Formulating and Implementing Environmental Strategies: A Comparison of U.S. and German Printing Firms

Despite advances in knowledge and practice within the area of strategic environmental management, we have very limited knowledge about the adoption of environmental strategies in the printing industry. As has been found in other industries, it is likely that printing companies can gain competitive advantage through formulating and implementing proactive environmental strategies. The benefits can include cost reduction, improved product quality, and enhanced relationships with external stakeholders (such as customers, regulating agencies, and local communities). In fact, there is evidence that some printers have been able to significantly reduce environmental impacts, production costs, and compliance liability by adopting proactive eco-strategies.¹

The existing literature on environmental management in the printing industry, however, mainly focuses on regulatory compliance and technological solutions. It is likely that many printing firms have not yet fully discovered the benefits of taking a strategic approach to environmental issues.

About This Article

This article addresses the opportunities and challenges for printing companies that take a strategic approach to environmental issues. We summarize the experiences of four environmentally proactive printing companies in the United States and Germany. We then discuss similarities and differences across the four firms and draw conclusions for printing companies (and organizations in other industries) that are interested in taking a more strategic view of environmental issues.

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Printing and Environmental Management

The printing industry in the United States comprises approximately 62,355 firms, with sales of approximately $210 billion annually. Thus, the industry is a significant contributor to the overall U.S. economy.

Historically, printing has also been a contributor to manufacturing industries’ negative impacts on the environment. Printers generate an array of both hazardous and nonhazardous wastes.

Principal among environmental issues in the printing industry is the release of volatile organic compounds (VOCs), which can come from many points in the printing process. Paper use and waste are also significant concerns for the industry.

Small firms predominate in the printing industry. This gives rise to a number of issues that are particular to small companies with regard to strategic environmental management.

Because smaller companies have less developed management structures and shorter lines of communication, information exchange and teamwork are much simpler to manage. Employee motivation and involvement, product quality, and overall performance can be improved more easily because workers have more control over their own work patterns.

However, previous research has shown that a majority of small firms do not employ formal strategic management techniques or implement environmental actions for the purpose of achieving cost advantages. This may be due in part to a relative absence of necessary capital, lower managerial awareness, and a lack of environmental management expertise in smaller firms.

Research Methodology

For the research project discussed here, we identified a list of printers that were known for proactive environmental management practices, based on public ratings and the opinions of industry experts. From that list, we chose four companies for study.

The companies we selected were diverse in size and location. We wanted to compare large and small printers in order to learn more about how they differ. We also wanted to address cross-cultural issues as important aspects of strategic decision making by providing a comparison between German and American printing firms. As noted in Exhibit 1, the companies selected were:

- Hickory Printing (a large American printing company),
- Zeitungsdruckerei Leipzig (a large German printing company),
- Oktoberdruck AG (a small German printing company), and
- Alonzo Printing (a small American printing company).

The following case studies are based on interviews and communications with key respondents at these four firms.

Case Study: Hickory Printing

Hickory Printing Group is a privately held commercial lithographic printing company with two plants in North Carolina. The firm was established in 1917 by Mr. and Mrs. William Reese, the parents of the current chairman of the board, Thomas (Tom) Reese.

In 2004, with 259 employees and total sales of $40.8 million, Hickory was ranked 123rd in the Printing Impressions 400. The majority of the
company’s clients are in the furniture industry. Most are located in the United States east of the Mississippi, although Hickory also has customers in Mexico and Canada.

Hickory’s commitment to environmental issues began with the personal beliefs of Tom Reese, who was influenced by his family’s values and by the religious teachings of the Lutheran Church. Reese believes that natural resources are for Earth’s creatures, and that those resources have to be used wisely so they will be available in the future.

Though Reese has been actively involved in pollution control and promoting public awareness of environmental conservation since the early 1950s, his appreciation for wildlife did not have much impact on his job when he started working at Hickory in 1950. Later on, however, his interest in wildlife organizations and his work as president of the Wildlife Federation informed the development of his environmental philosophy at Hickory.

