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**Formulation and Implementation of Environmental Strategies in Printing Firms:
A Comparison between the U.S. and Germany**

By
Diana B. Mross

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
School of Print Media in the College
of Imaging Arts and Sciences of the
Rochester Institute of Technology

June 2005

Thesis Advisors: Professor Scott Williams
Professor Sandra Rothenberg

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Abstract

This thesis will guide the reader through the investigation process of a research area previously ignored in the research literature: the formulation and implementation of environmental strategies in printing companies. It will address strategies in printing firms, primarily from a cultural and structural point of view, which are formulated and implemented to help protect the environment and to save resources. The investigation will include a review of previous literature regarding strategy, environmental management and technology, and health and safety management. It will introduce the research questions, the methodology, and the analysis of research findings.

Through the exploratory case study method, the researcher will show how some printing companies integrate environmental protection within their strategic decision process. The researcher investigated two small and two large printing firms in the U.S. and Germany to learn how company size and cultural background influence environmental strategy formulation and implementation processes. In addition, the researcher wanted to know about the individual competitive context, adapted by Porter and Kramer (2002) that influences each firm in its strategic decision-process.

The analysis of the four case studies shows that the environmental strategies of printing companies differ, depending on each individual company and the competitive forces it faces. Though the history of each firm's environmental strategy development is

distinctive, all four companies succeeded in creating a competitive edge, gaining a range of common and in some cases individual benefits. Some key factors driving the firms' strategic decision-making processes kept reappearing in the studies: organizational structure, ownership, location, company size, and the history and cultural background of the company. The factor conditions turned out to be the most important element of the competitive context for all four cases. This involves particularly leadership and personal commitment of the members of the firm (employees, the chairman of the board, the CEO, or the mother organization). The demand conditions seemed to be more important to the small firms than to the large firms investigated. All four companies concentrated on process improvements and the resulting increased efficiency and saved resources, thereby reducing environmental impact and saving costs. From the strategy focus and competitive context of each firm it was possible to ascertain its strategy type: emergent or deliberate. Both small firms deliberately use their environmental stance, and thus have formal strategies. The large firms have an informal feel to their environmental initiatives.

The overall goal of this thesis research was to provide the printing industry with valuable information regarding the adoption of environmental strategies. The investigator hoped to help close the gap in the printing literature and to encourage more printing companies to start integrating environmental issues in their strategic decisions in order to become more competitive and socially responsible businesses.

Chapter 1

Introduction

Within the last decade, an increasing number of books and articles have been published on environmental issues, particularly on environmental management and strategy found. Articles on environmental issues in the printing industry have mainly been published in several printing periodicals (e.g., *In-Plant Printer*, *Newspaper Techniques*, *Deutscher Drucker*). However, there is very limited comprehensive literature specifically about environmental strategy in the printing industry.

As has been found in other industries, it is likely that printing companies need to start integrating environmental thoughts into their overall strategic view. Environmental strategies are increasingly implemented in other industries for several reasons, such as gaining a competitive advantage. More significant is the increased demand for environmental awareness from external sources, such as regulating agencies, customers, banks, and insurance companies, which will influence the printing company's business success.

This research will examine how environmental management can be integrated within corporate strategic planning processes by firms of different sizes and geographic locations in the printing/graphic arts industry. It will also address how the operating

context influences a company's approach to environmental strategy, and what challenges printing companies have to face when implementing environmental strategy.

In particular, through a comparison between selected German and American printing companies of different size, the thesis research will examine differences and similarities that may contribute to information exchange and improve international relationships. American companies were compared to German counterparts because Germany is considered to be a leader regarding environmental protection (e.g. Dryzek, Downes, Hunold, and Schlossberg, 2003; Birch, 1994). Small and large companies have different practices of strategic planning. Small printing firms need to be considered as an important part of the industry because the majority of printing companies are small-or medium-sized. Within the printing industry, firms with less than 60 employees are considered to be small.

The researcher was very interested in environmental issues because first, it is believed that irresponsible behavior with the world's resources will lead to an environment that may not be valuable for future generations. An ultimate goal is to reach more key players in the printing industry to support them by providing useful information on how to implement environmental strategy. The overall goal of this study is to outline the opportunities and challenges for printing companies when taking a strategic approach to environmental issues.

Chapter 2

Theoretical Basis of the Study

Environmental issues can be viewed from different perspectives, such as the technology perspective or management/organizational perspective. This thesis focuses on the management perspective of environmental issues, and therefore periodicals in the management arena have been reviewed that included articles about business and environmental issues. The variety of the literature consulted focuses on issues such as environmental management, environmental strategies, and environmental regulation. Additionally, basic theoretical research on strategic issues in small-and medium-sized businesses (SMBs) and cross-cultural environmental management will be examined.

Chapter 3

A Review of the Literature in the Field

1. Definition of Environmental Strategy

A competitive strategy is about establishing a set of distinctive activities to provide a unique mix of value to the customer that would be difficult or costly for rivals to match (Porter, 1996). Porter (1996, 1975) contributes a conceptual framework about competitive strategy, which can be applied to the environmental arena. Businesses, no matter in which industry they are located, need to create a competitive edge to their activities in order to be successful in the marketplace. Therefore, the strategy formation process, including the three steps: analysis, formulation, and implementation, is essential to determine a position in the industry where the company is able to defend itself against the competitive context (Porter, 1975).

Rosen (2001) and Porter (1975) stress that a company should be strategically interested in identifying its critical strengths and weaknesses, opportunities, and threats by taking a constructive approach. Therefore, executives carefully need to examine the company's strategic assets such as technology, access to resources, reputation, etc. in order to analyze the company's market opportunities (Reinhardt, 1998). A company's strategic positioning should become a long-term goal of a decade or more (Porter, 1996)

and should be chosen with respect to market and non-market factors (Maxwell, Rothenberg, Briscoe, & Marcus, 1997). However, depending on the individual firm and industry, strategies will vary since a different set of competitive forces will be prominent (Reinhardt, 1998; Porter, 1975).

In recent years, the idea of creating superior environmental performance is increasingly recognized (Rosen, 2001) because companies have to deal with forces such as environmental regulation, changes in technology, and the behavior of competitors (Porter, 1996). Therefore, firms in several industries have initiated environmental activities from a strategic perspective. Porter (1996), however, argues many companies still fail to have an environmental strategy.

One way to do this is to integrate ecological principles into management and the overall corporate strategy (Rosen, 2001) by analyzing environmental problems as business problems (Reinhardt, 1998). Therefore, a company needs to understand its industry's structure and its competition in an international market, which should be the starting point for strategic analysis (Porter, 1975). The right industry structure, competitive position, and managerial skills are essential determinants in order to deliver increased value to shareholders while at the same time improving the company's environmental performance (Reinhardt, 1999). Managers need to be aware that their interpretations of market forces, organizational capabilities, and regulations will strongly influence their decisions on corporate environmental strategy (Sharma, 2001). They also have to be aware that a strategy requires making hard choices (Porter, 1996).

1.1 An overview of the development of environmental strategies

According to Clemens (2001), the first phase of managerial recognition of environmental issues began in the 1960s, and on minimizing costs. At that time managers thought that environmental controls would decrease profits. From 1970 to 1985, when regulatory and public pressure arose, companies tried to resist this pressure (Fischer & Schot, 1993). The U.S. Congress, for example, responded to the public concern by passing environmental legislation and creating the Environmental Protection Agency (EPA) (Clemens, 2001). In response, multinational firms started to formulate environmental policies that were not consistent with the implementation of the environmental initiatives (Fischer & Schot, 1993).

In the late 1980s, the first arguments arose that environmental performance could provide a competitive advantage (Clemens, 2001). From 1985 to 1992 companies started to embrace environmental issues because pressures from customers, industrial customers, and investors became more visible (Fischer & Schot, 1993). However, Clemens (2001) argues that during the early stages of environmental responsibility, innovative and proactive environmental strategies were rare and many firms focused on tentative and passive managerial strategies. Firms tended to plan for compliance but did not integrate environmental issues into strategic business goals and their policies (Fischer & Schot, 1993).

In the early 1990s, more companies discovered that U.S. consumers wanted to adjust their consumption habits, which encouraged them to integrate environmental

departments and strategies (Clemens, 2001). Rosen (2001) observed an increasing shift from compliance-based environmental management to environmental strategy. In 1995, Porter and van der Linde also stated that there is a transition from the static view of environmental regulation to a dynamic approach of international competitiveness based on innovation. Although the new, post-compliance strategic approach to environmental management is being expressed at many levels of the business system (Rosen, 2001), there are still critics (e.g. Porter, M. E. & van der Linde, C., 1995) who maintain that the environment has not been a principle area of corporate or technological emphasis, and that knowledge about environmental impact is still at a basic level in many firms and industries.

However, proactive environmental strategies that focus on innovation (e.g. by changing product design and processes) can bring about a competitive advantage. Companies that define a proactive strategy may be able to achieve lower environmental impact, lower costs, better product quality, and enhanced global competitiveness (Porter, M. E. & van der Linde, C., September-October 1995).

2. Strategy analysis

In recent years, businesses started to deal with increasing competition in fighting for markets and customers. Businesses that want to gain a competitive advantage through environmental issues should consider formulating and implementing an environmental strategy. But before taking these steps, a company needs to conduct a strategic analysis.

In the first section of the literature review a definition of strategy is introduced and a short overview of the development of environmental strategies is presented. Companies need to analyze which competitive context influences the decision- making process for an environmental strategy. According to Porter (1975), the analysis of social and economic factors is essential for formulating a competitive strategy (p. 1).

Before a company can formulate and implement a strategy, management should analyze all factors facing the firm and influencing the managers' perception of environmental issues (Banerjee, 2001, 2). Porter and Kramer (2002) introduced a comprehensive framework of competitive context that includes four elements:

- factor conditions,
- context for strategy and rivalry,
- demand conditions, and
- related and supporting industries.

The next sections will go into each of these elements in detail.

2.1 Factor conditions

Factor conditions are the internal drivers of a company's environmental strategy. These include

- human and capital resources,
- physical, administrative and information infrastructure, scientific and technological infrastructure,

- and natural resources (Ghobadian et al. as cited in Clemens, 2001; Porter & Kramer, 2002).

Clemens (2001) additionally listed leadership, corporate tradition, and corporate ethics, as well as organizational adaptability as internal factors influencing the firm's decision-making process. Sharma's (2001) study revealed several other internal factors such as continuous improvement, efficiency, productivity related to EMS and ISO standards, employees, corporate citizenship, responsibility for neighbors, principles and corporate values, strategic vision/ mission/ identity or CEO vision, and employee reward systems.

According to Banerjee (2001, 2), a very important key driver of change in the process of strategy formulation and implementation are the members of an organization. Managers play a key role in driving the decisions on environmental strategies. Senior managers can enable their organization to cooperate with government regulators, environmental organizations, and communities to create mutual interest by voluntary agreements (Rosen, 2001). Executives are able to influence the firm's view of environmental issues by formulating private codes as legal requirements, which are public commitments that need to be followed if the firm wants to gain public trust and confidence of workers, customers, investors, and insurers (Fischer & Schot, 1993).

2.2 Context for Strategy and Rivalry

According to Porter and Kramer (2002), the presence of local policies and incentives that encourage investment, and the presence of open and vigorous local competition are factors of context for strategy and rivalry. The environmental regulations of policy makers such as governments and regulatory agencies, that monitor and control ecological impacts (Banerjee, 2001, 2), find a place within this element of competitive context. Regulatory forces are a major factor influencing a firm's environmental strategy (Banerjee, 2001, 1; Sharma, 2001) by limiting or preventing entry into industries (Porter, 1975). Regulatory forces can influence businesses by announcing licensing requirements or restrictions from controls such as air and water pollution standards, product safety, and efficiency regulations (Porter, 1975). However, Sharma (2001) found that regulatory factors tend to be a more important driver of corporate environmental initiatives at initial stages.

The context for strategy and rivalry also includes competitors and market conditions. A company that builds partnerships with similarly positioned companies within an industry in order to set private standards, or that works together with the government to formulate regulations that favor its products (Reinhardt, 1999), will find it easier to manage its competitors. Markets are changing, e.g., increasing energy costs could influence environmental activities (Rosen, 2001). Companies need to carefully observe market changes because competitors could be faster in recognizing consumer demands and buying behavior. For example, publishers of a few mass-market magazines

in North America and Europe were forced by readers to switch to chlorine-free paper, because chlorine is considered to be toxic to humans and other organisms (Reinhardt, 1998). Although there were no regulatory requirements, publishers were concerned about their image as environmentally responsible publishers and began to communicate their customers' demands to their pulp and paper suppliers.

2.3 Demand Conditions

Porter and Kramer (2002) introduced another element of competitive context: the demand conditions, which include the presence of demanding customers, the presence of local demand in specialized segments that can be served nationally and globally, and the presence of customer needs. The authors agree that managers recognize customers' increasing demand for environmentally friendly products. Consumers have a high influence on competition within an industry because they can force down prices, and demand higher quality or more service (Porter, 1975).

However, much of the change in customer demand for environmental quality comes from government regulation since environmental quality is a public good (Reinhardt, 1998). Additionally, companies need to consider differences in approaching customers, for example, rural-based customers may demand different environmental initiatives than urban-based customers (Porter, 1996). Customers demand more environmentally friendly products and packaging because they have to face additional

costs when they use products that pollute or waste resources and for which they have to pay disposal costs (Porter, M. E. & van der Linde, C., September-October 1995).

Other demand is coming from local communities, environmental interest groups, and non-governmental organizations (NGOs). Greenpeace Germany, for example, issued a magazine printed on chlorine-free paper because it found out that German magazine publishers and readers alike have not realized the improved quality of chlorine-free paper (Porter, M. E. & van der Linde, C., September-October 1995).

Environmental organizations can provide companies with information about best practices that may not be well known by those other than the pioneering companies (Porter, M. E. & van der Linde, C., September-October 1995). Research organizations such as INFORM can influence industries' environmental initiatives by providing new findings for source reduction activities (Porter & van der Linde, 1995).

2.4 Related and Supporting Industries

The framework by Porter and Kramer (2002) includes a fourth element of competitive context: related and supporting industries, such as the presence of locally-based suppliers and companies in related fields. In recent years, suppliers such as Xerox or Heidelberg, for example, became powerful because they are some of the few printing equipment vendors selling to many competing printers (Porter, 1975). Suppliers can become strong influencing factors if they do not need to deal with sales of substitute products to the industry, or if the supplier group's products are differentiated (Porter, 1975).

Within the paper industry, for example, production and product development has become increasingly customer-driven (Birch, 1994), which in turn transformed the paper industry into an influencing supplier of the printing industry. If printers and ink manufacturers are important customers, suppliers will try to protect the industry through reasonable pricing and assistance in activities like R&D (Porter, 1975).

Industry groups are important factors as well because they are calling for environmental standards and voluntary action (Maxwell, Rothenberg, Biscoe, & Marcus, 1997). Financial institutions and insurers should be mentioned because they are trying to support industries by evaluating the risk of environmental activities.

3. Strategy formulation

After the analysis of the internal and external context following Porter's (1975) structural framework, the formulation of environmental strategy is the next step. Executives need to synthesize all analyzed information that applies to the specific situation of the company and to develop a coherent plan that brings together the important aspects of the strategy analysis. Strategy formulation is a key step on the way to environmental commitment because it provides the strategic direction for an organization's long-term business success (Rothenberg, Maxwell, & Marcus, 1992).

Hax and Majluf (1991) introduced two polar concepts that help form the strategy formation process: the *deliberate strategy* provides the organization with a purposeful direction (the intended course of action leading to the realization of the strategy), whereas

the *emergent strategy* outlines the process of learning (identified from patterns observed in the past). Explicit versus implicit, formal-analytic versus power-behavioral, and past versus forward-looking strategies are other dimensions, which will not be discussed in further detail.

According to Banerjee (2001, 1), companies have the choice of developing and implementing a variety of strategic options to address environmental issues. However, how managers perceive environmental risks and market opportunities will determine the level of integration of environmental issues within the company, in turn determining the range of corporate choices from reactive or proactive strategies (Banerjee, 2001, 1).

Rothenberg, Maxwell, & Marcus (1992) emphasize that each organization needs to find its own approach to environmental strategies and environmental management. If a company decides to actively commit to environmental issues, then its competitive advantage, interaction with stakeholders, and legitimacy for environmental activities can be earned. Therefore, executives must include benchmarking, financial planning, change of corporate culture and structure, and the level of environmental strategy integration into the decision-making process before the company can formulate its environmental mission statement and policy. Management has to commit to specific aspects of a program, such as “structure for environmental policy, mechanisms to monitor and review environmental performance, incentives and controls to encourage environmental achievements, guidelines and tools for environmental investments, methodologies and tools to assist environmental decision making, and guidelines for communication with stakeholders. “ (Rothenberg, Maxwell, & Marcus, 1992, p. 2).

3.1 Level of integration

At first, the focus of strategic attention needs to be identified, which can be different on different levels within an organization (Hax and Majluf, 1991; Banerjee, 2001, 1).

According to Banerjee (2001, 1), at the highest level is enterprise strategy, which examines the firm's role in society and formulates its mission. At the next level, corporate strategy determines the kinds of businesses a firm should integrate to meet its enterprise strategy goals, including product-market decisions, technology development decisions, and business portfolio decisions. Business strategy, the third level, involves selecting organizational resources to achieve competitive advantage and also to integrate different business functions. The fourth level of strategy is functional nature, involving planning operations procedures in different areas e.g. marketing or R&D.

3.2 Internal and external benchmarking

In order to find ideas for environmental initiatives, companies can benchmark with companies within or outside their industry. According to Rothenberg, Maxwell, & Marcus (1992), there is no one best strategy or set of management programs for each individual organization but looking for best practices at other companies may give an idea of where to start.

At first, the top management level needs to evaluate external factors such as the demands, threats and opportunities of technological, political, social, and legal issues

(Hax and Majluf, 1991). Second, the top manager levels need to evaluate internal factors such as organizational structure, company history, and culture, products, manufacturing processes, available resources, and individual employees (Rothenberg, Maxwell, & Marcus (1992). Benchmarking the internal context leads to vision, by describing, e.g., the mission of the firm, corporate philosophy, and business segmentation (Hax and Majluf, 1991).

3.3 Portfolio Management

Portfolio management as an instrument for resource allocation involves financial planning and cost accounting (Hax and Majluf, 1991). According to Reinhardt (1999), investments in environmental improvements, like all other investments, can only be beneficial if they create value after all business costs have been included. Managers need to decide on the perspective of economic rationalism and corporate needs (Banerjee, 2001, 2). Companies have to satisfy shareholders by achieving a return on investments, which will force them to carefully analyze financial risks in connection with environmental issues.

4. Strategy implementation

When introducing environmental changes, companies face certain implementation issues (Rothenberg, Maxwell, and Marcus, 1992; Maxwell, Rothenberg, Briscoe, and Marcus

(1997). How will the new activities be integrated with existing ones? What should be the time horizon of the changes? How can operations at different geographic locations be consistent? Additionally, Rothenberg, Maxwell, & Marcus (1992) state that companies may face difficulties when implementing a proactive strategy because individual business units show variations in their environmental performance.

Banerjee (2001, 1) breaks the implementation issues into four broad areas:

- employee focus (involve all employees in environmental activity),
- manufacturing focus (reduce environmental impact in manufacturing process),
- corporate focus (integration of environmental issues into corporate strategy),
- and
- marketing focus (actions geared toward customers and external stakeholders).

The author does not present a comprehensive view but addresses fundamental areas of environmental activity. Banerjee's research (2001, 1) reveals that 53% of firms focused their activities at the corporate level, with R&D as the most common activity and only 39% formulated specific environmental goals every year or environmental mission statements that described their goals.

4.1. Managerial Practices

4.1.1 Corporate culture and structure. Rothenberg, Maxwell, and Marcus (1992) argue that the structures in place often are not capable of supporting the communication necessary for implementing a proactive strategy. Therefore, the design of organizational

structure and administrative systems, and human resources management are directly related to the implementation of strategy (Hax and Majluf, 1991). Companies that prepare to integrate environmental strategies need to match the structure and corporate culture with the designed strategic choices. Therefore, sometimes management attitudes and organizational structure need to change fundamentally (Birch, 1994), requiring new skills and changes in management commitment. Senior management has to deal with cultural changes, because besides formulating a vision, diplomacy and motivation are essential to achieve the required results. Since ethics and social responsibility influence corporate responses to environmental issues (Banerjee, 2001, 2), managers need to develop internal and external support for and commitment to a radical change in corporate culture. They must consider the core values of the company when designing environmental strategy (Rosen, 2001; Rothenberg, Maxwell, & Marcus, 1992).

Social responsibility as a corporate value can be communicated by showing respect, care, or concern for environmental issues (Banerjee, 2001, 2). The key is clear, honest and informative communications (Birch, 1994) that show commitment without making employees feel cynical (Rhee & Lee, 2003).

4.1.2 Environmental management. According to Rosen (2001), companies increasingly recognize environmental management systems (EMS) as the most systematic and comprehensive organizational approach to continuously improve environmental and business performance. Florida and Davison (2001) conclude from their study that high-

adopters of environmental initiatives were much more likely to view EMS as a key factor in reducing community environmental risk.

EMS tends to be integrated in larger, innovative factories that also have a total quality management (TQM) in place (Rosen, 2001). Results of a survey conducted in 1999 by Florida and Davison (2001) agree that high environmental performance factories, which adopted EMS and pollution prevention (P2), tend to be quite a bit larger, with an average of 250 employees and a higher number of people dedicated exclusively to environmental issues than other factories. These companies could rely on more internal and corporate resources.

Government policy makers show interest in EMS because it supports the shift to beyond command-and-control environmental regulation (Florida & Davison, 2001). According to Florida and Davison (2001), high-adopters were significantly more likely to report using performance measures to track and monitor regulatory compliance, waste, customer and community satisfaction, and cost savings. It is also more likely that they track emissions, source reduction, reduced energy use, and improved product quality. Implementing an EMS indicates a company's environmental consciousness. However, the study conducted by Banerjee (2001, 2) revealed that the most common approach of integrating environmental issues is total quality environmental management (TQEM), which is considered at the higher level of strategic decision-making in order to manage and measure environmental performance.

Total quality management system (TQMS) is a system which helps to manage quality at every stage of the production process (Dalessandro, 2001), and examines all

environmental costs involved in every stage of manufacturing, distribution, consumption, and disposal of products (Banerjee, 2001, 2). Companies that already have a TQMS in place can expand this system to total quality environmental management (TQEM) by including environmental quality (Banerjee, 2001, 2) or establishing an EMS separately, which is a formal system for articulating goals, making choices, gathering information and measuring progress, and improving performance (Florida and Davison, 2001). Companies can apply the basic principles widely used in quality programs, such as using inputs more efficiently, eliminating the use of hazardous materials, and eliminating activities that do not add value to the product (Porter, M. E. and van der Linde, C., September-October 1995).

However, managers need to be aware that implementing TQM or TQEM systems requires the commitment of senior managers, effective leadership and teamwork, continual monitoring at all stages, and reviews and audits (Dalessandro, 2001). Building effective teams, e.g., as quality circles and project teams (Dalton, 2000), will improve the process of problem solving, which creates trust, improves communication and motivation, develops interdependence and helps workers to identify with the company.

4.1.3 Leadership skills. Managers need to implement strategies that help allocate the company's resources. Companies need to employ managers that are able to empower employees in making their own day-to-day decisions, which is one of the most important functions of a communicated strategy (Porter, 1996). A management team that recognizes and encourages the environmental initiatives of middle and lower levels is essential to

successful strategy implementation (Maxwell, J., Rothenberg, S., Briscoe, F., & Marcus, A., 1997). Companies need managers who are able to adopt supportive managerial behavior and to lead, simplify, synthesize, clarify, and communicate goals and achievements. They must also support operating people (Dalton, 2000) with appropriate reward structures (Rosen, 2001).

4.1.4 Training and education. Training and education of employees is essential to allocate the right human skills for implementing environmental activities. One goal of training and cultural change programs is to positively influence employees' attitudes toward environmental and safety issues in order to reduce the risk of accidents (Reinhardt, 1999). According to a study conducted by Banerjee (2001, 1), 51% of firms focused their environmental training of employees on mostly in-house recycling of paper, cans, and bottles. Thirty-six percent of the respondents stated that they have established environmental training programs for employees, while 34% distributed regular newsletters, and 42% rewarded initiatives.

Companies should train their employees to look for innovation-based, productivity-enhancing solutions, and to develop the necessary commitment for environmental issues (Porter, M. E. & van der Linde, C., September-October 1995). Employees should be empowered to track their own and their customers' environmental activities to analyze solutions for environmentally friendly product design, packaging, raw material, or process change.

4.1.5 Information through communication and building partnerships. One important aspect of the successful implementation of environmental strategies is the exchange of information. Therefore, companies need to establish the support of other companies (Rosen, 2001) and more proactive relationships with both regulators and environmentalists (Porter, M. E. & van der Linde, C., September-October 1995). Banerjee (2001, 2) suggests the need for building a number of environmental alliances with local, state, and federal regulatory agencies, and competitors.

According to Maxwell, Rothenberg, Briscoe and Marcus (1997), many non-market strategies, such as the initiation of large industrial projects, provide the opportunity to engage stakeholders such as the local community in discussions. Employees responsible for environmental issues should schedule regular public meetings to communicate the environmental impact of the company's operations, and to support each other for collaborative research (Reinhardt, 1999).

Banerjee (2001, 1) found in his survey that 31% of firms extended their manufacturing focus to evaluating their suppliers on environmental criteria, and 43% had cooperative alliances with environmental organizations. According to Florida and Davison's (2001) research, high-adopters of environmental strategies were significantly more likely to report sharing information with government agencies, neighbors, environmental groups, and business groups. They also were more likely to involve community groups, environmental groups and local businesses in activities and initiatives. High-adopters of environmental strategies were also significantly more likely to sponsor community environment activities such as recycling, Earth Day events, and

neighborhood beautification programs, while providing grants for local projects, and reporting that their relationship with the community had improved.

4.1.6 Green marketing, eco-labeling and certification. Companies have the opportunity to decide on new marketing strategies because the demand for environmentally friendly products is growing rapidly, especially in Europe, and is reaching entire international industrial supply chains (Rosen, 2001).

Banerjee (2001) presents research results that indicated a preference for packaging modifications to improve environmental performance (49% of firms). From the 49%, 65% concentrated on product and 52% on package design, 37% on consumer education, and 47% green product development. These results show that almost half of the firms concentrated their activities linked to marketing on environmental concerns.

Further, companies have started to advertise their environmental efforts to their customers, supported by government and a variety of nonprofit organizations that are developing an increasing number of credible eco-labeling for products that meet environmental standards, such as Germany's "Blue Angel" program, and certification programs, such as the ISO 14000 environmental standards, and the EPA's Energy Star program (Reinhardt, 1998).

