry (Porter, 1980). Porter (1980) discusses that suppliers can take profitability out of an industry if the industry is unable to absorb or pass on increased prices from the supplier.

On the opposite end of the five forces spectrum is the power of buyers. According to Porter (1980), buyers can demand better quality, lower prices, and particularly in the case of this study more environmentally friendly firms. Some sources of power for buyers is that they can make a difference if they purchase large volumes of products. They can pit the industry against each other, and perhaps the biggest reason is that they have low switching costs going from one company to another (Porter 1980).

The threat of substitutes is another major source of competitiveness in the positioning school of thought. Firms overlook many times this force because they do not see the

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Figure 1: Five forces (Source: Porter, 2008:80)
threat of substitution or it is perceived to be mostly benign. Rivalry among firms in an industry is distressing to the firms because it drives up costs and competition that takes away from profits (Porter 1980). However, firms that are able to manage these forces and use them to their advantage can generate competitive advantages.

Competitive advantage is defined as something that makes a firm unique and gives it an advantage on the market (Porter, 1980). In order to achieve this a company can either offer low prices, and thus gain the upper hand in the market and attract more customers, or it can try to differentiate itself and provide a higher value to the customer. By providing the customer with a higher value, the company can charge a price premium (Porter, 1985). It is generally debated that these two strategies conflict with each other with the argumentation that it is not possible to both offer the lowest prices and charge a price premium.

Gaining a competitive edge has advantages to a company and often puts it above its rivals in terms of market share and profits. In order to be competitive, it is believed that a corporate strategy is needed where actions are taken that promote competitiveness. The general assumptions made in this paper about competitiveness gained from environmental differentiation indicate that corporate strategy will be viewed as something that is linked to competitiveness.

According to Porter (1985), what sets the companies apart is the firms value chain; in other words the processes and points of contact that the consumer has with the company. Along this process the company has the opportunity to create value by tailoring the product or service to the needs of the chosen customer segment. As with most other areas of business, the company needs to keep up with the change of attitude and needs of the consumer, so the reasons for gaining a competitive edge in the first place may not always continue to do so. Sustaining the barriers that made the company unique in the first is vital in order to remain competitive.

However, this view has been challenged by Hart (1995) who argues that firms create competitive advantages from internal factors. Hart's (1995) study discusses that firms use internal resources to create competencies that reduce costs and generate differentiation; resulting in the firm creating competitive advantages. This perspective is part of the resource-based view that some authors like (Hart, 1995: Barney, 1995: Orsato, 2006) argue are the reason for competitive advantage and ultimately: competitiveness. According to Orsato (2006), the resource-based view "highlights the influence (internal) organizational processes exert on competitiveness"(p.129). This school of thought differs from the positioning because the firm generates its competitive advantages internally and not from the industry.

Barney (1995) builds upon the work of Hart (1995) and explores the role of SWOT analysis in determining internal resources for a firm that will lead to competitive advantages. The argument centers on the fact that companies that conduct SWOT must address four key questions about their resources and capabilities: the question of value, the question of rareness, the question of imitability, and the question of organization (Barney, 1995). The study follows the airline, computer, and steel industry (Barney, 1995). It finds that the competitive advantages cannot be derived solely from the competitive environments that the three studied industries comprise; that in fact that managers conducting internal processes like SWOT leads to proper allocation and
utilization of resources to generate competitive advantage (Barney, 1995). The study is later reinforced by Orsato (2006) when his environmental competitiveness framework focuses on the incorporation of internal processes as being the source for firm competitiveness.

The construction industry has undergone large dynamic shifts in the past where they have had to change on many different levels, and this made the construction industry unique (Betts and Ofori, 1992). Individual construction companies have found themselves not focusing on distinguishing themselves from others in the industry, but rather on the ever changing prevailing views coming from external pressures (Betts and Ofori, 1992). Ofori (2003) expands on his earlier Betts and Ofori (1992) article detailing the framework firms in the construction industry should follow to achieve competitiveness. Ofori (2003) determines that there is no framework currently in existence that properly fits the complex industry of construction. However, he does mention that Porter's (1980:1985) models on externals forces would be prevalent to any strategic plan for a construction company.

Given the complexities and external forces present in our particular industry and bearing both views on strategy and competitive advantage, the authors believe that the most relevant approach to this study’s purpose is Porter’s (1980) industry structure view. The resource-based view of a firm is not a compelling strategic tool in the construction industry, where it is very hard to internally become unique (Betts and Ofori, 1992). Furthermore, Ortiz et al. (2009) discuss along the lines of the industry structure view in regards to sustainability, arguing that external players like governments and environmental entities should do more in terms of creating regulations to improve sustainability in construction.

The following section of the literature review will discuss how environmental strategies relate both to general competitive strategy and sustainability issues.

### 3.2 Environmental Strategy

This section reviews literature on environmental strategies. It will also detail the possible motives behind following environmental strategies and the relationship it has with competitive advantage.

Mintzberg (1989) describes environmental strategy as a consistent action over a period of time intended to manage the interface between the business and the environment.

It is important to understand how the views of businesses on environmental strategy have changed over time. In the not so distant past, most firms looked at environmental strategy as a reactionary mechanism (Rosen, 2001). Simply put, most firms viewed the environment as a burden that constrained their operations, with enforcement of environmental regulations from governments drawing the consternation of many businesses (Rosen, 2001). However, Rosen (2001) argues that there has been a shift away from reactionary views of environmental strategy toward a more proactive one. Firms now find it advantageous to use strategic environmental sustainability. This
would seem to validate that the business world is keen on addressing environmental strategies with a focus on sustainability, despite the fact that they could be more stringent.

Proactive companies believe they now have the power to impact environmental challenges, as well as profit from it in some way. This is in stark contrast to the old prevailing norm of only addressing environment related issues to 'managing' stakeholder concerns or regulatory authorities (Berry, 1998). Berry (1998) express that the move toward more proactive environmental strategies is a result of external pressures from governments, customers, employees, and competitors. Furthermore, they argue that there is "growing evidence that firms that adapt more proactive environmental management strategies become more efficient and competitive" (p. 38). Clearly, companies are seeing both the social responsible and business sense in being environmentally proactive with their strategies.

According to Reinhardt (1999), firms today believe in the underlying principle that earth is no longer healthy and that companies feel that remedying earth’s problems will lead to opportunities to make money. However, Reinhardt (1999) discusses that while it does pay to invest in environmental strategies sometimes, not all environmental problems will be worthwhile. The focus is that environmental issues should be treated as business issues. Environmental strategy, argues Reinhardt (1999) should be made “for the same reasons [managers] make other investments: because they expect them to deliver positive returns or reduce risk” (p. 150). Orsato (2006) reaffirms this position in his paper and suggests that Reinhardt's view is generally accepted among most academics. According to Orsato's (2006) article, it is important to focus on Reinhardt's idea that "environmental policy, like other aspects of corporate strategy, needs to be based in the economic fundamentals of the business: the structure of the industry in which the business operates, its position within that structure, and its organizational capabilities" (p. 128). This in many ways mirrors Porter's (1980) five forces model.

Reinhardt (1999) identifies five approaches that firms can use to incorporate the environment into business strategy which include: environmental differentiation, managing your competitors, saving costs, managing environmental risk, and redefining markets. It is interesting to see how closely Reinhardt's five approaches resemble Porter's (1980) five forces. He highlights the role of environmental strategy in capturing benefits that generate competitive advantage and/or mitigate risks. An essential approach that Reinhardt's (1998) article argues in greater detail than his later work is that the main source of benefit to a company is environmental differentiation. Environmental differentiation can be a tool to increase performance; though this is contingent upon end users accepting increased costs from the perceived value in adding more environmental value (Reinhardt, 1998). As is relevant in any type of differentiation, it is paramount that the firm is able to create value in a way that cannot be easily reproduced (Reinhardt, 1998). Another strategy would be to follow an approach of managing your competitors. Many times this can be accomplished through setting private standards within a particular industry or lobbying governments to implement certain regulations that favor the company and constrain their competitors (Reinhardt 1998). It seems to be clear that many of the foundations of Reinhardt's (1998: 1999) view are structured around theories purported by Porter (1980: 1985).
Reinhardt (1999) uses the chemical industry and gasoline producers as examples of this approach. Savings in cost is also another reason to pursue environmental strategy. It is important to distinguish that this is internal costs savings and that companies are able to sometimes reduce internal costs while also increasing environmental performance. For example, environmental activities can increase efficiencies, reduce legal fees, and reduce waste that is positive both to the firm and the environment. Managing environmental risks is another strategy that functions very much like a risk management approach because it strives to mitigate environmental accidents, consumer boycotts, and other environment related conflicts. An additional strategy is to redefining the market. This environmental strategic approach is a combination of the previously stated strategic approaches. It allows firms to reduce environmental impacts by incorporating environment strategy into the company’s overall risk management approach. This approach also takes into consideration the role of stakeholders and managing them. It is a multistage approach that incorporates many of the same elements of Porter's competitive strategy theories. It can therefore be deduced that environmental strategy is based in large part to competitive strategy theory.

Reinhardt's (1999) view is relevant to this study because it is a theory that uses many of the same principles of the competitive strategy while tailoring it to the environment. The following chapters will bridge and integrate the theories of environmental strategy and competitive advantage, but first a closer look must be taken to look at the different aspects of environmental strategy. The proceeding chapter will discuss environmental sustainability and its importance to strategy.

### 3.2.1 Environmental Sustainability

Sustainability has been argued to be important strategically for a firm that wants to remain competitive. Wüstenhagen's (2003) case study on Vestas, the Danish wind power turbine company conveys this well. In his study on Vestas, it was noted that sustainability is a major factor that contributed to Vestas revitalization from a bankrupt company in 1987 to an industry leader in 2001 (Wüstenhagen, 2003). The case study notes that sustainability, in combination with other factors like vision, management of internal growth, international expansion, politics of wind power, and environmental management are the reasons for the recent success of Vestas (Wüstenhagen, 2003). It is worth noting that Wüstenhagen (2003) argues that Vestas uses its sustainability efforts to shore up its competitive abilities to stave off competition and maintain their leadership position. From the case it is evident that sustainability effects competitiveness, but it is not enough to discuss sustainability in such vague terms. It is important to understand the concept of sustainability to be able to fully comprehend its role in environmental strategy.

Sustainability is a broad concept encompassing economical, social as well as environmental aspects and is affected by all the stakeholders of the company (Goodland, 1995). Environmental sustainability is broadly defined as the maintenance of natural capital seeking to "sustain global life-support systems indefinitely" (Goodland, 1995 p. 6). Environmental services that comprise environment strategy are either the source or the sink (Goodland 2005). Both of these environmental services include the constraints on four major human activities. These include on the source side, renewable and nonrenewable, while on the sink side, pollution and waste assimilation.
(Beckerman, 1994: Goodland, 1995). Therefore, environmental sustainability is to maximize the areas that sustain the environment while minimizing the areas that are detrimental (Goodland, 1995). For example, Goodland (1995) says renewable energies should be "within regenerative capacities of the natural system that generates them" (10) while nonrenewable sources "should be set below the rate at which renewable substitutes are developed by human invention and investment" (10).

Not everyone is in agreement regarding how the term sustainability should be treated and there are three varying views on how the concept is treated. The three different views are weak, strong, and superstrong sustainability (Goodland, 1995). Weak sustainability is where a large majority of economists’ views are; however, this form of sustainability has been rejected by some like Beckerman (1994). Goodland (1995) suggests that it is a good first step toward environmental sustainability, but that weak sustainability is too weak to be considered environmental sustainability. This is because this perspective treats certain types of capital as substitutes and creates inefficiencies. In other words, sustainability should be maintained and be non-declining over time, but there is no emphasis on whether it is by conserving our economy or the natural environment in which it is achieved. Strong sustainability builds upon some of the principles of weak sustainability.

It does, however, distinguish that not all capital can be substitutes and that investments must be made to offset the loss of capital. It realizes though that not all-natural capital can be substituted which is an important qualification to the weak sustainability view (Goodland, 1995: Dyllick, 2002). To make this clearer, take Goodland's (1995) example that "if there are to be reductions in one type of educational investments, they should be offset by increased investments in other kinds of education, not by investments in roads" (16). Absurdly strong sustainability is where no form of capital would ever be depleted, and is therefore, aptly named superstrong environmental sustainability (Goodland, 1995). Dyllick (2002) define ecologically sustainable companies through three factors: 1) natural resources are consumed at a rate below natural reproduction or substitutes 2) they do not cause emissions that accumulate in the environment at rate that cannot be naturally absorbed or assimilated, and 3) they do not engage in activity that degrades eco-systems (p.133).