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

Although Hickory does not have a coordinated environmental strategy, Reese believes his environmental initiatives will help the company’s bottom line in the long term. Hickory is environmentally conscious because Reese sees this as the correct way to do business, regardless of whether there is a return on investment. Reese says, “If you are responsible from an environmental standpoint, then you probably also [run a] 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’s environmental management program incorporates three components: enforcement/compliance, common sense, and research.

As part of the enforcement/compliance component, Calvin McGill, vice president of logistics and engineering services, is responsible for ensuring compliance with all environmental regulations. Maintaining compliance was Hickory’s most important goal in 2004.

As part of the common sense component, Reese attempts to instill his philosophy in his employees, who execute his ideas. Reese finds that the best way to get good suggestions is by talking to his employees via a comprehensive communication structure involving press, purchasing, estimating, and logistics.

Lastly, Reese is firmly committed to the third component of his strategy, research, which he defines as finding ways to “improve the environment from a realistic standpoint, as opposed to a regulatory standpoint.”

While Hickory does not benchmark against other companies, Reese tracks various sources of information for new ideas about what the company could do to help the environment.

### Environmental Activities

As Bill Herbein, vice president in charge of sales and marketing, explains, Reese was “way ahead of the curve” with recycling initiatives. In the 1960s, when economic conditions encouraged Reese not to waste anything, Hickory began salvaging its wastepaper. In the early 1970s, each plant began recovering silver from the prepress process, and continued to do so until the firm shifted from computer-to-film (CTF) to computer-to-plate (CTP) processing in 2000.
In the 1980s, employees began salvaging paper from their offices and aluminum from their drink cans. Also in the 1980s, Reese became more interested in air quality issues, prompting Hickory to start programs that reduced emissions through substitution of press solutions and elimination of some petroleum-based chemicals.

In the mid-1990s, Hickory eliminated isopropyl alcohol in its fountain solution. The company also tried soy-based inks, but discontinued further use because there was no exceptional reduction in VOC emissions.

Reese insists that the firm continuously reduce its use of chemicals and invest in technology solutions, such as the implementation of a centralized purchasing system and automatic blanket washers. In recent years, Hickory’s environmental manager began looking for ways to reduce water and energy consumption, as a first step toward implementing a “green building” concept.

Hickory’s latest initiatives reach out to the community. Hickory has begun collecting and recycling customers’ wastepaper along with its own in return for credits on the customers’ next printing orders. Hickory started this “outreach” waste management program because it wanted to help solve disposal problems for smaller printers and customers, as well as for other local businesses, such as Roadrunner, Office Depot, and the local hospital. In the end, Hickory also realized an economic benefit from the concept, recouping $.05 to $.08 per pound from the paper mill, depending on the market for recycled paper.

In 2004, as part of another community outreach effort, Reese gave an endowment of $3 million to Lenoir Rhyne College to establish an institute for natural resource conservation. This initiative was in line with Reese’s interest in research on environmental issues.

**Strategic Benefits**

Since Hickory Printing implemented its community waste management program, its customer base has increased. Being a green printer also helps Hickory save costs in purchasing and disposal because employees improve their material consumption practices. Furthermore, reducing the amount of waste going to area landfills and conserving natural resources both bring personal satisfaction to Reese and to Hickory’s employees.

Hickory has been recognized locally and nationally for its commitment to the conservation of natural resources. In 1994, the Graphic Arts Technical Foundation (GATF) honored Reese with the printing industry’s highest award for conservation. He was the first printer ever to receive the Dr. William D. Schaeffer Environmental Award.

**Case Study: Zeitungsdruckerei Leipzig**

Zeitungsdruckerei Leipzig (ZDL) was established in 1992 as a state-of-the-art plant in Leipzig/Stahmeln. It specializes in web offset printing. ZDL is owned by two equal partners, the media enterprises Madsack Hannover and Axel Springer AG in Berlin.