Companies also have the opportunity to self-certify EMS and to communicate this effort to their stakeholders (Dalessandro, 2001). According to Banerjee (2001, 1), 37% of the surveyed firms advertised their environmental efforts. However, a few authors (e.g. Reinhardt, 1998; cited in Rhee & Lee, 2003) have criticized the certification of ISO14001

and eco-labeling as ‘fashion’ and ‘impression management’, because imitation is easy and therefore can threaten the market position.

4.2 Technology implications

Decisions on strategic actions, such as new product development, location of new manufacturing plants, increased R&D investments for innovation and Life Cycle Analysis (LCA), technology development, and changes in process design are made at the corporate level (Banerjee, 2001, 1; Birch, 1994). According to Birch (1994), Germany dominates in the development of environmental technology, claiming 29% of all international patents.

4.2.1 Process change and environmental life-cycle assessment. Companies have the option to decide whether to maintain, adjust, or replace products and processes to improve environmental performance, which will lead to an examination of products or processes regarding their degree of environmental impact (Rothenberg, Maxwell, & Marcus, 1992). Those researchers suggest that companies should consider customer demand for improved environmental performance within the entire product life cycle. Dillon and Baram (as cited in Fischer & Schot, 1993) state that technology transfer increases because suppliers voluntarily provide information and expertise on safe handling and use of products to downstream customers, which in turn leads to customers’ demand for more environmentally friendly products and services from suppliers.

4.2.2 Pollution prevention. Pollution will lead to economic waste because resources will be used incompletely, inefficiently, or ineffectively when harmful substances and scrapped products are discharged into the environment (Porter, M. E. & van der Linde, C., September-October 1995). Waste also includes labor, investment in transport and storage of raw materials, the cost of constantly having to check for inferior products, the cost of the paperwork and computer systems, the cost of disruption to production schedules, and disappointing a customer by undetected poor products (Birch, 1994). Companies mainly recognize resource inefficiencies in unnecessary material utilization and poor process controls, which result in waste, defects, and stored materials (Porter, M. E. & van der Linde, C., September-October 1995). Florida and Davison (2001) state that high-adopters of environmental initiatives were more likely to identify direct reductions in community environmental risk through air emission reduction and elimination, solid waste reduction and elimination, energy use, fossil fuels, water pollution control, and recycling.

5. Special issues

5.1 Printing industry

The printing industry has a relatively high impact on the environment because of the materials and processes that are used in this industry. Pulp and paper manufacturers, packaging companies, and ink manufacturers were the first printing related industries to

initiate environmental activities. According to Rhee and Lee (2003), paper companies have to deal with a variety of environmental issues including the purchase of chlorine-free bleached pulp (supply chain), energy savings and water recycling (process), environmental labeling (product), sustainable forestry management, and used-paper recycling (product recovery).

Printing companies followed in committing to environmental issues by introducing initiatives ranging from plant design to company policy to production methodology (Cross, 1994). Cross (1994) notes that some printing companies, such as HP, realized that the commitment to environmental issues could result in win-win situations for the environment and for business. They were able to significantly reduce environmental impact, production costs, and compliance liabilities because they adopted proactive eco-strategies.

Government regulations and the benchmarking of other industries laid the groundwork for environmentalism in the printing industry. Environmentalism is a way for printing companies to successfully differentiate themselves from their competitors (Anonymous, 1994), because it has increasingly become a priority for industrial customers and consumers, in addition to better quality, service and price (Cross, 1994).

In recent years, the EPA, environmentalists, and printing companies have started to cooperate more closely together. For example, in 2000, these constituents agreed that a national standard on management of solvent-contaminated shop towels would be beneficial to printers (Lechner, 2000). There are also three projects initiated by members of the printing industry: the Great Printers Project, Design for the Environment for

pollution prevention, energy efficiency, production and use of less toxic and non-toxic chemicals, and recycling; and the Common Sense Initiative (Martz, 1995).

The literature on environmental issues in the printing industry mainly focuses on regulatory compliance, technological solutions, and environmental initiatives at the functional level of the company. For the past 15 years, printers have reduced the alcohol content in lithographic fountain solution; installed air treatment systems to reduce the VOC content of web dryer exhaust; radically altered their habits when using wipes and solvent cleaners; switched to safer, milder chemicals, and become more conscious about what they throw away (Anonymous, 1994). Printing companies waste material and money during the printing process, but according to Heidelberg's Director Dr. Klaus Spiegel, environmentally friendly printing can help to protect the environment and provides the potential to save money (Heidelberg AG, 2003). Commercial printer Sandy Alexander, NJ, for example, recycles films and plates; installed closed-loop system; communicates environmental initiatives to customers; created partnerships and strategic alliances; uses a waterproof water processing color-proofing system; and recycles fixer and developer (Anonymous, 1994).

Larger companies have adopted a higher level of environmental consciousness as a valuable asset in the marketplace (Anonymous, 1994) and have formulated proactive environmental strategies. For example, Transcontinental Printing Inc. constructed a new plant without drains in its production areas as the first in the world, designed on the leading edge of environmental technology—a membrane technology adopting a process called ultra-filtration. The company has a comprehensive company-wide environmental

management policy in place and included ecological risks in its capital budgeting process.

5.2 Small and Medium-Sized Businesses (SMBs)

This section summarizes some special issues regarding strategy formulation and implementation in small and medium-sized businesses (SMBs). SMBs are important in order to gain knowledge and understanding of the relationship between business and the environment (Tilley, 1999) because they account for most of the printing establishments in Germany and the U.S. The German printing industry is made up of 12.000 printing firms, of which 94 percent have less than 50 employees (retrieved June 11, 2004, from http://www.bvdm-online.de/Zahlen/betriebe_beschaefigte.php). This is why there is a growing attention on small firms adopting environmental improvement strategies.

Most of the research conducted on SMBs provides similar conclusions about the differences of SMBs compared to larger firms. According to Dalessandro (2001), larger companies are pioneers in applying new theories whereas smaller companies may follow them. One important issue is the corporate commitment to environmental issues in SMBs. Because smaller companies have less management structures and shorter lines of communication, communication and teamwork is much easier to manage (Dalessandro, 2001). Employee motivation and involvement, participatory arrangements, and quality and environmental performance can improve because workers increasingly control their own work patterns. The lack of commitment by only one person in a small firm can cause

more serious problems in terms of compliance than it would in a large firm. Larger organizations have complicated hierarchical structures, relying on high levels of specialization, standardization, and formalization of behavior, whereas small firms have organic structures (Perez-Sanchez, Barton, and Bower, 2003).

Tilley (1999) found a gap between the environmental attitudes and behavior of small firms. Small firms have difficulties transferring their ideals and values into action. In addition, they encounter economic barriers, and deal with inadequate institutional structures. This is particularly due to strong external forces such as customer demand. Petts, Herd, Gerrard, and Horne (1999) conducted a study to understand the attitudes of individuals in SMBs to environmental compliance and the effect upon corporate behavior. This gave indications about the potential for self-regulation. Their survey results show that environmental activities are implemented at several proactive and reactive and occasionally non-compliant levels. Small firms' environmental performance is primarily based on waste minimization, recycling, and substitution of materials. In previous case studies, the majority of small firms did not implement environmental actions in order to achieve cost advantages.

Whereas large firms adopt strategic management as a predictive process, small firms have an adaptive process (Beaver and Ross, 2000 cited in Anderson and Atkins, 2001). Small firms are likely to have "fewer and different strategic options available and have a different strategic focus than their larger counterparts" (Dilts and Prough, 1989, p. 32). However, Tilley (1999, p. 243) argues that "just because small firms tend not to employ formal strategic management techniques does not mean that small firm

environmental policy ought to be strategic in design and vision.” It is important that managers recognize the “value of adopting a coordinated strategic approach to small firm environmental policy” (Tilley, 1999).

The reason for the lack of environmental strategy in the majority of SMBs could be the absence of necessary capital or managers’ awareness and expertise to adopt specific environmental strategies, but there are opportunities for SMBs to take at very little cost (Dalessandro, 2001; Perez-Sanchez, Barton, and Bower, 2003). According to Porter (1975), a diversified firm is able to divide fixed operating costs of efficient facilities over several units, while the smaller firm will find it difficult to utilize even technologically efficient facilities. Small firms are increasingly being forced by the market to be more flexible and more diverse (Porter, 1975). They also have to achieve returns on invested capital like foreign firms to maintain independence of self-ownership (Porter, 1975; Dalessandro, 2001) through specialization and differentiation.

5.3 Cross-cultural issues

Cross-cultural issues are separately defined in this section in order to emphasize this factor because these issues play an important role in formulating and implementing environmental strategies. Shareholders, customers, and policy makers are increasingly forcing companies all over the world to improve environmental performance (Banerjee, 2001). Environmentalism has changed people’s view on their relationship with the world. (Drysek, Downes, Hunold, and Schlossberg, 2003).

According to Drysek, Downes, Hunold, and Schlossberg (2003), environmentalism begins with a “set of normative concerns” (p. 114), but the structural characteristics of the state has a major influence on the form of a country’s environmental movement and its relationship to the state. Environmentalism in Europe seems to focus on identity and fundamental values as well as strategy, whereas American environmental groups are very instrumental and focused on achieving specific policy goals.

Kolk, Walheim, and Wateringen (2001) concluded in their study on Fortune Global 250 companies that the country’s origin influenced the frequency of environmental reporting. Companies’ reporting initiatives are more strongly influenced by national societal pressure than by legislation. This applies more to Germany than to the U.S. Steger, Schindel, and Krapf (2002) conducted a cultural and competitive analysis of (environmental management audit scheme (EMAS) adoption using Geert Hofstede’s four cultural dimensions and Michael Porter’s competitive context (national diamond). For Germany, they summarized the following cultural indices (p.35f.):

- There is an equal position of government and industry (power distance level is low).
- Individuals prefer to act as part of cohesive group (individualism level is middle).
- The German society is a masculine society preferring hard values such as competition (masculinity level is high).
- Germans are relatively comfortable with flexibility and ambiguity so they do not need structured and clearly defined situations (uncertainty avoidance level is

low).

In addition, they used Porter's national diamond (p.36f) in order to examine the central aspects of competitive context in Germany. Germans believe that quality of life is more important than industrial growth because of dense population and high income. They compete for environmental space and resources and a decentralized political system (factor conditions). German customers appreciate EMAS validation (demand condition). Insurance companies and banks appreciate the validation (related and supporting industries). Especially large companies strive for EMAS validation as a standard (strategy, structure, and rivalry). In addition to that, the researchers included the government aspect. German government is open to the idea of granting regulatory relief.

The results of a survey called Environment U.S.A. 91 indicate that more than half of Americans would sacrifice jobs to fight pollution (Crimmins, 1991). Moreover, 74% of Americans would like to keep environmental protection as a priority in government affairs, even if this means interference with economic growth. Kempton, Boster, and Hartley (1995) found some evidence about the level of understanding of environmental problems. They undertook a study of environmental beliefs and values of laypeople in the U.S. to investigate potential public support for environmental solutions. According to this source, humanity has become the major force of environmental change, and the values and cultural models of people in the U.S. are influencing decisions on which environmental policies to adopt. Laypeople do not passively receive environmental news but rather actively interpret what they hear via their preexisting cultural models, which seem to be derived from the most widely publicized environmental problems of recent

decades. However, people have serious misunderstandings about global environmental issues, which discourage public support for policies for irrelevant reasons. Developing an informed public will be more complex and difficult than ever thought. For example, the researchers only found one utilitarian value with real emotional force, which is the desire to preserve the earth for the next generations.

The Allensbach Research Institute conducted on behalf of the Dual System Deutschland AG one of the biggest surveys regarding the environment and economy in Germany (Schweinsberg & Kamrad, 2003). The study reveals how strongly German citizens believe in corporate environmental initiatives. Only 6% of the respondents trust the environmental commitment of political parties and only 7% trust large companies. German citizens place more trust in non-profit organizations, consumer councils, and environmental associations such as Greenpeace, and BUND (Bund für Umwelt und Naturschutz Deutschland). German citizens particularly look for quality labels that guarantee environmental and consumer protection. In addition, the Allensbach Research Institute conducted another survey on behalf of the Dual System Deutschland AG about Germans' environmental knowledge and environmental education (Anonymous, 2003). Sixty-two percent of the representative citizens age 16 and over said they are very strongly or strongly interested in environmental protection. The survey also suggests that people know more about concrete environmental relevant topics, such as the right waste separation, than abstract concepts such as "Agenda 21."

Chapter 4

Research Questions

1. Introduction

The researcher proposed to study how companies in the printing industry formulate and implement proactive environmental strategies, and which challenges these companies have to face. Therefore, companies need to analyze how every element of the competitive context influences the decision-making process. Executives need to know about the company's strengths, weaknesses, opportunities, and threats.

The literature reveals knowledge about regulatory and technological solutions regarding environmental issues, but little is known about how environmental strategies are formulated and implemented in the printing industry. Researchers increasingly pay attention to small- and medium-sized businesses (SMBs) and what they can do regarding environmental issues, but there is no comprehensive knowledge about how SMBs in the printing industry adopt proactive environmental strategies compared to larger companies. In order to help closing this gap, the researcher provided a comparison between large and small printing firms.

In addition, the researcher provided a comparison between selected German and American printing companies on how they formulate and implement environmental strategies in order to address the cross-cultural issues as important aspects of strategic

decisions. Further, the researcher analyzed which possibilities and challenges printing companies may have to face during the formulation and implementation process of proactive environmental strategies.

2. The research questions

In order to address the research problem, three primary research questions were stated that led to four hypotheses.

Through a comparison between selected German vs. U.S. printing companies, the thesis research will address:

1. How printing companies formulate and implement environmental strategies;
2. How vendors, customers and other external key parties influence the decision-making process of implementing environmental strategies,
3. What challenges companies may have to face, and how they can deal with those challenges when formulating and implementing environmental strategies; and,
4. How these factors vary across firm size and national context.

3. Research propositions

During the literature review, the researcher developed some assumptions about specific differences between firms that should be considered when conducting the interviews.

These assumptions led to research propositions, which guided the researcher when it came to the analysis of the research findings. These assumptions led to recommendations for printing companies and for further research.

First, the researcher suggested that large printing companies concentrate more on environmental technology than on environmental management. In most cases, technology is a major part of the production processes that have a big impact on the environment. Therefore it is believed that large companies invest mainly in environmentally friendly technological solutions, particularly because they have better financial resources than small firms.

Second, German printing companies have more advanced environmental strategies. This proposition is based on environmental management and technology literature that pictures a pioneering effort of the German industry in general. Therefore, the researcher assumed that this also may be apparent within the printing industry.

Third, the researcher proposed that there is a push-situation in Germany vs. a pull-situation in the U.S., which means that German printing companies may push their customers to buy environmentally friendly products and services whereas in the U.S. printing companies tend to become more environmentally conscious because of customer demand.

Fourth, small companies face challenges concentrated on technology because the literature suggests that small firms in particular have limited financial resources. Therefore investing in the latest environmental technology is not always possible.

Chapter 5

Methodology

1. Overview

The thesis research was modeled using the theoretical concepts of case study research outlined by R. K. Yin (1994) in *Case Study Research: Design and Methods*. 2nd edition. According to Yin's concepts, the following sections will explain why the case study strategy was chosen as the research method, which research design was constructed, and which advantages and limitations needed to be considered. Furthermore, this chapter includes the rationale for selecting specific cases, and the broader theoretical relevance of the qualitative research approach (Yin, 1994).

2. Definition of the case study method

According to Stake (1995), quantitative researchers focus on explanation and control whereas qualitative researchers want to understand the complexity of interrelationships. The major goal of a qualitative inquiry, such as the case study method, is to analyze and portray the multiple views of a case and its functioning in everyday settings (Stake, 1995; Graziano and Raulin, 2004).

Researchers prefer the case study strategy when investigators pose “how” and “why” questions, intend to have little control over events, and focus on a contemporary phenomenon within some real-life context. Since the research questions for this thesis research concentrate on “how” and “why” questions, which are more explanatory in nature, and because “such questions deal with operational links needing to be traced over time, rather than mere frequencies or incidence” (Yin, 1994, p. 6), the investigator decided to use the case study method. In addition, because the researcher wanted to observe the natural flow of behavior in natural settings and further to reflect the complexity of organizational phenomena, the case study was considered to be the most appropriate research method (Graziano and Raulin, 2004; Yin, 1994).

2.1 The advantages of the case study method

The case study’s unique advantage is its ability to deal with a full variety of evidence such as documents, artifacts, systematic interviews, direct observations, and participant-observation. Moreover, one of the most valuable strengths of the case study method is the ability to negate a general proposition and to observe information about relationships among variables (Graziano and Raulin, 2004). Yin (1994) states that with the help of a case study, a researcher is able to describe the causal links in real-life interventions, which would be too complex for the survey or experimental methods.

The major advantage of choosing a lower-constraint research approach is the flexibility it affords in modifying the selected cases because of new information, or in

selecting cases different from those initially identified (Graziano and Raulin, 2004; Yin, 1994). However, the investigator needed to be careful about not changing the purpose or objectives of the study in order to suit the cases that were found.

2.2 Limitations

Yin (1994) maintains that a lack of rigor in case study research can happen when investigators present equivocal evidence or biased views, to lead preferred findings and conclusions. A second concern is that the findings in case study research can be only generalized to theoretical propositions and not to populations. A third concern is that case study reports can be extensive documents, and the investigator's ability to write good case studies cannot be objectively screened before a study begins (Yin, 2003).

3. Case study design

The case study is a separate research strategy that requires its own research design. First the research questions helped to structure the observations, interviews, and document reviews, which then were referred to throughout the case study design. The case study design will be explained in the following paragraphs including the interview structure, as well as data sources consulted and procedures used (data collection process).

3.1 Interview questionnaire

The first step of the case study design process was to structure interview questions related to the primary research questions, which were addressed to chosen interviewees (See Appendix). These interview questions helped the investigator to stay focused on the primary research questions through the data collection process.

From a pool of approximately 30 questions in the beginning, only 15 topical questions, called content items, were outlined into four primary topics:

- Strategy formulation,
- Strategy implementation,
- Benefits, and
- General questions.

Additionally, topical questions were added to each of these 15 main interview questions in order to ask about the respondents' opinions, attitudes, knowledge, and behavior (Graziano and Raulin, 2004). With the support of the topical information questions, information was gathered for the description of the case.

Finally, the interview was structured into an introduction, which explains the purpose of the study and gives instructions to the respondent. Demographic questions, called factual items, were listed in order to acquire information about the respondents, such as their occupation, years employed at the company, position and responsibilities (Graziano and Raulin, 2004).

3.2 Study proposition

Since the available literature does not provide a conceptual framework about environmental strategies in the printing industry, particularly in small printing firms, the research was based on exploratory or inductive case study design, which led to the creation of a theory based on a developed theoretical framework. In exploratory research, researchers could have a reason not to make propositions, but there should be statements about a) what is to be explored, b) the purpose of the exploration, and c) the criteria by which the exploration will be judged (Yin, 2003). Therefore, according to the primary research questions, specific propositions were stated (see Chapter 4) in order to direct attention to the scope of the study and to stay within appropriate limits.

3.3 Selection of cases and the unit of analysis

The investigator decided to use a multiple-case holistic study, which is likely to be stronger than a single-case design (Yin, 2003). Therefore, several companies were integrated as cases, and several environmental managers and key personnel were chosen to interview rather than just one. Stake (1995) explains that each case study is instrumental to the need of general understanding and the need of gaining insight into the question by studying a particular case. The investigator's goal was to understand each case itself by concentrating on its unique characteristics and the interaction with its

contexts, which means to examine the effects of environmental strategies in each printing company, and further to coordinate between the individual cases.

For this thesis research, the investigator tried to select cases, which were relevant to the questions of interest, aware that a sample of just a few was unlikely to be a strong representation of others (Yin, 2003). Therefore, the question was posed, “what group of companies will help us to understand the problems facing environmental strategies in printing companies?”

In order to answer the research questions, first, the potential cases were discussed with the primary thesis advisor on the basis of the major selection criteria: the printing companies had to be proactive in formulating and implementing an environmental strategy at present or in the past. Second, a diversity of printing companies was needed, sought in size (small, big), location (Germany and U.S.), anticipated levels of success in implementing strategy, history of involvement in environmental protection or innovation, etc. The researcher was particularly interested in a comparison between printing companies in Germany and the U.S. because even while these two countries have similar political and cultural backgrounds, it was assumed that the adaptation of environmental issues differs significantly.

The companies were screened according to public records in sources such as company web sites, environmental reports, and magazine articles, and according to suggestions by key informants in associations and organizations such as Graphic Arts Technical Foundation (GATF) and the German regional association “Verband Druck und Medien Sachsen, Thüringen und Sachsen-Anhalt.”

Two large printing companies that advertised themselves as environmentally protective and which were also successful with this strategy, one in the U.S. and one in Germany, were chosen for case study interviews. Further, two small printing companies, one in Germany and one in the U.S., were selected in order to generate case studies of small companies that were using an environmental strategy, and to gather information that helped to analyze whether there is a difference in the strategies between large and small companies.

The research was conducted by focusing on several interviews with key respondents at Oktoberdruck AG in Berlin, Germany (a small company with approximately 26 employees), Leipziger Zeitungsdruckerei (a large printer with more than 100 employees). The plan within the U.S. was to conduct a case study on Alonzo Printing in California (a small printing firm) and Hickory Printing (large printing companies). Interviews with American and German employees brought conclusions about the different levels of environmental awareness in the two countries.

The initial research questions showed how to define the unit of analysis, meaning which key personnel (ranging from CEO to marketing/ distribution to environmental manager) or the amounts of sites were necessary to include. Each company was the focus of an individual case study, and the study as a whole was structured as a multiple-case design.

3.4. Data collection methods

According to Yin (1994), selecting several different sources of information supports the process of data analysis, and makes the finding or conclusion in a case study more convincing and accurate. Therefore, multiple sources of evidence such as documentation, archival records, interviews, direct observations, and participant-observation were used to address a broader range of historical, attitudinal, and behavioral issues. Documents, for example, were a helpful source in order to verify the correct spellings and titles of organizations and provided other important details. Archival records were used as well, however the researcher had to consider the conditions under which they were produced as well as their accuracy.

Further, a focused interview was created, in which a respondent was interviewed for approximately an hour. The interviews remained open-ended even when the investigator followed a certain set of questions derived from the literature review. Interviews were chosen as the most essential source of case study evidence because well-informed respondents were able to provide important insights into a real-life situation. However, interviews are only verbal reports that are likely to include common problems of bias, poor recall, and poor or inaccurate articulation.

Direct observations and in-person interviews were conducted through field visits at sites in the German companies. A telephone interview was conducted with the marketing manager and the CEO of Alonzo Printing in California. For the interviews, an interview schedule was used as the instrument (Graziano and Raulin, 2004).

According to Yin (1994), the researcher developed a formal, presentable database, including interview transcripts and interview notes, which increased the reliability of the case study research because other investigators have the chance to review the evidence directly and are not limited to the written thesis. Additionally, a “chain of evidence” was presented to enable external observers to follow the research process from initial research questions to case study conclusions. A guide for the case study report with outline, format, and bibliographical information was developed. The researcher cited specific documents, interviews or observations within the report in order to create a link to the relevant portions of the database.

4. Data analysis

Once the research design was completed, the researcher had a strong guide for data collection and data analysis (Yin, 2003). After the interviews had been conducted, the case-write-up was the researcher’s priority. Once the cases were reconstructed, they were submitted to the key respondents in each company in order to review for accuracy and stylistic improvement (Stake, 1995). The investigator was confident that common problems of complying with formulation and implementation of environmental strategies would emerge. Much was learned about the quality of initial stages of the strategic planning process by focusing on only four printing companies.

It is believed that using the multiple-case study design benefited the investigator to draw common conclusions, which expanded the generalizability of the research

findings (Yin, 2003). The selection of four cases was appropriate in order to build theory with much complexity, and the triangulation of evidence by using multiple data collection methods supported the process of theory building (Eisenhardt, 1989).

The data analysis consisted of examining, categorizing, tabulating, and testing both quantitative and qualitative evidence to address the initial research questions (Yin, 2003). The investigator summarized each case as a stand-alone entity in order to search for unique patterns of each case first before examining patterns across cases (Eisenhardt, 1989). As suggested by Eisenhardt (1989), the researcher selected categories and then searched for “within-group similarities coupled with intergroup differences” (p. 540) in order to search for cross-case patterns. Further, the investigator chose pairs of cases and then to “list similarities and differences between each pair” (p. 540).

Pattern matching, and cross-case synthesis were the main techniques used for building a novel theoretical framework. The data analysis process resulted in new insights that can be used by printing companies to improve their environmental strategic planning and implementation process.

In the end, the researcher investigated the environmental practices of one large firm in the U.S., Hickory Printing,

- a large firm in Germany, ZDL,
- one small firm in Germany, Oktoberdruck, and
- one small firm in the U.S., Alonzo Printing.

Chapter 6

Case Study 1 – Hickory Printing

1. Introduction

The Hickory Printing Group, headquartered in Hickory, NC, is a large U.S. printing company, and comparable in size to the German printing firm ZDL. In order to get different perspectives about the company's strategic approach to environmental issues, interviews were conducted with several company employees. William Herbein, the VP of sales, was interviewed on the telephone about the company's background and environmental initiatives. Second, the researcher conducted an onsite visit to talk with Thomas W. Reese, the chairman of the board, and Calvin McGill, the VP of logistics and engineering services, as well as with a few other key contacts in purchasing, maintenance, pre-press, pressroom, and production services management. (Please refer to the list of employee names found in the endnotes to Chapter 6.) Peter Miller, VP of human resources, prepared an interview schedule with approximately 30 minutes for each interviewee, except for the key respondents Mr. Reese and Mr. McGill, who were interviewed for more than an hour.

2. Historical background

2.1 Company Profile

Hickory Printing Group is a privately-held commercial lithographic printing company. The firm was established in 1917 as the Hickory Printing Company by Mr. and Mrs. William Reese, the parents of the current chairman of the board, Tom Reese. Originally family members and close friends worked at the plant. Now, the company is fully owned by current and former employees who are responsible for its management. In the 88 years of the firm's history, Hickory Printing has had only two board chairmen, a fact of which the company is very proud. Hickory Printing was built on the vision of Mr. Tom Reese who is now 80 years old.

According to the *Printing Impressions* 400 rankings (Printing Impressions, PI 400 – The Who's Who in Printing for 2004, retrieved January 10, 2005 from <http://www.piworld.com/doc/283069181099188.bsp>), Hickory Printing Group, with 259 employees and total sales of \$40.80 million, was ranked 123 in 2004, up from 131 in 2003. As a company ranked in the top 125, Hickory Printing is considered a fairly large printer. Currently a team of 259 skilled employees operates two specialized printing facilities in North Carolina, one in Conover and the other in High Point. The majority of clients are located in the U.S. east of the Mississippi, but the firm also has clients in Mexico and Canada. Hickory Printing's main customers are companies in the furniture industry, considered to be one of the most important industry sectors in North Carolina.

