

MARKET ADVANTAGE AND ENVIRONMENTAL STRATEGIES OF FIRMS: COMPETITIVE RATIONALES FOR PROACTIVE ENVIRONMENTAL MANAGEMENT

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ABSTRACT

If environmental investments are supposed to generate economic returns or become sources of competitive advantage, managers need to identify the appropriate circumstances favoring such scenarios. They first need to recognize that competitive advantage might be embedded not only in the products and services they sell but also in the way they define their systems of production and consumption. Such recognition will allow them to naturally incorporate business environmental strategies in the overall management of the company. This is the main justification for this article to present a framework categorizing the generic types of corporate environmental strategy: it has immediate implications for the practice of management. Used as a classification scheme, it can help managers to define and prioritize areas of organizational action, optimizing the overall economic return on environmental investments and the potential to transform these investments into sources of competitive advantage.

Keywords: Environmental Competitiveness, Corporate Environmental Strategy.

Business and the Environment: Beyond the ‘Free Lunch’ Debate

The last decade was marked by a heated debate in the field of *Business and Environment* around ‘whether it pays to be green’. If the defenders of the ‘free lunch’, ‘double dividend’, or ‘win-win’ hypothesis¹ – as it has been popularized – were proven to be right, opportunities for business to profit from environmental investments should be extensively available. As a consequence, a major shift would be expected in business-environment relationships. Although intense and polemical, the debate did not generate an answer for the all-embracing question around the profitability of environmental investments. Instead, the article of Reinhardt (1998) was a milestone for putting the debate in the right direction. According to Reinhardt’s view, the strategic appropriateness and profitability of environmental investments are similar to most issues in business administration: they do not follow universal principles. The question encompassing the debate needed to be redefined.

¹ The debate was triggered by the publication of a short essay in *Scientific American* (Porter 1991). The early stages of the debate can be found in “The Challenge of Going Green” *Harvard Business Review*, (July-August, 1994): 37-50, and in Walley & Whitewead (1994). See also the most elaborated article of Porter and van der Linde (1995), and subsequent critique of Palmer et al. (1995).

In simple terms, Reinhardt moved the debate away from the grand topic of ‘whether or not’ corporations can offset the costs of environmental investments to one that questions ‘when’ it is possible to do so. According to his view, the possibility for corporations to profit from environmental investments depends on “the economic fundamentals of the business, the structure of the industry in which the business operates, its position within that structure, and its organizational capabilities” (Reinhardt 1999a:20). Based on this perspective, directing a firm’s efforts toward profit generation from investments in cleaner technologies might make business sense in certain circumstances. Not in all. Hence, managers need proper analytical tools to identify situations favoring environmental investments, which are particular to their business.

If certain circumstances benefit corporations to pay off their environmental investments, another question remains central to the (renewed) debate: Can such investments also become sources of competitive advantage? Some academics and practitioners think affirmatively Bonifant et al. (1995). A positive correlation between these two aspects would obviously motivate companies to give higher priority to environmental investments, and industrial competition would itself promote more ecologically sustainable organizational practices. However, the lack of empirical evidence for such a correlation suggests that this is another all-encompassing issue requiring refinement. One might expect that only certain circumstances favor firms to transform environmental initiatives into sources of competitive advantage. Although organizations can improve the productivity of the use of their resources (or *resource productivity*) in many areas of activity, only in special circumstances would they improve their overall competitiveness. Identifying such circumstances is, therefore, important for both the practice and theorization of environmental issues in management, and the characterization of such scenarios encompasses the broad outlook of this article.

The focus of environmental initiatives developed by corporations triggers a final issue in the debate about environmental competitiveness. Improved environmental performance in firms has mainly been a result of innovation in *organizational processes* and their control based on environmental management systems (EMS). In fact, corporations that have their EMS certified according to ISO 14001, for instance, are not allowed to place such certification in their products simply because the certification is not a guarantee of environmental performance. The certification refers to the conformity of organizational processes (management systems) to the standards defined by the International Organization for Standardization (ISO). Interestingly, only *products* and *services* have traditionally been considered sources of competitive advantage; not organizational processes. In this regard, would not the search for competitive advantage based on ISO 14001 certification be an unrealistic goal for firms?