Each day, more than 250 employees at the company produce approximately 520,000 copies of the BILD newspaper for distribution in Leipzig, Halle, Dresden, Chemnitz, Magdeburg, and Thueringen, as well as approximately 280,000 copies of Leipziger Volkszeitung (LVZ) for distribution in Leipzig, Delitzsch, Altenburg, Dresden, Eilenburg, Grimma, Doebeln, Oschatz, Wurzen, and Borna.

Since its inception, ZDL has been concerned about being environmentally friendly, in large part because of motivation from the company’s stakeholders. ZDL’s parent firms have established environmental guidelines for ZDL to fol-
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The plant manager makes the final decision about what will be done and who is responsible for implementation. Employees then have the opportunity to read the eco-balance statement in detail in the corporate newsletter.

ZDL is a member of the Bundesverband Druck und Medien (BVDM), the Federal Association of the German Print and Media Industry, which is headquartered in Wiesbaden. Through this organization, ZDL’s managers can learn about improvements in the field of environmental protection and share their experiences with other companies. Once a year, ZDL meets with other BVDM newspaper printers of similar size in order to compare ecological operation ratios.

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ZDL also works closely with environmental protection organizations and consulting firms. In addition, ZDL has established good partnerships with its ink suppliers, who are members of the Verband der Druckfarbenhersteller (Association of Printing Ink Manufacturers) and have signed a declaration of voluntary commitment not to use carcinogenic ingredients in their inks.

ZDL’s environmental initiatives are mainly related to process improvements, and cover a range of activities. They include reducing packaging, lowering energy consumption by means of the facility’s combined heat and power station, recycling of solvents and used inks, and reducing chemical use through a shift from computer-to-film to computer-to-plate production, a change that was completed in 2004.

The firm also concentrates on improving paper and ink consumption. When its newspaper production operation started in 1993, ZDL used 62 percent recycled newsprint. Today, ZDL uses...
96 percent recycled newsprint, while maintaining optimal print quality.

**Strategic Benefits**

ZDL believes its relationships with stakeholders have improved since the company began to show its commitment to environmentally sound newspaper production. ZDL communicates with its readers about how the newspaper is produced, publicly and honestly reporting both positive environmental experiences and problems that the firm encounters.

Certain process improvements, such as shifting over to CTP production, created a more environmentally friendly prepress operation while delivering huge savings in time and material.

**Case Study: Oktoberdruck AG**

Oktoberdruck AG was founded in Berlin in 1973. It was organized as a self-administered collective printing firm and originally had five employees. The company specializes in multicolor sheet-fed offset printing.

After the fall of the Berlin Wall in 1989, Oktoberdruck grew to 35 employees and achieved annual sales of 5.5 million DM (approximately $3.4 million).

Today, the company has 26 employees, all of whom own proportional shares of Oktoberdruck and collectively determine, within democratic structures, how the firm will operate. Though Oktoberdruck has successfully functioned as a self-administered collective company for more than 30 years, it does not have a set of formal guidelines expressing how the company should operate.

The company’s self-administered organization grew out of its founders’ collectivist vision and political ideology. All employees strongly believe in autonomy and the concept of a self-determined work ethic.

Oktoberdruck considers environmental commitment a natural responsibility of the company, and its employees’ alternative way of thinking creates the groundwork for the firm’s environmental consciousness. The company’s long-term goal is to conserve the environment for future generations while maintaining company values and a healthy business. Oktoberdruck tries to achieve this goal through flexibility and attentiveness.

**Environmental Activities**

During 1985 and 1986, Oktoberdruck participated in a study entitled “An Investigation of the Environmental Impact of an Offset Printing Company,” which was conducted by students from the Technical University of Applied Sciences in Berlin. The study resulted in the firm’s first major investments in work safety, such as installation of an exhaust air unit, a ventilation system, and a noise protection wall.

Since then, Oktoberdruck has improved its environmental performance in several other ways: decreasing car trips by using bike couriers; reducing consumption of packaging materials; improving the filtration of its fountain solution; reusing cleaning cloths and wrapping paper for packaging; and substituting steel straps.