2.2 Environmental Facts

In the 1960s, when recycling was not yet common, Hickory Printing began salvaging its waste paper following the vision of Tom Reese who was, according to Herbein, “way ahead of the curve.” Since then, the company’s recycling effort has escalated.

Between the early 1970s and the year 2000, each plant recovered silver from the prepress process. In 2000 the company switched to computer-to-plate (CTP), eliminating the problem of silver recovery. In the 1980s, employees began salvaging paper from their offices and aluminum from their drink cans. The latest initiative reaches out to the community. Offering area businesses credits on their next printing orders, Hickory Printing collects and recycles its customers’ waste paper along with its own. When Hickory Printing makes deliveries to customers, depending on the customer’s order size, Hickory also collects the clients’ waste paper to take back to its own facility.

The efforts of Hickory Printing and particularly those of chairman Reese regarding environmental protection have not gone unnoticed. Hickory Printing has been recognized locally and nationally for its commitment to the conservation of natural resources. In 1991, Hickory Printing received the Catawba Valley Award for Environmental Excellence. In 1992, Mr. Reese was awarded the National Teddy Roosevelt Conservation Award. Also in 1992, the company received the Environmental Stewardship Award in Waste Management from the Greensboro, North Carolina Chamber of Commerce. In 1994, the Graphic Arts Technical Foundation (GATF)

honored Mr. Reese with the highest award in the printing industry for conservation—he was the first printer ever to receive the Dr. William D. Schaeffer Environmental Award.

Year	Award	Awarded To
1991	Catawba Valley Award for Environmental Excellence from the Chambers of Commerce of Alexander, Burke, Caldwell, and Catawba Counties	Hickory Printing
1992	National Teddy Roosevelt Conservation Award	Mr. Thomas Reese
1992	Environmental Stewardship in Waste Management from the Greensboro, North Carolina Chamber of Commerce	Hickory Printing
1994	Dr. William D. Schaeffer Environmental Award from GATF	Mr. Thomas Reese

Table 1. Awards received for environmental initiatives by Hickory Printing or Thomas Reese.

3. Environmental Strategy

3.1 Strategy Formulation

3.1.1 Motivation and process of formulation

Hickory Printing’s awareness of environmental issues begins with the personal beliefs of the chairman of the company, Tom Reese. The religious beliefs taught by the Lutheran Church influenced Reese’s philosophy, which is that natural resources are for the earth’s creatures, and that those resources have to be used wisely and not wasted to make sure that they are available in the future.

Reese’s commitment to the environment developed early. As a boy his father, who was one of the founders of the North Carolina Wildlife Federation, taught him to hunt and fish in the North Carolina mountains. “I appreciated the value of nature,

especially wildlife, and the environment that they live in, of course,” Reese remembers. He later became president of the North Carolina Wildlife Federation, which continually had problems with politicians and some industries, because, Reese says, “backend pollution was an accepted fact that nobody tried to do anything about.” The paper industry, for example, polluted the streams and the air because no laws forced them change their behavior.

At that time, pollution was legal and businesses did what was legal. As Reese recalls it, public awareness of pollution did not come until the late '60s or early '70s. But since the early '50, Reese had been actively involved in pollution control and public awareness for environmental conservation. In Hickory Printing's environmental position statement Reese states that “we must enact laws and develop regulations” to ensure that “we provide ... a natural resource environment in order to live a quality life.” “The natural resources upon which we depend are finite,” he says, and must be used wisely.

Even today, Reese feels that the toughest part is to convince politicians, because they (and a lot of industries) are more concerned about public opinion. “One thing I've learned working with government bureaucrats,” Reese says, “is that if you want to get something done, you convince them it was their idea.” Being president of the Wildlife Federation enabled Reese to work with government agencies, such as the EPA, and to formulate his environmental philosophy at Hickory Printing.

When Reese started working at Hickory Printing in 1950, his appreciation for wildlife did not have much impact on his job. But as he developed his perceptions, he became an environmentally responsible businessman. Company president George Glisan

recalls that Reese “started to ask what he could be doing as a businessman to engage in practices that were good for the environment and conservation,” and that “he started doing things back before anybody really was thinking that these things would be worthwhile to consider or do.”

To Reese, good environmental practice means not to waste anything, including one of the world’s most valuable national resources, solid waste. Calvin McGill, who is responsible for Hickory Printing’s logistics and engineering services, is always looking for ways to reduce how much is sent to landfills because everything sent there is wasted.

Hickory Printing is environmentally conscious because that is what Reese sees as the correct way to do business, regardless of whether there is a return on investment or not. It is his philosophy that encourages Hickory Printing “to do the things that are good for the environment.”

Glisan, whose background is in business, does not

“I really don’t think it is a strategic focus as much as a cultural value of the company. When you have a strategic goal, it implies that there is some sort of an investment decision associated with it. When it is an investment decision, this implies that there is a return that is going to be demanded on an investment.

Whereas Tom got into it because he sees it as part of the virtues that were taught by his family, as well as his upbringing in the Lutheran Church where you are taught to be good stewards of all that God has created and given to humanity.”

In 2004, Hickory Printing developed a website to give the public an idea of who they are. Glisan explained that the company did not put in a tab about environmental or

conservation issues. This is so much a part of who and what Hickory Printing is that the company does not announce it as an add-on.

Even though Glisan does not have a strategic plan regarding the firm's environmental stance, he has no doubt that the company will continue in the future as a privately-held independent printing company. Once Tom Reese has left the company, Glisan believes that the environmental banner will not be dropped.

In addition to Reese's position, there is the influence of state and federal agencies that insist that Hickory Printing comply with environmental laws and regulations. Rick Annas, the VP of purchasing, must be sure that all raw materials meet or exceed the company's personal goals and state, federal, and county regulations. The tracking of materials ensures that Hickory Printing stays within guidelines that were set by the EPA, OSHA and other regulators. Every month Annas writes a report about the chemicals that the company has in use.

Calvin McGill, VP of engineering and logistics, emphasizes that there are two things that have influenced the reduction of chemicals: "One is Tom Reese insisting that we reduce our chemistry." The other is the yearly survey of facility emission reduction activities from the Department of Environmental Health and Natural Resources. McGill has to show what Hickory Printing has done regarding process control, material substitution, process efficiency improvement, and energy consumption to reduce emissions. According to McGill, it is primarily "the EPA driving the train." The vendors try to keep up with what the EPA has scheduled for the new regulations down the road, and Hickory Printing tests their new products.

3.1.2 Environmental strategy and its integration in the overall corporate strategy

Reese strongly believes that being environmentally proactive goes hand-in-hand with doing good business. “There is something to be said if you are responsible from an environmental standpoint,” he said, because then “you probably also do responsible business. When we make decisions, we consider the impact we will have on the environment, and what we can do to mitigate that impact.” Hickory Printing Group Environmental Position Statement (1980s) reflects Reese’s philosophy: “Business should be a leader in the movement to protect and preserve our natural resources and should take the leadership in wise use of these resources for the common good.” “Those in business must become leaders in environmental or conservation organizations,” Reese says, and “work to see that these organizations promote sound conservation practices with which we can successfully operate our business.”

Glisan calls Hickory Printing’s particular niche “high-quality, high-touch service.” The company fosters an environment that focuses on people, a focus it believes is the way to differentiate itself from competitors. “We want to have employees who have been here for many, many years to develop that particular high-touch, high-feel personalized relationship because machines can’t do that,” Glisan says. Many of the firm’s employees have built skills and abilities because they have been with the company for so long. The employees have also built personal relationships with customers to such an extent that some clients insist on having a specific pressroom supervisor there for the press okay.

Even though Hickory Printing has not stated specific environmental goals, the company's environmental responsibility differentiates it from other printing firms. Reese says that there is a lot of pressure from environmental groups for big companies to use recycled paper when they are printing. Many companies do it for that reason alone, a reason that does not drive the way Hickory Printing operates. Reese believes that the practice of planting two trees for each one cut for paper is the more environmentally-sound practice. He disagrees with some environmental groups' pressure to use recycled paper because he feels the process of recycling is less environmentally sound.

Bill Herbein says the firm's waste management program is a great public relations opportunity for Hickory Printing, because "it gives people an incentive to do business with us rather than our competition. Strategically, besides making great sense for the community and for our environment, it makes great sense for us from a business standpoint."

Hickory Printing considers itself a personal, open door company with a flat organization and only a few layers of management structure. Glisan believes that Hickory Printing is also able to retain its employees, because of what the firm stands for and the values it upholds. "The same values that protect the environment outside are the kind of values that protect it inside," he said.

Another value besides environmental responsibility is independence. As a privately held company, Hickory Printing does not have to worry about Wall Street, and so, according to Glisan, can afford to invest in environmental initiatives. "It is not really a

concern whether we are different or unusual. We are not going to worry about what others think,” Glisan says.

Larry Bayer, the pressroom manager, characterizes Hickory Printing as a highly motivated yet laid-back company. A lot of the employees have been with the company for 30 to 35 years. Bayer says: “You see the owner every day. You see the president of the company everyday. We are like a little family here. It is a good place to work.” The company hosts picnics, Christmas dinner, and Chick Filet Day, and has a bonus program. Compared to his experience in larger plants, Bayer sees a noticeable difference in Hickory’s commitment to environmental issues. “The bigger companies don’t really care,” he says. “They have shareholders. They are all looking at the bottom line. At a privately-held company like this you pretty much do what you want. It is a big difference.”

In the long-term, Reese believes his environmental initiatives will help the company’s bottom line. “One reason why a lot of companies do not do anything much environmentally,” he says, “is that they are thinking short-term rather than long-term.”

3.2 Environmental Strategy Implementation

3.2.1 Process Improvements

Solid waste management

The economic depression of the 1970s encouraged people not to waste anything, an attitude that led Hickory Printing to its first initiative to start selling scrap paper. The firm

also started collecting drink cans, film, and all kinds of scrap metals. “We are very well aware what needs to be done with our waste,” says Mike Garren, the engineering supervisor. “Our ink, for example, used to be a waste stream for us. We recycled the waste by getting larger tanks to send back to the ink company.”

In the '80s, Hickory Printing started picking up customers' scrap paper to sell it, and to give customers credit for it against future printing orders. The motivation was to tell the firm's customers that Hickory Printing's employees wanted to be good citizens, to help customers with the disposal of their scrap paper, and to prevent something with potential value from going to the landfill. Unfortunately, today Hickory has to send a quantity of waste to landfills. Garren says, “We recycle as much as we can.” The paper is not completely separated at Hickory Printing, Herbein explains, because the premium, the benefit to be derived from separating paper, does not offset the cost. Now, Hickory Printing is very careful about what to accept in the first place.

McGill started a new paper recycling program with local companies, collecting their scrap paper and shredding it for them. Not only print customers use that waste program, but also local companies such as Roadrunner, Office Depot, and Image Printing, and by now the program has reached its maximum customer base. Other printers, McGill explains, are also having problems disposing of their paper, because they don't have large trailers. “They are willing to give me their paper, and I give them \$.02 a pound, or \$40 a ton. I sell it for \$115 a ton. The paper is not going to the landfill.” Hickory Printing also picks up scrap paper from a hospital that is required to shred its

documents. Since Hickory shreds everything anyway, this service brings the firm an additional job that recycles 20,000 to 30,000 pounds a month.

Hickory Printing started this “outreach” waste program from an environmental standpoint rather than from a cost standpoint. “We knew their waste paper was going straight to the landfill,” McGill says.

“That’s why we came up with this program. One day there was another vendor who called me up and said, ‘Hey, your tractor is down here delivering. We need to stitch this perfect-binding job. You brought me a whole tractor-trailer load. But I don’t have any room for it. I have all of this scrap paper here in the way. Can I put it on the tractor?’”

At its Conover plant, Hickory Printing recycles about 260 tons of paper a month. McGill did not need to convince Mr. Reese that recycling paper was worthwhile because of the additional \$9,900 revenue per month. In 2004, the income from recycled paper was \$69,000. Depending on the market, McGill receives from \$.05 to \$.08 per pound. Weyerhaeuser pays \$115 a ton for book stock, or \$67 a ton for coated groundwood.

Pressroom manager Bayer claims to have one of the lowest waste-to-use ratios (approximately 4% to 5% total waste per job) in the printing industry. Hickory Printing installed a Tobias preset system on the press, which receives files digitally, RIPS and proofs the files, and generates the plates. This system reduces the need for manual adjustments, which in turn means less prep waste. On average, 2,500 impressions are made on the web press before the print quality is acceptable, whereas other printing firms may need 4,000 to 5,000 impressions for the same medium-to high-quality jobs.

Emission Control

In the '80s, Reese became interested in air quality issues. He joined the National Air Quality Committee and got involved in environmental initiatives with GATF on its Environmental Conservation Board.

According to McGill, the primary focus is compliance with air, land, and water regulations. Hickory Printing started to reduce emissions through the substitution of press solutions and the elimination of some petroleum-based chemicals. McGill identifies all emission sources, and then calculates the amount of volatile organic compounds (VOCs) and hazardous air pollutants the plant emits. About 10 years ago, Hickory Printing eliminated isopropyl alcohol in the press fountain solution. McGill introduced two substitutes, ethylene glycol and butyl ether. McGill maintains a material safety data sheet, which gives him the percent of VOCs and the chemical abstract service number of each chemical for identification. From its original list of 141 hazardous air pollutants and 212 toxic air pollutants, Hickory Printing has reduced its purchases to five: ink, blanket wash, Enviro Wash, the automatic blanket washer, and two categories of non-toxic fountain solutions. Although some in the industry may argue that chemicals do not have a major impact on the environment, Reese does not believe in using any toxic chemicals if it is possible to stay away from them.

Jim D'Arcy manages the prepress department at the sheetfed facility in High Point. In 2000, he moved from film to a computer-to-plate (CTP) system, which reduces most of the environmental impact. "Waste products from CTP that can be put right down the drain," D'Arcy says.

Bayer believes that there are other opportunities to reduce or remove chemistry. He refers to a new technology called Single Fluid Ink, a process in which no fountain solution is used because the chemistry is in the ink. Tap water wets the non-image area on the plates. However, this technology has not been adopted yet because for Bayer, the quality is not sufficient.

McGill is also looking at water and energy consumption, and wants the company to generate its own electricity. To reduce energy use and increase profit, Hickory Printing is going to start implementing the “green building” concept. For example, when the air conditioning runs at its peak, McGill will make sure that receiving and loading dock doors stay closed. Each quarter he gathers information on power expenses to make sure that the company reduces its usage.

Prepress

Typically, the sooner you catch a problem, the more spoilage you can prevent. Paper waste is always considered when the prepress department chooses the paper size and the imposition of pages. For example, D’Arcy suggested that one client redo its layouts to enable chop cuts, saving the company time in the bindery.

Maintenance

Mike Garren, the engineering supervisor, has a staff of six maintenance employees at the web offset plant in Conover and two at the sheetfed offset plant in High Point. Maintenance problems are taken seriously because any malfunction on a machine

can cause increased paper waste or spoilage. A problem with the splicer can produce improper cuts, causing web breaks or the paper sticking to one of the blankets.

It is difficult to plan ahead because “production always takes precedence over maintenance,” Garren explains. The general factory equipment is routinely checked every morning, and the computer system shows whether all of the air conditioning and heating equipment is running properly.

The work order system alerts the maintenance department to any malfunctioning. However, in emergencies employees often fail to fill out work orders, even though the maintenance staff regularly reminds pressmen to track what happens. In addition, this system does not measure what specific error causes what specific amount of paper waste. If an error occurs repeatedly, pressmen will make notes in the press logbook. Counters weigh the waste paper during the press run by using a scale that subtracts the waste signatures from the job.

At one time Hickory Printing tried a system that tied into inputs on the press like e-stops, splices, and blanket washes. This extensive system recorded all the incidents that caused waste. It could tell when the purchasing department needed to order new blanket wash, or how much down time was caused by web breaks, etc., as well as the amount of paper waste. It automatically gathered the information and asked the pressmen for a reason. Hickory tried that system for about three months. However, the company did not continue using the system because it was DOS-based, and a new system called Auto Count seemed better, even though with Auto Count, the pressman has to record all information manually.

Purchasing

Rick Annas, the VP of purchasing, makes sure that materials are received on time, at the best possible price, and of the best possible quality. The emphasis during daily operations is on paper and chemicals. Hickory Printing centralized its chemical management system so that all materials purchased for the two plants could be tracked appropriately, using the clout of the company as a purchasing tool to get the best deals, to have more consistency, to increase volumes, and reduce the purchase price. Monitoring the details of purchases is the focus of McGill in the logistics and engineering department. Purchasing is also not involved with waste management.

Press

Pressroom initiatives also reflect the firm's environmental consciousness. Plate cleaners and metering roller cleaners have been eliminated. The company is down to using ink, alcohol-free fountain solution, and blanket wash. Hickory Printing has also installed automatic blanket washers on its presses, primarily for safety and emission reduction.

3.2.2 Product Improvements

Paper

Hickory Printing uses very little recycled paper because, according to Reese, "We just don't have much in the way of requests for recycled paper. Personally, I don't

necessarily buy that idea in the first place. That's probably why we don't push it. I think we should recycle all of the scrap paper, but most paper today comes from pulp. Trees are grown like a crop, and the paper mills plant those trees for the specific purpose of cutting them to make pulp. The way to recycle paper is to make a product of lesser value out of it. In other words, when you recycle paper, make toilet tissue and paper towels, even newsprint. It is extremely expensive to use recycled paper and try to make first-class printing paper out of it." Reese believes that using recycled paper is just about politics and emotional PR, and he "does not accept the conventional wisdom on anything." Annas estimates that less than 3% of clients ask for recycled paper.

Ink

In the past, Hickory Printing looked at soy-based inks, but did not see an improvement in the process, or that they reduced VOCs. According to Annas, the company felt like they were more hype than anything important.

3.2.3 Management Practice

Supply Chain Relationships

Hickory Printing looks for good suppliers that can help the firm with process improvements. For example, Hickory Printing first implemented Creo equipment because at the time they felt it was the best. However, they switched to Fuji because Fuji helped them eliminate film and chemicals. Hickory has also developed relationships with press

manufacturers. In Garren's opinion, press manufacturers realize that paper is the most expensive material used in the printing process and are always trying to address this fact. Hickory Printing installed a Tobias system that takes prepress information and presets the ink keys on press, which reduces make-ready time tremendously.

Annas does not feel that one vendor is pushing environmentally friendly products more than others. Vendors are more concerned with cost and quality. Vendors are "another set of eyes for Hickory Printing to see what it is doing or could be doing. One thing we request of our suppliers is ... to be open and honest with us as far as new ideas." One manufacturer even helped the company overcome resistance to new materials and technology.

McGill believes that 80% of the company's customers are primarily looking for a quality printed product rather than for environmentally sound practice. But most customers know Tom Reese as a major environmentalist who is leading the industry's change for a better environment.

Since 1998, Hickory Printing has been receiving environmental questionnaires from potential customers who are very environmentally conscious and want to know about emission controls, and environmental process improvements. However, they are primarily large customers who hand out the questionnaires to printing firms before they authorize them as their printers. McGill says, "They are certifying us, and we have to be in compliance with their requirements in order to do business with them." Over the years, McGill estimates that 20% of the company's customers have sent this type of questionnaire to them. These customers actually give him ideas for improvement. For

example, one food company encouraged Hickory to comply with food and drug regulations, tracking all of the heavy metals. For another customer, Hickory agreed to comply with Canadian regulations which are considered to be stricter.

Environmental Management

As vice president of engineering and logistics, Clavin McGill, counts three categories of environmental initiatives: enforcement/ compliance, common sense, and research. Tom Reese is committed to the research perspective—finding ways to “improve the environment from a realistic standpoint as opposed to a regulatory standpoint.” McGill is responsible for compliance with all environmental regulations, which involves reading, interpreting and enforcing the federal, state, and OSHA regulations.

Hickory Printing went through the certification process for ISO 9000 in order to stay competitive with other packaging printers. But Reese is not convinced that it improves what the firm has already been doing. ISO certification requires a tremendous amount of paperwork which in turn requires additional hired staff.

Research and Development

Tom Reese recently gave an endowment of \$3 million to Lenoir Rhyne College, a Lutheran liberal arts college in Hickory with about 1,600 students, in order to establish an institute for natural resource conservation. The school’s mission statement declares that all natural resources are for people’s use, and it is the people’s responsibility to use them wisely (corporate document, Lenoir Rhyne College, Thomas W. Reese’48 Institute for

Conservation of National Resources, January 21, 2005). Reese believes Hickory Printing is the first printing company that initiated a research institute with the intent of combining business and environmental programs, chemistry, and physics in order to solve environmental problems.

Reese has also been a member of the board of trustees of the North Carolina Nature Conservancy, as well as chairman of this board. He is also Trustee of the North Carolina Recreation and Natural Heritage Trust, which “allocates state funds to various state agencies for the purchase of land for conservation or recreation purposes.” (Brochure, The Hickory Printing Group Environmental Position Statement, 1980’s).

Benchmarking

Hickory Printing tracks all information that could suggest new ideas about what the company could do to save the environment. But Reese does not benchmark with other companies. He is a very independent person who does what he wants. Reese looks out for the latest information on environmental issues, but technical aspects are Calvin McGill’s responsibility. Reese believes that Hickory Printing’s philosophy toward the environment is contagious because other printers see what Hickory is doing and copy it.

Communication

In the ’80s, Hickory Printing communicated with clients by sending them the firm’s Environmental Position Statement in the format of an image brochure. A hickory

tree leaf is the firm's logo, showing its affiliation with the town of Hickory. The company's Environmental Position Statement reads:

"We at The Hickory Printing Group are committed to protecting and conserving our natural resources while producing high quality graphic materials. We have long been a leader in the environmental and conservation movement. Over the years, we have consistently implemented environmentally sound technologies as they have become available."

Another initiative to communicate the firm's environmental commitment is the firm's community waste management program. Even though at times Hickory Printing may not make a profit because of the volatile scrap paper market, this program increases the firm's customer base. NAPL suggests that printers be problem-solvers. Hickory Printing is trying to be a solutions provider.

Reese finds that the best way to get good suggestions is by talking to his employees. Many of Hickory Printing's employees share interests, such as hunting and fishing. The homey atmosphere encourages communication. Hickory Printing also has a comprehensive communication structure. It is Bayer's responsibility as pressroom manager to remind the pressmen of environmental and safety issues. He tours the plant every morning to look for oil on the floor, covers on the rag barrels, etc. Bayer discusses new products with McGill, the corporate engineer and works closely with the estimating department to review standards and change prices if the production process improves. Every production plan that comes to the press for a job has written goals for the operator.

McGill also works with the purchasing department, which has guidelines regarding the interaction of certain chemicals with the press.

Training

Training is the most important initiative, says Bayer. “We have employees that are in training programs who are actually not part of the press group. So the press group has an extra person on the shift.” Bayer wants to cross-train every employee so that different people can operate different machines with a minimal amount of cost involved. Employees who have been with Hickory Printing for many years receive training for new equipment. Bayer uses GATF training programs and encourages employees to read the books in Hickory’s library. However, Bayer does not use GATF for information on environmental issues and technology.

Integration to strategic planning

Hickory Printing has a yearly strategic plan, monthly goals, and individual goals. One of the current yearly goals is the reduction of spoilage. “We are looking at reducing that number from 1.103% to 1%,” says Bayer, who is looking at specific measures such as reducing press setup time and paper and ink consumption. Bayer argues with the idea that zero spoilage is not achievable. He believes that goals are always set lower than what is actually possible.

In 2004, Hickory’s most important goal was to maintain its compliance with environmental regulations. Bayer says, “We have to receive a B+ with all of our goals in

all departments. That B+ comes from the survey we send to our customers.” However, there is no specific goal to reduce VOC emissions by a specific amount because since 1995, Hickory Printing’s VOC emissions have been reduced by 70%. McGill constantly strives to reduce emissions, and never opts to use a chemical that is forbidden by the EPA. Another goal is to be at 15 mg per cubic meter for particulate matter for paper by 2007. Hickory Printing is working with regulators in order to discuss new regulations forcing the industry to reach that limit.

McGill and the production manager, Michael Cansler, execute Reese’s environmental ideas. Reese will say, “In the future that is where we have to be. I need you to get me there. “ “Mr. Reese reads all of the environmental regulations years in advance,” McGill explains. “We already know what is coming. And we are usually prepared for it.”

In general, employees receive their goals from the president, George Glisan. For example, they look at waste and manufacturing cost every day. Managers meet every week to discuss the variances that occurred between estimated and actual production cost and time. Bayer reviews these reports every week, and also examines a spreadsheet of every job that is produced in a year for every customer. “Our customer would care about productivity and paper consumption, because that’s what the estimate is based on,” he said. “The more efficient that we become in manufacturing, the more the price goes down. We can reduce our cost and still maintain our value-added, and retain that customer.”

4. Outcomes

4.1 Positive outcomes

Glisan says that he cannot tell whether being environmentally friendly has increased Hickory Printing's customer base, but the firm has customers who give positive feedback about Hickory's environmental commitment. Reese believes that being environmentally friendly has attracted more customers. "Contrary to popular opinion, most of the real leaders in the early environmental movement were business people" he said.

4.1.1 Awards and personal satisfaction

In the mid '90s, Reese received the William Schaeffer Conservationist of the Year Award from GATF for his initiative in salvaging waste, reducing emissions, and being a green printer. "One of the greatest things to me is something that is very intangible – personal satisfaction," he said. "It may be kind of old-fashioned, but the fact that there is no monetary worth to it is worth a lot to me. My own philosophy keeps things going."

4.1.2 Loyalty and customer retention

Hickory Printing's waste management program reduces waste going to landfill and also increases customer loyalty because of this additional service. Hickory Printing is thus able to transfer its environmental value to its customers.

4.1.3 Cost savings

Bayer sees an economic benefit to environmental awareness. “Not only are we more environmentally friendly by not introducing toxic chemistry into the plant, but we are saving money if we don’t need it.” The recycling programs also actually generate income.

4.2 Challenges

Reese’s overriding struggle, of course, is environmental. In the 1950s, the general public and especially the government were not conscious about industry’s impact on the environment. When Reese became affiliated with the wildlife organization, he encountered his biggest problem in working with government. In his opinion, there should be as little government control as possible. In the ’90s, Reese began to realize that a lot of “environmental” ideas were propaganda that was distributed to the public through the media, which blamed business for everything. The challenge is to get business to cooperate with environmental organizations. “It should have been a cooperative affair, not a punitive one like it was,” Reese said. “That was one of the biggest mistakes that we ever made. You get more done if you do it in a cooperative manner than you would by telling them.” Hickory Printing responded to the increasing regulatory pressures “by trying to stay ahead of the game” because Tom Reese likes to be a leader. “We were going to do things before we were told to or it became the ‘thing to do’.”