This article addresses questions such as this by presenting a classification scheme/framework of potential sources of competitive advantage that may result from the implementation of generic environmental strategies in corporations. The framework establishes a fundamental distinction between sources of competitive advantage based on products/services and organizational processes. This basic distinction supports a new understanding of sources of competitive advantage in the terrain of environmental issues in business. The four possible types of environmental strategies represent the ‘decoupling’ of the elements involved in corporate environmental management that have not yet been treated as independent areas of strategic action by specialized literature.

A Neglected Dimension: Corporate *Processes* as Sources of Competitive Advantage

In the classic work of Porter (1980) on industrial competition, two basic types of competitive advantage that firms can possess were identified: *low costs* and *differentiation*. Cost advantage may result from the ability of a firm to produce with the lowest expenditure in its industry. Through the sheer efficiency of the use of labor and capital, firms can obtain competitive advantage by selling products with the lowest cost. On the other hand, the uniqueness of certain dimensions of the products or services valued by consumers allows a firm to explore differentiation strategies. Among these unique dimensions are the peculiarities of the product (for example, its aesthetics, technology, or performance), the services provided by the firm, such as the technology employed in performing certain activities, and customer support.

A spontaneous question arising from Porter's generic principles of competition relates to their applicability to environmental issues in organizations. Can the search for competitive advantage promote better environmental practices in firms? Addressing this question requires one to recognize that the two traditional types of competitive advantage are associated with the *products* and *services* sold by a firm². In simple terms, competitive advantage represents market advantage for the products and services commercialized by the corporation. The capacity of a firm to trade high volumes of low-cost products or to obtain price-premiums by selling differentiated products or services represents its competitive advantage.

On the *Business and Environment* front, competitive advantage seem possible to be obtained not only by corporations strategically positioning their products and services in the marketplace but also through the character of their organizational processes³. Academics and practitioners have recently suggested that management of industrial risks through environmental management system (EMS) have the potential to become sources of competitive advantage (Berry and Rondinelli 1998; Reinhardt 1999b). As it has been mentioned, an EMS consists of a specialized form of management control, which does not have a direct relationship with the products and services commercialized by corporations. Hence, if environmental management systems can indeed become sources of competitive advantage, what can explain such phenomenon? Are there special circumstances in which corporations, by certifying their EMS, can generate competitive advantage?

Until now, the distinction between product and processes as sources of competitive advantage has not been considered important by specialized literature⁴. As this article will demonstrate, this peculiarity is more important than it apparently seems to be. Identifying the differences between environmental issues associated with organizational processes and the products and services sold by the company is not a mere intellectual exercise. Such distinction can reveal the subtleties involved in the conditions in which corporations can optimize their efforts and eventually transform environmental investments into sources of competitive advantage.

² For an overview of the sources of competitive advantage, see: Chapter 2 of Porter (1985).

³ The concept of *organisational processes* employed here encompasses both the activities of controlling production processes, as well as generic organizational (bureaucratic) activities, such the documentation of an EMS (environmental management system). For an overview of organizational processes, see: Hall (1999).

⁴ See endnote 7 (page 69) in Reinhardt (1998). Reinhardt included production processes into the broad definition of environmental product differentiation, suggesting the relative irrelevance of such distinction for the development of corporate environmental strategies. He explicitly states that "this article, following common usage, employs the term 'product differentiation' to encompass market strategies in both of these categories" (product and process differentiation).