While weak sustainability is misleading in being considered a form of sustainability, at least in the views of Beckerman (1994) and Goodland (1995), it does seem to be the most generally accepted approach in business circles (Goodland, 1995). Therefore, in the authors' view weak sustainability is definitely the most prevalent approach used right now in the construction industry. The authors’ hope is that industries move toward a more strong sustainability strategy.

The following section of the literature review will discuss the role of eco-efficiency and eco-effectiveness in the context of business operations.

3.2.2 Eco-efficiency and Eco-effectiveness

In this section the concept of eco-efficiency will be explored further. Eco-efficiency is
an essential term when discussing the role of environmental strategy and firm competitiveness. It also links to sustainable development because eco-efficiency is directly related to sustainability issues, as it is an environmental strategy to achieve sustainability. The World Business Council for Sustainable Development first used the term eco-efficiency in 1992 (Schmidheiny, 1992). The basic definition of eco-efficiency is the goal of creating value while decreasing the environmental impact (Schmidheiny, 1992). The concept of eco-efficiency is further developed by De Simone (1997) to mean the possibility of creating economical value goods or services while lessening harmful impacts on the environment and the consumption of natural resources. De Simone (1997) argue that eco-efficiency is achieved by providing competitively-priced goods and services that meet the needs of humans while bringing quality of life, and making concerted efforts to reduce ecological impacts and that resource uses are in par with the environment's carrying capacity (p. 47). Businesses today see the path toward being a sustainable firm as eco-efficiency (De Simone, 1997).

In Dyllicks’(2002) view this is an intrinsically wrong way of looking and extremely troubling perspective on the link between business and sustainability. "The most broadly accepted criterion for corporate sustainability constitutes a firm's efficient use of natural capital" (p. 136), or simply eco-efficiency as its been coined now by businesses. Dyllick (2002) concede that eco-efficiency is a valuable tool, but that it only leads to "relative" improvements. As is discussed earlier in the sustainability section, ecological sustainability is not solely limited to these relative improvements (Goodland, 1995).

Therefore, eco-efficiency is most likely the result of businesses adopting a position of weak sustainability; thus ignoring factors of substitutions and irreversibility seen in strong sustainability (Beckerman, 1994: Goodland, 1995). Dyllick (2002) discuss that the pitfalls of being eco-efficient are analogous to a firm increasing the number of sales it makes (in most cases making economic sense), but if the firm has a negative margin from the sales than the strategy will lead to financial problems for the firm (p. 137). Companies that implement a strategy of eco-efficiency run into the same efficiency risk of fueling instead of reducing environmental degradation (Dyllick, 2002). Senge (1999) argues that firms can improve their resource efficiency, but that natural systems still decline at the same time. He discusses that if growth is at a greater proportion than productivity improvements than total resource extraction could actually increase.

It is important then to understand what Dyllick (2002) call absolute threshold of efficiency, which can be best explored by their example that:

"More efficient cars, for example, reduce the cost of driving a car. However, today roughly 70-80% of the world cannot afford to use cars...thus more efficient...cars might very well backfire from an ecological point of view by increasing the number of car and kilometers driven per year...to avoid this type of rebound effect companies will have to focus on absolute amount of mobility-induced [Carbon Dioxide] emissions worldwide" (p. 137)

According to Dyllick (2002), eco-effectiveness is an opposing view to eco-efficiency and it is based on the effectiveness of processes designed to be healthy and renewable to the environment; where sustainability is 100 percent the goal. Young (2006) define it as:
"To enable business to operate in a manner that allows nature and business to succeed, to be productive, the objective being for business to seek a balance with the natural world in such a way as to remove negative impacts and to develop systems to restore and enhance the natural environment" (p. 404).

This clearly connects back to the idea of weak and strong sustainability. The underlying flaw in eco-efficiency according to Young and Tilley (2006) is that eco-efficiency is still wasteful and is not sustainable in the long-term. Young and Tilley (2006) convey this thought further by quoting 'waste is food' from McDonough and Braungart (1998).

The authors of this study would agree with Dyllick (2002) that more scholarly studies should be conducted on eco-effectiveness, and while we see the negative implications of eco-efficiency, we also see it as a positive step forward. As the authors of this paper alluded to earlier, any step in a positive direction in our opinion is a good thing, even if ideally a more strong sustainable approach would be undertaken in the business world. We believe that eco-efficiency does not have to be inherently flawed, as long as managers take care to insure they strike a proper balance. Eco-efficiency is a good step in environmental strategies of firms to gain competitiveness while reducing environmental impact (much like firms adopting weak sustainability positions as opposed to none), and we hope this leads more toward the concept of eco-effectiveness.

Environmental differentiation is an important part of competitive environmental strategies and it will be discussed in the following section because an important goal of this paper is to see how firms differentiate themselves through environmental strategy.

3.2.3 Environmental Differentiation

This section introduces the possible reasons for having an environmental differentiation strategy.

According to Reinhardt (1998) environmental differentiation exists when "a business creates products that provide greater environmental benefits, or that impose smaller environmental costs, than similar products" (p. 46). There could be a myriad of reasons for adopting strategy of environmental differentiation. The two more prevalent and important ones, says Reinhardt (1998), are the ability to charge higher premiums and/or gain market share. The reasoning behind charging higher premiums accounts for the higher costs associated with environmental differentiation and the consumers’ willingness to pay more for products with more environmental value. Additionally, companies can gain market share in environmental areas that may not have been available to them before. Reinhardt (1998) responds to critics who claim it is too costly, by arguing that a policy of environmental differentiation leaves firms at least as well off, if not better than before.

It is not enough for a company to merely say that they want to engage in environmental differentiation. There is a process that should be adhered to in order for it to be successful to the company. Reinhardt (1998) explains that there are three critical elements that must be satisfied for environmental differentiation to be effective. These three factors can also be applied to generic product differentiation, but they can cause different problems within the environmental context. The three areas that need to be
fulfilled are the following: gaining willingness from the customer to pay for environmental quality, legitimate information about environmental product attributes, and the product innovation must be protected from imitation (Reinhardt, 1998).

The following chapter will connect and integrate the theories of environmental strategy and competitive advantage.

### 3.3 Environmental Strategy and Competitive Advantage

The purpose of environmental strategy is to understand how firms can derive competitive advantages from the natural environment. As previously stated, there are two different approaches to environmental strategy. The main point of contention between the differing schools of thought is whether competitive advantage is gained externally or internally from the company. Therefore, the understanding between how firms achieve competitive advantage from the natural environment will vary depending on which school of thought is applied. This part, however, will be mostly devoted to the industry structure view (positioning) and a combination theory given the choice of the construction industry and realm of discussion.

Porter (1995) argues that many times people have misconstrued the relationship between environmental goals and industrial competitiveness as a tradeoff. They discuss that government regulation should not be viewed as inhibitor of a firms competitiveness; noting that this too is a misconception like believing environmental strategy is a tradeoff (Porter, 1995). According to Porter (1995), the mistake is in viewing regulations and other external factors in a static view, but in the new prevailing dynamic view. The end result is that regulation spurs innovation (Porter, 1995). More broadly put, environmental mandates create instances where companies must innovate. The Porter (1995) article states that in the industrial view (structured view) innovation is the key to differentiation and low cost. Additionally, the innovation undertaken by firms that follow an environmental strategy leads to competitive advantages achieved through new innovations.

It is also argued that market demands can have a similar effect on an industry. Market demands and regulations should be seen more as an opportunity rather than a constraint (Porter, 1995). In another report by Porter (1995b), they provide examples and evidence that regulations have created new innovations to certain industries in particular the chemical. For example, Dow Chemical and 3M had innovative breakthroughs in response to environmental regulations. This study also pointed out that only in rare instances did costs increase for the company because of the costs needed for innovation.

Another important element of environmental strategy is whether a company is reactive or proactive. As aforementioned in the section on environmental strategy, industries today are becoming more and more proactive with their environmental strategy. Proactive strategies align more with the resource-based view where internal resources are used to seek out competitive advantages (Sharma et al., 2007). While Sharma et al. (2007) subscribe to the resource-based view, they do mention that external factors do to an extent influence a firms competitiveness and its innovation which is an important point to concede given the internal nature of their approach. The competitive advantages
mentioned by Porter (1995b) caused through the environment would seem to be further validated by Reinhardt's (1999) study that is based on many of the same premises. Additionally, it even links back to sustainability explored earlier. Firms that engage in sustainability practices are companies that follow environmental strategies that can lead to competitive advantage that could increase competitiveness.

This leads toward a framework developed by Orsato (2006). The Environment Competitiveness Framework is a matrix that attempts to identify where a firm should focus its efforts to maximize the environmental investments (Orsato, 2006). The framework presented in figure 2 combines aspects of both strategic management theories in an environmental context. The matrix uses both the results of competitive advantage and competitive focus. The model depicts four strategies that Orsato (2006) believes to be the product of the two focuses. They are resource productivity, cost leadership, beyond compliance practices, and eco-oriented products/services.

![Figure 2: General competitive environmental strategies (Source: Orsato, 2006 p131)](image)

Companies have the ability to produce distinctive value that market demand will be willing to pay a premium for. Therefore, firms can gain a competitive advantage through environmental differentiation (Orsato, 2006). Differentiation can be in the form of green attributes of a product or service, eco-oriented products or services, or green practices of the firms that go beyond compliance (Orsato, 2006).

The different strategies associated in this matrix means that the first competitive strategy is combining both elements of competitive advantage with both competitive focuses. This strategy means that both environmental impacts and costs are reduced at
the same time (Orsato, 2006). Obviously, this will result in positives for both the company and the environment. Companies can also choose to follow a strategy of differentiation. This means that the company chooses to pursue a strategy of environmental differentiation of its product, service, brand image, or a combination of the three (Orsato, 2006). However, it is worth highlighting that when a firm's environmental strategies are not related to products or services, but rather internal processes, then competitive advantage can be gained by tradeoffs between resource productivity and beyond compliance practices (Orsato, 2006). Environmental differentiation is an important part of Orsato's (2006) competitive environmental strategies.

The following section will explore some of the strategy prevalent in the overall construction industry.

### 3.4 Construction

This section will explore some of the current trends in the general construction industry. Lutzkendorf (2005) discuss that there are two emerging trends in construction: to holistically look at buildings throughout the lifecycle and implementing sustainable development into construction. There are general areas of protection described by Lutzkendorf (2005) to build sustainable buildings. The most pertinent ones for the purpose of this study are the protection of the natural environmental/ecosystem, protection of natural resources, and protection of human health and well-being (Lützkendorf and Lorenz, 2005). The table 1 below represents the requirements that have been formulated to help classify sustainable buildings (Lutzkendorf, 2005).

Table 1: Requirements to classify sustainable buildings (Source: Lutzkendorf, 2005)

<table>
<thead>
<tr>
<th>Requirements to classify sustainable buildings</th>
<th>-Minimization of life cycle costs/cost effectiveness from a full financial cost-return perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-Reduction of land use and use of hard surfaces</td>
</tr>
<tr>
<td></td>
<td>-Reduction of raw material/resource depletion</td>
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<tr>
<td></td>
<td>-Closing of material flows</td>
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<tr>
<td></td>
<td>-Avoidance/reduction of hazardous substances</td>
</tr>
<tr>
<td></td>
<td>-Reduction of CO2 emissions and other pollutants</td>
</tr>
<tr>
<td></td>
<td>-Reduction of impacts on the environment</td>
</tr>
</tbody>
</table>
Lutzendorf (2005) argue that while it is a trend in the construction industry to implement the principles of sustainable development; "sustainable buildings or building projects are not yet explicitly offered and requested by the majority of market participants due to various reasons" (p. 215). They attribute it to a lack of understanding of sustainable development performance or benefits in general. However, Lutzendorf (2005) identify the following reasons why this will change: motivation in the financial and investment sectors, property researcher's success in empirically proving the financial benefits of sustainable buildings, and government's introducing various forms of regulatory mechanisms. Financial and investment sectors realize that in this day in age the importance of sustainability and instituting Corporate Responsibility programs and Socially Responsible Investment policies (Lützkendorf and Lorenz, 2005). The next reason for change is extremely noteworthy because it pertains to sustainability in context of the construction industry leading to increased performance.