The next big environmental challenge for the printing industry is the toner that is used for digital printing. Emissions also remain a problem because petroleum-based inks are still used. Waste in general tends to be a challenge, since web printers have tremendous paper waste. Reese's suggestion is to do more research with government universities to investigate how to make use of that waste.

Reese states that his biggest personal challenge is convincing people that environmental initiatives are the right thing to pursue. He feels that a lot of people still do not understand the need for conservation. But at Hickory Printing it is no longer a problem. "We have got a good philosophy going here, as far as the environment is concerned," he says.

Glisan is not aware of any particular struggle that Hickory Printing has had to encounter because the firm does things independently of what customers, vendors, etc. think. "We always made sure that vendors had those kinds of products that passed our own internal tests," Glisan said. "If they didn't have something that met our own needs and requirements, then we weren't buying."

McGill says that printing is still primarily about quality, "but reducing the different air emissions is right up there with it. It takes research and engineering until you get the right combination. It took five years to eliminate alcohol in the fountain solution at Hickory Printing. There was resistance at the beginning. The pressman who had been working here 30 years said it was impossible. Now we are doing it, but it was five years of push and tug."

The next big challenge regarding the environment, McGill believes, is emission control. It is not a concern for Hickory Printing but for the industry. “We are concerned, because in this general area if the other companies can’t comply with the requirement and are shut down, then it is actually going to hurt our operation.”

5. Conclusion

Hickory Printing demonstrates how important it is to have top management believe in environmental conservation. At Hickory Printing three elements work together to bring about conservation: compliance with regulations, Tom Reese’s research and development in order to stay ahead of mere compliance, and the common sense that flows from Reese’s philosophy. All interviewees, either employed at Hickory Printing for the long-term or for a short time, agreed on the strong influence of the owner’s environmental belief. Hickory Printing’s environmental commitment is more a philosophy rather than a strategic plan. Few specific environmental goals are stated, and Tom Reese is the only one who really knows the specific long-term goals.

Hickory Printing does not use its environmental philosophy for marketing or push its environmental ideas on customers unless they ask for it. Why don’t they try to educate those 80% of their customers who are not yet very interested in environmental issues? Why not develop a marketing strategy that targets more environmentally conscious customers? The waste management program could be considered a means of educating customers, even though Hickory Printing may not be aware of it.

Hickory Printing's strategic approach is to offer the personalized services of a privately held company. Because Hickory Printing is privately held and still small enough to make independent decisions, the environmental impact of corporate decisions can always be considered. Environmental initiatives have distinguished the company and increased its business, as is the case with the waste management program. Although the idea for that program came from coincidence rather than through strategic planning, it can be considered proactive because of the search for new ideas, and its early adoption.

The company's initiatives regarding waste management and emission control reflect the most important aspect of the firm's culture: Not to waste anything and to conserve natural resources. Further environmental initiatives involved the shift from film to CTP, installing a centralized purchasing system, and the process of ISO 9000 certification. Some new initiatives point to water and energy consumption.

Hickory Printing prefers two-way communications, and is open to suggestions from suppliers about new technology and materials. Reese scouts information and communicates ideas to employees, who then plans and produces their jobs according to Reese's philosophy.

Hickory Printing has had to face challenges, such as resistance to change and how to establish a good relationship with regulatory agencies. For the future, Hickory Printing sees a challenge in communicating more effectively with the industry in order to spread the word of natural conservation.

The researcher believes that Hickory Printing is a great example of what a company can do beyond being environmentally compliant if environmental awareness is

part of the firm's culture. Hickory Printing's message is clear: If business leaders learn how to appreciate and sustain nature, they will influence others to do the same.

Hickory Printing Employees Interviewed

a) Rick Annas is the VP of purchasing. He has been with Hickory Printing for 26 years.

He began work in the shipping department and then spent 17 years in purchasing.

b) Larry Bayer has been working in the printing industry since 1974. He held a management position in the pressroom at World Color Press, now Book Color World.

Five years ago, he started out as pressroom manager at Hickory Printing because the firm seemed like a well-organized plant with growth potential.

c) Jim D'Arcy has been with Hickory Printing for five years and is the director of the prepress department. D'Arcy began working on web presses and moved into conventional prepress as a stripper. Before working at Hickory Printing, he was manager of a conventional prepress and electronic prepress department and a digital printing facility.

d) Mike Garren is the engineering supervisor and has been with Hickory Printing for almost 25 years. He is responsible for maintaining the machinery and all auxiliaries such as air conditioning and air compressors.

e) George Glisan is the company president.

f) William Herbein is the VP for sales and marketing.

g) Calvin McGill has been with Hickory Printing for 12 years as the vice president of logistics and engineering services.

h) Peter Miller is the human resources manager.

i) Thomas W. Reese is the chairman of the board.

Chapter 7

Case Study 2 – Zeitungsdruckerei Leipzig

1. Introduction

Zeitungsdruckerei Leipzig GmbH (ZDL) is a large newspaper printing company in Leipzig, Germany, that formulated and implemented an environmental strategy. This case study is based on a two-hour interview conducted in August 2004 with Dirk Müller, the facility manager at ZDL and its key person for implementing environmental initiatives. In addition, the researcher used public company information from the company's website (<http://www.zdl-online.de/>), its corporate brochure (Leipziger Verlags- und Druckereigesellschaft mbH & Co. KG (2004). Leipziger Volkszeitung. Leipzig), and its ecological balance report (Leipziger Verlags- und Druckereigesellschaft mbH & Co. KG (2003). Oekobilanz 2003. Zeitungsdruckerei Leipzig. Leipzig).

2. Background

2.1 Company profile

Zeitungsdruckerei Leipzig was established in 1992 as a state-of-the-art plant in Leipzig/Stahmeln, specializing in web offset printing. Together with the newspaper-

publishing house Leipziger Volkszeitung, which is located in the center of Leipzig, the printing plant operates under the name Leipziger Verlags- und Druckereigesellschaft mbH & Co. KG (LVDG). LVDG is owned by two equal partners/shareholders, the media enterprises Madsack Hannover, and Axel Springer AG in Berlin. They invested a total of 250 million Euro in the printing plant and in the newspaper publishing operation (see Figure 1).

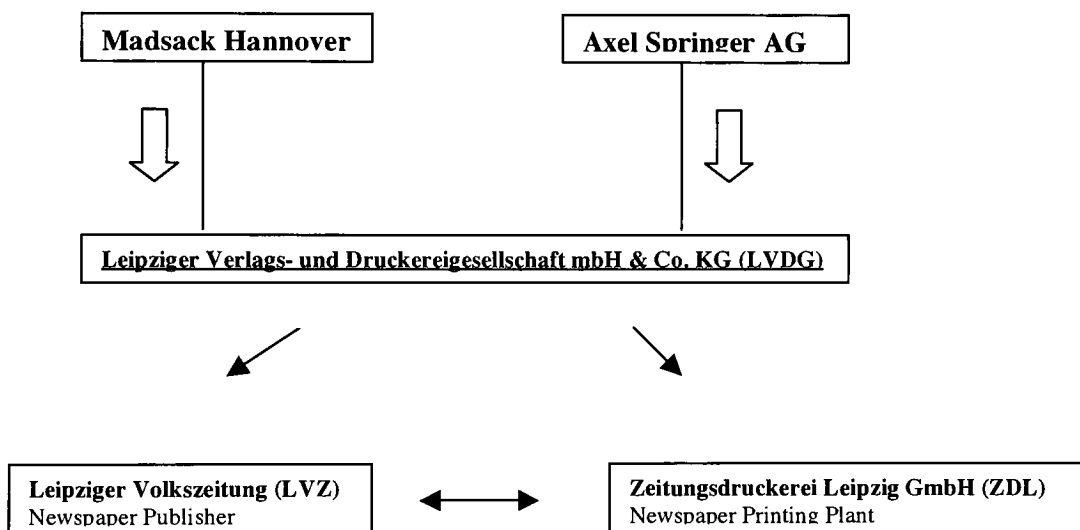


Figure 1. The relationship between the mother companies, LVDG, LVZ, and ZDL.

At ZDL, there are more than 250 employees who produce approximately 30 different products, including newspapers, such as the *BILD-Zeitung*. Approximately 520,000 *BILD* are produced for distribution in Leipzig, Halle, Dresden, Chemnitz, Magdeburg, and Thüringen. The main product, however, is *Leipziger Volkszeitung* (LVZ), the local newspaper whose history goes back to 1894. Every day, approximately

280,000 copies of LVZ are produced for readers not only in Leipzig but also for a wider distribution area in Saxony that includes Delitzsch, Altenburg, and Dresden. Of all the subscription newspapers offered in the distribution area, LVZ has a market share of 91% (Leipziger Verlags- und Druckereigesellschaft mbH & Co. KG, 2004, Leipziger Volkszeitung, p. 3). Additionally, ZDL prints regional newspapers such as the *Döbelner Allgemeine Zeitung*, *Oschatzer Allgemeine*, and *Osterländer Volkszeitung*, as well as advertising materials.

2.3 ZDL's suppliers and the raw materials they supply

Stora Enso Newsprint, with its paper mill in Eilenburg, Saxony, became ZDL's main supplier for newsprint paper. Seventy percent of the year's paper, in various weight categories, is ordered from this paper mill. Additionally, ZDL purchases paper from its partner UPM Kymmene (named after the merger of Kymmene Corporation, Repola Ltd., and its subsidiary United Paper Mills Ltd. in 1995) in Schwedt/Oder, Brandenburg. Together these suppliers provide 96% of the newsprint needed in ZDL's print production. All the paper that comes from these suppliers is 100% recycled paper, defined here as paper produced from de-inked 50% used newsprint and 50% used magazine paper.

The second important raw material, printing ink, is ordered from ZDL's main ink suppliers, Hostmann-Steinberg and Flint-Schmidt in Berlin. In 2002, ZDL went through 700 tons of printing ink. Printing plates, plate setters, and developer solution are supplied

by AGFA Gevaert AG, which is located in Leverkusen. Approximately 2000 printing plates are used in the production process each day.

Another vendor is Ewert Ahrensburg Electronic GmbH (EAE), located in Ahrensburg, one of the leading suppliers of control and workflow solutions for highly automated production processes in printing and publishing companies. ZDL also works with ppi Media GmbH, an IT specialist in production planning and control for newspaper, magazine, and commercial print products. Ppi Media helped ZDL set up its production planning system.

3. Environmental Strategy

3.1 Formulation of environmental strategy

3.1.1 Motivation

Since its inception, ZDL has been concerned about being environmentally friendly because of the company's commitment to its stakeholders: the mother companies, clients, the general public, and regulators.

Madsack Hannover and Axel Springer AG influence and drive ZDL's strategic decision process. They have established environmental guidelines for ZDL to follow. Axel Springer AG is actually the main client of ZDL. Müller elaborates:

“This publishing company would never print products such as the *Bild Zeitung* and *Bild am Sonntag* at ZDL if ZDL didn't have a relatively high environmental standard. Axel Springer invests in environmental

management itself and presents an image of being an environmentally-conscious company.”

Advertisers are a second important group of clients. Because most of the advertisers at LVZ take environmental protective actions, ZDL is motivated to initiate environmental actions as well. Advertisers indirectly force ZDL to maintain environmentally sound business practices in order to maintain customer relationships.

The general public also has an influence on ZDL’s environmental performance. ZDL produces the LVZ newspaper, which informs the public about environmental topics, particularly about positive regional and cross-regional environmental activities. They also publish articles critical of other companies’ environmental violations. Therefore, ZDL believes it should evaluate its own environmental actions.

Environmental regulators have a major influence on ZDL’s initiatives. According to Müller, ZDL’s first priority is to be compliant with valid environmental regulations. Müller says that combining “economical actions with the requirements of the environment in order to create intact living conditions for today and for tomorrow” is very important for the general public as well as for the business itself.

3.1.2 Goal Setting

Environmental management (EM) and environmental strategy are principles of the corporate policy, and make environmental protection as a company goal equal to product policy, health and safety, and social policy. However, ZDL does not formally state its

environmental commitment and strategic goals to the public via an environmental policy, or a mission or vision statement. The improvement of ZDL's business performance is the firm's main strategy. Being compliant with regulations, saving resources, and achieving cost savings for input and output resources are the strategic goals. ZDL believes that there is nothing that cannot be improved. "The company's environmental strategic goals are based on long-term continuity, which means that goals achieved yesterday will be evaluated today in order to see if improvements are possible tomorrow," Müller states. "Depending on previous achievements, goals are adapted and/or refined in order to achieve optimal results."

According to Müller, ZDL does not compete with other companies on its environmental stance. The primary goal is to produce high quality products with acceptable competitive prices and on-time delivery. ZDL strives for process improvements or efficiency increases because these will positively influence costs. Cost savings can also be achieved through the reduction of waste material and the linked reduction in disposal cost. The goal for 2005 to 2007 is to reinvest in the web offset press so that it will be updated to the state-of-the-art standard, an investment that will also bring environmental advantages.

3.1.3 Management Structure

The environmental management functions move from top management to the operations technology division to Dirk Müller (see Figure 2). The organizational structure is

relatively flat and direct, helping to effect important decision-making processes regarding environmental issues, and to move information from the base to top management without losing too many details.

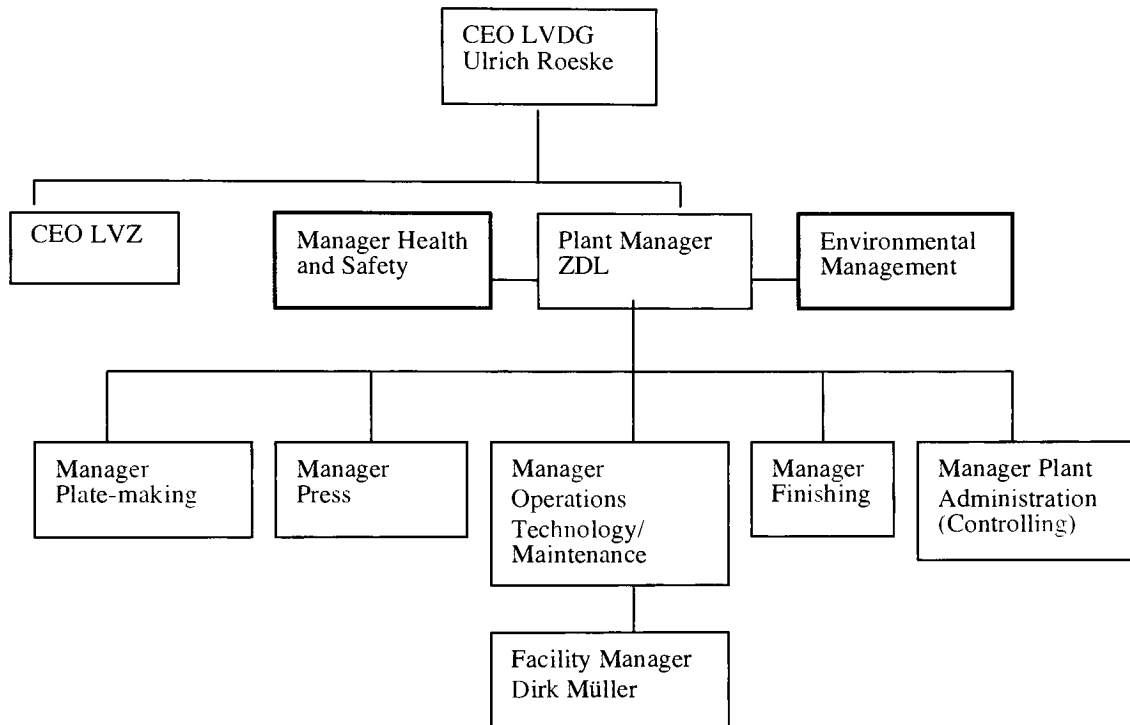


Figure 2. ZDL's Management Structure, in a document sent by Müller via email on February 8, 2005.

ZDL and LVZ are at the same level and are operating under LVDG. The plant manager has the highest position at the printing facility.

3.2 Strategy Implementation

3.2.1 Management Process

ZDL's environmental management

ZDL's environmental management integrates all relevant divisions (see Figure 2) into planning, executing, and controlling as well as further developing specific activities. The purpose of ZDL's environmental management is to execute the company's environmental goals. These goals are monitored by the plant manager and CEO Roeske. The division managers of the production departments, operations technology, and administration are also members of the environmental management team and are authorized to delegate subtasks to the employees of their divisions, who work directly at the machines. All workflows and the internal implementation of environmentally relevant activities are organized and maintained under permanent monitoring by the responsible personnel. Technological and managerial processes are evaluated in order to satisfy the company's demand for improved environmental decisions without jeopardizing high product safety and quality. Analyses and regularly provided statistics about consumption in the facility support the environmental management.

Since ZDL believes that its environmental management is performing well, the company decided not to get certified for ISO 9001 or ISO 14001. Therefore, ZDL does not have formal documentation and does not maintain an environmental handbook. ZDL decided also not to certify for EMAS, the European Union environmental audit scheme, and therefore does not consider its strategy as "formal." The decision to continue with an

informal environmental strategy was made because certification would just confirm what ZDL has already been doing successfully for years. The company believes that becoming certified would simply entail a big bureaucratic expenditure, requiring additional working hours for employees. Partnering newspaper printers are also considering not getting certified for EMAS anymore because, to put it in Müller's words, "every three years it's only about reviewing the documents." A company cannot promote itself with the EMAS label because the EMAS certificate is only given as a document. The company itself would be certified, but would not be allowed to print a label stating this on its products, as is the case with the German *Blue Angel*.

Integration to strategic planning

Every year Müller compiles an ecological balance statement evaluating all material and energy flows that run the printing facility and that are produced and leave or permeate the printing facility. Müller and the plant manager compare the results of this "eco-balance statement" with specified goals and then define new modified aims.

Müller explains that the purpose of this analysis is to evaluate how the company is doing compared to the previous year. They look particularly at the degradation of results in comparison to the previous year. The team asks, "Can we improve what we already have achieved or has the technologically feasible limit been reached?" Although all managers are involved in the eco balance review, the plant manager makes the final decision about what will be done and who is responsible for the implementation.

Establishment of partnerships

ZDL is a member of the *Bundesverband Druck und Medien* (BVDM) in Wiesbaden, the Federal Association of the German Print and Media Industry that lobbies for the German printing industry. In addition to printing-related topics, members of this association discuss questions and problems associated with environmental protection and sustainable development. A standing special committee for environmental protection meets twice a year about environmentally friendly activities in the printing industry. Müller is actively involved in this committee. For years BVDM printing firms have been aware of their responsibility for environmental actions, and have tried to initiate ecological improvements. Müller is convinced that most large printing companies in Germany have adopted high environmental standards.

The association compiled a compact handbook for active environmental protection. Frequently updated and based on current environmental regulations, this handbook serves printing companies as a reference, guide, and working aid for planning operational environmental protection. For example, the handbook explains the environmental goals of the printing industry, important basics of emissions control, the effect of waste products on air and water, all regulations for chemicals and waste, and current available environmental technology. It also provides the forms needed to adopt the ideas of the eco-balance.

ZDL works closely with environmental protection organizations such as the *Haus der Umwelt* and *Umweltstammtisch* in Leipzig, *Wohlfahrt-Unternehmensberatung Umweltschutz*, a German charity that is environmentally active, and consulting firms.

Because ZDL is such a large firm, the company is monitored by administrative agencies, such as the Environmental Protection Professional Agency and public authorities such as the German Environmental Protection Agency.

ZDL has established good partnerships with its ink suppliers, who are members of the *Verband der Druckfarbenhersteller* and who have signed a declaration of voluntary commitment not to use carcinogenic ingredients in their inks. In purchasing ink, ZDL is aware that the client wants quality images but not at exorbitant prices. The company sees that its ink is ordered from an environmentally friendly ink manufacturer, because it feels that employees' and clients' health is more important than product quality.

Benchmarking

ZDL's decisions about how to formulate and implement environmental initiatives depend to some extent on the experience of other companies. ZDL managers study improvements in the field of environmental protection and share their experiences with other companies.

Most benchmarking is done through ZDL's BVDM membership. Müller is convinced that the printing industry has a very high environmental standard compared to the other industries in Germany. BVDM conducts a yearly survey of the print-specific environmental ratios for all members of the association. Depending on those ratios, ZDL sets its own ecological operations goals.

Once a year, ZDL meets with other BVDM newspaper printers of similar size in order to compare ecological operations ratios. ZDL uses yearly consumption of newsprint

as a guideline for the size of each firm, and only compares itself with firms that have a consumption of 30,000 tons of paper per year. Specific environmental business ratios are used for comparison.

Communication with employees

The most important part of planning and implementing the firm's environmental activities is the cooperation of employees. ZDL expects policies to apply to everyone, and whatever needs to be improved should be communicated. Every employee is encouraged to make suggestions for improvements in all areas. Most suggestions come from people on the production floor. These suggestions are examined for feasibility and are recognized by a point system.

ZDL also pays attention to teamwork in all divisions, particularly between technology and financial divisions, because good teamwork improves workflow efficiency. Managers are responsible for planned processes to be carried out, and for desired goals to be achieved. Consequently the eco-balance report and the achieved results are published in detail in the corporate newspaper. Dirk Müller explains, "for us it is also a real medium to work with. I can break it down to that point where I can see how many milliliters of development chemistry per printing plate we need."

Training

ZDL organizes yearly safety-training programs in which employees learn about health and safety issues, environmentally sound practices, how to work with hazardous

materials, and the gentle use of raw materials and supplies. The training starts with common sense. Müller says, “It starts when somebody is going to the restroom and switches off the light afterwards. Yes, this is something really simple, but it has to be fixed in people’s heads.”

Communication with external stakeholders

ZDL communicates to its external stakeholders through the daily newspaper *LVZ* how the company deals with environmental issues. In addition, ZDL publishes its eco-balance report on the corporate website. ZDL is one of the few printing companies that provides an eco-balance report on a yearly basis.

These external stakeholders read ZDL’s eco-balance report:

- Shareholders Axel Springer AG and Madsack Hannover,
- Vendors for paper, ink and chemistry
- Machine suppliers
- Printing associations, e.g. Bundesverband Druck und Medien
- Agencies
- Waste management companies
- Printing companies with similar profiles and paper usage

3.2.2 Process improvements

Emission reduction through new technology

Environmental activities focus on the improvement or optimization of existing processes. So investing in environmentally sound technology is the primary strategic action. “When we think about reinvestments,” Müller explains, “the environment is a big topic.” “The machine manufacturer who designs the next generation machine is looking for the newest standards in environmental technology,” he says, and so does ZDL.

ZDL recently invested 1.75 million Euro into shifting from computer-to-film (CTF) to computer-to-plate (CTP). In 2004, the production of printing plates changed over completely to CTP, resulting in a savings of 17,680 liters of film development chemistry, 2,880 liters of fixing agents, and 9.5 tons of negative film per year, and also avoiding the disposal costs of the spent chemicals and film that resulted. Optimizing the platesetter operation also reduced water consumption by 85%.

Through intensive conversations and discussions with paper suppliers, ZDL has negotiated for most paper rolls to be delivered without a front cover. The usual shroud of the paper roll with seaworthy covers and packaging carton paper was overkill, and the paper roll is now just packed surrounded by wrapping paper, a waste reduction of 300 tons per year.

Müller explains ZDL’s efficiency improvements on the cooling technology:

“We start the air conditioner two hours before a shift, and this still produces optimal conditions for the pressmen. We now run the cooling

technology less, and therefore save energy [and] water, and yes, environmental protection also is noticeable in economic ways.”

The facility’s combined heat and power station also saves energy. The company prints newspapers primarily during the night hours, causing high peaks in energy curves and resulting in higher energy costs. The power station is turned on during peak energy usage and produces part of the company’s energy, thus saving part of the cost paid to energy providers.

A goal through 2007 is to invest in technology upgrades for presses. Through the installation of automatic rubber blanket washing units in the new presses, the use of solvents will be dramatically reduced and emissions will be lowered. The new presses also have noise barriers that reduce noise emission during the press run.

Waste management

ZDL separates most of its waste. Waste materials are prepared for professional disposal through certified companies. ZDL adopted this waste management system because the earnings for waste paper and waste printing plates are much higher if the waste material is collected and disposed of separately.

ZDL collects old solvents in a detergent tank for recycling, reducing the cost of disposal. When the tank is full, the old solvents go to a refinery. ZDL washes cleaning rags rather than paying for their disposal.

ZDL also concentrates on improving paper and ink consumption. When the newspaper production operation started in 1993, it focused on establishing constant

production conditions in order to deliver newspapers on time. At that time the company used 62% recycled newsprint. By now ZDL uses 35.695 tons of 96% recycled newsprint, while maintaining optimal print quality.

ZDL also applies environmental considerations to ink consumption. Old spot colors are not disposed of with ink sludge, but are mixed with black ink when reprocessing, thus saving the company 5,000 Euro (10 tons of black printing ink at 430 Euro per ton).

4. Outcomes

4.1 Positive Outcomes

4.1.1 Image improvements

ZDL's environmental activities are valued and recognized in the printing industry, by regulatory organizations and associations, by newspaper readers, and by advertisers. The company has earned an image of being an environmental printer. To put it in Müller's words, employees like the fact that "they can say, 'Hey! Look at us! We are doing it! We are living it!' ... and that others may take [ZDL] as an example and say, 'Yes, if they can do it, then we can do it, too.'" ZDL publicly and honestly communicates to its readers how the newspaper is produced, reporting both positive environmental experiences and the problems that the firm encounters.

4.1.2 Cost savings

ZDL is convinced that investments in environmental protection can have economic benefits. ZDL achieved cost savings through its process improvements and personnel decisions. Müller takes his responsibility for environmental issues seriously because of his personal environmental philosophy. Consequently, ZDL did not need to establish a separate environmental manager position or department. The shift from CTF to CTP also delivered a huge savings in time and material.

4.1.3 Better living conditions in the future

ZDL believes it has proven that environmentally friendly actions result in ecological benefits. Shifting over to CTP created a more environmentally friendly prepress operation and saved ZDL time and money. “From 1993 to 2003,” Müller says, “the former spoilage rate of 11.3% per year was consistently reduced to 9.0% per year, and this with good print quality.” One percentage point of reduced spoilage saves approximately 500 tons of paper yearly, with a corresponding monetary value of about 250,000 Euro. Additionally ZDL and the paper mills save energy, and paper suppliers reduce their transportation costs, all of which reflect the success of “preventing instead of disposing.”