In addition, the company improved internal safety training with regard to chemical handling and storage, as well as training on paper consumption and customer service. The proportion of recycled paper used by the firm increased from 24 percent in 1997 to 38 percent in 1999.

Because the company believes that innovation and technological advances are essential for staying competitive, it also conducts research and development and involves vendors and manufacturers in ecologically oriented troubleshooting.
In 1995, Oktoberdruck was the first printing firm in Berlin/Brandenburg to implement an environmental management system (EMS) and to become validated by EMAS. Adopting these management practices has helped the firm with environmental strategic planning, formulating goals and environmental programs, benchmarking against other firms, and training employees.

Although the executive team ultimately is responsible for compliance with environmental requirements, every employee is involved in the firm’s decision-making and implementation process. Employees from every department serve on an environmental committee that meets on a regular basis to exchange information, advise management, and participate in decision making.

After Oktoberdruck relocated within Berlin in 2001, it decided to start all over again with the EMAS validation process. The firm believed that it needed to react to an ongoing reorientation of political and social values and to increasing ecological pressures on the printing industry. As Martina Fuchs-Buschbeck, the company president, points out, “In recent years, environmental issues have begun to be perceived as political issues.”

Oktoberdruck’s environmentally conscious customers—which are primarily independent publishing companies, environmental groups, and agencies located in Berlin—are accustomed to the fact that the firm is audited.

Since August 2004, Oktoberdruck has been preparing to implement an integrated management system that addresses quality, environmental, and health and safety issues. It has also been preparing for the new EMAS validation.

**Strategic Benefits**

Oktoberdruck has received an award for environmentally conscious corporate management from the Arbeitsgemeinschaft selbstständiger Unternehmer e.V. (Consortium of Self-Employed Entrepreneurs). It also has gained financial advantages when applying for and receiving federal funding.

In addition, the firm realized immense process improvements after purchasing new printing presses and other equipment with environmentally friendly aspects. Moreover, with the goal of attracting new clients and satisfying existing customers, the firm has begun to use its environmental stance as a marketing tool and a value-added customer service.

**Case Study: Alonzo Printing**

Alonzo Printing Corporation was founded in Hayward, California, in 1976 by Jim Duffy. It is a union shop that specializes in sheet-fed and web offset printing.

Today, the company has about 54 employees and generates approximately $9 million in annual sales. Alonzo’s clients include corporate and nonprofit organizations, publicly held companies, financial institutions, environmental groups, government agencies, and political organizations.

Originally, Duffy did not focus on Alonzo’s environmental impacts. His thinking on environmental issues changed in the late 1980s, however, when he met Alan Davis, the founder of Conservatree Paper, a nonprofit organization dedicated to converting paper markets to the use of environmentally friendly papers.

After meeting Davis, Duffy began to informally integrate environmental issues into the company’s strategic decision process. According to Duffy, it was easy to promote the new environmentally friendly philosophy because the San Francisco Bay Area, where the company operates, has a high regard for environmentalism. How-
ever, he recalled, “the most influencing factor [was] just personal commitment.”

The company put a great deal of thought into determining what it actually meant for Alonzo to become an environmentally friendly printer. At one point, an executive team (consisting of the president, the vice president, the sales manager, and a couple of operations personnel) met for the express purpose of discussing how they could carry out the environmentally friendly philosophy.

At this meeting, one employee recalled, “We began to look at all of our processes, all of our marketing, all of the types of clients we go after and [decided] 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.” The executive committee believed that small to medium-sized companies could not integrate the kind of technologies that Alonzo uses unless environmental issues were also an important component of the value they offer.

Alonzo is located in a geographic area that has very stringent environmental regulations. Since the company’s clients are primarily local businesses, many are quite interested in pursuing environmentally sound business practices.

Alonzo also realized that many nonprofit entities—and, more recently, many for-profit corporations as well—were beginning to acknowledge their clients’ or shareholders’ increasing demands for use of recycled paper. In response, Alonzo began seeking customers from the environmental “niche” market.