Lutzendorf (2005) discuss that recent studies by Wilson et al. (1998), Heerwagen (2000), Yates (2001) and Lützkendorf and Bachofner (2002) have been able to point out that sustainable buildings are more cost efficient, effective, profitable, and marketable. Furthermore, Lützkendorf (2005) also look at recent studies like Nevin and Watson (1998) and Kats et al. (2003) that have empirical evidence of the aforementioned financial success of sustainable development. The Kats et al. (2003) study "produced a comprehensive and well-documented cost benefit analysis of sustainable buildings. They concluded that minimal increases in upfront costs of about 2% to support sustainable design...result in life cycle savings of 20% of total construction costs (Lutzkendorf2005, p. 217). The last reason for change toward more sustainable development is the external pressure of government regulation that promotes change in an industry, as discussed in the strategy and competition section about Porter's (1980) model.

Korkmaz and Messner's (2008) study revealed that the five forces portrayed in Porter's (1980) publication are major factors in the strategic choices construction firms make. The authors Korkmaz and Messner (2008) emphasize that environmental factor can change the construction industry quickly, and is one the biggest catalysts for strategic changes in the industry. The authors of this thesis believe that Korkmaz and Messner
3.5 Brief overview of the literature review

After conducting the literature review, some apparent connections between the different concepts used were observed. These relationships are important for the reader to understand in order to follow the thought process behind this study and to fully grasp the analysis later on. The figure presented below depicts vital relationships as seen by the authors through their literature investigation.

That investigation revealed important linkages. Extensive research into the area of environmental strategy yielded environmental sustainability. Environmental sustainability is the starting point of environmental strategy. Sustainability is the driving force behind environmental strategy. Environmental strategy can then be offered as a major building block toward environmental strategy. According to the literature, there are two different views on environmental sustainability: eco-efficiency and eco-effectiveness. Both of these concepts stem from environmental sustainability and determine the degree of rigidity of the environmental strategy. Therefore, the model clearly conveys that environmental strategy is derived by one of the two forms of environmental sustainability. The environmental strategy will be heavily influenced by which of the two is undertaken.

Once an environmental strategy is formulated it will then inherently incorporate elements of sustainability. Environmental strategy is the point where a company must merge the ideas of sustainability with competitiveness. It is at this stage that companies must devise a plan that makes environmental sustainability a viable and competitive venture. Competitive advantage and environmental differentiation bridge the gap between the environmental strategy and competitiveness. This portion of the figure demonstrates that the strategy filters into one of the two, depending on the goal of the company. However, it is important to note the red dashed line present in the model. This is the represent the relatively new literature that argues the elements of the two can be combined: a hybrid of the two so to speak. During this stage the alteration or competency gained from the environmental strategy is implemented in the product or service with a main purpose of competitiveness in mind.

The figure presented here is to illustrate the above thoughts and concepts in a way for readers to more easily follow relationships between environmental and competitiveness theories. It is the intent of the authors of this paper to use this figure to eliminate some of the convolution of the concepts.
Figure 3: Main links between environmental strategy and competitiveness
Chapter 4: Research methodology

This chapter presents the way that data collection was done, how the sample was selected, and how the analysis was conducted.

4.1 Choice of research method

The method of collecting primary data has to be fitting to the purpose of the paper. The study of this paper is attempting to capture the perspective of specifically chosen firms in the construction industry. In other words, how the process of creating an environmental strategy has looked like, and what it has led to in terms of competitiveness for the company. This was done to better understand how environmental initiatives are impacting competitiveness in the construction industry. It is their story, beliefs and view on the problem at hand that will be contributing to the empirical data in the field of environmental strategy and competitiveness. When trying to find an answer to the research question, deeper knowledge about the perceptions and the reality of the respondents is a vital part that enables an analysis that also integrates the literature. Such a method is what characterizes the qualitative research. Furthermore, the qualitative method is associated with a type of interpretivistic view, explained in Chapter 2, as the focus is on interpreting and understanding the perspective of the respondent. (Bryman, 2008) In addition, “qualitative research” is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible” (Denzin, 2003, p. 4); therefore it was appropriate for gathering the information needed for this study.

There are several approaches to how primary data can be gathered using a qualitative method. There are several different techniques used in qualitative research, such as focus groups, interviews, observations and data analysis (Malhotra, 2007). This study requires the participant to have significant knowledge about the represented company's environmental activities and has to be involved in the decision-making process when it comes to the environmental strategy. Using a focus group to collect the information is therefore impractical since not many people in the company are likely to have access to this knowledge; even if there were, arranging a time when all of them can meet simultaneously is troublesome since they generally have their own timetables to tend to. Focus groups will therefore not be the method used in this paper. This leaves the interview as a more practical alternative suited for our purpose. To get the information needed, specific questions had to be asked in different areas such as environmental strategy, sustainability and competitiveness. Thus, a sense of direction was necessary in order to guide the respondent through all relevant areas and make sure that every key area is covered in the time allotted for each interview. The semi-structured interview that is based on themes is most appropriate for above-mentioned reasons but also because a structured interview, questionnaire, would imply more closed specific question and a higher number of interviewees.
4.1.1 Semi-structured interviews

An interview is "a purposeful discussion between two or more people" (Saunders, 2003, p. 245). There are three types of interviews: structured, semi-structured and unstructured interviews (Saunders, 2003).

For this study a semi-structured interview will be used. The semi-structured interviews allow the researcher flexibility, to both collect the information and to conduct the interview, but still making sure the needed topics are covered, based on the main themes and questions included in the interview guide. The researcher can omit some questions in a specific interview where they are not needed; it offers more flexibility and adaptability. Furthermore, the semi-structured interview is often used in explanatory studies where variables can be studied in relation to each other, such as differentiation and competitiveness in relation to changes in production (Saunders, 2003). The characteristics of the semi-structured interview make it appropriate for this study, as the discussion with the interviewees have to be guided in a certain direction, but it should not restrict the interviewee to talk freely about other aspects too.

4.1.2 The interview guide

The purpose of the interview guide is to provide a structure, not standardizing it as in the structured interview, but in a way that gives the respondent a level of flexibility and opens up the possibility for more in-depth responses (Malhotra, 2007). In this case, the interview guide was also provided to the interviewees prior to the interview to give them time to prepare, and more accurately answer our questions. A technique also suggested by Bryman (2008).

Following the components of the purpose, environmental initiatives and competitiveness, these areas led us to the development of the questions for the interview guide. The literature review was also structured according to the previously mentioned themes. This further guided us to where the knowledge gap was and helped in formulating more questions, so that in the end it would be possible to find an answer to the research question.

The first set of interviews was conducted over telephone and with only one person at a time where as the second set of interviews were done through Skype in the same manner as the first ones. The geographical distance between the locations of each interviewee left no possibility for a face-to-face interview. Something to think about when conducting a phone interview is that an important sense used when interacting with other individuals is removed. Since you cannot see the respondent, one has no way to determine body language or facial expressions that in some cases can help with interpreting the emotions and feelings tied to a certain circumstances. The emotional perspective is not of great importance in this case since the focus is not so much on emotional aspects, but on explanatory data of how environmental strategies have emerged and their ties to competitiveness.

The first interview guide was designed so that it covers all the main themes and it has questions easily understandable by the interviewees (see Question construction below). The language used was English, as the interviewees were asked before the interview
whether they were comfortable conducting the interview in English. They all consented to the interviews in English. The authors realize that the native language should be used when possible. This is to avoid misunderstandings and misinterpretations that can arise otherwise, and are circumvented when using an interviewee’s native language (Bryman, 2007). However, the interviewees acknowledged that they are more than competent in handling English so there was no problem in having fruitful communication (Bryman, 2007).

The purpose of the second interview was to gather additional information from the same sources as the first interview. After having put together the empirical findings and analysis, the authors recognized that some additional information was needed in order to better answer the research question. The goal was to form the second interview guide in the same way as the first ones using a semi-structured interview guide.

Interviews were recorded using a computer as an external recording device. The answers could then be transcribed and compared to each other when presenting the results. The respondents all agreed to be recorded and they were all ensured that the information gathered would not be used for any other purpose than this thesis.

4.1.3 Question construction

The construction of the semi-structured interview guide was done with the purpose of the research in mind and it was important that the areas or themes that had been previously identified were covered. In the same line with Bryman (2008) it was important that the questions were characterized by clarity and that they would be easily understood to avoid misinterpretations. It is also important that the questions are not leading or biased toward a certain outcome that the researcher may have.

The areas or themes that were identified as being important were environmental strategy, sustainability and competitiveness. For the most part the interview guide was followed in order but at times, some questions had been answered in the same time as others and thus required some flexibility in the interview guide.

The questions in the interview guide were formed with the literature in mind and the goal was to form questions that covered the areas of the literature review without being too specific and consequently limiting the answers. Questions that could be answered by yes or no were avoided since they too, would limit the respondent in their answers.

4.2 Research Sample

The choice of industry was made rather late in the process of writing the paper. There were a number of factors that influenced the choice of industry. One factor that influenced the choice was that it would be preferable if the industry had seen a change over time in the way that they respond to environmental issues. It was believed that this
would help in the analysis by making it clearer how the environmental strategy has been formed. Since the geographic location had been limited to Sweden, the three biggest companies in Sweden (Report, 2008) were chosen, since it was felt that this would give a more overall view over the industry and would make our sample more reliable and credible, and thus the findings too. Additionally, it is an industry that has a great potential of improvement to the environment and as one of the interviewed companies expressed it, "More than half of the Earth’s population live in an urban environment. With urbanization comes extensive demands for natural resources, which means there’s a need for new ways of thinking and working. We have to change society" (Skanska website). The authors' view that the construction industry has in the past had less than stellar environmental strategies is intriguing to us and further influenced our decision for the construction industry to be the focus of research.

Three of Sweden’s largest construction companies, based on the Construction Europe Report (2008) were chosen for further investigation as from a background research where it was observed that all of them were following an environmental strategy. After feeling confident that the selected industry and companies had the potential to provide us with the information that we required, it was merely a matter of finding the right person to talk with in each company. A call was placed to the headquarters of each company, where upon explaining the purpose of our study, all three companies directed us to their manager in their environmental department (all the companies had an environmental department which underlined even more that they were developing environmental strategies to some degree).

The interviewees for this study had to fulfill certain criteria, such as knowledge of the environmental projects and processes of the firms, as well as being involved in the decision-making process when it comes to the environmental strategy. The sample was created from what the authors considered being the "right" person to talk to, much like the non-probability sample that in the literature is called a judgmental sample (Malhotra, 2007). Non-probability samples simply means that respondents are not chosen by chance in contrast to the probability sample where each respondent in the chosen population has the same probability to be interviewed (Malhotra, 2007). The non-probability sample has the disadvantage of not being representative, and not providing the possibility of generalizing results over the whole population (Bryman, 2003 p. 93). Since this is not something that is sought after in this study it is not going to be an issue. The authors want to provide overview that creates a basis for deeper investigation of the linkages.

The sample for this study consists of three managers from the environmental department of each chosen company. Even though it might seem a small sample, taking into consideration that the interviewees represent the largest construction companies in Sweden and the complexity of the questions asked, the gathered information was sufficient for conducting this study.

4.3 Collecting the information

After having decided the industry of choice, the criteria for the future interviewees were established. As mentioned previously, they needed to have knowledge about the projects regarding the environmental strategies conducted by the company and to be
involved in the decision-making process regarding it. As a result, three managers in charge with the environmental department were selected.

The next step was to contact them in order to establish the interview date and hour. Each interviewee was first contacted through the phone, the topic was detailed for them and it was made sure that they were the right ones to talk to. Furthermore, they were asked if they felt comfortable having the interviews in English, so that the authors of the paper could fully understand their points without any misinterpretations. They agreed to answer to the questions in English, and thus a date and an hour was set for the actual interviews.

Afterwards, a room was booked in the Umeå University Library, in order to have good conditions and be able to conduct the interviews in silence and to have a computer to be able to record the conversation using a computer program. Even though the interview was conducted through the phone, the phones built-in speaker was used in order for the computer program to record it.

The first interview was conducted with NCC, on the 4th of May 2010. The interview lasted 90 minutes and almost all the questions were answered. Since it was the first interview, the flow in the beginning of the interview was staggering slightly but after a while the conversation flowed more naturally.

The next interview was with PEAB, also on the 4th of May 2010. The interview lasted 80 minutes, slightly shorter than the first interview, largely due to the fact that a good flow was maintained throughout the interview.

The last interview was conducted with Skanska on the 6th of May 2010. All questions were answered in the 70 minutes time that the respondent had allotted for us.