4.2 Challenges

One of ZDL's biggest challenges was the shift from CTF to CTP technology, particularly when parallel production (CTF being phased out and CTP technology being phased in) made the retention of quality standards and the adherence to production schedules and delivery deadlines very difficult.

Müller identifies another challenge that faces smaller firms. Only a few small printing firms are members of the BVDM because they cannot afford the membership fees. The large companies and the association need to address this situation. The handbook is a big step in this direction, since it can be ordered by anyone as a guideline for daily environmental activities. Because Müller is actively involved in the BVDM, he understands the difficulties of small firms. Therefore, ZDL organized some events where they explained some of their operating procedures. For example, Mueller says,

“I am always preaching to separate the trash because it is cheaper. ... If you throw everything into a big pot, that is mixed waste. Either the disposal firm has to touch it again ... to sort it, which will increase costs, or it is going to be combusted, but thermal recycling is always expensive. Those are the little things we try to show.”

Further, smaller printing firms have problems implementing an environmental management system (EMS) because it is very complex and time-consuming. Mueller argues that there is no need for a small firm to document on which shelf, for example, the four or five inks have to be put. However, “if the pressman tells his trainee ‘Okay, the

remaining ink is going there, and the solvent waste is going there,' then a lot will be done already." Müller continues:

"Or for paper waste, if newsprint, white waste sheets, packaging materials, and inserts are collected separately and then provided for disposal, you can sell them separately, since ... different qualities of paper bring different amounts of money, particularly for commercial printers."

5. Conclusion

ZDL is satisfied with its environmental commitment and its informal strategic approach. ZDL complies with laws and regulations and strives proactively to improve processes. The company invests in activities that are technologically and economically feasible, and is actively engaged in partnerships to improve environmental sustainability.

To some extent, ZDL markets itself as an environmentally conscious printing company. Even though it is a relatively young company, its commitment to the environment has a solid place and in the company's culture. Through the company website, an image brochure, and a yearly eco-balance report, ZDL openly communicates its environmental commitment.

The eco-balance report verifies the company's effort by sharing environmental initiatives, specific performance measures and consumption ratios, and real achievements with the public. Every client, shareholder, and interested stakeholder has access to it. This distribution of the eco-balance report to the public is actually just a by-product of what

was meant to be used primarily internally. ZDL's image has profited because it is one of the few companies in the printing industry that reports yearly in extensive detail about its own environmental initiatives. Companies that are certified by EMAS only have to submit an environmental report every three years.

ZDL implemented state-of-the-art technology that helps to reuse materials and to reduce waste. The shift from CTF to CTP resulted in the elimination of film development and fixing chemistry. Printing plates and printing inks are recycled and reused in the printing production process. Chemicals that cannot be recycled are neutralized and disposed of in an environmentally friendly way.

ZDL Employees Interviewed

Dirk Müller's background is in mechanical engineering. He also earned a diploma in health, safety, and fire protection, and is, besides Mr. Roeske, responsible for implementing ZDL's environmental initiatives. Since 1993, he has been employed in the operations technology division. As the house supervisor or facility manager he is responsible for maintaining the facility (except for production and supply systems) and the property. He takes care of disposal activities within the printing facility, and the yearly eco-balance report.

Chapter 8

A Case Study of Oktoberdruck AG

1. Introduction

The small printing firm, Oktoberdruck AG, is located in Berlin, Germany. Personal interviews were in September 2004 with three key respondents from management, prepress, and press who have been involved with environmental initiatives throughout the history of the firm. The main interviewee was Martina Fuchs-Buschbeck, who has been with Oktoberdruck for 20 years. First in the pre-press department, she moved up to middle management and is now in top management. In addition, Matthias Gottwald was interviewed, a pressman at Oktoberdruck since 1992, and Wolfram Schmidt, who was himself an owner of a small printing firm for seven years prior to joining Oktoberdruck's prepress department in 1986.

2. Company Background

2.1 Company Profile

Oktoberdruck specializes in multi-color sheetfed offset printing. The firm was founded in 1973 as a self-administered collective printing firm with five employees. The company's

organizational structure is a result of the political beliefs held at this time, which will be explained in section 2.2.

Since the fall of the Berlin wall, Oktoberdruck has grown from 12 employees to 35 employees, and has achieved annual sales of 5.5 million DM (approximately 2.75 million Euro). However, the company's organizational structure could not handle the firm's growth, and so had to change to either a hierarchical structure, or a "grassroots democracy." Oktoberdruck management chose the latter. Unfortunately, this self-administration could only be maintained through the loss of 10 employees who wanted to break up the shareholding and co-determination model. Those employees founded a new printing firm and Oktoberdruck kept its self-administration.

Today, the firm is still self-administered, which means that all 26 employees own proportional shares of Oktoberdruck and determine together within democratic structures how the firm will operate. Customers and employees alike find a "communication transparency" in the firms' production workflow, ensuring an open working environment and exchange of information to enable employees to be part of the decision-making process.

2.2 Organizational Structure

Oktoberdruck's original organizational structure was a result of the political beliefs that were present in Germany in the 1970s. For 30 years, Oktoberdruck was known as a very politically active firm. The company's current self-administrative organization grew out

of the original vision of its founders, who brought their political ideology of collectivity into the culture and structure of Oktoberdruck. Schmidt says that Oktoberdruck's development is closely linked with its structure.

According to Fuchs-Buschbeck, the firm's organizational structure is the most important element in any strategic decision. All employees strongly believe in autonomy. There are elected department heads and one basic equal wage. All employees own Oktoberdruck collectively and share the risk. Every three years, employees elect the president and top managers who constitute the management circle (called "Räteprinzip"). Current managers have to campaign for votes in order to maintain their positions.

One important element of this organization is the process of ongoing learning, because employees frequently have the opportunity to function in new positions and responsibilities. Fuchs-Buschbeck explains, that "the personal further education of all employees is a primary goal when engaging in new tasks/responsibilities and positions."

Oktoberdruck holds department meetings in which every employee participates in decision-making. Gottwald believes that "a certain voluntary action is important for the success of the company." This voluntary action is possible because the company size is limited. The idea of self-administration originated from the concept of a self-determined work ethic. Though Oktoberdruck can claim 30 years of successful functioning as a self-administrative collective company, Fuchs-Buschbeck believes that there is no set of formal guidelines that expresses how the company really works.

2.3 Client Base

Most of the products that have been and are printed at Oktoberdruck reflect the cultural and political change in Berlin. Oktoberdruck's clientele is primarily independent publishing companies, environmental groups, and agencies located in Berlin, so most of the printed products contain information about contemporary political, social and/or cultural events in and around Berlin.

Oktoberdruck's client base (retrieved March 19, 2005 from <http://www.oktoberdruck.de/referenzen/php>) includes the small publishers Zitty Verlag, Berlin Verlag, Verlag Das Grüne Branchenbuch and Naturfreunde Verlag, environmental organizations, and various agencies and political parties such as the Environmental Verification Committee ("Umweltgutachterausschuss" or UGA) and *Bündnis 90/Die Grünen*.

2.4 Environmental Facts

According to its corporate website, Oktoberdruck claims to print "as clean as possible." In 1995 Oktoberdruck was the first printing firm in Berlin/Brandenburg to implement an environmental management system and to be certified by EMAS.

3. Environmental Strategy

3.1 Formulation

3.1.1 Motivation

Oktoberdruck is an example of a small German printing firm that considers environmental commitment to be its natural responsibility. This environmental consciousness stems from the employees' political and social interests. What drives Oktoberdruck's environmental initiative is the firm's environmental commitment developed from its employees' political and alternative orientation. "Oktoberdruck has a certain alternative way of thinking, which laid the groundwork for environmental consciousness," Schmidt explains. "There was always someone who took care of environmental issues because employees working for the firm share those basic values."

Another important aspect of Oktoberdruck's culture is the company's eagerness to build interpersonal relationships. Oktoberdruck believes that people should be the focus of a business environment. The idea of using bike couriers, for example, was driven by that belief. The strong belief in personal relationships is reflected by the firm's orientation toward local businesses. Oktoberdruck considers building strong personal relationships to be its business niche, where quality of life and quality of work are the most important aspects.

3.1.2 Process of Formulation

Quality and environmentalism are two essential aspects of the company culture. Oktoberdruck focuses on conserving the environment for future generations, being sustainable, and maintaining company values. According to Fuchs-Buschbeck, sustainability means maintaining what is already in place. This also applies to the “sustainability of business management.” Oktoberdruck aims to achieve sustainability through the firm’s culture.

Because Oktoberdruck’s goal is to maintain its business into the future, it is important for employees to evaluate the business strategy frequently to determine whether it is still appropriate for current market conditions. Oktoberdruck believes that flexibility and attentiveness are necessary attributes in order to maintain a healthy business. Even though the focus in decision-making is primarily on production and not on environmental protection, Oktoberdruck aims to continue as an ecologically oriented and self-administered company.

In 1991, Oktoberdruck decided to implement an EMS that would formalize its environmental commitment. The German Senate Administration of Development and Environmental Protection approached Oktoberdruck to participate in a support program because it knew about the firm’s long-term environmental commitment. Within the scope of the German Environmental Development Program II, a pioneer project was conducted at six small- and medium-sized firms in West Berlin with funds from the Senate Department of Urban Development and Environmental Protection (“Senatsverwaltung für

Stadtentwicklung und Umweltschutz”), and from the European Regional Development Fund (“Europäischen Fonds für regionale Entwicklung”). As one of the first of those six firms, Oktoberdruck actively participated in the realization of EMAS. For more than a year (1994-1995), the firm prepared for its EMAS certification with support from federal and state resources.

Fuchs-Buschbeck considers Oktoberdruck’s environmental strategy to be a formal strategy since the firm’s environmental commitment is documented and communicated in written format. Some employees asked, “Why do we need a certificate if we have been intimately connected with the environment for the past 30 years?” Oktoberdruck wanted an environmental label and a formal EMS that would support the firm with continuous process improvement.

Oktoberdruck formulated an independent environmental policy to verify that all environmental regulations are met and to develop a program with concrete goals for improved environmental protection. All questions regarding the EMS and internal audits are published in an environmental statement. The statement is evaluated by an external independent auditor and then made accessible to the general public. In 1996, the environmental statement was declared valid and Oktoberdruck received the EMAS certification. Oktoberdruck was the first printing facility in Berlin/Brandenburg with a valid EMS according to EMAS requirements.

In 2001, Oktoberdruck relocated within Berlin. A simple revalidation of the facility was impossible because EMAS certification is site-related. Fuchs-Buschbeck says the certification of a new validation would have cost approximately 40,000 DM

(approximately 20,000 Euro). Oktoberdruck ultimately decided to start all over again with the EMAS certification process, remembering the lessons learned in the old facility. Because Oktoberdruck had been a pioneer in using non-chlorine-bleached paper, it already had experience with environmental paper, and so was able to increase its catalog of “eco” products. Since August 2004, Oktoberdruck has been preparing to implement an integrated management system including quality, environmental, and health and safety issues. Oktoberdruck decided to adopt ISO 9001 elements for quality issues, and ISO 14001 elements for environmental, health and safety issues without getting certified. However, the EMAS validation for the new location and use of the EMAS label is planned for March 2005.

A reorientation of political and social values influenced this strategy decision. Fuchs-Buschbeck points out: “A few years ago it was possible to earn a negative image as an “eco” stationery shop because recycled paper was still grey. However, in recent years, environmental issues have begun to be perceived as political issues.” Within the last four years, ecological pressure has become more evident in the printing industry. This increasing pressure forced Oktoberdruck to react.

Oktoberdruck’s motivation for continuing with EMAS comes primarily from social relevance, public importance, and the supposed long-term economic benefits. For many years Oktoberdruck’s environmental commitment attracted environmentally-conscious customers. Oktoberdruck decided to revalidate because their customers are accustomed to the fact that the firm is audited. They appreciate the firm’s validation. The

firm took small steps along the way to comply with voluntary guidelines and to achieve its own goals at the same time.

In 2004 Oktoberdruck first began to use its environmental stance as a marketing tool. The firm approached new clients and sought to satisfy its existing customers with this new marketing stance. Fuchs-Buschbeck believes that Oktoberdruck's historical background supports the firm's credibility. Schmidt says that Oktoberdruck always had a certain image in the minds of its environmentally conscious clients. "As the first printing firm in Berlin/Brandenburg to do so, in 1998 we implemented an environmental management system (EMS) at a registered location, according to EMAS." Any interested person can find the most recent environmental statement for the fiscal year 1999/2000 at the company's website. The firm uses the slogan "OKTOBERDRUCK: ENVIRONMENTALLY. FRIENDLY. PRINTING." A customer will learn about the company's characteristics immediately by this logo.

3.2. Strategy Implementation

3.2.1 Management Practice

Benchmarking

Oktoberdruck benchmarks with other firms concerning how they are involved with EMAS and how they structure their environmental reports. Schmidt states that Oktoberdruck benchmarks primarily from a technology point of view. According to Schmidt, "There were actually other printing firms and film development firms that asked

Oktoberdruck how it recovered silver.” Fuchs-Buschbeck points out that people are very environmentally conscious, engaged, and interested in quality work.

Environmental Management

Most environmental initiatives are strategically planned at Oktoberdruck. The company developed environmental guidelines and then took an extensive inventory of operating and production procedures, risk potentials, hazardous materials concerns, etc. After analyzing this examination, the firm developed its first environmental program, including the creation of operational waste management.

The most important aspect for EMAS certification was the development of a functioning EMS. ZDL had to define environmental policy, create procedures to monitor that policy, formulate goals and programs, define and describe employee responsibilities, identify problems, specify necessary training, explain how the company will implement procedures, and evaluate the operational environmental impacts at the site. The core piece of the EMAS is the environmental handbook.

One of the other requirements for validation with EMAS is the regular execution of environmental audits. Internal EMAS audits are conducted three times a year. Each department needs to participate in one of these yearly audits. An external audit is also scheduled once a year. The entire firm participates even though all employees do not necessarily understand in detail all of the guidelines in the handbook. Gottwald says that there is a universal interest among employees in environmental issues, so that nobody needs to be convinced of the importance of these audits.

Oktoberdruck employees work in press, prepress, and administrative (including kitchen) areas. Top management and the shareholders are hierarchically above the other departments. The workforce elects each person who holds a management position in a department or on the executive team. Environmentally relevant tasks are determined and assigned to each employee, and these responsibilities are explained in the environmental handbook. The executive team is responsible for compliance with these environmental requirements.

Integration in strategic planning

Every employee is involved in the firm's decision-making process. Fuchs-Buschbeck says, that "the employees are the most important resource because the common spirit is 'eco.' There is no top management level or marketing department that enforces specific values." At business meetings all strategic aspects of the firm are openly discussed.

Employees receive operational child allowances, subsidized life insurance from the firm, and the more common social benefits. Oktoberdruck's interest in good relationships with employees and clients can be seen in initiatives such as the availability of a company "bike doctor," responsible for the concerns of bikers, and the sponsorship of a solar-auto rally.

Internal Communication and Training

Employees from each department form an environmental committee that meets on a regular basis to exchange information, advise management, and participate in decision-making. This transfer and exchange of information is a necessary requirement for improving operational pollution control. All employees receive information at regularly-held division meetings and/or through blackboard announcements. An environmental statement is provided periodically and special activities are promoted through the Internet and consulting sessions. Oktoberdruck advertises these activities as value-added services. Self-initiative is strong among employees. Once an improvement has been achieved, it is then taken as a standard. Through the strong communication efforts of the firm, environmental aspects are omnipresent and are considered in almost all decisions.

Building relationships with external stakeholders

Early in the production process, Oktoberdruck provides each client with product consulting, influencing the client's choice of product. For each client, the firm composes a workflow description to endure quality management. Oktoberdruck is able to influence its environmentally conscious clients from the beginning of product design, and in turn, such clients also have an important influence on the firm's existence. Customers usually stay with Oktoberdruck for five to seven years, and benefit from the open communication, particularly in difficult times. The loyalty is mutual. Oktoberdruck feels that if a client asks for an environmentally friendly product and also considers the

environmental impact the product will have during production, use, and disposal, then it has been successful in communicating its philosophy to that client.

Oktoberdruck also involves vendors and manufacturers in ecologically oriented troubleshooting. For example, sales people from the press manufacturer MAN Roland work with company employees to reduce alcohol in the fountain solution.

Research and Development

Oktoberdruck is involved in research and development because it believes that innovation and technology are important in order to stay competitive. In 1985/86, Oktoberdruck participated in a study that was conducted by students of the Technical University of Applied Sciences Berlin, entitled, An Investigation/ Exploratory Analysis of the Environmental Impact of an Offset Printing Company. The study resulted in investments in work safety such as the implementation of an exhaust air unit, ventilation system, and a noise protection wall.

3.2.2 Process improvements

Oktoberdruck tends to make small investment in new technology, and has found that process improvements are possible with such small investments. Fuchs-Buschbeck says that every process in the firm is questioned. According to EMAS, Oktoberdruck voluntarily established a control system for the continuous improvement of internal environmental activities.

One outstanding improvement from an environmental standpoint was achieved in the distribution department by small initiatives such as decreasing the number of car trips. This decrease was due to better planning. Oktoberdruck's distribution method also includes the environmentally friendly use of bike couriers. According to Fuchs-Buschbeck, the bicycle delivery method protects the environment against exhaust fumes and the personal delivery of products enables the firm to interact on a personal level with its clients.

In the fulfillment department, paper consumption for packaging materials was reduced from 700kg cartons in 1996 to 504kg cartons in 1997. In the pre-press area, photochemical materials and fixing agents are processed to produce less waste. In the pressroom, employees are trained to handle chemicals safely, to know the effects of materials, e.g., in the ventilation system, and to properly store hazardous materials. Fountain solution is kept longer in the machine or is better filtered to produce less material consumption.

Waste management has also been made more efficient. Separation and separate waste disposal have been always a part of Oktoberdruck's operational pollution control. Commercial waste was reduced by 50% from 1993 to 1996 and has been consistent since then. Reusable cleaning cloths are standard. Used wrapping paper is reused for packaging, adhesive tape is made of paper, and steel straps are reused or are replaced by reusable straps. Extra paper is given to kindergartens. The firm encourages a reduction in the use of hazardous materials through continuous training in production methods.

The following is a summary of technological investments made by Oktoberdruck. In 1988, the firm installed a fixing bath silver-recovery machine in the prepress department. In 1992/93, larger environmental investments were made with the financial support of the Environmental Development Program I, and a ventilation system was installed in the printing hall. In 1994, Oktoberdruck introduced the “green eco box,” in which all writing materials, toner cartridges, floppy disks, and ink ribbons were disposed of in a controlled way or recycled. In 1995, Oktoberdruck was validated according to EMAS, after the evaluation of its EMS. In 1995/1996, the firm shifted to automatic rubber blanket cleaning. The automatic press cleaning process allowed an exchange of detergents from hazardous material level AII to AIII. The firm also reduced its use of development and fixing agents, hazardous waste, and packaging, through the introduction of powder chemistry. In 1997, the firm cooperated with a neighboring company to dispose of waste paper, reducing transportation costs. In 1997, the company reorganized its internal structure, and implemented a company-wide control system for error prevention in order to save resources. In 1998, a new ventilation system was installed in the platemaking department, to improve the indoor climate and prevent health problems for employees. A moisturizing machine operated by pumps was installed, which saved the firm from investing in a compressor. In 1998/99, measurements of single high-powered machines showed that no noteworthy savings were possible because machines and computers already used state-of-the-art technology.

3.2.3 Product Improvements

Paper

In Germany, the demand for environmental-friendly paper products is increasing. In customer meetings, Oktoberdruck representatives explain to clients that recycled paper can be used in most cases without loss of quality. Chlorine bleached paper will be printed only at the client's explicit request. In 1997, the proportion of jobs printed on environmental "blue angel" paper (100% recovered waste paper) was 24.5%.

The proportion of recycled paper within the company's total paper consumption increased from 24% in 1997 to 38% in 1999. Environmental-quality labeled recycled paper constituted 27% of the paper used in 1999, and paper with recycled and fresh fibers made up the other 11% of the total. This positive change was achieved through internal training and the customer decisions it brought about.

In 1994, the firm decided to eliminate stretch film in packaging; however this change caused increased reclamation because of transport damage. Then the firm decided to reuse pieces of stretch film, partly for security reasons.

Ink

Oktoberdruck has substituted raw materials of vegetable origin for 80% of the mineral oil conventionally used in offset printing ink. The ink pigments still contain mineral oils because they product better quality color prints.

4. Outcomes

4.1 Positive Benefits

4.1.1 Competitiveness

Fuchs-Buschbeck believes that Oktoberdruck is successful because of its special position as a small self-administered firm. But Oktoberdruck is aware of increasing pressure from competitors. This threat does not seem to disturb the firm's optimistic view, a view created and supported by its self-administrative structure, committed workforce, and loyal customer base. However, the company has increased its emphasis on service as one important ingredient for success. Fuchs-Buschbeck says: "It is all about substantial work and word-of-mouth advertising, because experience and history are effective."

Experience and historically-grown values influence the firm's image as an innovative and environmentally friendly printing facility, concerned about sustainability and social issues.

4.1.2 Awards

Oktoberdruck has received recognition for its initiatives. In 1998, Oktoberdruck received an award for environmentally conscious corporate management from the consortium of self-employed entrepreneurs ("Arbeitsgemeinschaft selbststaendiger Unternehmer e.V."). Schmidt sees an increased advantage of EMAS certification when it comes time to apply for federal funding.

4.1.3 Cost savings

Oktoberdruck realizes that reducing waste and purchasing materials more carefully is profitable. In its documentation from the years 1993 to 1995, Oktoberdruck recorded all purchasing data. Then in 1996, the firm was able to determine its actual consumption needs and order appropriately.

4.2 Challenges

Oktoberdruck has had to confront challenges that, in the end, have made the firm stronger and helped its strategic development. Fuchs-Buschbeck, Gottwald, and Schmidt agree that the biggest challenge regarding environmental protection the company has faced was its relocation in 2000. Schmidt said that “the production [at the new facility] had to start as quickly as possible.” However, Oktoberdruck was facing pressure from the environmental regulating agency because the construction license had to go to a printing facility, not just to some unspecified business, even though it was already partially in use. Fuchs-Buschbeck had strongly suggested applying for the site license while it was still an empty building, but that didn’t work out. Even permission for the original construction was difficult to get because a lot of details had to be reworked. Oktoberdruck had to find solutions to construction problems while continuing with its printing production schedule. Despite all of these and other problems, because the new printing presses and

other machines were purchased with environmentally friendly aspects in mind, the improvements that Oktoberdruck realized were immense.

Oktoberdruck's company structure brings another challenge. It is a self-administered business, but there are problems with that designation. There is no valid legal business structure that defines Oktoberdruck's management style. Becoming an AG, for example, is not a good option, since the shares in an AG can be sold externally, a condition that is not desired by the firm. Fuchs-Buschbeck hopes to find a legal business format that will allow the purchase of small shares while maintaining the current size of the workforce. In the future, no single employee should receive 12% of shares because this would give that employee too much weight. Fuchs-Buschbeck notes that "the firm does not maintain very good partnerships with other associations, because the others do not accept Oktoberdruck's idiosyncratic philosophy."

5. Conclusion

Taking into consideration that Oktoberdruck is a small firm in a very competitive industry, it is interesting to see how it has developed its environmental strategy.

Oktoberdruck's history reflects the development of an emerging environmental consciousness, stemming from employees' personal political and social values, into a strategy that was confirmed by EMAS certification.

As the first printing facility in Berlin with a valid EMS, the firm has taken proactive initiatives in research and development. The EMAS label itself shows that

Oktoberdruck is an environmentally certified printing plant. However, in times of increasing EMAS competition, Oktoberdruck succeeds primarily because of its loyal client base and the firm's historically grown environmental image.

An environmental committee consisting of employees from each department ensures a direct exchange of information among the workforce. Customer service representatives educate clients in extensive meetings about ecological product design and production. Recently Oktoberdruck began describing its environmentally friendly tradition in business communications.

Oktoberdruck believes that its self-administered management style is the key to the firm's success in times of increased market pressure. The experience and achievements of the past reflect Oktoberdruck's concern about sustainable practices and social issues. Its relocation did not deter the company from the expense of renewing its EMAS validation, but instead gave it a new venue for working on solutions to environmental technology and management problems.

Oktoberdruck's record shows that much can be done to protect the environment with small investments: the sponsored solar-auto rally, distribution via bikes, less usage of packaging, donating paper to kindergartens, and the "eco box" concept. Other small firms can learn from Oktoberdruck where to ask for funds, and how to become environmentally friendly with small initiatives. Businesses in other industry sectors may also benefit from emulating Oktoberdruck's employee spirit, loyalty, commitment to the firm's philosophy, and self-administrative management structure.

All the interviewees agree that the company's high measure of success has to do with the personal responsibility of each employee to support the mission of conserving the environment for future generations and maintaining the firm's values.

Chapter 8

A Case Study of Alonzo Printing

1. Introduction

In July 2004, two researchers conducted telephone interviews with two key contacts at a small commercial printing firm in California, Alonzo Printing Corporation. (Alonzo considers itself a medium-sized firm in the printing industry). Jim Duffy, the president, and Mike Sellers, the VP for sales and marketing, were interviewed separately. Charlotte Seligman, the president of Traversant, Alonzo's marketing consultant firm, provided additional information through a telephone interview on February 10, 2005.

2. Background

2.1 The company profile

Alonzo Printing Corporation, centrally located in Hayward, California, is a union shop that specializes in sheetfed and web offset printing. Jim Duffy, who is the owner and president of Alonzo Printing, founded the firm in January 1976. The company later acquired Technical Printing Inc., whose digital capabilities allow Alonzo Printing to offer print-on-demand to its customers.

Today, the company has about 54 employees and generates about \$9 million in annual sales. The strategically placed, full-service facility with access to the entire San Francisco Bay Area and Silicon Valley produces books, catalogs, directories, manuals, publications, marketing materials, and direct mail in quantities from one to 100,000. Alonzo Printing serves a variety of customers representing industries such as government, education, health care, hi-tech, and publishing. They attract corporate and non-profit organizations, publicly-held companies, financial institutions, environmental groups, government agencies, and political organizations.

2.2 Basic Environmental Facts

According to the firm's corporate website, Alonzo Printing was the first printer in Alameda County to be certified as a Green Business. Its main environmental initiatives are the standardized use of recycled paper and soy based inks.

3. Environmental Strategy

3.1 The formulation of environmental strategy

3.1.1 Motivation

About ten years ago, Alonzo Printing started to focus on being an environmental company. Duffy, the owner and president of Alonzo Printing, was motivated by one personality in the late 1980s. He recalls:

“I was influenced in my (if you want to call it) printing environmentalism by a gentleman named Alan Davis, who was the founder of Conservatree Paper. ... It was in the late 1980s, '89 or '88, ... He was a purist, and whatever the paper companies did was never good enough. I found that if you got them to move a little bit, it was a big deal ... I believe in what he had to say ... I decided to move in these directions.”