In the latter part of the 1990s, however, the company had to rethink this approach because of changes in the marketplace: A recession had caused environmentalism to take a backseat in the minds of price-conscious customers. Alonzo still feels the effects of that recession.

Recently, Alonzo’s new marketing and brand communications firm, Traversant, has helped the company to again promote its old environmentally friendly image. Most customers still remember the company as an environmentally responsible printer. In 2004, Traversant started targeting environmentally aware customers through a new brand communications strategy.

**Environmental Activities**

Alonzo was the first printer in Alameda County, California, to be certified as a “Green Business.” Its main environmental initiatives involve the standardized use of recycled paper and soy-based inks.

In the late 1980s, Duffy convinced Alonzo’s main supplier, Weyerhaeuser Paper, to produce paper with a greater percentage of postconsumer content. Duffy continued Alonzo’s partnership with Weyerhaeuser in order to move to 30-percent postconsumer content.

At that time, Alonzo also published its first environmentally focused ad in *Garbage Magazine* and established the “Save a Tree” program. The company began to offer recycled paper as a standard (rather than a custom-order) stock, and was the first company to use kenaf paper, a nonwood paper alternative. Alonzo prints without any alcohol in its presses and uses a computer-to-plate process. It recycles water, paper, office waste, and solvents. The company also is involved in educational programs and exceeds regulatory compliance standards.

Alonzo measures its environmental achievements in part by surveying clients every 18 months. The company then integrates the survey results with its own employees’ feedback in order to determine whether external perceptions match internal perceptions. Alonzo also conducts internal “eco-audits” to measure its use of water and
energy (electricity and gas), as well as its use of paper, ink, and solvents.

**Strategic Benefits**

Pursuing an environmentally friendly strategy has helped Alonzo retain customers and establish a good relationship with its union. The firm also has been recognized by various private and government agencies for its environmental leadership. Implementation of the CTP system has allowed Alonzo to increase labor productivity, save time, and improve its environmental performance.

Traversant believes that marketing Alonzo’s environmental stance as a value-added service will differentiate the company from its competitors, and thus attract new customers. However, Alonzo still faces challenges in convincing companies that increased use of postconsumer recycled paper is cost-effective.

**Comparing Environmental Strategy Formulation and Implementation Within the Study Companies**

Each of the companies highlighted in this article has taken what printing experts and/or environmental professionals consider to be a leadership position with regard to environmental management in the printing industry.

All four companies have succeeded in creating a competitive edge. Their successes range from reducing costs to improving stakeholder relations to capturing and retaining customers. Yet the environmental strategies of these companies have differed depending on the characteristics of each individual firm and the competitive forces it has faced.

**Leadership and Motivating Factors**

Among the strongest findings from these case studies is that leadership and personal commitment on the part of firm employees are critical to the success of environmental strategy formulation and implementation.

In all of the companies studied, leadership came from the CEO and/or the founders of the organization. In the case of Hickory and Alonzo, it was the CEO’s passion for environmental issues that drove the organization to move beyond compliance. At Oktoberdruck, it was the values of the management team as a whole. At ZDL, the parent companies communicated their expectations regarding environmental issues.

Over and over again in our interviews, the influence of firm leaders was made clear. These leaders created a culture in which environmental issues were important. Without strong leadership, a proactive environmental strategy is not possible, especially in the face of constant pressure to resort to more traditional means of achieving strategic success.

Of course, these firms also were heavily influenced by external stakeholders (such as regulators, environmental organizations, and clients), as well as by each firm’s strategic focus and operating context. However, such factors seemed to play a more prominent role in the later stages of the companies’ environmental initiatives.