The second set of interviews was done through Skype. The interviewees were contacted beforehand in order to confirm that they agreed to conduct the follow-up interviews and a date and time for these were decided upon.

The interviews lasted for approximately 20 minutes and were conducted on the 23rd, 24th and 27th of September 2010.

After conducting the interviews the information gathered on the digital recording was transcribed and is presented in appendixes 1-8. It was then summarized in the tables used in the presentation of empirical findings. A more thorough description of the responses as well as a comparison of the three companies’ responses followed the tables. Lastly the analysis was made, comparing and finding linkages between the literature and the empirical findings.

4.4 Research analysis

The analysis will be conducted with data display and analysis strategy. According to Saunders (2003) this method combines both an inductive and a deductive approach and it has three main components: data reduction, data display and drawing conclusions (Saunders, 2003:394). Miles and Huberman (1994) suggest that data reduction can be
done by summarizing the interviews. In appendix 1-3, a transcript of the interviews is presented, which was the base for the selection of the main concepts and ideas for the data display. The Tables in Chapter 5 represent the data display of the selected information from the interviews. Miles and Huberman (1994) suggested the use of matrixes with well-established columns and rows is a way to display the data. In the end, the conclusions were drawn upon the data display and the information provided in the transcription of the interviews.

The analysis was done by relating the empirical findings to the previous theory presented in Chapter 3. Miles and Huberman (1994) believed that by using data display the analysis and the conclusions are more accurate because it is easier to see and understand the different aspects presented.
Chapter 5: Research findings

This chapter will begin by presenting an overview of the companies that participated in the interviews, explaining their field of operations, and their environmental involvement. This will be followed by the presentation of the primary data. This data will be presented in three different themes and the information from all three respondents will be presented comparatively.

5.1 Companies Background

5.1.1 NCC

NCC is one of Sweden's leading construction companies with revenue of more than 52 billion SEK and 18,000 employees. The company operates in all of Scandinavia, the Baltic states, and Germany. In Sweden the company is divided into four divisions, construction, roads, property development and housing. Their vision is to be the leading company in the construction industry when it comes to corporate responsibility and it is apparent that they have been taking this into account throughout their business model. The awareness for environmental issues originated from a series of industrial accidents, where the incident at Hallandsåsen in the late 90s was one of them. It started as risk awareness and evolved in time to become more dependent on a variety of sources such as government regulation and customer awareness (NCC interview). Much like the strategy of eco-efficiency, NCC has focused on reducing energy usage by monitoring their energy consumption. They use 3D-models in what they call virtual building to save material and energy use, more effective transportation, and by practices such as lower temperatures when producing asphalt. Furthermore, they are reusing materials such as old asphalt, as well as the use of renewable energy-sources in transportation and office environment. Another step in their green production is the removal and reduction of hazardous materials with their involvement BASTA, a national industry collaboration that regulates the usage of dangerous chemicals further than government and EU regulation requires (NCC). (NCC website)
5.1.2 PEAB

PEAB is a public company with its main area of operations in Sweden but also in Norway and Finland. The company has revenue of over 35 billion SEK and around 13,000 employees; it is one of the largest construction companies in Sweden. PEAB believes that all environmental efforts have to be done in agreement with the stakeholders, such as employees, customers and suppliers. Relationships have to be formed that build on knowledge and trust (PEAB). The importance of environmental issues at PEAB has started to increase in the last decade. This prompted the company to expand the environmental department, which had previously been relatively small (PEAB interview). Much like NCC, PEAB is working with their energy usage as well as their choice of materials. PEAB is also working on developing new technology, using technical innovation in order to save energy, and resource consumption. The company is also involved in the collaboration in BASTA together with NCC and Skanska. (PEAB website)

5.1.3 Skanska

In the industry of construction and construction related project development, Skanska is an internationally active firm. It is Fortune five hundred company with 53,000 employees and revenue of about 135 billion SEK. They are a major player in the construction industry. The company strives for sustainability in relation to quality, green development, corporate environment, and ethics. Skanska emphasizes environmental involvement in areas such energy conservation, choice of materials and a responsible handling of waste products and harmful materials. The company seeks to be the first choice for customers dealing with green projects (Skanska ANNUAL REPORT 2009).

5.2 Empirical findings

The empirical primary data presentation will start with information regarding the companies' environmental projects, followed by sustainability and competitiveness. The initial table presents an overview of the main points of the response to every question from each respondent. (1.NCC 2.PEAB 3.Skanska)

Table 2: Background Companies Interviewed

<table>
<thead>
<tr>
<th>Background</th>
<th>1. Environmental manager for NCC Construction Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briefly introduce your role/title within the firm</td>
<td>2. Environmental manager at PEAB</td>
</tr>
<tr>
<td></td>
<td>3. Environmental manager at Skanska</td>
</tr>
</tbody>
</table>
### 5.2.1 Environmental strategy

<table>
<thead>
<tr>
<th>Environmental strategy</th>
<th>Findings</th>
</tr>
</thead>
</table>
| **What is the purpose of the environmental department? Why was it formed?** | 1. Initially, the purpose of the environmental department was to handle the perceived risks of the construction industry.  
2. The importance of the department and its progress was due to external pressures, mainly from customers.  
3. Supporting the business in order to comply with legislation and continued improvement of environmental impact. |
| **What role did internal/external stakeholders have in the creation of the environmental department? (Employees, government, shareholders, customers, the local community)** | 1. Definitely customer driven, where the market created a demand for an environmental department.  
2. Initially government regulation was the prominent factor that affected the company. It has changed into being customer that mainly brings the environmental issues to light.  
3. All stakeholders were involved in its creation. It was obvious to the company that they needed to respond to stakeholder views and that it was a vital part in order to be taken seriously on the market. |
| **Would you say that the firm is following an environmental strategy?** | 1. Yes, there are guidelines and policies that steer the company in their environmental initiatives. It guides the company in what areas focus should be.  
2. A vision and a plan has been formed that have identified different scenarios for the future. The goal is the forming of a sustainable society.  
3. The goal of the company is to be in the front of sustainable construction and move all of its projects towards greener production. The company has identified key areas that are of importance when trying to achieve this goal. |
| **How important is the environmental strategy/activities to the firm?** | 1. It is essential for the survival of the company.  
2. Their environmental vision is taken very seriously and so is the strategy.  
3. The company wants to take a leading role in sustainable construction, environmental strategy is vital to achieve this. |
| **What extent were the consumers/customers needs taken into account when developing an environmental strategy or introducing new green activities?** | 1. In recent years, the customers' needs have been taken into account.  
2. There is always a dialog, in fact, the customers' opinions on these issues are the main contributor the the company's environmental involvement.  
3. They have a major part in it. Green business is very lucrative and the customers' opinions are valuable when trying to capture the green business. |
| **How did the company's environmental activities evolve over time?** | 1. There was a gradual change, both on our part and how the society perceives the environmental issues.  
2. There is a mix between focusing on short term and long-term goals, since the environmental department is relatively new; it is hard to describe it as a stage like process.  
3. The journey over the past 15 years have had an exponential growth, slow in the beginning and more and bigger changes towards the stage in which it is today. |
All companies identified a process where the company had undergone a transition in the way that they are responding to environmental issues. NCC described it as "a process that initially regarded the risk awareness" (NCC) of their business, followed by industrial accidents, to a more customer oriented approach PEAB and Skanska identified the market as a major driver for their incentive to change. Skanska views the environmental department as "an important internal tool that gives the employees direction in their environmental involvement" (Skanska) to a larger extent than the others. The others view it more as a department that spearheads the environmental projects.

As already indicated, the primary driver for the companies' environmental involvement has been external. The three companies recognize that the industry long has been "overly reactive in their approach to environmental issues" (PEAB) and that "the last 10-15 years is where the change has started to happen" (Skanska). NCC and Skanska both recall an industrial accident that in the late 90s that challenged the way in which the industry operates. The incident at Hallandsåsen in Sweden created a sizable attention in media where harmful chemicals leaked into the groundwater after the use of hazardous materials in the construction process. This was identified as a major turning point for the industry that transformed their way of thinking and "kick started" their environmental involvement. Furthermore, this incident also raised the awareness of the media and government, and further accelerated the process. Stakeholders that were especially recognized to have impacted the environmental strategy were customers and government even if others were mentioned as well.

Sweden's three largest construction companies all state that they are following an environmental strategy, although its meaning and purpose slightly differ. NCC describes it as "guidelines and policies that direct the firm in what areas to focus the environmental initiatives" (NCC). PEAB has created a vision and "identified different scenarios for the future" (PEAB). The components of the environmental strategy are also pretty similar in all of the companies. Energy conservation, both in the building process and during the buildings lifetime (approximately 80% is in the latter) are high on the firm’s agendas. Other areas are the choice of materials with the purpose of eliminating health issues for workers and habitants, resource reduction, waste management, the use of recyclable and renewable resources, and transportation.

The environmental strategy has been identified as something that is "absolutely essential for survival on the market" (Skanska) with PEAB saying, "I think you could talk about the survival of the company" (PEAB) when asked of its importance.

Skanska sees customer involvement in environmental activities as important in order to capture that part of the market. They believe that by "becoming the leading company in the area and an edge in this market will generate much business" (Skanska). PEAB on the other hand are talking about having a dialog with the customer and believe it is important to listen to people. After all, "a lot of the changes in the building sector are due in large part that customers are talking about these issues" (PEAB).

NCC clearly recalls a gradual change of how the company has related to environmental issues, where external forces have molded the guidelines and policies. Where environmental involvement is inevitable due to the high focus in media and among customers. They further state, "there is not doubt that there has been a change in the
market and what customers demand these days, the customer is demanding different products than they were 10-15 years ago" (NCC). They go on discussing "when constructing properties in the past, the policy was to build them just to meet the minimum requirements for example, energy consumption" (NCC). Today they are constructing buildings that are between 30-50% more energy efficient than regulation demands and the reason is simple they say, "it is what the market demands"(NCC). Due to PEAB's more recent focus on environmental issues, there has not been as much of an identifiable process that has changed over time. Instead, PEAB is talking about a process that involves long-term and short-term activities. Even though there is a mix of working with long-term and short-term goals, they admit that a "problem right now is that there might be too much of the quick issues and less of developing the company in long-term" (PEAB).

### 5.2.2 Sustainability

Table 4: Sustainability- findings

<table>
<thead>
<tr>
<th>Sustainability</th>
<th>1. It is a highly relevant topic. The construction industry has a big part in the growth of a sustainable society.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you view sustainable development? Is it an important issue in society today?</td>
<td>2. The construction industry has not been so active in themselves and have done nothing when it had not been demanded.</td>
</tr>
<tr>
<td>How do you view the industry of construction, does it play a big role in the fight against the deterioration of the environment?</td>
<td>3. It has a big impact on the environment, something that can be significantly reduced with the right measures.</td>
</tr>
<tr>
<td>What was the initial view of introducing policies for environmental changes? Was there any resistance?</td>
<td>1. It has been tough work; sometimes the whole environmental involvement can be challenged when for example a customer questions our involvement.</td>
</tr>
<tr>
<td></td>
<td>2. It was surprising how well the environmental strategy was received. However, there is still some resistance.</td>
</tr>
<tr>
<td></td>
<td>3. There was not really any resistance, most employees stand behind the company in their environmental efforts.</td>
</tr>
</tbody>
</table>

As mentioned before, Skanska has a goal of being in the forefront of sustainable development in all of their projects. They recognize it is important for society and mankind and that the habitat has its limits. It is "one of the biggest tasks mankind has ever faced"(Skanska). The construction industry is believed to have a big impact on the environment and that "with the right measures it can be significantly reduced" (SKANSKA), with the ultimate goal being no impact at all. Also NCC has appreciated the importance of the construction industry as a major actor in the fight against environmental deterioration. Further is stated that the construction industry has been referred to as the 40% sector since that is how much of society's energy consumption comes from property maintenance. They argue, "the construction industry is vital for a
society that wants to continue to grow" (NCC) and that it gives them a chance to make sure that it grows in a sustainable fashion. "The construction sector has been quite good at some parts of the environmental issues but not good enough," argues PEAB’s manager (PEAB). She further suggests that most firms have done nothing unless they have seen a demand for it and that environmental strategies long have been too reactive. One way to work with sustainability is education, something that is believed to be important in order to take a more proactive approach (PEAB).