Subsequently, Duffy convinced Weyerhaeuser Paper to produce paper with a greater percentage of post-consumer content. Alan Davis, however, responded, “Well, that’s not good enough,” which motivated Duffy to continue partnering with Weyerhaeuser Paper in order to move it to 30% post-consumer. Alonzo Printing thus built a great relationship with Weyerhaeuser Paper, which is one of the firm’s main suppliers, especially for recycled paper.

3.1.2 Process of formulation

It was Duffy’s perception of common sense and his original intent of making things better that led him to informally integrate environmental issues into the company’s strategic decision process. It seemed easy to promote the new philosophy because in his opinion, besides Washington, D.C, the Bay Area has the nation’s highest regard for environmentalism.

For Duffy, “the most influencing factor is just personal commitment.” Duffy believes that if the CEO, the president, or the top of an organization is committed to a

program, “You can sell yourself as anything. We still have that tagline of being environmentally conscious, we still talk about it, and we are perceived by a lot of people to be that way.” Therefore, the Alonzo Printing sales force continuously communicates this message, as is outlined in the marketing program.

Sellers, who joined Alonzo Printing in 2002, agrees that it takes the president, an individual, who is looking for a way to differentiate. He is convinced that Alonzo Printing came up with an approach, a mentality, and guidelines that would work for companies that are anywhere from three to ten times Alonzo’s size. In his opinion, small to medium-sized companies like Alonzo are not going to be able to integrate the kind of technologies that Alonzo has unless environmental issues are also an important component of the value they offer. Sellers illustrates:

“I would say that being environmental is more than printing on recycled paper ... Recycled papers are house stock, it’s not just a special order. So you’ll always get soy oil ink or a computer-to-plate [CTP] process. We recycle all of our water, all of our solvents, we’re involved in education, we’re certified, we exceed all of the regulatory compliance issues. So when you deal with Alonzo you’re not just getting recycled paper, you’re getting great quality, consistent process and you’re going to reduce landfill, reduce emissions into the air, reduce waste water into the water streams ... It has to fit in with all the other things. You have to provide the customer good quality, good turnaround, consistency of products, technical support, access to you and price.”

Alonzo Printing developed its environmental commitment throughout the years. At one point an executive team, involving the president, the vice president, the sales manager, and a couple of operations personnel met for this express purpose, to discuss how they could execute the philosophical beliefs of being an environmental printer. Sellers defines environmentalism as dealing with the problems of pollution at their source. He goes on,

“We began to look at all of our processes, all of our marketing, all of the types of clients we go after and tried to pitch them on the value of being an environmental printer, [distinguishing] between being an environmental printer and a printer who prints on recycled paper.”

Alonzo Printing was the first printer in Alameda County, CA, to be certified as a Green Business. The green certification organization had an influence on the company's choices to some extent. However, it was Alonzo's decision to approach the certifying organization, to work with them, and to comply with all the requirements. By the time Alonzo became aware of certification, the firm had already focused on being environmental. Sellers explains that for Alonzo the “big issues were ... going to CTP, the aqueous-based technologies, the soy oil inks, and the recycled papers.” Recycled paper is a house stock for Alonzo whereas for most organizations it's a custom-order stock. “There are very few [printers] who, ... when [a client] calls to get an estimate, the first thing you quote is recycled paper,” Sellers says, and “typically [a client] has to ask for it,” but at Alonzo “you have to ask not to have it.”

Alonzo Printing is recognized by various private and government agencies for its environmental leadership, and therefore is considered to be one of the predominant ecological printers in the nation. Alonzo submitted a document called Management Plus Review to NAPL that states the company's beliefs. Sellers described the Management Plus Review as "a two-sheet statement of our environmental strategy. And then what we do is focus on living up to that, as far as the consumables that we use and the processes that we use. So, ... I would say it is formal, but it's not a 20-page charter as well."

3.1.3 Basic aspects of environmental strategy and fit into overall company strategy

Alonzo prints on 100% post-consumer paper, using soy-based inks, without any alcohol in the printing presses or fountain solutions. Alonzo was the first company to use Kenaf paper. Duffy remembers:

"We ordered a truckload of that paper. Well, that was \$1.40 a pound, I mean, times 40,000 pounds. That was a significant investment in that paper, and we finally sold the last roll and made double the money. ...

What I had left somebody was looking for, I had it, and so I sold it."

From the latter part of the 1990s, Alonzo Printing advertised that it only printed on recycled paper with soy-based inks. However, a third factor, the marketplace, influenced the development of Alonzo's environmental strategy. As the economy started to shift, this strategy changed. The recession forced the firm to rethink its capabilities because environmentalism had taken a backseat in the mind of price-conscious

customers. Duffy explains that at one point Alonzo went to Gray's Harbor Paper, and asked them to produce 100% post-consumer 50 lb. offset paper, which they did, but the cost was significantly more. "It was probably \$.50 a pound instead of \$.30 a pound," Duffy says, and "it is a question of whether the customer will pay for it." Currently, as a medium-sized printer, Alonzo still feels the effects of that recession. The firm prints now on approximately 85% recycled paper with only soy-based or vegetable based inks.

The EPA and the Bay Area Air Quality Management District impose limits, otherwise fees and penalties are assessed. Alonzo has to deal with very stringent environmental regulations, so the company decided it would be better to invest in environmentally friendly procedures at the beginning and reduce waste, rather than paying in the end because of non-compliance.

The regional context plays an important role in how the company is able to integrate environmental issues into its strategic planning. Since most of Alonzo's clients are local, where there is a lot of environmental interest, the company has a better chance to communicate in the same language as its customers.

3.2 Strategy Implementation

3.2.1 Product Improvements

Sellers is aware that most of the solutions Alonzo Printing may need are already available somewhere in the larger market, and so Alonzo reaches out to cross-industry solutions.

For example, a sales representative from a different industry provided the firm with electrical devices.

While Alonzo's basic goal is to be compliant with federal standards, its broader environmental goal is to offer recycled paper for everybody again. In the late 1980s, Duffy remembers reading in "the *New York Post* [about the] garbage barge that went around the world and ended up back in New York because nobody wanted to take it." This event gave him an idea for the firm's first environmentally focused ad, which Alonzo Printing published in *Garbage Magazine*. "It was a cartoon of a dump truck backing up to the Grand Canyon, and the Grand Canyon was scratched out and 'The Last Great Landfill' was on the sign." Alonzo Printing also had a 'Save a Tree' program, that gathered facts about recycled paper. Duffy believes that "some people are still really interested in that," but Alonzo does not to pursue it anymore.

3.2.2 Process Improvements

Becoming a member of the Green Business Program in the Bay Area requires integrating certain activities into the business, which involves recycling of waste water, paper, office waste and solvents. Alonzo also tries to use non-petroleum based solutions and substitutes with water-based, citrus-based, or renewable resources. Alonzo Printing uses soy ink, which is more expensive than petroleum inks, but which come from renewable resources, and therefore fits in with the company's consciousness of supporting a sustainable development.

Sellers gives another example of waste recycling:

“...We take our waste inks, we containerize them, they’re converted to a solid, and then they’re used for fuel in firing reactors and big turbines that generate power. So, they don’t go into the ground. We don’t want them to be there for the next generation to have to deal with.”

In 1992, a used distiller from England was installed in the prepress department, because the affluent from the prepress chemicals are hazardous waste and need to be collected. Duffy, who is always looking for new opportunities, explains that “all of the chemistry from pre-press went into this distiller, and it became a sludge, and what came out of it was clean water, which went down the drain.”

The company decided not to continue with the distiller after it broke down, for two reasons: film is becoming obsolete, and a new distiller would have been too costly. In 2001, Alonzo tried a new process that would require fewer plates, but it did not work out, even though they believe this will be standard in the industry within the next five years.

3.2.3 Managerial Practice

Training

Duffy brings his image of being an environmental printer to the floor level. The company’s employees know that they are working for a green company and they believe in that. Employees receive some environmental education, but the emphasis on green is

not as strong as it once was. “I think it is [important to say], that we believe in being a green business and that this is the way of doing business,” Duffy explains.

“Not everyone agrees,” he says, however “the person who ultimately makes the decision is the customer, and therefore you sometimes have to change your focus [to] what’s happening in the market.”

Alonzo Printing prides itself on offering its employees thorough training and an opportunity to attend industry classes and seminars to enhance their skills. Alonzo Printing aims to deliver a finished high-quality product that helps a client to reach individual goals and objectives. Every client receives the highest level of environmental awareness regarding what is involved in the production process, with the possible exception of recycled paper since that choice is up to the client. Duffy believes that if the company could get by only printing on recycled paper, that would be its policy, but salespeople need to sell jobs, and don’t always come up with work that is solely on recycled paper. “When our sales people go out to sell,” he explains, “I don’t think they are saying we are an environmental printer. However, they need to be able to explain our marketing program in order to assist them in making the right choice. To do so, we created a sales kit to better communicate Alonzo’s environmental position.”

Feedback

Alonzo measures its environmental friendliness by handing out surveys to clients about every 18 months and integrating the results with its own employees’ feedback, to see whether external perceptions match internal perceptions. The company conducts

internal 'eco-audits' in order to compute its water, electricity, and gas usage, as well as its paper, ink, and solvent usage. All waste paper that comes off the press is separated into containers throughout the building, and recycled with a local vendor. In order to be certified as a green business, Alonzo Printing's numbers are measured against other organizations. Environmental performance is monitored by a person in the accounting and administration departments, who gathers all the numbers from operations, and fills out forms for the reporting agencies. The company has a management information system (MIS) in place where, for example, ink estimates vs. actual usage is tracked whereas solvents and fountain solutions are tracked in the purchasing department.

3.2.4 Marketing

Alonzo Printing realized that it had to communicate what the firm was doing in order to help its clients understand its mission. And so, the company website announces, "Alonzo Printing's mission is to create long term partnerships with customers and vendors that improve the quality of life for employees and their families through growth, prosperity and commitment to the environment." (retrieved June 10, 2004, from <http://www.alonzoprinting.com/companyinfo/culture.html>). Alonzo uses a green logo and calls itself an environmental printer. The firm's business cards read, 'Alonzo Printing Company: Printing. People. Planet.

The firm is aware that non-profits, and more recently corporate America, are realizing that their clients or shareholders are increasingly demanding recycled paper. To

some extent, Alonzo tried to bring customers in from that niche market. But now Alonzo is working on a new marketing plan that “will focus on environmentalism,” Duffy says, “and [how] this is the right way to do things.”

Alonzo’s new marketing and brand communications firm Traversant believes that this message will differentiate the company from its competitors. Charlotte Seligman, the president of Traversant, has known Jim Duffy for many years. Seligman approached Alonzo Printing to suggest that the company start promoting its environmental stance again, because she believes that Alonzo already owns a niche market with this environmental stance. According to Seligman, Alonzo Printing already has had an environmental strategy, which the company stopped promoting. Now Traversant has set up a more formal marketing initiative. According to Seligman, Alonzo has a unique position in the market.

In 2004 Traversant started targeting environmental customers and took the chance of distinguishing Alonzo Printing through a brand communications strategy. Traversant created a document that describes the company’s environmental leanings as an important part of this brand communications strategy. Seligman agrees that Alonzo’s residence in the very green state of California is advantageous to its strategy. Traversant is now trying to increase market share by appealing to “emotional guilt” by stressing the emotional aspect of saving the environment, with messages such as, “Isn’t the real question about the planet and not the money?”

Traversant is helping Alonzo Printing to promote its former image, since most people remember Alonzo as an environmental printer. Traversant will plan and design the

strategy, and Alonzo will produce all marketing materials, including a corporate brochure, a direct mail program, email announcements, newsletters, a sales tool kits, and ads in small nonprofit magazines that focus on fundrasing. Alonzo's biggest challenge will be to pay for all of this. Seligman says it is very difficult to spread a message to people, and so the message has to be continuously communicated to the public.

Duffy wonders whether this marketing effort will have a significant impact on the firm's success, since all business is based on price. Sellers says that they will talk about, for example, the content of post-consumer waste if people are open to that message. Alonzo is attempting to educate its customers about the business so that they are able to speak the same language. Duffy says, "The marketing people we are working with today really believe in the environmental thing, and they want to really push that. So, we are going to start pushing that in our marketing program again."

4. Outcomes

4.1 Positive outcomes

4.1.1 Awards

As the first certified green printer in Alameda County, Alonzo has received a variety of awards for its environmental activities. However, Duffy argues that even though the firm may win customers from being in an environmental niche market, this will not necessarily assure the firm's survival in an economy that forces customers to become more price conscious.

4.1.2 Good relationships

Another benefit of pursuing a solid environmental policy is Alonzo's good relationship with its union. The shift to computer-to-plate "made the working environment much better, healthy," Sellers explains. Sellers explains that being unionized is about people:

"There's certainly a business side of it, but when you look at it [on] the environmental side, ... not only are you saving trees but you're making your whole work environment [better]— the smell is different, the cleanliness is different. All these things about the environment make people want to get up and do it more than just for the paycheck. So I think that there [are] benefits (maybe almost intrinsic benefits) that we don't realize."

4.2. Challenges

Alonzo Printing's biggest challenge was to negotiate with paper companies about a cost-effective increase in its use of post-consumer paper. The second biggest challenge was to educate customers on the benefits of printing on recycled paper. "It does cost more to buy recycled paper," Duffy says "The hope is that if enough people did it and continued to do it, the mills would be set up to automatically handle fiber or recycling pulp or whatever, and be able to process it easier than trees." The challenge is to make people understand.

Sellers remembers that some years back it was difficult for printers to become more environmentally proactive because of the strong presence of photographic

processes. However, new technology has become more affordable within the last 10 years, and now there are 20 certified green printers in Alameda County. Perhaps more yet are environmentally conscious but just not yet certified.

Particularly during an economic downturn, it becomes more difficult to convince price-conscious consumers to considering the environmental ramifications of their choices. For example, one client, an environmental magazine publisher, decided to shift from 100% post-consumer paper to 30% post-consumer because of price issues, and since the magazine's advertisers haven't noticed the difference, the publisher may not go back to the 100% post-consumer paper. Duffy feels that there's not much he can do about it because the printing industry is very competitive. The consumer calls three or four printers to get the cheapest price available. As a union printer, Alonzo has higher labor costs than much of its competition. At the same time Alonzo has a highly skilled workforce with an average tenure of 12 years. The company is used to looking beyond costs, and hopes to help its customers do the same.

The lack of funds to reinvest in new technology and new equipment is a big drawback for printing companies. There is a strong belief that most environmental processes are associated with higher costs, which challenges particularly the smaller firms that want to maintain an environmental strategy. Sellers explains,

“Recycled papers are more expensive than virgin papers. And they can range anywhere from 2 or 3% up to maybe 25 or 30% [higher], depending on the paper and the grade. ... The soy inks versus petroleum-based inks are 2% or 3% more expensive. Computer-to-plate systems, compared to

traditional film and plate systems, can cost hundreds of thousands of dollars more. The plates themselves can be more expensive.”

But while being environmentally correct may be more expensive, what is the alternative? Duffy sees no other way out because “being environmentally compliant is just something that governments require today and so that’s a requirement in doing business.”

5. Conclusions

Alonzo Printing, the first printer certified as a ‘green’ business in Alameda County, CA, started took proactive and leading environmental direction through the strong social commitment of its top management. Through strong leadership, the company was able to integrate an environmental belief system into its culture and to mature this philosophy. While being compliant with federal regulations was the basic goal, other factors such as the company’s regional and cultural context and customer demands also had a strong influence on the firm’s decisions.

Alonzo’s experience demonstrates that a successful environmental strategy has to be evaluated in connection with economic conditions. An environmental strategy should not be either overestimated or underestimated as part of the whole strategic planning process. One of Alonzo’s major new objectives is to redefine its environmental strategy, as part of its overall marketing strategy.

Chapter 10

Cross Case Study Analysis

1. Introduction

As introduced by Reinhardt (1998) and Porter (1975), the characteristics of an environmental strategy differ depending on each individual company and the competitive forces that affect it. This statement also applies to the four printing companies investigated in this thesis. The following analysis will reveal differences and similarities between them, and comparisons will be made across firm size and firm location.

First, the researcher will compare environmental strategy formulation and implementation activities. Second, the researcher will compare how external context and size influence the companies' strategic approach to environmental issues. Last, the researcher will discuss overall findings, and suggest how other companies may learn from this information in order to successfully formulate and implement an environmental strategy.

2. Strategy Formulation

2.1 Background Information

Each of the four printing firms, Oktoberdruck (small/German), Zeitungsdruckerei Leipzig (large/German), Alonzo Printing (small/American), and Hickory Printing (large/American) has a distinctive background regarding how its environmental strategy developed. Table 2 summarizes the companies' background information, showing differences in size, location, founding year, and printing category, which is important for understanding each company's environmental strategy.

Table 2. Background information of selected companies

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo Printing (S/A)	Hickory Printing (L/A)
Year founded	1973	1992	1976	1917
Location	Berlin, Germany	Leipzig, Germany	Hayward, CA, U.S.	Hickory, NC, U.S.
Employees	26	Approximately 250	60	260
Sales 2004	Not known	Not known	Approximately \$9 million	\$40.8 million
Printing category	Sheet-fed offset	Web offset	Sheet-fed and web offset	Sheet-fed and web offset, packaging

The organizational structure and cultural background of a company is very important for strategic decision-making. In addition, for understanding each company's environmental strategic focus, knowledge of each company's client base and region of business is important.

ZDL and Hickory Printing have flat organizational structures, with two to three management levels. Oktoberdruck is different from the three other firms because of its self-administrative collective organization. Oktoberdruck and Alonzo Printing operate

locally and have similar types of clients, of which the majority are environmental groups and associations. ZDL's client base includes primarily its mother firm and main client Axel Springer, and advertisers whereas Hickory Printing serves a variety of industries with the majority of clients located east of the Mississippi. Table 3 compares the management structure, ownership, and client base and region of business of the firms.

Table 3. Comparison management structure, ownership of the firms, and client base and region of business

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Management structure	Self-administrative collective	Three levels of hierarchy	Not discussed	Two levels of hierarchy
Ownership	Fully owned by employees	Owned by mother firms	Privately owned	Fully owned by employees
Customers	Majority of customers are environmental groups, associations and government agencies	Newspaper publisher LVZ, its mother firm Axel Springer, and advertisers	Majority of customers are environmental groups, associations, NGOs and government agencies	Variety of industries
Region	Locally oriented	Regional	Locally oriented	Majority of business comes from east of Mississippi

As mentioned in the chapter on methodology, the researcher selected companies that were considered environmentally proactive. The basic publicly known environmental facts indicate the pro-activity level of strategy formulation and implementation in each individual case. All four companies have as their priority being compliant with federal and state regulations. In addition, as seen in Table 4, they all decided on environmental activities that go beyond regulatory compliance, because there is strong corporate support for long-term environmental management (Petulla, 1987, cited in Fischer & Schot, 1993).

Table 4. Comparison of basic environmental facts

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo Printing (S/A)	Hickory Printing (L/A)
Certification	First printing firm with valid EMAS certification in Berlin/Brandenburg	Has ISO 9001 but no ISO 14001 or EMAS certification	First printer in Alameda County to be certified as Green Business	In ISO 9001 certification process, but ISO 14001 certification is not planned
Major Process Improvements	Shift from CTF to CTP, ventilation systems	Material consumption and waste reduction, heat and power station	Water and paper recycling	Early silver recovery, salvaging waste paper from offices, waste management program for customers, lowest waste factors in the industry
Product Improvements	Pioneer in using chlorine-free bleached paper	Majority is recycled paper	First company using Kenaf paper	Company does not believe in recycled paper; soy-based inks did not reduced VOCs
Awards	1998 award for environmentally-conscious corporate management	Not discussed	Not discussed	Awards 1991, 1992, 1994. First receiver of Dr. William D. Schaeffer Environmental Award

2.1.1 Motivation

While compliance with environmental regulations was the same for all four companies, the motivation for proactive environmental initiatives came from different sources. Oktoberdruck's environmental commitment developed from its employees' alternative way of thinking. Hickory Printing's proactive environmental efforts are based on the chairman of the board's deep personal conservational belief. This is similar to Alonzo Printing, whose CEO's environmental consciousness was awakened through the influence of the founder of *Conservatree*. ZDL received its environmental policy from its mother companies. Leadership is the key motivation factor for all four firms. It is the ability of management to empower employees in making their own day-to-day decisions (Porter, 1996). Managers in those firms were able to adopt supportive behavior and to lead, synthesize, clarify, and communicate environmental goals and achievements (Birch,

1994). Even though Oktoberdruck does not have a clearly defined leader because of its unique organizational structure, there is “group leadership”, making all employees equally responsible for decisions.

As Banerjee (2001, 2) suggests, very important key drivers of change in the process of strategy formulation and implementation are the members of an organization. In the case of Oktoberdruck in Germany, this is particularly evident since all employees (not only management) drive the strategic decision process. Apparently, when the company was founded, political and social movements set the stage for the self-administrative collective structure of the firm. This organizational structure opened the way for a culture that values self-initiative, autonomy, political activity, environmental behavior as natural responsibility, and the human being as the center of life. The common ecological spirit and the idea of social responsibility as a corporate value (Banerjee, 2001), profoundly affect Oktoberdruck’s decision-making.

The founder of the *Conservatree* program influenced the CEO of Alonzo Printing in the 1980s. Since about 1994, the personal commitment of the CEO has been driving the company’s environmental strategy, similar to what Banerjee (2001, 2) found in his studies. However, increasing economic pressures and therefore the demands of price conscious customers forced Alonzo Printing’s marketing firm, Traversant, to approach the firm. Traversant is now the driving force in Alonzo Printing’s environmental strategy. This firm developed a brand communications strategy for Alonzo to reach out for new customers. They created marketing messages convincing more prospective clients on an

emotional level about the value of environmentally friendly printing. Alonzo pays strong attention to regulators, public incidents, and corporate America.

ZDL's case is consistent with the perception about large, German, publicly-held companies. ZDL's two mother companies, the advertising clients of LVZ, and the general public influence ZDL's environmental strategy. Also, because ZDL is a publicly-held company, regulators have a very strong interest in ZDL's environmental business practices. Since 1992, when the firm was established, ZDL's mother firms have set strict environmental guidelines and ZDL has adhered to them.

Hickory Printing is a large, privately-held independent company, fully owned by employees. This has a tremendous impact on the range of decisions that can be made regarding environmental issues. Hickory Printing's chairman of the board, an environmentalist, established a "family" culture at the company that, like at Oktoberdruck and Alonzo, drives initiatives beyond regulatory compliance. It is the philosophy of this personality that influences strategic decisions. He believes in the conservation of resources and that people are important elements in environment, and this philosophy has instructed employees how to implement environmental initiatives in their daily production work. Because of his philosophy, environmentally-focused decisions are preferred, whether there is a positive ROI in the short term or not. Though only 20% of customers, mostly large firms driven by their stakeholders, are interested in environmentally sound business practices, Hickory Printing continues to be a leader in environmental initiatives.

The key point is that whether the firm is small, large, German, or American, the leadership skills and strong personal environmental beliefs of top executives are the most important motivating factors for strategy formulation. Even if Oktoberdruck does not have a clearly defined leader, “group leadership” drove the firm’s formulation of environmental strategy.

2.1.2 Process of Formulation

I adopted the two polar concepts introduced by Hax and Majluf (1991): *deliberate and emergent* strategy to categorize the printing firms investigated. The deliberate strategy will provide the organization with a purposeful direction (the intended course of action leads to the realization of the strategy), whereas the emergent strategy implies the process of learning (strategy is identified from patterns observed in the past).

It seems that ZDL and Hickory Printing do not use its environmental stance to directly compete with other printing firms. Hickory Printing, like ZDL, manages environmental issues informally as an internal element of the firm. ZDL sets yearly new goals for process improvements depending on previous achievements. Therefore, ZDL’s environmental strategy is considered an emergent strategy. Though Hickory Printing wants to be an environmental leader, there is no formal strategic approach to environmental initiatives; therefore the researcher considers also Hickory Printing’s environmental strategy as an emergent strategy. Both small firms, Alonzo Printing and Oktoberdruck, are considered to have formulated deliberate strategies because they were

more concrete about using their environmental stance strategically. They use formal strategic initiatives such as marketing and EMAS certification. Table 5 shows the categorization of all four firms according to the concepts of deliberate and emergent strategy that were introduced by Hax and Majluf (1991).

Table 5. Types of company strategy

	Small	Large
German	Deliberate	Emergent
American	Deliberate	Emergent

As discussed by Ree & Lee (2003), each company uses a range of decision areas such as product, process, organization and systems, supply chain, and external relationships. Primarily, all four environmental strategies in the companies investigated agree on at least one decision area: process. In all four case studies, continuous process improvements and improvements in production efficiency are the major focus of strategic decisions. This results in similar benefits stated by decision makers in all four of these companies: the potential of saving resources, reducing environmental impact, and saving costs (Porter, 1995). For example, the implementation of CTP saved them cost in purchasing and disposal, and protect the environment because film and chemistry was

eliminated. Improved print processes reduced paper spoilage and therefore reduced cost of disposal and reduced amount of paper waste going to landfill.

Hickory Printing considers its environmental stance less a strategy and more a philosophy. This philosophy of conserving the environment for future generations drives innovative, proactive environmental initiatives. The intention to conserve the environment for future generations has a strategic aspect because according to Hax and Majluf (1991) a strategy defines “the nature of economic and non-economic contributions it intends to make to its stakeholders.” Hickory Printing realizes that the most utilitarian value with real emotional force is the desire to preserve the earth for the next generations (Kempton, Boster, and Hartley, 1995). The firm has the ultimate long-term goal of eliminating chemicals, however Hickory Printing uses its environmental stance less strategically than other firms. The company’s strategic advantage is seen in indirectly using environmental initiatives to improve production and efficiency. The core strategic aspect lies in cost savings, resulting in competitive prices.

ZDL also applies this strategy of increasing production efficiency in order to affect competitive pricing. In both cases, environmental initiatives are not directly the focus for competition. Although ZDL seems not to compete directly on an environmental stance, process improvements through investments in environmentally up-to-date technology result in cost savings and higher efficiency. Cost savings as well as higher efficiency then result in a competitive advantage. ZDL’s overall company strategy is to produce high quality products with acceptable prices and on-time delivery. In addition, it

seems that ZDL is primarily concerned about maintaining its image as an environmentally sound business, and its customers' trust in the firm.

The retention of customers, and the maintenance of the "responsible citizen" image is also a strategic goal of Oktoberdruck, Hickory Printing and Alonzo Printing. In addition to saving resources and costs, Oktoberdruck and Hickory Printing agree that a positive environmental stance results in personal satisfaction. They also agree on the importance of improving work and life environments from a health-and-safety point of view. Table 6 compares the firms' strategy focus.