Once an environmentally friendly image was established (particularly through long-term commitment), firms found that this image could help them maintain or improve their relationships with external stakeholders. At the same time, internal factors (such as personal long-term commitment and leadership by top management) remained important in helping the companies maintain their environmental focus and overcome any challenges that arose.
**Strategy Formulation and Implementation**

There are two primary paths to strategy formation: deliberate and emergent. Deliberate strategy formation provides the organization with a purposeful direction (i.e., an intended course of action leading to the realization of the strategy). An emergent strategy, by contrast, is a process of learning.\(^8\)

A somewhat surprising finding was that both small firms deliberately developed an environmental strategy as a means to attract and retain customers. By contrast, the large firms had a more emergent approach to their environmental strategy, primarily focusing on the continuous introduction of technological solutions and process improvements. See Exhibit 2.

Both small firms stated that increasing market pressure made it essential that they work to maintain their niche by offering customers ecologically sound products and integrating the environmental element as a value-added service. This approach helped to differentiate them from other competitors and redefine competitive markets.

At all four companies, regulatory compliance was the cornerstone of environmental strategy. But the companies also understood that this was not sufficient for a firm that wanted to be seen as environmentally friendly. After compliance, all four companies concentrated on process improvements and the increased efficiency that resulted, which had the added benefit of saving resources and reducing costs.

Beyond compliance and process improvements, the companies’ strategies differed based on each organization’s history, culture, and capabilities, and the external pressures to which it was subject.

For example, each company took a different approach to environmental product strategies. As can be seen in Exhibit 3, the firms have a range of approaches to the use of environmentally friendly inks and paper. Alonzo Printing uses 100 percent postconsumer recycled paper as its house stock. Okberdruck and ZDL are moving toward increased use of recycled paper. Hickory prints on recycled paper if requested by the customer and if the customer is willing to pay the additional cost.

This difference exists in part because Alonzo (in California) and Okberdruck and ZDL (in Germany) have a customer base that is more likely to value recycled paper. In addition, at Hickory, Tom Reese perceives fewer environmental benefits from using recycled paper than do the other three companies. In his view, the biggest environmental impact of recycled paper comes from its role in reducing waste. He believes that the reuse of scrap or recycled paper should be limited to products of lesser quality because the production of high-quality recycled printing papers can create other environmental problems.

There was evidence that national context may also influence how environmental strategy is implemented. For example, both German firms had a greater focus on goal setting than their American counterparts.

In addition, both German firms undertook formal benchmarking of environmental performance and management. At ZDL, the results of process improvements are compared with those of other newspaper printing firms. Okberdruck primarily benchmarks against companies that are EMAS-certified or those that have environmentally sound technology.

It may be that these differences in goal setting and benchmarking are influenced by national culture and higher levels of social de-

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**Exhibit 2. Approaches to Strategy Formulation at the Study Companies**

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<tr>
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<th>Small</th>
<th>Large</th>
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<tbody>
<tr>
<td>German</td>
<td>Deliberate</td>
<td>Emergent</td>
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<tr>
<td>American</td>
<td>Deliberate</td>
<td>Emergent</td>
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</tbody>
</table>
Formulating and Implementing Environmental Strategies

In order to be a true environmental leader, involves convincing other businesses, particularly clients and suppliers, to join them in preventing pollution.

Challenges

The challenges faced by the four study companies vary in importance and strategic significance. Oktoberdruck encountered its main challenge when the firm relocated because it had to go through the process of EMAS revalidation again.

As is often the case for small firms, both Alonzo and Oktoberdruck encountered financial limitations that have made technology investments more difficult. Oktoberdruck, however, has been able to overcome some of its financial problems through acquisition of federal research funds. In addition, given Oktoberdruck’s unique organizational structure, it has also been able to make necessary investments in technology by cutting wages through agreements with all employees.

At Alonzo, a key part of environmental strategy is the standard use of recycled paper. Alonzo must continue to educate customers about the benefits of printing on recycled paper, which still costs more than virgin paper. Particularly during an economic downturn, it becomes difficult to convince price-conscious consumers to consider the environmental ramifications of their choices.

Hickory perceives its main challenge in the environmental arena as building cooperative relationships with environmental organizations. Another challenge for Hickory, as an industry leader, involves convincing other businesses, particularly clients and suppliers, to join them in preventing pollution.