"There is always some resistance, even now" (PEAB) states when asked about the initial view of the environmental strategy and how it was met within the company. It was, however, exceeding the expectations and was surprisingly well received. Now people are starting to see it as a natural part of business and more importantly as a business opportunity. NCC describes it similarly saying that "it has not been a bed of roses" (NCC) where both external and internal stakeholders have had objection at times. It can be a customer that is wondering what the point of getting involved in the environment is and rather wants the lowest prices, something that can lead to uncertainty within the organization as well where employees and management are asking themselves why they get involved when it will not generate any more profit or customers. It has proven to be justifiable and the last 4-5 years really has changed the attitude towards environmental issues in a positive direction. Skanska describes the current situation, saying that most actors within the company are fully behind the firm’s environmental involvement and "take pride in the company's efforts to reduce its environmental impact" (Skanska).
## 5.2.3 Competitiveness

### Table 5: Competitiveness - findings

| Competitiveness | 1. It is hard for firms to have the possibility to make very unique products. However, we do differentiate ourselves through minor changes (i.e. offering “passive houses, energy declarations, and green offerings).  
2. It is hard to be unique in the building industry. We strive to be unique in the sense that our company wants to have all departments in the company thinking “green” and always having the environment in mind when a project is undertaken.  
3. The development of advanced CO2 calculation tools and buildings are certified by environmental organizations like Svanen (first and only company in Sweden). |  
---|---|
| What makes your environmental activities unique on the marketplace? How are you different from your competitors? | 1. It is nearly impossible to trace back profitability to a given environmental activity. However, environmental activity does generate interest, but it is hard to say to what extent.  
2. The survival of the company depends upon environmental activities and management has identified this is where the money is.  
3. It has been responsible for winning contracts where environmental issues were big concerns. More and more customers are demanding this environmental element. |  
| What impact have you been able to identify in market share/profit/general growth followed by the environmental activities | 1. Through minor differentiation, relying on the small unique options that we can offer.  
2. We want to be the leader in sustainable practice, the sustainable society. A clear vision has been created to attempt to achieve this.  
3. It will be sustained through close relationships with the customers and environmental organizations that certify green construction. The goal is to be the leader in green sustainable building. |  
| Will you be able to sustain the identified advantages? How? | 3. Environmental activities are and will be a relevant topic in the future, and firms must continue to see the relevant changes and to adapt to them. |  
| Do you think environmental activities will continue to be a relevant topic and why would the firm continue to develop and invest in it? | 1. The organization needs to balance the business. The green market is young and implementing radical changes before the market is ready will not move the company in a competitive direction.  
2. PEAB believes in focusing on current long-term strategies where environmental thinking is a part of every project and throughout all the branches of the organization.  
3. The intention is to involve environmental issues throughout the organization. That is something we are working on at the moment; however the organization does not revolve around environmental thinking at this point, which would seem to be the next step. |  
| You mentioned previously that it is hard to differentiate the company in an environmental way. What could you do, that you are not doing today to more successfully differentiate yourself? Have any more radical strategies been considered in order to establish the company as a truly sustainable company, and by doing so trying to establish a stronger position on the green market? | |
You described that an environmental strategy was vital to the competitiveness and even the survival of the business. It was also described that some of the environmental activities or practices that have been widely accepted are now more or less seen as common practice. According to your belief, will this continue to happen until most or all of the company’s practices are seen as common practice?

1. Complete environmental sustainability is far away. Continuing to invest in environmental practices is the right way to remain competitive. There is always a way to do something better.

2. Having companywide involvement and perfecting common practices is the strengths of PEAB. Companies always need to continue to be innovative and not standing still but continuing to move forward is essential for any business success.

3. There will always be a need for innovation and the development of new techniques as well as making existing ones more efficient.

Many businesses today are undergoing many hardships due to economic downturn. Do you consider environmental strategy to be compatible with times of economical struggles, in other words, can a business in the construction sector continue to think environmental in times of bad economy?

1. Small steps in the right direction will always be possible as long as you believe in what you are doing. Some things are cost saving and there for very compatible with economic downturn while other actions are costly.

2. It makes things more difficult, but there are many cost saving solutions in the environmental strategy. Environmental thinking is a must even in a bad economy.

3. There are many environmental initiatives that cut costs, and customers are still asking for environmentally friendly product offerings.

What is your strategy for dealing with a construction company that is all green and have more specialized and comprehensive methods for building environmentally friendly? Can you hope to compete with such a company?

1. There are different market segments and NCC has chosen to target a broad group. By working on long-term goals they will compete.

2. Education and innovation together with a long-term commitment to environmental issues will lead to a leading position in green construction.

3. Skanska has an advantage due to its size and as long as innovation and a focus on moving forward exist, we can use that size to prosper.

All of the companies recognized that it is hard to create drastic uniqueness in the construction industry on environmental activities, but did mention that they are able to use small changes to environmentally differentiate their offerings. The environmental manager from NCC commented "We strive to make ourselves unique, but it’s definitely not easy. I don’t think that any of the construction companies that have had the possibility to create a very distinctive product. It is rather smaller details and components in the process that we manage to differentiate" (NCC). He then continues to mention this concept of efficiency "We are working a lot with energy efficiency" (NCC). Another environmental manager from PEAB adds, "It is very hard to be unique. We want to be unique by having all our organization with us...we have a unique possibility [at PEAB] to have quicker spread of information in the environmental development" (PEAB). The interview with Skanska reinforced this notion that smaller changes like advanced CO2 emission tools provide a sort of uniqueness in the market (Skanska).

The companies interviewed talked about long term solutions where the goal was to be a leader in environmental sustainability. More drastic and immediate strategies were
deemed unsuccessful and as NCC put it, “would not move the company in a competitive direction”. It was further pointed out that a preferable strategy is “to be excellent at what we do and in so doing, establishing us as an environmentally friendly company” (Skanska) rather than trying to be the company that takes the environmental initiatives the furthest.

A big aspect of competitiveness is economic gain. However, it is hard in the construction industry to identify precisely the economic impact that environmental activities have on the firm. NCC's manager says "There are so many things overall that contribute to profitability and to back trace something to an environmental activity is close to impossible" (NCC) from a profitability standpoint, while addressing growth by remarking "[Environmental activity] creates an interest for sure, but whether it has increased the number of projects we have been offered is harder to discern" (NCC). Skanska mentions that the effects of their efforts have not been fully realized, but that in less quantifiable terms the company feels confident that they have won several contracts based upon their environmental activities (Skanska). The PEAB manager responds to the economic gain in more general and blunt terms "[Environmental activities lead to] the survival of the company" (PEAB). It would make sense that the natural progression from how companies create economic value out of environmental activity would be how they maintain it.

The companies are actively engaged in insuring that they are able to sustain their current environmental practices, while also attempting to build upon them. All of the managers discussed company-wide goals or initiatives that stress wanting to be the most prominent construction company for sustainable development. Additionally, NCC slightly qualified these sentiments to include that they plan to do this through minor differentiations in what they offer compared to competitors (NCC). Each of the companies realized the significance of not letting up on the gas when it comes to gains they have made in environmental activities. The companies realize that this issue of the environment is going to be relevant for the indefinite future. Since a successful company needs to continue to grow and be innovative, both PEAB and Skanska point out that innovation will continue to involve an environmental thinking. More and more of the environmental activities will become common practice, but this will not stop the innovation or make environmental sustainability an area of lesser importance. It was also revealed that environmental strategy and times of bad economy can coexist to some degree since much of that strategy is about being cost efficient.

All of the interviewees are in agreement that environmental activities will be relevant in the future. The manager from PEAB gave a resounding "of course" and proceeded to discuss how in the future companies can no longer afford to "deal with economical and environmental demand separately" (PEAB). Another interesting remark made by the PEAB manager relevant to this particular discussion is a quote from another question she was posed "The company has identified [environmental] issues as crucial to the future of this company to earn money" (PEAB). Skanska's manager adds, "A continuously larger portion of the market will be placed in green and sustainable construction. To be able to make profit and in the long term survive in the business adaptation has to be made" (Skanska). The three leading construction companies speak similarly about the phenomenon of niche market segments, where they state that the type of market segments that they are catering to, making changes that the market is not ready for is not going to lead to a gain of competitiveness. Focusing on long-term
solutions and making sure that an environmental thinking exists throughout the organization is rather the key as described by Skanska.
Chapter 6: Analysis

This chapter will present the empirical findings in relation to the literature review analyzing their importance to the purpose of this study.

6.1 Environmental strategy

All companies identified external forces as an important factor to the evolution of their environmental strategies. This is in the same line with the positioning school conveyed by Porter's (1980) five forces model explaining that the firm’s performance and competitiveness is contingent upon externalities and the industry itself. However, it is also clear that the firms believe that competitiveness also can be generated by internal means. Skanska for example stated that the environmental strategy primarily is seen as an internal tool. This indicates that the two distinct schools of competitive theory are not mutually exclusive.

When explaining how the environmental strategy had evolved over time NCC stated that it started out as a way to manage risk, mirroring one of the five approaches identified by Reinhardt (1999) namely managing environmental risk. The role of the environmental strategy has gone from being risk mitigation to a larger focus on capturing the possible benefits. This reinforces Berry and Rondinelli's (1998) description of how proactive firms now realize that there is a way to profit from the environmental strategy and how it has changes from the prior view of just being a way to address and manage stakeholder concerns. PEAB described it as being "overly reactive in their approach to environmental issues" (PEAB)

In the way the respondents described the process of how the environmental strategy was formed in the three companies, it became clear that they were putting their focus on what Betts and Ofori (1992) refer to as the ever changing prevailing views coming from external pressures and have not taken the opportunity to distinguishing themselves from within in relation to the other companies in the industry. They were talking about how the environmental strategy was meant to guide the company in the "areas to focus the environmental initiatives" (NCC) or the vision for where the company is heading in the future. None of them mentioned was how they intended to capture the benefits of their strategy or how it would separate them from their competitors.

6.2 Sustainability

Just like Reinhardt (1999) argues about firms no longer believing in the underlying principle that earth is healthy, the companies recognize the importance of the environment as well. Skanska comments, "sustainable development is very important for our society and the continued well being of mankind" (Skanska).
It is having a goal of sustainable development and an ultimate goal of having no impact at all on the environment (Skanska). While also recognizing the importance of the environmental well-being and its connection to the well-being of society, their environmental strategy is still more in line with eco-efficiency rather than eco-effectiveness. Their strategy and their visions are centered on the product offerings and the production process and their goals to make it sustainable. The key difference between eco-efficiency and eco-effectiveness illustrated by Dyllick and Hockerts (2002) example:

"more efficient cars, for example, reduce the cost of driving a car. However, today roughly 70-80% of the world cannot afford to use cars...thus more efficient...cars might very well backfire from an ecological point of view by increasing the number of car and kilometers driven per year...to avoid this type of rebound effect companies will have to focus on absolute amount of mobility-induced [Carbon Dioxide] emissions worldwide" (p. 137)

states that the making of environmentally sustainable buildings in this case, is not enough to be in line with eco-effectiveness. To reach eco-effectiveness the strategy would also have to address the issue of resource depletion, recognizing that if the whole world would live by western standards, there might not be enough resources available to make this possible. Resource depletion would then be a problem, even if the buildings themselves were self-sufficient energy wise it would not be completely sustainable.

This alignment with eco-efficiency further suggests that the companies are still viewing sustainability in a way that is depicted in the literature as weak sustainability. Unless they incorporate elements in their plan such as creating a way to ensure that as suggested by Dyllick and Hockerts (2002) natural resources are not consumed faster than what they can be naturally reproduced and that harmful emissions or other activity that degrades the eco-system, they cannot be 100% sustainable. The companies did not explicitly state which type of sustainability their respective forms are pursuing, but it is fair to imply from statements made by the PEAB manager like “not coming far enough” and “still a long way to go” imply that the companies are most likely looking at eco-efficiency.

It is also important to mention the importance that all the managers of the interviewed companies remarked about how sustainability is essential to their strategy. This emphasis appears to give more validity some of the connections we discovered in the literature review: mainly that sustainability is the backbone of environmental strategy. Environmental strategy and competitiveness are the two major concepts explored because this exploratory study looks at how environmental strategy had led to competitiveness. However, sustainability is an important component of both of the aforementioned topics.
6.3 Competitiveness

The companies discussed that environmental activities have to some extent contributed to the competitiveness of their respective firms. They attribute a lot of this increased competitiveness with the changing climate of the industry and the small changes implemented to create slight distinctions from rival companies. These small environmental changes represent a bit of what Orsato (2006) discusses in environmental differentiation. Another large part of derived competitiveness was in part the result of customer demands, government regulations forcing change, and the industry in general. Therefore, it seems that the construction industry uses at least to a basic level, some of the principles in Porter's (1980) competitive strategy to create competitiveness for the firm. The construction industry to a large degree tends to inhibit uniqueness based upon resource-based competitive advantages (NCC). The construction companies echoed the sentiments of De Simone and Popoff (1997) in presenting eco-efficiency an important part of making their companies competitive.