Generic Types of Business Environmental Strategies

The conditional nature of economic investments in environment-related innovations requires the classification of environmental strategies according to their potential to become sources of competitive advantage. The framework presented in Figure 1 can help managers to decouple the elements involved in corporate environmental management that have not yet been treated as independent areas of strategic action, as this article proposes. This decoupling is fundamental for the identification of specific conditions in which corporate environmental strategies may improve the competitiveness of the firm. The matrix combining these elements with the basic types of competitive advantage with which a firm seeks to achieve generates four possible strategies, represented in the figure.

Insert Figure 1 About here

The quadrants of Figure 1 represent a typology of specialized environmental strategies that corporations might adopt. The structure of the industry in which a firm operates, its position within that industry, the types of markets the company serves, and its capabilities will determine the appropriate competitive focus (processes or products/services) and the potential source of competitive advantage (cost or differentiation) for a firm. As the final part of this article will explore, the divisions between the four generic strategies are not rigid. Instead, they represent a stylized typology that makes it easier to identify where the competitive focus of environmental strategies might be hidden. The following sections will use empirical examples to expose them.

Strategy #1: Process-Oriented Resource Productivity

Social and economic factors, among others, have influenced corporations to achieve a significant degree of labor and capital productivity, enabling them to substantially reduce manufacturing costs and the consequent final price of products. Although gains in resource productivity have also been achieved, in comparative terms they lag behind these other two variables of the economic theory of the firm (Hawken et al. 1999). Some resources used in industrial activity have been relatively cheaper to obtain or are even free to be appropriated by organizations, such as water from public aquifers. Therefore, historical grounds – mainly related to the economic theory of the firm – justify corporations concentrating their efforts to obtain greater levels of productivity of capital and labor, relative to (natural) resources. Although these levels of productivity vary significantly among industrial sectors and individual firms, some areas of industrial activity present levels of waste generation that are remarkably high, such as in the production of coffee beans in which 99.8% of the primary resource (plant) is lost as waste (Pauli 1998).

In the early 1990s, Porter (1990) demonstrated that productivity is the key element for companies to gain competitiveness. Organizations should be able to transform costs into profits by identifying concealed opportunities for innovation, leading to more efficient organizational systems. In later work, Porter and Claas van der Linde (1995) asserted that companies should promote resource productivity in the form of materials savings, increases in process yields, and better utilization of by-products because waste consists, fundamentally, of an inefficient use of resources. In their proposal, companies would only need to find hidden opportunities to profit from environmental investments and eventually transform such investments into sources of competitive advantage.

More recently, Lovins et al. (1999) re-addressed resource productivity issues from a more technical perspective (see also Weizsäcker et al. 1997). They thoughtfully demonstrated that the potential of a new set of business practices to enhance resource productivity is so considerable that a new economic system may emerge from its application. The authors substantiate their argument by presenting examples of corporations that are increasing the productivity of natural resources, shifting to biologically inspired production models, moving to a solutions-based business model, and reinvesting in natural capital. Such practices would promote *Natural Capitalism* – what capitalism might become if the natural capital of ecosystems service were properly valued and preserved by corporations.

The pro-resource productivity arguments show the immense potential of profiting from an ‘ecologized economy’. However, the authors did not bracket industries in which such opportunities are minimal, implying the potential for profiting from environmental investments being extensive to all firms, independently of the industry in which they operate, or factors of political economy. In this regard, although the work of the Lovins’ and Hawken represents an enormous contribution to the *Business and Environmental* field, their arguments did not differ substantially from those promoting the ‘free lunch’ hypothesis. In other words, they do not recognize that there are particular conditions favoring firms to transform environmental investments into profitable business opportunities and, eventually, into sources of competitive advantage.

Recognizably, some level of savings on environmentally related efforts could be achieved in virtually every firm. But particular circumstances will result in some corporations, which focus their attention on resource productivity, to be rewarded more than others. Empirical evidence suggest that corporate environmental strategies based on *process-oriented resource productivity*, have greater potential to generate a competitive advantage in process-intensive industries facing low levels of resource utilization, high processing costs, and high levels of generation of by-products. In such circumstances, the focus on resource productivity not only can reduce the costs of waste management activities but may also unleash business opportunities that go beyond the current core competences of corporations.