Similarities and Differences

In sum, there are basic similarities among the firms studied, all of which take a proactive approach to environmental issues. There are differences, however, in the process of strategy formulation, the focus of strategic initiatives, and the mechanisms used to implement environmental strategies. Choices on these issues are affected by each firm’s consumer base, product offerings, competitive positioning, and beliefs about which options are truly environmentally superior choices.

Suggestions for Formulating and Implementing Company Environmental Strategies

The case study results discussed in this article indicate a transition in the printing industry away from an ad hoc approach to environmental actions and toward a process of formulating and implementing environmental strategies. Many printing firms still have not adopted a strategic approach to environmental issues, however.

Before a company begins the work of formulating and implementing an environmental strategy, management should analyze all factors facing the firm that influence the managers’ perception of environmental issues. Managers might find it useful to consider Porter and

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Exhibit 3. Comparison of Study Companies’ Paper and Ink Choices

<table>
<thead>
<tr>
<th></th>
<th>Oktoberdruck</th>
<th>ZDL</th>
<th>Alonzo</th>
<th>Hickory</th>
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</thead>
<tbody>
<tr>
<td><strong>Paper</strong></td>
<td>Increased use of paper with recycled content</td>
<td>Majority of paper used is recycled</td>
<td>100% postconsumer recycled paper used as house stock</td>
<td>No recycled paper used unless requested</td>
</tr>
<tr>
<td><strong>Inks</strong></td>
<td>Vehicles in inks are 80% vegetable oil</td>
<td>Uses soy-based ink</td>
<td>Always uses soy-based ink</td>
<td>No vegetable oil ink</td>
</tr>
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</table>

mand for accountability with respect to environmental issues.
### Exhibit 4. Questions for Environmental Strategy Development (with Examples from Company Case Studies)

<table>
<thead>
<tr>
<th>Strategic Area</th>
<th>Examples from Case Studies</th>
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<tbody>
<tr>
<td><strong>Factor Conditions</strong></td>
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<tr>
<td>Are there opportunities to reduce material use and resource costs through material consolidation and increasing operational efficiency?</td>
<td>Implementation of a central chemical purchasing system (Hickory)</td>
</tr>
<tr>
<td>Will leaders support a proactive environmental strategy?</td>
<td>Active leadership at all four firms</td>
</tr>
<tr>
<td>Is there an appropriate management structure for strategy implementation?</td>
<td>Adoption of formal EMS (Oktoberdruck)</td>
</tr>
<tr>
<td>Are company environmental values compatible with the firm's overall corporate value system and culture? If not, can they be?</td>
<td>Development of strong environmental values as an essential element of the corporate culture (Oktoberdruck and Hickory)</td>
</tr>
<tr>
<td>Is there sufficient human capital to implement the environmental strategy? If not, what training or new personnel is needed to build such capital?</td>
<td>Encourage employee suggestions (ZDL)</td>
</tr>
<tr>
<td>Are there sufficient environmental research and development capabilities to support a proactive environmental strategy?</td>
<td>Issue of concern, particularly for smaller firms (Alonzo)</td>
</tr>
<tr>
<td>Can the company use or develop environmental expertise in the firm to create new products, services, or markets?</td>
<td>Use knowledge of recycling to build new business in recycling customer waste (Hickory)</td>
</tr>
<tr>
<td><strong>Demand Conditions</strong></td>
<td></td>
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<tr>
<td>Does the firm have (or can they target) environmentally conscious customers?</td>
<td>Development of an environmental marketing strategy (Alonzo)</td>
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<tr>
<td>Will customers pay a price premium for environmental performance?</td>
<td>Search for environmentally conscious customers, such as environmental organizations (Alonzo and Oktoberdruck)</td>
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<tr>
<td>Can the firm increase customer interest in environmentally superior products?</td>
<td>Include environmental information in all marketing (Alonzo and Oktoberdruck)</td>
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<td>Can environmental performance be a value-added service?</td>
<td>Make environmental quality a basic element in customer service and sales (Oktoberdruck and Alonzo)</td>
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<tr>
<td>Can the firm use trustworthy media to promote firm environmental behaviors?</td>
<td>No example</td>
</tr>
<tr>
<td>Will the firm have to develop different environmental marketing plans for national and global markets?</td>
<td>No example</td>
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<tr>
<td><strong>Context for Strategy and Rivalry</strong></td>
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<tr>
<td>Is the firm already compliant with existing environmental regulations?</td>
<td>Ensure regulatory compliance (all four firms)</td>
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<tr>
<td>Are there local policies or incentives that encourage investment in environmental technologies?</td>
<td>Search for federal funds and participate in government projects (Oktoberdruck)</td>
</tr>
<tr>
<td>Are there ways to influence regulations, permits, and licensing to add costs to competitors’ operations?</td>
<td>Have an active voice in regulatory development (Hickory)</td>
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<tr>
<td><strong>Related and Supporting Industries</strong></td>
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<tr>
<td>Are there opportunities to build partnerships with suppliers on new environmental technologies or services?</td>
<td>Build partnerships and strategic alliances with paper suppliers (Alonzo)</td>
</tr>
<tr>
<td>Are there opportunities to establish strong relationships with environmental agencies to reduce compliance costs?</td>
<td>Constantly communicate with environmental agencies (ZDL)</td>
</tr>
<tr>
<td>What sources of financial support (from federal, state, or local agencies) exist for environmental improvements?</td>
<td>Search for federal funds and participate in government projects (Oktoberdruck)</td>
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<tr>
<td>Is the firm engaged in industry associations that provide information on new environmentally superior technologies?</td>
<td>Participate in industry associations (ZDL)</td>
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<tr>
<td>Is the firm making the best use of technical assistance programs offered by industry associations, universities, and government?</td>
<td>Work with and support educational institutions (Hickory)</td>
</tr>
<tr>
<td>Does the existing material-flows infrastructure need development for successful strategy implementation?</td>
<td>Help consolidate waste from customers to develop recycling infrastructure (Hickory)</td>
</tr>
</tbody>
</table>
Kramer’s comprehensive framework for understanding competitive context, which includes four elements:  