The comments presented by the interviewees on environmental activities on economic impact reference to a small extent observations made in Lützkendorf and Lorenz's (2005) literary work. In that literary work, the authors’ note, "empirical demonstration of the financial benefits of sustainable buildings is difficult to obtain due to the lack of detailed information on different building characteristics and associated performance...little representative empirical evidence [has been] published to date" (Lützkendorf and Lorenz, 2005 p. 216). This suggests that the problems in empirical data discussed in literature may in fact be a real world problem plaguing environmental managers presently, especially when making their case to colleagues more concerned with economic performance.

Sustainability is not something that is a once and done, it will have to be a constant refinement on the part of the businesses and they will need to adapt as needed (Goodland, 1995). The literature out there discusses the increasing importance of sustainability (Beckerman, 1994; Goodman, 1995; Lützkendorf and Lorenz, 2005) and the level of importance companies are placing in it at present. It can then be inferred that environmental issues will be an issue that will be dealt with for the near future. The interviews with the construction representatives indicate that companies in the construction industry in Sweden will be pressed to conduct environmental activities to remain competitive in the market. This is based off their experience in the recent past where sustainability and environmental strategy issues were addressed to meet the expectations of external entities and to meet the ever-changing status quo of the Swedish construction industry. The managers interviewed from the companies looked at felt strongly about their views.

NCC discussed that it was important to implement an environmental strategy early on to guide environmental activities within the firm. The company has been committed to an environmental strategy since a mishap in the late 90's. Conversely, the PEAB manager mentioned that her company is a relative latecomer in environmental strategy, emphasizing the company's lack of experience with environmental activities. This has slowed their ability to implement environmental change quicker. It does highlight that despite the fact a company might lag behind a competitor in environmental strategy, it is necessary for companies to pursue it. This is of note given the importance the
construction companies place on being the leader in sustainability and environmental development.

The companies comment that utilizing an environmental strategy makes the more competitive. They focus on the cost savings that allow them to be more competitive, even in the face of a gloomy economy. It is also important that companies look toward the long-term future to generate their competitive competencies, because as noted by the PEAB manager the industry pays too much attention to short-term solutions. This is not surprising given the increasingly competitive nature of the industry. Many of the sentiments expressed by the interviewees to a small part are present in publications on the subject.

6.4 Overall analysis

There are several implications of the empirical evidence and literary publications compiled. The links between the literature and the empirical evidence suggest that some of the theories presented in the academic publications look relevant in certain contexts with real world application. This relevance can be demonstrated by a comment Betts and Ofori (1992) make who argue that construction companies cannot create an overall strategic plan without incorporating elements of an environmental strategy into the framework of the company's overall strategic plan. Taking into consideration the data obtained through company interviews there would be some agreement to that statement. Therefore, companies would be well served to explore the role of environmental strategies and its overall impact on the firm’s competitiveness.

There is also a recurring theme presented at times by the literature and interviewees of external pressures to the construction industry. These pressures have been argued to be the catalyst for this transition toward environmental strategy. The governments and customers appear to be the biggest contributors to the changing policies and views of the businesses; this has been particularly the case in the Swedish construction industry. The strategies outlined by Porter (1980; 1985) are ever present in some form in the Swedish construction industry today. The empirical evidence and literary references to Porter from environmental strategy publications convey that external forces are at least partly responsible for some of the competitive advantages and competitiveness viewed in the Swedish construction industry.

Eco-efficiency is a strategy that may be a result of the dynamic changes the Swedish construction industry is undergoing as industries naturally innovate over time. Some firms place more weight in the concept than others. While some literature has criticized the concept of eco-efficiency as being a good strategy for the environment, it is hard to argue that it has been a bad selling point for companies that use it to leverage their position compared to rivals. The interview respondents described, in some form or another, this idea of environmental efficiency. It shows that companies are not afraid to commit to new strategies that involve environmental components. One other thing that can be deduced from eco-efficiency is the idea that firms are rapidly attempting to make small modifications. Many eco-efficient changes require little large-scale changes (De Simone 1997), and undoubtedly would be a vital part of any environmental plan to increase competitive advantage.
Some of the empirical evidence provides support on a relatively superficial level to the literature pertaining to the relationship between environmental strategies and the competitiveness of a firm. The two concepts have factors that suggest a relationship exists between the two. The managers subscribe to this thought as they all comment that one of the major goals of environmental strategy is to be competitive in the industry. Sustainability is an exceedingly important aspect and backbone of environmental strategy. The interviews also expressed an important idea that is repeated throughout different literary publications that competitiveness and environmental issues do not need to be mutually exclusive; in fact there are many cases the managers and the literature discussed where environmental activities could lead to increased competitiveness.

It can be seen both from the literature and empirical evidence collected that while there have been big strides made in environmental strategy in the industry, there is still large room for improvement. Take for example, the short-term vs. long-term dilemma and the eco-efficiency vs. eco-effectiveness. It is important to remember that the concept of environmental strategy can still be considered to be in its teenage years. The large increases in literature devoted to this topic and the increasing prevalence of it in business community shows the increasing importance of environmental strategy. This will be one of several major issues heading forward in the Swedish construction industry.
Chapter 7: Conclusions

This chapter presents conclusions of the study and some of its limitations. It also presents theoretical implications and areas of future research.

7.1 Conclusions related to the research question

Before we begin the conclusions to this study we want to remind the reader of the research question, since the conclusions are related.

- How has the introduction of an environmental strategy led to competitiveness within the construction industry in Sweden?

There is no doubt that the introduction of an environmental strategy has led to competitiveness in the companies studied in this paper. It was, however, not a concept that can be clearly identified and followed during the development of the environmental strategy. The reason that the strategy looks the way it does to the companies is mainly due to external forces that have guided the companies in the forming of the strategy. Most importantly among these external forces were government and customers. This confirms previous empirical research examining the industry where it is stated that the environmental strategy is a result of external pressure rather than the companies’ internal mechanisms (Betts and Ofori, 1992). The companies have started to see the benefits from having an environmental strategy, where not having one would significantly hurt the competitiveness of the company. This is something that all companies are clear about, stating that without an environmental strategy the company's survival is at stake. Further benefits have been harder to identify since differentiation has been described as hard and seems to have been left out, at least in the initial stages of the strategy.

When inquired further though, reasons given for the importance of the environmental strategy seemed to revolve mostly around the same external factors that formed the strategy in the first place. Stating that regulation is ever evolving and that the lack of environmental initiatives would result in a loss of customers. What is missing is the approach to the competing firms in the industry, where differentiation from competitors is considered hard, something that may also be the result of the construction industry where uniqueness in product offerings is hard to offer. With an increase in awareness for environmental issues more companies are likely to adopt environmental strategies and merely just having an environmental strategy would no longer lay grounds for competitiveness. Nevertheless, the environmental strategy is believed to continue to be an important aspect in any new steps that companies in the industry are taking. Whether it is new innovations or changes in practices, they will have to incorporate an environmental thinking.
The three construction companies that have been in focus in this study have been able to identify a market trend where customers are stakeholders started to demand a different type of thinking. They stayed competitive by adapting to these demands and started to devote more and more time and resources to excel in this area. However, it is believed by the authors that companies developing environmental strategies need to incorporate a clear goal of differentiation in order to fully take advantage of this emerging market segment. It is not something that the companies represented in this study describe that they have been doing.

The analysis indicates that the three construction companies have long been reactive in their approach to environmental issues and further that their environmental strategy shows similarities with what is called eco-efficiency in the literature. A strategy that is considered too weak for long-term sustainability but is nevertheless the most common way of relating to sustainability issues. Could there be any potential for differentiation in the way that these companies view sustainability? Perhaps by adopting a stronger view of sustainability and moving their strategy towards eco-effectiveness the firm could claim a stronger stand against the fight against environmental deterioration that holds up to scrutiny and in the same time establish a name for themselves on the marketplace as a truly sustainable company.

7.2 Theoretical implications

The paper set out to contribute to the empirical evidence in the field of environmental strategy and competitiveness. This was done by providing an overview of how the environmental strategy was formed and how it led to competitiveness in the specific industry of construction. The three companies interviewed can give an indication to how the rest of the industry has been working with environmental issues as well but the study is in no way representative or generalized to the industry as a whole.

Our findings suggest that the construction companies have adapted to the new market trend of environmental sustainability and by doing so they have managed to stay competitive. They have however not included the aspects of environmental differentiation to any larger degree when forming their environmental strategy. However it is clear that environmental issues are a vital part of business and that one cannot be competitive without it. These findings led us to a changing of the original model presented in the end of the literature review where the reality is that environmental differentiation has been standing apart from the other elements and that the construction companies have not fully been able to take advantage of this new market segment.
Figure 4: New interpretation of the links between environmental strategy and competitiveness
7.3 Limitations

Over the course of this study certain limitations arose that will be explained in this section.

An initial limitation surrounds the interviews conducted to compile empirical evidence. The interviews were limited to one person at each company; this means that the information given was not validated by a secondary source and could mean that their view is not necessarily the views of the company as a whole. Another limitation was the inability of capturing the whole Swedish construction industry, and therefore, a generalization about the whole industry cannot be made. This means that the conclusions to the paper should be viewed as an answer to the research question from the perspective of the people interviewed.

7.4 Suggestions for future research

A more comprehensive study that digs deeper into the theoretical aspects of how environmental strategy is formed and its relationship to competitiveness should be conducted in the future. This study is an initial exploration into the relationship between environmental strategy and competitiveness; it presents the issues at a surface level that future studies will dig down into. Future studies will overcome the limitations of too weak an empirical base resulting from the time constraints. It is the authors’ hope that proceeding studies on this topic will present it from a global perspective. This study is not intended to make any startling revelations, but is intended to pique interest in explorative studies pertaining to this topic that seek to explain rather than discover.
Chapter 8: Quality criteria

This chapter discusses the quality and trustworthiness of the results of the study. In the following paragraphs we will discuss the criteria used for evaluating the dependability and quality of this study. Although researchers have different views regarding which criteria are most appropriate for a qualitative study, we decided to consider four: transferability, dependability and usefulness.

8.1 Transferability

Transferability refers to whether the results can be transferred to other contexts, but also considers the epistemological position taken in this study. Interpretivism sees the phenomena tightly related to a certain context (Malhotra, 2007). The research method, qualitative study and the results reflect the understanding of a certain phenomena and thus they can be transferred to other contexts, whereas the actual empirical findings might not be transferable.

For this study, this means that the actual understanding of how the environmental strategies affect the competitiveness of a company in the construction sector, as a concept can be transferred to other contexts, other countries maybe, but not the specific national or contextual results that are tied to the Swedish economic environment.

8.2 Dependability

This criterion suggests that the researcher should track all the steps made during the research presenting the chronology of the activities, the factors that influenced the data collection or the analysis (Morrow, 2005). In Chapter 2 are presented the literature search, the scientific approach and the perspective through which the study is conducted and in Chapter 4 the research method, including the sampling process, collecting the information and the analysis strategy; all those steps are detailed in order to provide a deeper understanding of the process for the reader.

8.3 Usefulness

This study tries to understand through the eyes of the managers in the three major construction companies how environmental strategy affects the competitiveness of the company. The results will be helpful for the Swedish construction industry, as it will provide them with an understanding of how an environmental strategy affects their competitiveness. Whether the results can be used in real life situations is being evaluated by the criterion of usefulness (Charmaz, 2006, p. 183). The exception being for what is mentioned before, in Chapter 7 suggestions for further research could improve the results of this study and make it more useful in reality.
References


Appendix

Appendix 1. Interview with Göran at NCC

Q1. Briefly introduce your company and your role/title within the firm.

NCC is a big company with operations in a few different fields within the construction industry. I'm the environmental manager for NCC construction Sweden which is the branch that deals with the construction of buildings. Additionally I have had a cooperative responsibility since 2002 for the whole company when it comes to environmental issues. The reason is that there is no central environmental unit that deals with all parts of the company, so someone has to bring all branches together. Furthermore I help the board of directors with environmental issues. Both communication in the company and externally, but foremost internally. Not representing the company, more on development.