Table 6. Comparison of environmental strategy focus

	Oktoberdruck (S/D)	ZDL (L/G)	Alonzo Printing (S/A)	Hickory (L/A)
Compliance	Basic goal	Priority is being compliant	Basic goal	Number one goal is compliance
Process	Continuous process improvement	Improvement of business performance	Improve things	Constantly improve things
Customer	Building interpersonal relationships and promote environmental stance as added value of service	N/A	Promote environmental stance as added value of service	N/A
Sustainability	Sustainability of firm's philosophy/business. Conserve environment for following generations	Not discussed	Improvement of quality of life for employees and families ... commitment to the environment	Save resources for future generations
Strategic view	Long-term	Long-term	Short-term	Long-term
Strongest goals	Comply with voluntary company guidelines	Yearly business improvement	Offering recycled paper for every client	Elimination of chemistry
Key decision area	Concentration on environmental management/ formal EMAS certification	Concentration on technology investments (process)	Concentration on marketing	Elimination of chemistry and waste management (process)

All four companies seek benefits from their strategic focus. Table 7 summarizes them.

Table 7. Comparison of the benefits of adopting environmentally friendly policies

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Maintaining Image as environmentally-conscious firm	Yes	Yes	Yes	Yes
Save resources	Yes	Yes	Yes	Yes
Reduce environmental impact	Very important	Less important	Important	Very important
Improve health and safety	Very important	Very important	Very important	Very important
Differentiation	Yes, serving niche market	No	Yes, serving niche market	Yes, being environmental leader
Partnerships/Relationships	Retain loyal customer base	Maintain customers' trust	Have good relationship with union	Retain existing customers and improve relationships with local businesses
Personal satisfaction	Very important	Not cited as a benefit	Important	Very important
Financial government funding	Increased advantage for federal funding	Not discussed	Not discussed	Not discussed
Cost savings	Yes	Yes	Yes	Yes
Increased efficiency	Important	Very important	Important	Very important
Increased customer base	Yes	Not discussed	Yes	Yes
Making money	Not cited	Not cited	Making money/ROI	Making money

In summary, as suggested by Porter (1975), all four companies have created a competitive edge with their environmental focus, as seen by the range of benefits they have gained.

3. Strategy Implementation

3.1 Overall Observations

As suggested by Porter (1996), firms establish different sets of distinctive activities to provide a unique mix of value. As discussed by Ree and Lee (2003), environmental initiatives in one company may have a stronger weight in decision-making than they do in another firm. Further, companies choose different “depth,” levels of environmental activity.

3.1.1 Process Improvements

Though all four companies’ environmental strategy focuses heavily on process improvements, each firm has an individual approach to it. Some major technology investments were made by each company, such as solvent recovery, substitution of toxic chemicals in fountain solution, reuse and recycling programs, shifting from film to CTP, and automatic washing units (Anonymous, 1994; Rosen, 2001). Oktoberdruck invested constantly in environmentally sound equipment, and also achieved improvements through small initiatives such as better planning of transports. Alonzo, on the other hand, focuses more on recycling efforts. Oktoberdruck and ZDL both implemented separate waste disposal, whereas Hickory Printing did not because it thought that waste separation would cause higher costs. Hickory Printing instead tries to prevent pollution through

waste recycling programs and eliminating chemicals. Table 8 shows which process improvements characterize which firm.

Table 8. Comparison of process improvement initiatives

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Transports	Better planning/decrease of transports, bike couriers	Not discussed	Not discussed	Better planning of transports
Waste separation	Yes	Yes	Yes	No waste paper separation
Technology investments	Fixing bath silver recovery machine, ventilation system in pressroom and plate-making, automatic cleaning process	Update to state-of-the-art technology, shift to CTP, automatic washing units, combined heat and power station	Installation of used equipment	Shift to CTP, automated washing units
Reuse of materials	Reusable cleaning cloths, filter fountain solution	Reusable cleaning cloths, Ink reprocessing	Yes	Substitution of fountain solution
Recycling	Disposal of paper in co-op with neighboring company	Solvent and paper recycling	Solvent, paper, and water recycling, office waste recycling	Paper recycling
Elimination/Substitution of chemicals	Introduction of powder chemistry	Elimination of alcohol in fountain solution	Elimination of alcohol in fountain solution	Elimination of chemicals, substitution of fountain solution
Emission reduction	Yes, VOCs	Yes, noise and VOCs	Yes, VOCs	Yes, VOCs
Reduction in Material Consumption	Yes, paper and ink	Yes, water, energy, paper and ink	Not discussed	Yes, water, energy, paper consumption
Other activities	Sponsors paper to kindergartens, introduced green eco-box	Not discussed	Not discussed	Green building, Founding of Institute for Conservation of Natural Resources

3.1.2 Product Improvements

Oktoberdruck is very involved in product improvements through the reuse and substitution of materials, whereas Hickory Printing's strategy does not primarily focus on product improvements. Hickory Printing only prints on recycled paper if that is requested

by the customer, and does not use vegetable ink. Oktoberdruck, Alonzo, and ZDL increasingly offer recycled paper as a house stock.

Table 9. Comparison of product improvements

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Paper	Chlorine bleached paper only at explicit request	Majority of paper is recycled paper	100% post-consumer paper as house stock	No recycled paper unless requested
Packaging	Reuse of packaging, reuse of steel straps	Change of packaging	Not discussed	Not discussed
Substitution	Paper tape for foil tape	Not discussed	Not discussed	Not discussed
Inks	Vehicles in inks are 80% vegetable oil	Uses soy-based ink	Always get soy based ink	No vegetable-oil ink

3.1.3 Management Practices

Management practices including environmental management (see Table 9), integration in environmental decision-making, and training and communication are important elements in strategy implementation. The investigated companies showed different approaches to these activities. The findings do not support Rosen's (2001) statement that EMS programs tend to be integrated in larger, innovative factories because they can rely on more internal and corporate resources. Whereas Oktoberdruck implemented an EMS and got EMAS certified in 1996 in order to have a formalized management system in place, none of the other three firms is ISO 14001 or EMAS certified. This is primarily due to the perception that a certification process would involve more paperwork and would simply formalize already well-functioning environmental management initiatives. Hickory

Printing and ZDL are skeptical that an ISO or EMAS certification would improve their environmental initiatives. Although Hickory Printing is not quite convinced, it plans to get certified for ISO 9001 since this is becoming more of a requirement within the packaging industry.

Table 10. Comparison of environmental management practices

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Environmental management system	Integrated management system	Environmental Manager	MIS system to track inventory	Environmental manager
Certification	EMAS	Not ISO 9001/14001 or EMAS certified	Green business	In the ISO 9001 certification process but no ISO 14001
Responsibility	Executive team has overall responsibility for compliance	Plant manager and technology/facility manager	CEO and marketing personnel	Engineering and logistics personnel (compliance) and chairman (research)
Performance monitoring	Not discussed	Eco-balance report (analyses and statistics about consumption from year to year)	Performance is monitored by accounting/admin personal	Monitor waste and manufacturing costs every day; cost standards are reviewed every quarter
Audits	Extensive inventory was taken, internal audits three times a year, external audit once a year	Not discussed	Internal eco-audits in water, electricity, paper, ink, solvents and gas consumption	Not discussed

All four companies integrated environmental principles in their overall corporate strategies. However, the level of integration of employees in decision-making processes varies (Table 11).

Table 11. Comparison of employee integration in decision-making

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Level of employee integration in formulation	Employees are equally involved in planning and decision-making	Everyone is encouraged to make suggestions. The final decision rests with the plant manager	Marketing people and CEO are mostly involved in decisions	Goals come from the CEO and chairman of the board
Level of employee integration in implementation	New investments, process improvements, quality control, and marketing mix are openly discussed	All relevant divisions in planning, executing, and controlling,	"Employees only" implementing environmental initiatives	Production departments execute ideas

At Oktoberdruck, employees are equally involved in the planning and decision-making process. At its counterpart small company Alonzo Printing, it seems that only the CEO and marketing manager are involved in environmental decision-making. Alonzo employees take the environmental focus of the firm as a given, and translate the CEO's environmental commitment in practice. At Hickory Printing, all departments are involved in the implementation of environmental activities. However, long-term goals come from the top, and department managers are responsible for finding solutions. At ZDL, all divisions are involved in planning, executing, and controlling environmental initiatives. However, the facility manager is particularly involved in environmental management, and the plant manager has the final decision-making power.

Training is in general very important at all four investigated printing firms. Oktoberdruck and Hickory Printing pay close attention to cross-training employees. Alonzo and ZDL seemed to consider employee training with regards to environmental and health and safety issues as less prominent decision area in comparison to other discussed initiatives.

Further, Oktoberdruck and Hickory Printing are very involved in collaborative research and development, indicating a focus on innovation and pioneering efforts in

environmental issues (Reinhardt, 1999). Oktoberdruck participated in a university study and government projects, and Hickory Printing established the Institute for Conservation of Natural Resources. ZDL did not mention R&D but it is assumed that the firm stays up-to-date through its membership in the German print industry organization. Also Alonzo did not discussed any research projects.

All four companies use different channels to communicate with their stakeholders (see Table 12). Whereas Oktoberdruck, Alonzo, and Hickory Printing have their own environmental mission statements, ZDL follows the environmental policy of its mother companies. Oktoberdruck informs employees and clients through its corporate website, company brochures, and blackboard announcements, environmental statement, and client consulting meetings. ZDL publishes its eco-balance report in the newspaper and posts it on the corporate website. Alonzo has a mission statement and a document called “Management Plus Review” and sends surveys to clients every 18 months. Hickory Printing seeks two-way communication through plant tours, surveys from clients, its environmental impact statement and environmental statement, and the corporate website.

Table 12. Comparison of communication efforts

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Channels	Environmental committee meetings, brochures, blackboard announcements, corporate website, consulting sessions	Newspaper, corporate website, image brochure	Corporate website, consulting services	Corporate website and brochure, open conversations with employees, plant tours
Medium	Environmental statement (includes environmental program), mission statement	Eco-balance report	Mission statement, Management Plus Review submitted to NAPL, surveys to clients every 18 months	Environmental statement, and environmental impact statement

3.1.4 Relationship Building

All four companies agree with Porter (1995), Rosen (2001), and Banerjee (2001, 2) that building proactive partnerships and relationships with external stakeholders is very important. Each company focuses more or less on the same type of stakeholder. All four want to build partnerships with vendors who support them with ecologically-oriented troubleshooting and help with process improvements. They aim to strengthen their relationships with existing clients, industry associations, environmental organizations and regulators.

Table 13. Comparison of relationship efforts

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Vendors	Involve vendors in ecologically oriented troubleshooting	Ink and paper suppliers	Create long-term partnerships	Look for good suppliers to help with process improvements
Environmental organizations	Yes	Works closely with environmental organizations	Yes	Very involved in environmental organizations
Associations	Yes	Involvement in federal printing association	Green business certifying organization	Membership in various associations
Customers	Strong emphasis on personal relationships	Strong emphasis on good relationships	Create long-term partnerships	Personal relationships with customers
Community	Yes	Yes	Not discussed	Yes

3.1.5 Marketing

In 2004, Alonzo Printing began to engage in its environmental strategy more aggressively through the implementation of a brand communications strategy. Alonzo particularly targets environmental organizations by communicating a message about itself, which

makes the environmental aspect an important component of its value-added service.

Oktoberdruck also uses its environmental stance as a core part of the firm's customer consulting services. Oktoberdruck promotes its environmental image, and has created a tagline that reflects the importance of the firm's environmental commitment.

Oktoberdruck also heavily promotes its EMAS validation.

Table 14. Comparison of environmental marketing activities

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Marketing Plan	Yes	Not discussed	In 2004, started a brand communications strategy	No
Tagline	Oktoberdruck: Environmental. Friendly. Printing.	None	Alonzo Printing Company: Printing. People. Planet.	None
Special activities	Sponsoring of auto-ralley	Not known	Save a Tree program	Waste management program for local firms
Target new customers	Yes, but less important	No	Yes, specifically environmental customers/public organizations	No
Advertising	Spread-of-mouth	None	Environmental ad in <i>Garbage</i> magazine	None

4. Challenges

The challenges that these four companies have faced vary in importance and strategic focus (Table 15).

Table 15. Comparison of encountered challenges

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Formal paperwork	EMAS	No	No	Yes, ISO 9001 certification
EMAS certification	Relocation and re-certification of EMAS	N/A	N/A	N/A
Financial limitations	Financial limitations/ technology investments are of secondary focus	Not discussed	Limits for investments in technology	Yes
Organizational Structure	Continuation with self-administrative structure	Not discussed	Not discussed	Not discussed
Relationships	Difficult partnerships with other associations because majority of associations do not accept firm's organizational structure	Teach smaller firms about environmentally-sound practices	Negotiating with suppliers, and educating the customer	<ul style="list-style-type: none"> • Build cooperative relationships with environmental organizations and government agencies. • Convince the public that environmental initiatives are the right thing to do. • Employees' resistance to change. • Convince other businesses to reduce emissions.
Special challenges	N/A	N/A	Higher prices for environmental activities	Active maintenance is difficult because of high turnaround. Emission reduction at digital printing presses
Increasing market pressures	Increasing EMAS certification and eco-labeling in Germany	Constantly monitored by agencies	Difficult to promote the firm in other local areas and to differentiate. Competition with digital printing	Trying to stay ahead of regulations

Oktoberdruck faced its main challenge when the firm relocated, because since an EMAS certification is site-related, the firm had to go through the process of revalidation again. In Spring 2005, the firm hopes to receive its EMAS certification again. In agreement with Dalessandro (2001) about small- and medium-sized businesses (SMBs), Oktoberdruck is encountering financial limitations, which make technology investments a secondary focus. However, Oktoberdruck is a proactive firm that seems to be able to overcome its financial shortcomings through federal research funds. In addition, the firm's structure has helped. In some instances, necessary investments in technology have been made by cutting wages in agreement with all employees. Particularly, Oktoberdruck is faced with a very unique challenge. Oktoberdruck has difficulties developing good partnerships with a majority of associations because those do not accept the firm's organizational structure. Oktoberdruck's collective structure on the other hand is keeping the firm from establishing good relationships with associations because those organizations do not agree with it. Until now, the firm has not found any solution to that problem. However, they know that the company's collectivity has helped it to overcome challenges, which encourages the firm to continue.

Hickory Printing's main challenge in the early years was to work with government agencies. The chairman of the company, who is actively engaged in various organizations, influenced politicians with his continuous conservational efforts. However, Hickory Printing criticizes environmental organizations for making businesses appear responsible for environmental problems. Therefore, one challenge Hickory faces is to build cooperative relationships with environmental organizations. Another is to convince

other businesses, and particularly clients and suppliers, to prevent pollution. Emissions control in digital printing is a challenge for the whole industry, not just for Hickory Printing.

As Oktoberdruck, ZDL, and Alonzo Printing also do, Hickory Printing faces increasing market pressure from competitors and price-conscious customers. Whereas Oktoberdruck tackles this challenge with its EMAS certification, ZDL and Hickory Printing do not directly compete on their environmental stance. They try to stay competitive through efficiency improvements, ZDL through technology investments, and Hickory Printing through the cross-training. Alonzo Printing overtly implements an environmental marketing strategy.

The analysis of challenges shows that printing firms have realized that environmental performance is important (Rosen, 2001) because of the increasing forces of regulation, the behavior of competitors or market forces, and particularly changes in technology (Porter, 1996) and organizational capabilities (Sharma, 2001). All four companies have realized that environmental problems are also business problems (Reinhardt, 1998).

5. Comparison of company size: small vs. large

It seems that the smaller firms, Oktoberdruck and Alonzo Printing, are more concrete about using their environmental stance strategically than the two larger firms. As suggested by Porter (1996), both small firms have the long-term goal to strategically

position their firms as environmental printers. According to the adapted categorization by Hax and Majluf (1991), the small firms use formal initiatives such as marketing and EMAS certification, to solidify their environmental commitment. They formulate concrete long-term goals. Both small firms use this strategy not only to maintain but also to acquire new customers. Alonzo Printing uses its brand communications strategy to acquire new customers, whereas Oktoberdruck uses EMAS validation to maintain the firm's loyal customer base.

For both small firms, Alonzo and Oktoberdruck, the regional context plays a very important role. Their businesses operate in an environment that demands sound business practices due to stronger regulatory forces and customer demand. They both operate locally, where they serve a niche market, and provide value-added services to environmentally conscious customers.

As discussed earlier, the two large firms, Hickory Printing and ZDL, do not compete directly on their environmental stance, and therefore are considered to have emergent strategies. One is privately held (Hickory Printing) and the other (ZDL) publicly held. Hickory Printing is driven by its chairman's philosophy, and ZDL is primarily influenced by external stakeholders.

Though the two small firms focus on different environmental initiatives, they both have a similar strategy focus: offering their customers ecologically sound products and integrating this environmental element as a value-added service. This helps to differentiate them from other competitors and redefine competitive markets (Reinhardt, 1999). In addition, as suggested by Dalessandro (2001), both small firms have developed

partnerships, and network with the public sector and non-governmental organizations NGOs. However the importance of building good relationships and partnerships with external stakeholders applies also to the larger firms.

The small German and large American firm cooperate with other local businesses in order to share cost. Further, the case study of the small German firm does not support Dalessandro's (2001) statement that smaller firms follow large pioneering firms. This is probably because the companies were selected because of their proactive and innovative characteristics. Also, the results disagree with findings by Petts, Herd, Gerrad, and Horne (1999) that the majority of small firms do not usually implement environmental actions.

The large firms, it seems, concentrate primarily on process improvements. Previously, the researcher proposed that large printing companies concentrate more on environmental technology than on environmental management. All four cases showed that state-of-the-art technology is a major part of the production process. In small as well as in large firms, printing is a manufacturing process that can have a big impact on the environment. Both small firms are more aware of their assets such as technology, access to resources and reputation (Reinhardt, 1998). However, both large firms support the proposition that large companies concentrate mainly on environmentally friendly technological solutions. Their focus on process improvements such as waste management and emission reduction suggest investing in environmentally sound technology.

The small printing companies, Oktoberdruck and Alonzo Printing, share the challenge of not being able to invest in a lot of new technology. The researcher proposed that small companies face these challenges because they have limited financial resources

(Dalessandro, 2001). Both small firms in this research are more challenged by the behavior of competitors and changes in technology than their larger counterparts. The case studies support the proposition that investing in the latest technology cannot be a priority in small firms. However, this does not mean that it is less important in the decision-making process. Small firms wish to be less constrained by financial limits.

Whereas ZDL can afford large technology investments due to its size, the firm cannot afford to lose the trust of its stakeholders. Environmental agencies and groups constantly monitor the publicly-held firm. ZDL see itself as a role model or educator for smaller firms. In the same way, although Hickory Printing is privately held, the firm does not want jeopardize the people's trust in the its environmental initiatives. So Hickory, like the smaller firms, has the challenge of limiting its technology investments.

6. Comparison of cultural differences: U.S. vs. Germany

As with strategy formulation, corporate cultural issues play an important role in environmental strategy implementation. There is concluding evidence that American or German nationality has an influence on how strategy is implemented, though it depends also on the local environment and internal cultural values, e.g., more stringent regulation and higher societal environmental consciousness has an impact on the actual strategy.

Oktoberdruck in Germany is the only company that shows a dependence on the German acceptance for guidelines and certifications. This supports the findings by Steger, Schindel, and Krapf (2002) that German customers appreciate EMAS validation,

and German citizens particularly look for quality labels that guarantee environmental and consumer protection (Schweinsberg & Kamrad, 2003). However, ZDL does not strive for EMAS validation and formal environmental management as a standard (Steger, Schindel, and Krapf, 2002). Oktoberdruck seems to have more easily adopted a formal strategy, based on a formal environmental management system, because there is a greater need for legitimization in Germany due to greater environmental awareness. Though ZDL does not seek certification due to different structural and cultural values, both German firms had a greater focus on goal setting than their American counterparts. In addition, the German case studies agree with the results of the study by Steger, Schindel, and Krapf (2002) that government and industry are regarded as having equal positions, individuals prefer to act as part of a cohesive group, they are comfortable with flexibility and ambiguity.

There is also a difference in benchmarking tactics between U.S. and German firms (see Table 16). Both German firms benchmark in only a few specific areas. In ZDL's case, the results of process improvements are compared with other newspaper printing firms. Oktoberdruck benchmarks primarily companies that are EMAS-certified, or have environmentally sound technology. Both American firms have a wider perspective. Alonzo reaches out to cross-industry solutions through sources such as trade shows, magazines, and associations. Hickory Printing takes a special place because the firm has a very different perspective on benchmarking. The firm is very independent and does not benchmark other companies because the firm considers itself a leader. However, the chairman of the company seeks out the latest information on environmental issues.

Table 16: Benchmarking in German vs. U.S. printing companies

	Oktoberdruck (S/G)	ZDL (L/G)	Alonzo (S/A)	Hickory (L/A)
Type of Information	Regarding EMAS and technology	Comparing its own company's and the eco-balance reports of other newspaper printers	Reaches out to cross-industry solutions	Chairman tracks latest information. Managers look for more technology.
Sources	N/A	Printing Industry meetings	Trade shows, magazines, trade associations	Magazines, review of experiences of other companies, environmental seminars by GATF

Being an American or German firm does have as big an influence on environmental strategy as the philosophical/political/social values within and surrounding the company. In addition to the common challenges of balancing cost with environmentally sound practices, all firms encountered challenges individual to each firm's situation. Oktoberdruck (German) and Alonzo (American) both operate in a market environment where more stringent regulation and a higher societal environmental consciousness are in place. In Oktoberdruck's case, it was the political movements during the firm's establishment that influenced its alternative way of thinking and its personal concern for each employee, which then shaped the company's environmental strategy.

Increasing market pressures are evident particularly for the small firms. In recent years in Germany, social and political movements have been re-oriented around environmental issues. Environmental issues became political issues and are increasingly relevant to the public. Therefore, ecological pressure has affected Oktoberdruck, particularly as more companies started to compete for EMAS and ISO certification. Like Oktoberdruck in Germany, Alonzo has a unique position in California. Increasing economic pressures and therefore the demands of price conscious customers forced

Alonzo's marketing firm, Traversant, to approach the firm and to become a driving force in Alonzo's environmental strategy. Alonzo now pays more attention to regulators, public incidents, and corporate America.

The researcher proposed that German printing companies have further developed environmental strategies, which is supported by Oktoberdruck but not by ZDL. Whereas Oktoberdruck has a clear formal strategy with a yearly environmental program, etc., ZDL seems to have an informal strategy in place. The same can be said about the two American firms. Whereas Alonzo formulated a brand communications strategy with formal goals, Hickory Printing simply initiates activities supporting its environmental philosophy.

Further, it seems that there is a mix of printer-customer-push- and pull situation in both countries, U.S. and Germany. Whereas ZDL's newspaper clients primarily influence the firm's decisions, Oktoberdruck, it seems, influences its clients regarding product improvements. Because Oktoberdruck began early to be involved in the environmental movement, the firm attracted environmental-conscious customers. The majority of Oktoberdruck's clients are loyal customers who came to the firm because of its environmental image. However, Oktoberdruck's situation is more complex because there is an existing mutual relationship between the firm and its customers. Oktoberdruck's customers became more and more important to the firm in order to maintain the niche market of environmentally conscious publishers and organizations.

Both, Hickory Printing and Alonzo Printing did not become more environmentally conscious because of customer demand. Hickory Printing maintains that

only 20% of its customers look for environmentally sound business practices, and that only 3% want recycled paper. However, Hickory Printing only communicates about environmental issues to its customers if that information is requested. Alonzo Printing, on the other hand, targets environmentally conscious customers and convinces them on an emotional level. However, the success of Alonzo Printing's success with its environmental communications strategy will depend on the customer demand they create.

Chapter 11

Summary and Recommendations

1. Introduction

The researcher outlined in the literature review important concepts in the field of competitive strategy, environmental management, and environmental strategy. However, there is no comprehensive literature about environmental strategies specifically in the printing industry. Therefore, those concepts were integrated into the design of this thesis research. Through a comparison between selected German vs. U.S. printing companies, the thesis research addressed:

1. How printing companies formulate and implement environmental strategies;
2. How vendors, customers and other external key parties influence the decision-making process of implementing environmental strategies,
3. What challenges companies may have to face, and how they can deal with those challenges when formulating and implementing environmental strategies; and,
4. How these factors vary across firm size and national context.

2. Limitations

As discussed in Chapter 5 on methodology, case study research is considered an appropriate research design to investigate the study's research questions. However, there are limitations concerning the generalizability and accuracy of the findings. Case study research needs very thorough planning and investigation, as well as much time and effort. This was difficult because of a limited time frame and other factors occurring during the planning and investigation process. First, it was very time intensive to find proactive firms in both countries matching in size. The particular printing companies studied did not result in a perfect match of pairs. The common cultural beliefs of the small German company (Oktoberdruck) and the large American one (Hickory Printing) is a case in point. Also, considering the difference of size definition in the U.S. and Germany, the two large firms do not match perfectly. Second, the results of this study are not applicable to the entire population of printing companies because of the small selection of samples. Third, the research questions were quite broad and made it difficult to concentrate on specific key information. This resulted in different depth of information on some aspects of environmental strategy formulation and implementation in the case studies. Fourth, though a questionnaire was prepared, the content of individual interviews varied. In some cases, a second researcher (Dr. Sandra Rothenberg) was involved in interviewing key respondents, gathering information not necessarily with a focus on the research questions but helpful for the overall comprehensiveness of the case. Fifth, the number of key people interviewed in each firm ranged from one to nine. This resulted in case studies with

different depth and validity of information. Sixth, in one case only telephone interviews were conducted and no site visits. This also reduces the validity and accuracy of the case study. Seventh, there were no interviews conducted with the key stakeholders that influenced each firm's decision-making process. Eighth, during the case study write-ups, I was faced with the problem of eliminating bias and misinterpreting quotes, an especially difficult task in regards to the translation of the German interviews.

3. Key Findings

The analysis of the four companies shows that the environmental strategies of printing companies differ, depending on each individual company and the competitive forces it faces. Though the history of each firm's environmental strategy development is distinctive, all four companies succeeded in creating a competitive edge, gaining a range of common and in some cases individual benefits. While a priority for environmental regulatory compliance was apparent in each company, the motivations for proactive environmental initiatives came from different sources. Though motivation was important for all four cases, environmental strategy could not be successful without the support of an organizational structure, integrating employees in different positions and departments in decision-making processes. The most organic firm had the most serious environmental management. An environmental management structure is important so that a firm can continue with environmental strategy in case one key person leaves.