The already classic example of the Danish eco-industrial park of Kalundborg consists of evidence that the optimization of by-products and waste can go beyond current industrial practices. Participant companies did not have to make substantial investments to achieve higher levels of resource productivity and reduce their costs with waste management. Although high levels of resource productivity have been achieved in Kalundborg, other demonstration cases extend optimum levels of the utilization of resources even further. According to Gunter Pauli (1998), the founder of the *Zeri Emissions Initiative* (Zeri), most industrial organizations could not only use raw materials and waste more efficiently but would also profit from their integration into new business activities. Demonstration cases of *Zeri* show that some breweries in Namibia, Sweden, Canada and Japan are able to convert the waste from the brewing process into commercial products⁵.

In a traditional beer factory, the spent barley grains used to make beer are sold to pig or cattle farmers at low prices. In *Zeri*-oriented breweries, spent grains, which include 70% fibres and 26% protein, are used to farm mushrooms. With relatively unsophisticated equipment, it is possible to separate the enzymes generated by the breakdown of lignocellulose and the protein-enriched substrate, generated in the process of mushroom

⁵ See: <http://www.zeri.org/>

growing. The resulting five categories of enzymes are of high quality and purity and can be used as additives in natural soaps, which normally cannot compete against the synthetic soaps being manufactured at large industrial scale. The use of the enzymes produced by mushroom farming changes this situation. Artisanal soaps can have a performance that rivals the synthetic ones, giving a competitive edge to the current artisanal manufacturers. The result of such practices is not only the substantial reduction of waste in beer production but also the creation of new sources of income – and potential new businesses – by recovering the protein, which has traditionally been considered waste in the beer industry.

When wastes are not considered as such in process-intensive firms, business opportunities are made possible through the reconfiguration of industrial systems. Although the development of these business opportunities require considerable management capabilities, creativity, and – as in any business activity – are doomed to eventual failure, there are good reasons to suppose that such possibilities are available to those who pursue them. Once managers recognize that their business activity privileges strategies based on process-oriented resource productivity, they can concentrate efforts towards the exploration of hidden opportunities. Even though other potential areas of their business activity might be prone to generate profits from environmental investments, focusing on what makes more business sense might actually become a source of competitive advantage. As the next generic corporate environmental strategy shows, this potential can also be hidden in the resource productivity of the products.

Strategy #2: Environmental-Cost Leadership in Products/Services

In the traditional concept of cost leadership, competitive advantage is achieved when a firm is *the* lowest producer in its industry. Obtaining this cost advantage depends on a multitude of factors, such as cost of labor force, accessibility of raw materials, technology, and organizational capabilities⁶. Ecologically oriented design is one of such capabilities that have historically been neglected by firms. Curiously, design that considers the potential to reduce environmental impact of a product during its entire life cycle is not only crucial for resource productivity but it can also improve a firm's competitiveness.

Consider the case of the *Ecobasic* – a concept car⁷ shown by the Italian automaker *Fiat* during the Geneva Motor Show in March 2000, and winner of the Automotive Environment Award 2000. The innovative space-frame design results in a vehicle capable of transporting five passengers weighing only 1,652 pounds – a significantly low weight for a car that uses steel as the main structural material. For the consumer, resource efficiency simply means fuel economy of 100mpg (miles per gallon). Ecologically oriented consumers or otherwise, all benefit from the fuel economy during car use. Because of its innovations in design and manufacturing techniques, the *Ecobasic* is a vehicle that has the potential to portray both (relatively) low environmental impact and *the* lowest price in its

⁶ This topic has been formerly explored in Chapter 3 of Porter (1985). Later, it was extensively debated in the literature on competitive advantage. This is the main reason why a discussion about the conditions in which a firm might be encouraged to pursue strategies centered on cost leadership is not explored in detail here. For the purposes of this study, it is more important to further analyze the possibilities of corporations to use resource productivity strategies in order to reduce the costs of products.