Q1.1: Do you communicate both internally and/or externally mostly?

Both; however, mostly internally. There are communication and marketing departments working together with me that take care of most of the representation of the company, something that I have not been doing to a large extent.

Q2: What is the purpose of the environmental department? Why was it formed?

Environmental issues have been a subject of interest for a long time but it wasn't until in the 90s that it became an organizational issue. An incident that proved to be a real turning point for how NCC but also other construction companies view their impact on the environment was the incident at Hallandsås in the late 1990s where harmful chemicals got into the local water supply after the use of hazardous substances in the construction process. This made us as a company realize the risks involved in our operations. Incidents that generate such environmental impact are always prompting the company to look over the production process. The other part is how the market is expecting the company to respond to environmental issues. In other words it was both from a perspective of risk awareness as well as the demand from the market that created a need for the environmental department.

Q3: Would you say that the firm is following an environmental strategy?

Yes, there are guidelines as well as an environmental policy that focuses on a number of different areas where the company is working on certifying the different components of the production process in ways that ensure a responsible and sustainable management of resources. The certifications are regulating things such as eliminating the use of hazardous materials and the choice of materials used in production to eliminate any health issues for workers and habitants. Then there is the waste management the way that we manage resources. The biggest and increasingly important area is the energy usage, where we are developing energy efficient buildings and processes in the
production and constructions. Furthermore we work with the transportation, a process that cannot be eliminated but can be handled in a way that is more efficient and optimal to decrease the amount of transportation needed.

**Q4: How did the company's environmental activities evolve over time?**

There has been a gradual change in how we work with environmental issues, from risk awareness to where we try to meet the needs and demand from the market. These issues are now so important and have a high focus in media, debates and among customers that it environmental concern is inevitable. There is no doubt that there has been a change in the market and what customers demand these days, the customer is demanding different products then they were 10-15 years ago. It is also evident that the environmental issues are more driven by customers now than before. When constructing properties in the past, the policy was to build them just to meet the minimum requirements of for example, energy consumption. It is not like that anymore, today they are constructing buildings that are in between 30-50% more efficient than what the regulation demands. The reason is simple, it is what the market demands.

**Q5: How do you view the industry of construction, does it play a big role in the fight against the deterioration of the environment?**

It is a highly relevant topic in the construction industry. It is an industry that is called the forty percent sector because that is how much of society's energy consumption that comes from property maintenance. That makes it important to be able to offer products that decrease this share of the energy consumption. The construction industry is vital for a society that wants to continue to grow, and that makes it relevant to develop ways in which resources can be used in the best way possible.

**Q6: What was the initial view of introducing policies for environmental changes? Was there any resistance?**

Well it has not been a bed of roses. There have been both external and internal stakeholders that have had other views. Customers that question why those types of issues need to be dealt with and they want the lowest prices instead. This leads to uncertainty within the organization as well where some are asking why being involved in the environment when it does not generate any profit and no more customers. However with time it has become evident that these issues were important. The 4-5 last years have really changed things and the attitude towards environmental issues is now much more positive, both the individual employee and customers.

**Q7: What makes your environmental activities unique on the marketplace? How are you different from your competitors?**

We strive to make ourselves unique, but it’s definitely not easy. I don’t think that any the construction companies that have had the possibility to create a very distinctive product. It is rather smaller details and components in the process that we manage to differentiate. We are working a lot with energy efficiency but that’s not something we are alone in doing, however we consider that our progress with what’s called ‘passive houses’ to be in the forefront of development and it is a way that we can show our
competence in this type of project. Other than that its mostly minor things such as providing the customer with an "energy declaration" that tells the customer how much energy and resources will be consumed in the building process of a product, and also in the maintaining of it. Green offers are another unique product. If the customer accepts the offer it means that the construction will be done with a number of environmental factors in mind.

**Q8: What impact have you been able to identify in market share/profit/general growth followed by the environmental activities?**

It creates an interest for sure, but whether it has increased the number of projects we have been offered is harder to discern. It is hard to say how much individual components are contributing to a given gain in market shares and profit but can rather be viewed as a collective result of all the departments. There are so many things overall that contribute to profitability and to back trace something to an environmental activity is close to impossible.

**Q9: Do you think environmental activities will continue to be a relevant topic and why would the firm continue to develop and invest in it?**

Some of the issues are already today more or less conditional and they are no longer something that we advertised since it is assumed that they are taken into account, such as the use of safe and non-hazardous materials or dangerous chemicals. For this reason the issues need to be taken into account and they will continue to do so in the future as well. In all honesty, the energy issues are even they on the verge of becoming conditional where a company cannot compete without devoting their attention to them. The regulations from EU are having a big part in making it so, and as an example their vision is that by 2020, construction companies should be able to deliver zero energy houses, which means that they have 10 years to develop the means in which to build houses that generate as much energy as they consume, something that is seen as an interesting and stimulating way to promote the energy issues.
Appendix 2. Interview with Kristina at PEAB

Q1. Briefly introduce your company and your role/title within the firm.

I have a short background at PEAB. I am an environmental manager. I was in development management before that. I have 19 years in the building industry, with 15 of those years in an environmental capacity, so I understand the industry quite well.

Q1.1: Do you communicate both internally and/or externally mostly?

It's a lot of both. There is companywide communication between departments. About a year ago a new company policy facilitated easier flow of information from one business area to another. It helped bring about synergies and knowledge from the departments.

PEAB is not a company known for their environmental work. There is much focus on environmental and sustainability issues so external communication is quite a big part of the work. It will be even more important in the future.

Q2: What is the purpose of the environmental department? Why was it formed?

The department at PEAB was created approximately 10 years or so ago. For the most part it has been quite a small department. It was just one person with a few support staff from various business units helping up until 2006. When I came to PEAB there was not much focus on the environmental issues. The company made what was demanded and was not active in a sense. A lot of things happened in the market and stakeholders around the company forced the company to now focus very high on environmental issues. As a result the environmental department has grown to four people. There is no goal to create a large department on a company level because the company needs to have most of the resources be where the building projects are. We work very hard to get resources; perhaps we will be 5 people working for the company level soon. But I don’t think we will be more, and we all work in quite different areas.

I was sought out by the leading group of the company because they wanted to focus on energy and to lift up the environmental issues. They wanted an environmental manager who had worked a lot with energy and someone who could lift PEAB up in the environmental area.

Q3: Have there been any external stakeholders that asked for these types of things from PEAB, to have more environmental involvement?

Yes, it's both changes in Swedish regulations in law, but I think what is most important is our customers in the building sector have sort off...it's like everybody talks about this issue and sees the importance of making our world a little better.

One of the most important forces to change PEAB
Q4: Would you say that the firm is following an environmental strategy?

Of course PEAB has worked with environmental issues before. Maybe not so much strategically. What we have done now with the company is made a vision and strategy work so we have put together a certain method that we have identified different scenarios in the future. This formed a vision for PEAB which for the first time is very, very serious.

One of the most important things in the vision is that we are, we want to be in the front of sustainability, forming the sustainable society. I think for the first time PEAB has made this kind of work. This vision is decided and we also have strategies to reach this vision, and the work now is in forming goals for the different parts, goals that will hold PEAB to this goal for the whole company.

It is very broad sustainable society. But, today there is a lot of focus on or should I say coordinating the things we do in the energy field because energy use (industrial, residential, buildings we create). This is one of the most important things. We also focus on our choice of products to not put hazardous substances in our buildings or our work. We do need to follow and have easier guidelines for our people to follow. To our people actually making the purchase to educate them and in giving them clear directions what we should choose and should not choose. So there is more things to work on from what we have already done. Resources, reducing the waste and using less resources to be more effective.

These focus areas are not very new but I think we have a lot of things to do to save the environment AND save money. They often walk in the same direction even if people say it costs to work with environmental issues. I think it leads to less costs actually, because you earn money if you are looking at things like logistics. So I think we have quite a bit.

Q5. To what extent were the consumers/customers needs taken into account when developing an environmental strategy or introducing new green activities?

There is a dialog. All our business areas have a dialog with the customers. This is interesting because a lot of changing in the building sector is due in large part that customers are talking about these issues.

In the environmental department we have been trying to help PEAB by holding seminars to tell them about our goals and environmental work for people from other departments. We also often meet with customers at PEAB and listen to people in the field as well. It's important to listen to people, and it's very important to have people in the field who understand environmental issues.

Q6: How did the company's environmental activities evolve over time?

We have an overall strategy. We have a rather good picture of what areas we need to focus on. We are getting and getting a better picture of what we have competencies in. Because we have a lot of competencies. We have ten divisions of people from different geographical areas who form groups to identify issues that we need to take care of immediately. Some of the issues need to be taken care of very quickly. Because sometimes a project runs into a problem. There's a mix between working with long-term
issues and short term ones supporting the company. We work a lot to make our organization aware. So during projects they have these environmental issues from the start. We try to be a little flexible, but our problem right now is it might be too much of these quick issues and less with issues that are developing in the company long-term.

Q7: How do you view the industry of construction, does it play a big role in the fight against the deterioration of the environment?

I think construction sector has been quite good at some parts of the environmental issues but not good enough. We have been a little too much reactive. The construction industry could have taken a more proactive role in environmental issues. The companies have done nothing when it hadn’t been demanded. People also needed to follow up on demands. Internally, we need to be more proactive and I think education again is very important.

Q8: What was the initial view of introducing policies for environmental changes? Was there any resistance?

Quite interesting question. Of course there is some resistance, even now. When we presented our environmental strategy I was surprised at how well it was received. Everyone believes it is the right strategy. But people might just be saying that because I work in the environmental department. People are starting to see this as part of business, as a business opportunity.

Q9: What makes your environmental activities unique on the marketplace? How are you different from your competitors?

[Referring to her past experience in another building company] It is very hard to be unique. We want to be unique by having all our organization with us. The traditional way in the large building companies have the possibility to do development projects but it’s very hard to have the energy thinking part of EVERY project. PEAB is working with people from all the different parts when developing a project. We use resources from all parts. We have a unique possibility to have quicker spread of information in the environmental development.

Q10: What do you stand to gain?

I think you could talk about the survival of the company. The company has identified these issues as crucial to the future of this company to earn money in the future. There is a strong belief that we need to do and be quite good at it to be quite competitive in the market. I think changing our process in the direction leads to more efficient processes.

Q11: Do you think environmental activities will continue to be a relevant topic and why would the firm continue to develop and invest in it?

Of course there is huge work left to do. We have not come as far in the last 10 years as I would have hoped. But I think the most important thing is to get environmental issues and demand from education and practice. We cannot deal with economical and environmental demand separately. Environmental part must be a natural part in projects. We need a lot more people thinking environmentally.
Appendix 3. Interview with Carl at Skanska

Q1. Briefly introduce your company and your role/title within the firm.

Skanska develops, builds and maintains the physical environment for people to live, travel and work in. I’m an environmental coordinator working for Skanska Sweden. I work with a wide variety of environmental tasks but I’m specialized in the areas regarding chemicals and waste management.

Q2. What is the purpose of the environmental department? Why was it formed?

To support the business and our projects in compliance with legislation and continuously improve its impact on the environment. It was formed to make sure the compliance and continuous improvement were covered by the right employees and make it clear how important it is to work with environmentally friendly and sustainable construction.

Q3. What role did internal/external stakeholders have in the creation of the environmental department?

Many stakeholders have had a role to play, such as employees, government, shareholders, customers, the local community. It was obvious that all of them had to be involved and what was needed to be done in order to be taken serious as a contender on the market.

Q4. Would you say that the firm is following an environmental strategy?

Definitely yes. The company wants to position itself in the front of sustainable construction and move all of its projects towards greener construction. This is done by reductions in the energy needed during a buildings lifetime (this stands for roughly 80% of the buildings total energy impact compared to what is used during construction. That energy is of course also to be targeted for reduction but to construct the building in such a way so that the energy needed for heat, ventilation and so on I reduced to a minimum is essential).

In the long run we want to produce buildings that don’t consume energy but instead deliver energy to the net with solar power, windmills and so forth. Measures are also taken to reduce the CO2 output from projects. Different construction methods are being compared to show how much CO2 output they will cause. The company has been working for a long time with the reduction of unsustainable materials and hazardous materials, this work will continue as will the work to minimize waste that goes to landfill. Water can be a very serious issue and the reduction of water usage is also important. The company’s long-term goal is to have zero negative impact on the environment. It’s very important since the company wants to become the leading sustainable constructions company.
Q5. To what extent were the consumers/customers needs taken into account when developing an environmental strategy or introducing new green activities?