Some key factors driving the firms' strategic decision-making processes kept reappearing in the study: organizational structure, ownership, location, and the history and cultural background of the company were very important for decision-making. But in all four cases, leadership and the personal commitment of the members of the firm (employees, the chairman of the board, the CEO, or the mother organization) were the most important indicators of the success of strategy formulation and implementation, though it was separate from formal strategic planning.

These proactive firms are also driven by external stakeholders such as regulators, environmental organizations, and clients, depending on each firm's strategy focus and internal conditions. However, it seems that such secondary influencing factors were more prominent in the late stages of environmental initiatives. Once an image was established, particularly through long-term commitment, firms tended to maintain or improve their relationships with external stakeholders. The internal factors such as personal long-term commitments and the philosophy of top management and employees became more important to overcome challenges.

All four companies concentrated on process improvements and the resulting increased efficiency and saved resources, thereby reducing environmental impact and saving costs. The small German firm (Oktoberdruck) and the large American one (Hickory Printing) focused on sustainability, and stated personal satisfaction as an important benefit to the firm. All four firms are now proactively involved in environmental initiatives because they want to retain their customers and their "responsible citizen" image.

From the strategy focus of each firm it was possible to ascertain its strategy type: emergent or deliberate. Both small firms deliberately use their environmental stance, and thus have formal strategies. The large firms have an informal feel to their environmental initiatives. Both small firms stated that increasing market pressure makes it essential to maintain their niche market, that of serving environmentally conscious customers. For both small firms the regional context plays an important role for serving that market. They operate in an environment where environmental values are highly appreciated. In the larger, national context in which the large companies operate, a stated environmental strategy is as influential as the philosophical, political, and social values within and surrounding the company.

The findings in these case studies do not support most of the stated research propositions. There is no concluding evidence that German printing firms have further developed environmental strategies, and that they push their customers to buy environmentally sound products and services. It is more of a mix of customer push and printer pull. However, in comparison to the larger firms, both small firms were interested in educating the customer, e.g. through marketing messages and customer service. Also, there was a mix of supplier push and printer pull when it comes to introducing and testing environmentally superior technologies and processes. In addition, environmental organizations did have an impact because they provided awareness and ideas through professional and personal contact, which was particularly important for both small firms.

However, both large firms do support the proposition that large firms primarily focus on technological solutions. The small German company's differentiation strategy

rests on its EMAS certification and value-added customer service. The small American firm implemented a brand communications strategy, offering value-added services to environmentally conscious customers. Both firms that strongly believe in sustainability (Oktoberdruck and Hickory Printing) are also strongly involved in research and development.

4. Implications for printing firms

The results indicate that the printing industry may be in transition from initiating environmental actions ad-hoc to formulating and implementing environmental strategies. The case studies presented in this thesis show that printing companies are able to do more than merely concentrate on technology investments. They show that research and managerial practices are even more influential than specific technology acquisitions for the formulation and implementation of proactive environmental strategies. As realized by key respondents in the cases, the people involved in decision-making tremendously affect the outcomes of those decisions. The findings suggest that the most important factor is a strong, long-term commitment and philosophy. This is because internal and external stakeholders will recognize companies with responsible and ethical business practices. It is not short-term activities, but long-term commitment, that makes people trust in a firm.

From these case studies, printers could learn a few things about common and individual environmental challenges encountered by the printing firms investigated and how they dealt with those challenges. This may help other printing firms with their

planning and adoption of environmental initiatives as a strategic part of their overall corporate strategy.

There is still potential for deliberate environmental strategies in printing firms. Each company needs to create formal, long-term, environmental goals and formulate a distinctive set of activities to gain a sustainable competitive advantage. Therefore they need to analyze the individual and local competitive context. However, each printing firm needs to find its own approach to environmental strategy formulation and implementation because each firm's individual and national context is different. Printing firms have opportunities to develop individual coherent plans for each of the four elements of Porter's and Kramer's (2002) competitive context: factor conditions, demand conditions, context of strategy and rivalry, and related and supporting industries. Having a coherent plan will provide strategic direction for long-term business success. Figure 3 summarizes what printing firms could consider when examining each of the four elements. Most likely all printing firms have to pay attention to factor conditions, which are the internal drivers for a successful formulation and implementation of an environmental strategy. Most essential is that managers:

- improve their leadership skills and develop strong environmental values, which need to become an essential part of the organizational culture,
- adopt a formal environmental structure to ensure that strategic long-term goals will be achieved and to encourage integration between environmental issues and all other business operations,
- empower employees in making their own day-to-day decisions and motivate

through information, training, and reward systems

If a company has not yet integrated ecological principles into management activities and the overall corporate strategy, then it is even more important to develop internal and external support for commitment to a radical change in corporate culture. An environmental strategy may not be considered as trustworthy if the firm's core values do not match with environmental values. The fostering of participation by giving feedback and information, the building of trust and respect through consistency in actions, the creation of common goals, and communication recognition are very essential for long-term success. Process improvements are opportunities for every company to reduce environmental impacts and to save on costs. To do so, managers need to recognize formal environmental management, such as total quality environmental management systems and environmental cost accounting systems. As seen particularly with the small firm Oktoberdruck, those systems support a firm with the strategic aspects of goal setting, reviews and audits, and monitoring as the most systematic and comprehensive organizational approach to continuously improve environmental and business performance and to manage quality at every stage of the production process. In some cases, firms are able to gain their competitive advantage through leadership in research and development if they have the financial support from government and the strong philosophical belief in really doing things better. Investment in the idea of green buildings may only be possible for large firms. However, small firms can implement small initiatives, as the case of Oktoberdruck has shown.

Companies that are seeking to focus on demand conditions need to be aware that success is closely linked to the firm's local context. The case studies of the small firms present successful environmental strategies because those firms have been operating in a local context where environmental awareness was very high in society. Both firms positioned themselves in a niche market for environmentally conscious customers, retaining and increasing their customer bases. Companies either have the opportunity to examine their current customer bases for demand for environmentally friendly products and services or to create demand through marketing messages. In the case of Hickory Printing, a marketing campaign might not work if customers know about the firm's beliefs on conservation but do not consider it as the main reason why they do business with Hickory. However, Hickory was able to increase revenue through the implementation of a waste management program for local companies. Educating customers about environmental impact could differentiate the firm from competitors if they still have limited understanding of the firm's environmental initiatives and production processes. The use of eco-labels and certification (such as ISO 14001 and EMAS) are an opportunity to manage competitors but have to be strongly examined within the contexts of strategy and rivalry, as well as the supporting industries. This is because they may only work if the local and national context demands it.

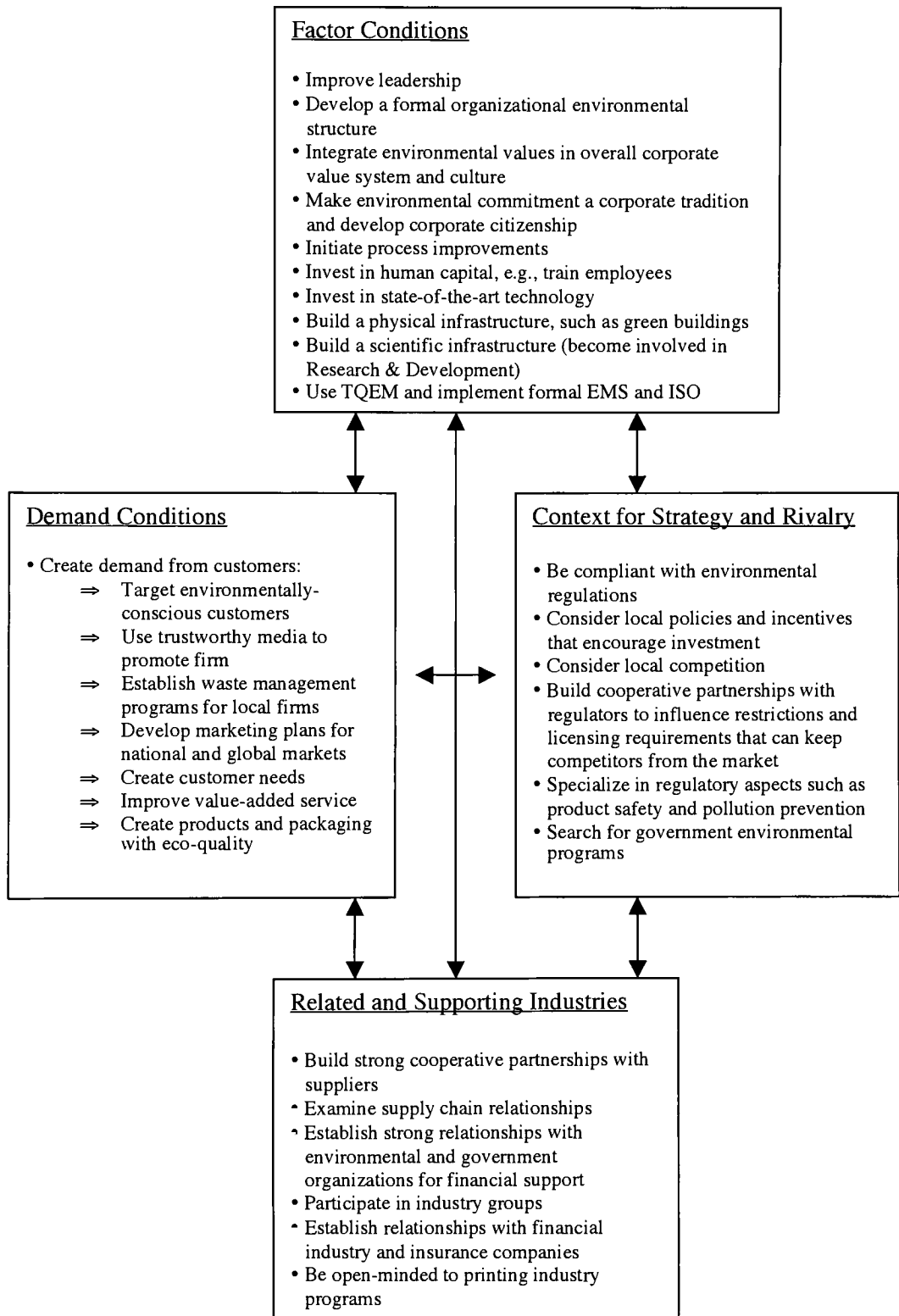
Most likely all companies have to deal with the context of strategy and rivalry. All firms need to be compliant with local, state, and federal laws because non-compliance could result in fines and could endanger the firm's reputation or maybe even shut it down. All firms should use the tool of benchmarking to learn about competitors and to

learn how to adapt the best practices of firms in other industries to their individual situations.

In regards to supporting and related industries, managers need to observe if they are operating locally or internationally and what group of stakeholders is more influential. For example, if regulators are more influential than environmental groups, then the firm should consider strengthening the partnership with regulators. Creating alliances with suppliers and research institutions will benefit most firms because they are a source of ideas and motivation for technology improvements. The initiation of more practical changes, such as establishing supply chain performance measures and product life cycle assessments, is also an opportunity. This is because a firm could differentiate itself from competitors by providing customers with knowledge of a product's environmental performance during its entire life cycle.

Particularly for small firms, the research also suggests that, as Perez-Sanchez, Barton, and Bower (2003) stated, managers first need to realize that financial support is not always the main issue. This is because environmentally-proactive behavior comes primarily from strong personal motivation and leadership. Leadership is the key to enabling top management to allocate resources for improvement, e.g., through partnerships with government organizations. Second, the values and attitudes of managers need to be part of a long-term business strategy. Third, small firms particularly need to pay more attention to training in order to develop internal expertise and to identifying the skills, knowledge, and awareness they will need for special issues. Small measures taken can achieve important results.

Figure 3. Competitive context



Managers who are able to develop a deliberate environmental strategy will be able to:

- Develop an environmental program that maximizes strategic opportunities and is consistent with the firm's strategy and capabilities
- Differentiate the firm from competitors (differentiating products and services)
- Realize potential for cost reduction because of improved material utilization and process controls
- Reduce environmental impact
- Prevent compliance liabilities
- Redefine competitive markets
- Identify new opportunities to maintain and grow the firm's customer base.

Further, the investigator suggests that educators and consulting services, be they printing associations or higher educational institutions, integrate their strategic views into environmental initiatives. Concretely, this means management schools should include environmental issues, particularly environmental risk assessment and cost accounting, into their curricula of strategy courses. In addition, printing associations, such as GATF/PIA, need to think more along strategic lines in their training programs to convince printing firms that being environmentally friendly can result in the benefits mentioned above. Further, it is important to teach small firms how to adopt predictive instead of adaptive strategy formation processes. This also means helping small firms with the implementation of formal EMS's because they are very complex and time-consuming. Since one important concern for small firms is the financial side, printing associations and government organizations need to be the primary resources for support.

Larger firms should learn to support their smaller counterparts by facilitating access to the same resources for information exchange.

Suppliers also have opportunities for improving their views on environmental issues. They still have the potential to educate printing firms on environmentally-friendly technology developments. Suppliers should be aware that printing firms tend to perceive them as an important source for information exchange and cooperative partnerships. Therefore, suppliers also have opportunities to become more strategic in regards to environmental initiatives and should start developing strategic alliances.

5. Recommendations for further research

The case study analysis indicates how different companies in the printing industry formulate and implement environmental strategies. Further research would be necessary to draw more precise conclusions. Therefore, the researcher suggests conducting quantitative research in Germany and the United States, such as a survey investigating the process of formulation and implementation of environmental strategies in a larger population of printing firms. Further, a time series study could be conducted in order to see how strategy formulation and implementation change over time. In addition, since the results of this study only give insight into the formulation and implementation of environmental strategies of printing firms in advanced countries, it is of interest to examine if the national context of less advanced countries may lead to similar or different results than presented in this study.

The results of the study show that companies have to confront different challenges depending on various factors. Further research could investigate the relationship of specific environmental initiatives and the challenges that result. The researcher suggests conducting studies that concentrate on supply- chain relationships. There is room for further research on how the printing industry can cooperate with other industries.

Bibliography

Bibliography

- Anderson, A. R. & Atkins, M. H. (2001, September/Oktober). Business strategies for entrepreneurial small firms. *Strategic Change*, 10(6), 311-324.
- Anonymous (1994, October). Greening the corporate culture. *American Printer*, 214(1), 58.
- Anonymous (2003, April). Umweltbewusstsein ist der Schlüssel für zukunftsfähige Gesellschaft. Umweltbrief.
- Banerjee, S. B. (2001, 1). Corporate environmental strategies and actions. *Management Decision*, 39(1), 36.
- Banerjee, S. B. (2001, 2). Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. *Journal of Management Studies*, 38(4), 489-513.
- Birch, P. (Ed.). (1994). Managing change in the Printing and Publishing Industry: Strategic Approaches. Leatherhead, UK: Pira International.
- Clemens, B. (2001). Changing environmental strategies over time: An empirical study of the steel industry in the United States. *Journal of Environmental Management*, 62, 221-231.
- Crimmins, J. (1991, July 9). Environmentalism surges in poll Americans say they'd sacrifice jobs, pay more for cause: (North Sports Final, C Edition), Chicago Tribune, p. 5.
- Cross, L. (1994, October). Printers take eco-initiative. *Graphic Arts Monthly*, 66(10).

- Dalessandro, W. (Ed.). (2001). Critical Issues in Strategic Corporate Environmental Management. Arlington, MA: Business and the Environment, Cutter Information Corp.
- Dalton T. (2000). The Printer's Guide to Waste Reduction. Paramus, NJ: National Association for Printing Leadership.
- Dilts, J. C. & Prough, G. E. (July 1989). Strategic options for environmental management: A comparative study of small vs. large enterprises. *Journal of Small Business Management*, 27(3), 32.
- Dryzek, J. S., Downes, D., Hunold, C., & Schlossberg, D. with Hernes, H.-K. (2003). Green States and Social Movements: Environmentalism in the United States, United Kingdom, Germany, and Norway. Oxford: Oxford University Press.
- Eisenhardt, K. M. (1989, October). Building Theories from Case Study Research. *Academy of Management. The Academy of Management Review*, 14(4), 532-550.
- Fischer, K. & Schot, J. (Eds.). (1993). Environmental Strategy for Industry: International perspectives on research needs and policy implications. Washington, D. C.: Island Press.
- Florida, R. & Davison, D. (2001). Gaining from green management: Environmental management systems inside and outside the factory. *California Management Review*, 43(3), 64-84.
- Graziano, A. M. & Raulin, M. L. (2004). Research methods: A process of inquiry. 5th edition. Boston: Pearson Education.
- Hax, A. C. & Majluf, N. S. (1991). The strategy concept and process: A pragmatic approach. Englewood Cliffs, New Jersey: Prentice Hall.

- Heidelberg, AG (2003, October 29). *Heidelberg opens Environmental Information Center: World first – “Optimized UV Printing” certificate awarded to the Speedmaster CD 74 UV*. Retrieved 10, June, 2004, from <http://www.heidelberg.com/www/pages/content.jsp?contentID=31590&locale=en>
- Kempton, W., Boster J. S, & Hartley, J. A. (1995). *Environmental Values in American Culture*. Cambridge, MA: MIT Press.
- Kolk, A., Walhain, S. & Wateringen, S. (2001, January/February). Environmental reporting by the fortune global 250: Exploring the influence of nationality and sector. *Business Strategy and the Environment*, 10(1), 15-28.
- Lechner, W. (2000, May-June). Where to find answers to environmental questions. *In-Plant Printer*, 40(3), 28.
- Martz, U. H. (1995, April). International standards: Why we need them. *Newspaper Techniques*, p. 34, 50.
- Maxwell, J., Rothenberg, S., Briscoe, F., & Marcus, A. (1997). Green Schemes: Corporate environmental strategies and their implementation. *California Management Review*, 39(3), 118-134.
- Perez-Sanchez, D., Barton, J. R., & Bower, D. (2003, June). Implementing environmental management in SMBs. *Corporate Social-Responsibility and Environmental Management*, 10(2), 67-77.
- Petts, J., Herd, A., Gerrard, S. & Horne, C. (1999, January/February). The climate and culture of environmental compliance within SMEs. *Business Strategy and the Environment*, 8(1), p.14-30.
- Porter, M. E. (1975). Note on the structural analysis of Industries. Harvard Business School, 1-19.
- Porter, M. E. (1996, November-December). What is strategy? *Harvard Business Review*, 61-78.

- Porter, M. E. & Kramer, M. R. (2002, December). The competitive advantage of corporate philanthropy. *Harvard Business Review*, 3-14.
- Porter, M. E. & van der Linde, C. (1995, September-October). Green and competitive: Ending the stalemate. *Harvard Business Review*, 120-134.
- Porter, M. E. & van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 9(4), 97-118.
- Printing Impressions (2004). *PI 400 – the who's who in printing for 2004*. Retrieved January 10, 2005, from <http://www.piworld.com/doc/283069181099188.bsp>
- Reinhardt, F. L. (1998). Environmental product differentiation: Implications for corporate strategy. *California Management Review*, 40(4), 43-73.
- Reinhardt, F. L. (1999, July-August). Bringing the environment down to earth. *Harvard Business Review*, 149-157.
- Rhee, S. & Lee S. (2003, May/June). Dynamic change of corporate environmental strategy: Rhetoric and reality. *Business Strategy and the Environment*, 12(3), 175-190.
- Rosen, C. M. (2001). Environmental strategy and competitive advantage: An introduction. *California Management Review*, 43(3), 8-15.
- Rothenberg, S., Dr. Maxwell, J., & Dr. Marcus, A. (1992). Issues in the implementation of proactive environmental strategies. *Business Strategy and the Environment*, 1(4), 1-11.
- Schweinsberg, K. & Kamrad, M. (2003, März). Umweltschutz: Kein Vertrauen in Unternehmer. *Impulse*, Jg. 32.

- Sharma, S. (2001, November/December). Different strokes: Regulatory styles and environmental strategy in the North-American oil and gas industry. *Business Strategy and the Environment*, 10(6), 344-364.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks: Sage Publications.
- Steger, U., Schindel, C. & Krapf, H. (2002, January/February). The experience of EMAS in three European countries: A cultural and competitive analysis. *Business Strategy and the Environment*, 11(1), 32-42.
- Tilley, F. (1999, July/August). The gap between the environmental attitudes and the environmental behavior of small firms. *Business Strategy and the Environment*, 8(4), 238-248.
- Yin, R. K. Yin. (1994). *Case study research: Design and methods* (2nd ed.). Applied Social Research Methods Series. Volume 5. Thousand Oaks: Sage Publications.
- Yin, R. K. Yin. (2003). *Case study research: Design and methods* (3rd ed.). Applied Social Research Methods Series. Volume 5. Thousand Oaks: Sage Publications.

General References

- Anonymous (1996, January). GATF and PIA form eco-alliance. *Graphic Arts Monthly*, Vol. 68, no. 1, p. 22.
- Bailey, I. (2003). *New environmental policy instruments in the European Union: Politics, economics, and the implementation of the packaging waste directive*. Hants, UK: Ashgate Publishing.
- Bennett, S. J., Freierman R., & George, S. (1993). *Corporate realities and environmental truths: Strategies for leading your business in the environmental era*. New York: John Wiley & Sons, Inc.
- Boehmer-Christiansen, S. & Kellow, A. (2002). *International environmental policy: Interests and the failure of the Kyoto process*. Cheltenham, UK: Edward Elgar Publishing.
- Camm, F., Drezner J. A., Lachman, B. E., & Resetar, S. A. (2001). *Implementing proactive environmental management: Lessons learned from best commercial practice*. Santa Monica, CA: RAND National Defense Research Institute.
- Corral, C. M. (2002). *Environmental policy and technological innovation: Why do firms adopt or reject new technologies?* Cheltenham, UK: Edgar Elgar.
- Dickeson, R. V. (1991). *War on Waste II: How to reduce paper waste in web printing*. Alexandria, VA: Graphic Communications Association.
- Hitchens, D. M.W.N., Clausen, J., & Fichter, K. (Eds.). (1999). *International environmental management benchmarks: Best practice experiences from America, Japan, and Europe*. Berlin: Springer-Verlag.
- Hoffman, A. J. (2000). *Competitive environmental strategy: A guide to the changing business landscape*. Washington, DC: Island Press.

- Imkamp, H. (2000, June). The interest of consumers in ecological product information is growing – evidence from two German surveys. *Journal of Consumer Policy*, 23(2), 193-202.
- Ledgerwood, G., Street, E., & Therivel, R. (1992). The environmental audit and business strategy: A total quality approach. London: Pitman Publishing.
- Lesourd, J.-B. & Schilizzi, S. G. M. (2001). The environment in corporate management: New directions and economic insights. Cheltenham, UK: Edward Elgar.
- Miller, N. (2002). Environmental politics: Interest groups, the media, and the making of policy. Boca Raton: Lewis Publishers.
- Rothenberg, L. S. (2002). Environmental choices: Policy responses to green demands. Washington, DC: CQ Press, a Division of Congressional Quarterly Inc.
- Sharma, S. (2000, August). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, 43(4), 681-697.
- Sunderlin, W. D. (2003). Ideology, Social Theory, and the Environment. Lanham, MA, USA: Rowman & Littlefield Publishers, Inc.
- Weidner, H. & Jänicke, M. (Eds.). (2002). Capacity building in national environmental policy: A comparative study of 17 countries. Berlin: Springer-Verlag.
- Wilson, W. G. & Sasseville, D. R. (1999). Sustaining environmental management success: Best business practices from industry leaders. New York: John Wiley & Sons.
- Yearley, S. (2005). Cultures of Environmentalism: Empirical Studies in Environmental Sociology. New York: Palgrave MacMillan.
- Yearley, S. (1991). The Green Case: A Sociology of Environmental Issues, Arguments, and Politics. London: HarperCollins Academic.

Appendix

Appendix

Interview Questions

1) Let me tell you what I am doing

- a) I will let you review it for accuracy and confidentiality

2) Clarify my understanding of your company (do your research first)

3) Tell me about yourself

- a) Job history
- b) Time at Company

4) Strategy Formulation

- a) Does your company have formal or informal environmental strategy?
 - i) If no – do they have an “emergent” strategy
 - ii) Is it part of your larger strategic planning process
- b) Why did you decide to formulate and implement an environmental strategy?
 - i) Was there a particular incident or did it evolve over time?
- c) What is this strategy? Is it written or more informal?
- d) How did you arrive at this strategy?
 - i) What were the formal and informal analyses (analyze the industry structure, international market and competitive context)?
 - ii) Which factors did you benchmark (e.g. structure, culture, products, processes, resources)?
 - iii) How and to which degree do you integrate your stakeholders into your strategy (e.g. mission statement, policy)?
- e) Which factors of the competitive context have or had the most influence on your environmental strategic planning process? Why? (Internal and external factors of the competitive context, specifically regulators, customers, media, suppliers and partners, and competitors)
 - i) Did you realize an increasing demand for environmental products? How would you characterize your environmental aware customers?
 - ii) How relevant is the environmental media's role regarding in the printing industry?
 - iii) How can a small firm be competitive if at the same time investing in costly technology in order to be compliant with most stringent regulations?

5) Strategy Implementation

- a) Do you have specific goals? (Both long and short term)
 - i) How are these developed?

- b) What specific environmental activities (management and technology) did you formulate and implement?
 - i) Technologies – new products, new materials, new suppliers, new processes
 - ii) Management – Is there a formal environmental management structure?
 - (1) Who is responsible for developing, executing and monitoring environmental strategies?
 - (2) How are employees involved and do you keep them committed? How are they trained, motivated and empowered?
 - (3) How did you acquire new skills and changes in management commitment? Which difficulties did you face in integrating the diverse business philosophies into one common environmental goal? How did you deal with cultural change within the company (How did you solve resistance to change if there was any at management and employee level)?
- c) How much did you need to invest in economic, human, technological, and information resources e.g. in emissions control technology, prevention technology?
 - i) Were there trade-offs? Would you consider investments for activities even when they are not profitable? Which activities are these and why?
- d) What type of external relationships helped you implement your strategy
 - i) Government, suppliers,
- e) What did you find most challenging (e.g. change of corporate structure, overcome inconsistencies between goals and resources, across business functions and geographic markets)?
 - i) How did you overcome these challenges

6) Benefits

- a) Have you seen a return from this strategy? How?
 - i) How can environmental strategies bring a competitive advantage? Are these consistent with overall business goals? What are the benefits?
- b) Has your strategy changed over time based on these returns?

7) General Questions

- a) Which factors are necessary for the company to be successful with an environmental strategy? Which strengths were necessary for your company to be successful with the environmental strategy?
- b) The printing industry is one of the industries that have high impact on the environment. Why do you think is the printing industry left behind in integrating environmental management/ environmental strategies?
 - i) Are there any differences or specialties about the printing industry that influence environmental decisions? (Specifically regarding resources and infrastructure, corporate culture/ ethics/ values, social responsibility)
- c) If your company is operating in both countries, Germany and the USA, did you recognize any differences (cultural) in the strategy planning/ formulation and implementation process between these countries?