- **Factor conditions**: Internal drivers of a company’s environmental strategy, such as human and capital resources; physical, administrative, technical, and information infrastructure; and material resources.
- **Demand conditions**: The presence of customer demand, both nationally and globally.
- **Context for strategy and rivalry**: The presence of local policies and incentives that encourage investment, as well as the presence of open and vigorous local competition.
- **Related and supporting industries**: The presence of locally based suppliers and companies in related fields.

**Exhibit 4** outlines questions that should be considered in each of these areas when developing a comprehensive environmental strategy. The questions reflect the case studies discussed above, as well as our review of the relevant existing literature.

As the four case studies discussed in this article suggest, even the most environmentally proactive printing firms often do not take a comprehensive approach to strategy development.

All four firms involved in our study considered factor conditions (with a focus on reducing material use and waste). Two of the firms also integrated demand conditions into their strategy, clearly identifying and targeting customers with an interest in environmental issues.

More sporadic focus was placed on the remaining two factors—context for strategy and rivalry and related and supporting industries. Strategic opportunities do exist in these areas, as our study shows: Oktoberdruck was able to identify government assistance for environmental initiatives. Hickory Printing reached out to suppliers and firms in other related industries for ideas on new technologies.

### Concluding Thoughts

Clearly, each printing firm needs to find its own approach to environmental strategy formulation and implementation because each firm’s individual and national operating context is different. Depending on each company’s unique mix of strategic focus and specific activities, however, there are opportunities for printers to gain competitive advantage through environmental actions.

Firms can achieve such advantage by differentiating themselves from competitors, reducing costs and environmental impacts, avoiding compliance liability, increasing customer base and revenues, and retaining customers. Taking a holistic, strategic approach is the first step to identifying these opportunities.

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### Notes

7. All quotes in this article from personnel at German companies are translated from German.

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