To a major extent. We see the green business as a very important part of the market. We want to become the leading company in the area and believe that an edge here will generate much business. It will become a major advantage and in the long run it will be absolute essential for survival on the market.

Q6. How did the company's environmental activities evolve over time?

Different steps and stages have been taken during the journey the company has taken during the last 15 years. Smaller changes in the beginning and mayor changes during the later years. It has moved from reactive to proactive. This journey started in the late 90's and really took form in the beginning of 00's. Today we have a company that acts and thinks green. A lot of work is of course still to be done.

Q7. How do you view sustainable development? Is it an important issue in society today?

Sustainable development is very important for our society and the continued wellbeing of mankind. It’s a well-known fact that a population will reach a limit where its habitat can no longer sustain its growth. It’s important not to waste resources or harm our habitat so that we don’t reach that limit prematurely or damage it beyond recognition. It’s a very important issue in today’s society and one of the biggest tasks mankind has ever faced.

Q8. How do you view the industry of construction, does it play a big role in the fight against the deterioration of the environment?

Absolutely, it has a big impact on the environment and with the right measures it can be significantly reduced. The long-term goal is to not affect the environment in any harmful way at all.

Q9. What was the initial view of introducing policies for environmental changes? Was there any resistance?

There was no big resistance. However, due to a serious environmental accident in the past, we were forced to go through a major transformation in our way of thinking. Thanks to that our environmental work developed fast and seriously. Today, the company board is fully behind the ongoing environmental changes. Most employees stand behind these changes and take pride in the company’s efforts to reduce its environmental impact.

Q10. What makes your environmental activities unique on the marketplace? How are you different from your competitors?

We are for example the first and only company in the country with buildings certified
by Svanen. We also have an advantage thanks to our size; it’s not just our business unit that is working this way. We can learn from each other and a good example of this is how far our colleagues in the US have come with the environmental certification system LEED. We have also come a far way with our CO2 calculation tools. We are working with a lot of different questions in the environmental sector.

Q11. What impact have you been able to identify in market share/profit/general growth followed by the environmental activities?

The effects have not been fully introduced yet but a growing group of our clients are starting to make demands with focus on the environment and also to listen to different ideas and ways of building offered by us to reduce the negative effects on the environment. If it wasn’t for the changes that have been made and the projects we have started, we wouldn’t be able to win several of these contracts. The market is starting to turn green piece by piece.

Q12. Will you be able to sustain the identified advantages? How?

We want to keep a close relationship with our customers and partners, listening to their needs as well as offering new solutions that are advantageous both economically and environmentally. This includes pilot projects with new green technology as well as using the best third party certification systems and making a broader portion of our business green as we move along. Our goal is to become and maintain the position as the leading sustainable constructions company.

Q13. Do you think environmental activities will continue to be a relevant topic and why would the firm continue to develop and invest in it?

A continuously larger portion of the market will be placed in green and sustainable construction. To be able to make profit and in the long term survive in the business adaptation has to be made. Customers will demand it and so will mother earth herself.
Appendix 4. Interview guide

Background

1. Briefly introduce your company and your role/title within the firm.

Environmental projects

2. What is the purpose of the environmental department? Why was it formed?

3. What role did internal/external stakeholders have in the creation of the environmental department?

4. Would you say that the firm is following an environmental strategy?

   If yes, what is included in the firm's environmental strategy? (Give examples if needed, reduction of material and energy usage in the production process, less harmful emissions, the use of recyclable and renewable resources.)

   If no, what is guiding the firm in the environmental activities?

5. To what extent were the consumers/customers needs taken into account when developing an environmental strategy or introducing new green activities?

6. How did the company's environmental activities evolve over time?

Sustainability

7. How do you view sustainable development? Is it an important issue in society today?

8. How do you view the industry of construction, does it play a big role in the fight against the deterioration of the environment?

9. What was the initial view of introducing policies for environmental changes? Was there any resistance?

Competitiveness

10. What makes your environmental activities unique on the marketplace? How are you different from your competitors?

11. What impact have you been able to identify in market share/profit/general growth followed by the environmental activities?
12. Will you be able to sustain the identified advantages? How?

13. Do you think environmental activities will continue to be a relevant topic and why would the firm continue to develop and invest in it?
Appendix 5. Second interview guide

1. You mentioned previously that it is hard to differentiate the company in an environmental way. What could you do, that you are not doing today to more successfully differentiate yourself? Have any more radical strategies been considered in order to establish the company as a truly sustainable company, and by doing so trying to establishing stronger position on the green market?

2. You described that an environmental strategy was vital to the competitiveness and even the survival of the business. It was also described that some of the environmental activities or practices that have been widely accepted are now more or less seen as common practice. According to your belief, will this continue to happen until most or all of the company’s practices are seen as common practice?

3. Many businesses today are undergoing many hardships due to economic downturn. Do you consider environmental strategy to be compatible with times of economical struggles, in other words, can a business in the construction sector continue to think environmental in times of bad economy?

4. What is your strategy for dealing with a construction company that is all green and have more specialized and comprehensive methods for building environmentally friendly? Can you hope to compete with such a company?
Appendix 6. Second interview with NCC

Q1. You mentioned previously that it is hard to differentiate the company in an environmental way. What could you do, that you are not doing today to more successfully differentiate yourself? Have any more radical strategies been considered in order to establish the company as a truly sustainable company, and by doing so trying to establishing stronger position on the green market?

A well functioning organization in the construction industry needs to balance many aspects of business in order to be successful. The “green market” has only recently started to grow and so has our interest in it. We need to be flexible and be able to offer the customer a product that is suited for his needs. We are working to becoming environmentally sustainable with plus energy housing in the near future, the only radical strategy at this point would be to try to implement such strategies before the market is ready. That is not something that will move us in a competitive direction at this point.

Q2. You described that an environmental strategy was vital to the competitiveness and even the survival of the business. It was also described that some of the environmental activities or practices that have been widely accepted are now more or less seen as common practice. According to your belief, will this continue to happen until most or all of the company’s practices are seen as common practice?

Yes, more and more of the things that we have previously been advertised is now seen as conditional and is expected by the customer. There may be a time when complete environmental sustainability is seen the same way but we are far away from it. We will continue to invest in environmentally friendly practices and believe that new way to, for example conserve more energy will always be possible. By staying ahead in this, as well as so many other aspects we will continue to be competitive.

Q3. Many businesses today are undergoing many hardships due to economic downturn. Do you consider environmental strategy to be compatible with times of economical struggles, in other words, can a business in the construction sector continue to think environmental in times of bad economy?

We have been very fortunate here in Sweden and the economy has recovered some of what it lost. There are always things that a company can do better and more effective, especially in the construction industry. As long as you believe that what you are doing is right, small steps in the right direction will keep you motivated. Some of the things we do for lesser environmental practice requires a lot of cooperation throughout the many departments of the organization, an economic crisis does steal some of the attention that such practices requires. NCC still believes that environmental focus is a powerful and necessary force that will lead to success if managed correctly.
Q4. What is your strategy for dealing with a construction company that is all green and have more specialized and comprehensive methods for building environmentally friendly? Can you hope to compete with such a company?

There is a variety of different target groups in almost every industry; some choose to target a small part of the market while others go for a broader target group. As a large company, NCC has chosen to cater to a broader target group. On a long term basis, NCC will be working towards sustainable solutions that will win us the vote of the customer.
Appendix 7. Second interview with PEAB

Q1. You mentioned previously that it is hard to differentiate the company in an environmental way. What could you do, that you are not doing today to more successfully differentiate yourself? Have any more radical strategies been considered in order to establish the company as a truly sustainable company, and by doing so trying to establishing stronger position on the green market?

PEAB is headed in the right direction. The company has many companywide initiatives involving environmental strategy. The company is looking to expand upon the current strategies in place. PEAB is focused on being the leader in sustainable society. That goal is a driving force in PEAB’s green strategy. The company hopes that environmental thinking is a part of every project. PEAB has made large improvements in green thinking in the past several years, but there is still a ways to go. PEAB realizes that in order to differentiate itself from other construction companies is to focus on long-term issues. This is hard to do in an industry like construction where companies are competing on such a short-term basis. We hope the adoption of involving many departments in green thinking and a focus in long-term thinking will keep us competitive and a leader in the industry.

Q2. You described that an environmental strategy was vital to the competitiveness and even the survival of the business. It was also described that some of the environmental activities or practices that have been widely accepted are now more or less seen as common practice. According to your belief, will this continue to happen until most or all of the company’s practices are seen as common practice?

Over time more and more practices will become common practices. The stakeholders will demand it, and the success of the company will depend upon it. It is our hope to implement environmental strategy into companywide practices in the future. This is in line with PEAB’s decision to involve multiple departments with green initiatives for all projects. Innovation will always be something PEAB needs to look at because this industry has undergone many changes in the past. The construction industry is constantly innovating and PEAB is no different. The companies that are able to perfect common practices, while successfully innovating practices in advance of evolution in the industry will be the best off. It is important that a company not stand still and be content with current common practice, but to have to foresight to innovate as well.

Q3. Many businesses today are undergoing many hardships due to economic downturn. Do you consider environmental strategy to be compatible with times of economical struggles, in other words, can a business in the construction sector continue to think environmental in times of bad economy?
It does make things more difficult. However, the economic struggles have not deterred PEAB from pushing forward with an environmental strategy. We believe strongly that environmental strategies will lead to cost savings, which is good in both good and bad economies. It has gotten to the point that everybody must be thinking environmentally in order to be successful.

Q4. What is your strategy for dealing with a construction company that is all green and have more specialized and comprehensive methods for building environmentally friendly? Can you hope to compete with such a company?

There are always going to be companies that do something better. It is important to remember that PEAB is a large company. Our goal is to be the leader in the sustainable society. The emphasis on environmental strategy the past decade has set us up to compete with rival companies. We will continue to push education and innovation to achieve our goal of being the leader in green construction.
Appendix 8. Second interview with Skanska:

Q1. You mentioned previously that it is hard to differentiate the company in an environmental way. What could you do, that you are not doing today to more successfully differentiate yourself? Have any more radical strategies been considered in order to establish the company as a truly sustainable company, and by doing so trying to establishing stronger position on the green market?

We have many different departments that each fulfills an important role in the organization. Our intention is to incorporate environmental thinking throughout the whole organization and this is done when possible but as it is, the organization does not revolve around environmental thinking which seems to be the next step in a more “radical” direction. At this point in time we are working to expand our environmental thinking; however it is still a part of a larger strategy that needs to incorporate other aspects than only environmental. Our strategy is rather to be excellent at what we do and in so doing, establishing us as an environmentally friendly company.

Q2. You described that an environmental strategy was vital to the competitiveness and even the survival of the business. It was also described that some of the environmental activities or practices that have been widely accepted are now more or less seen as common practice. According to your belief, will this continue to happen until most or all of the company’s practices are seen as common practice?

A successful business always needs to continue to be innovative. As more and more practices continue to be used, new ones will emerge. Just as before environmental thinking was common, new ways of constructing replaces old ones. The difference now is that the new ways will incorporate an environmental thinking into them and it is my belief that they will continue to do so. It means that we have to continue with an innovative thinking and the previously mentioned work on integrating environmental thinking throughout the organization.

Q3. Many businesses today are undergoing many hardships due to economic downturn. Do you consider environmental strategy to be compatible with times of economical struggles, in other words, can a business in the construction sector continue to think environmental in times of bad economy?

Many of the changes we make to be environmentally sustainable are also cutting costs. Ultimately it is about satisfying the customer’s needs and environmentally friendly building is continues to be an attractive product.
Q4. What is your strategy for dealing with a construction company that is all green and have more specialized and comprehensive methods for building environmentally friendly? Can you hope to compete with such a company?

As with many other industries there are companies that focus on niche markets and by doing so acquire a more specialized product. Nevertheless, we have as our goal to be the first choice for customers who seek to build environmentally friendly. As a major player in the construction industry we have an advantage as long as we continue to stay in the forefront of technology and practices related to environmental issues.

The intention is to involve environmental issues throughout the organization. That is something we are working on at the moment; however the organization does not revolve around environmental thinking at this point, which would seem to be the next step.

There will always be a need for innovation and the development of new techniques as well as making existing ones more efficient.

There are many environmental initiatives that cut costs, and customers are still asking for environmentally friendly product offerings.

Skanska has an advantage due to its size and as long as innovation and a focus on moving forward exist, we can use that size to prosper.