⁷ Concept cars are prototypes that point to future technological choices; “they narrow the pool of technologies from which manufacturers are likely to choose and as such are a valuable indication of future trends” (Nieuwenhuis and Wells 1997:121).

class⁸. The concept of *environmental cost leadership* proposed here is based on such characteristics. By extending resource productivity efforts to the *use phase* of the product, as the example shows, corporations are able to explore strategies – and eventual competitive advantage – on the basis of the relatively low economic costs *and* the low environmental impact embedded in their products⁹.

Design strategies that increase resource productivity by a factor of 20 – or a 95% reduction of the environmental impact of a product – are not only imperatives for the ecological sustainability of societies in 30-50 years time but, in the view of some experts, also consists of feasible targets¹⁰. Such strategies require firms to establish a new type of relationship with their customers. In some cases, instead of commercializing products, corporations would finance their operations and generate profits from selling the services provided by products. By adopting the concept of ‘product *upgradability*’, a manufacturer provides possibilities (aesthetic, technical performance, etc.) for consumers to upgrade their products without having to discard them at the end of their useful ‘lives’. Such practices allow firms to substantially reduce the material intensity and consequent costs of materials directly employed in products. *Interface Inc.* is possibly the most notorious example of such practices. Instead of selling carpets to its clients, the company leases them and ‘upgrades’ the worn out areas. Such practices not only increase the resource productivity of *Interface’s* products at the same time they reduce the final cost of the product for the client (see: Anderson 1998).

Finally, cost reductions might result from the relationship between the design of a product and its overall environmental performance during the *end-of-life phase*. Design for disassembling techniques applied to industrial products can represent significant savings for companies operating in industries subject to ‘extended producer responsibility’ types of regulation (see: Lindhqvist 2000). Although the auto industry has successfully lobbied the European Parliament to delay regulation on end-of-life vehicles (ELV), regulatory measures seem to be unavoidable in the coming years. ACEA, the European Automobile Manufacturers Association, has argued that taking back the 150 million cars from European roads in the end of their useful lives would cost the industry \$12.2 billion. Such figures would be significantly different if automakers used principles similar to the *Ecobasic* design in today’s cars. Because the *Ecobasic* has been designed considering disassembling needs, material sourcing at dismantling stage will not represent a problem. Materials recovered will possibly compensate the cost of \$173 per car that German automakers estimated for the ELV collection and processing (Kurilko 1999).

In summary, corporate environmental strategies based on environmental cost leadership have the potential to generate competitive advantage in firms competing on the basis of cost, which are able to transfer gains in environmental innovations to products or services. As the examples have shown, many firms in the automobile industry face such situations. Today, car assemblers and component suppliers together have operating return-

⁸ According to *Fiat*, the *Ecobasic* will be sold at around \$4,650 (€5,000)

⁹ In fact, Porter (1985) classified this type of cost savings for the buyer as competitive advantage based on differentiation. The perspective presented here does not deny this possible classification. However, even though differentiation strategies might be possible for some lines of home appliances, for instance, a large number of them will still compete on the basis of cost simply because the consumer is not willing to pay for the ecological attributes of the product.

¹⁰ Today, the possibility to increase resource productivity is not an issue anymore. Instead, the debate concentrated on the factor that this productivity could be increased – the Factor ‘X’ debate. See: Reijnders (1998), Weiszäcker et al. (1997), and Ryan (1998).

margins on revenue at around 3.5% – a meager share of a complex and unstable business activity. The combination of such margins with the saturation of mature markets in industrialized countries increases rivalry and places carmakers under extreme pressure to reduce costs (O’Brian 1999). Add to this reality an increasingly demanding customer and a never-ending tightening of environmental regulations. For firms operating in such context, innovations that have the potential to reduce the cost *and* environmental impact of their products can certainly become a competitive edge, and ultimately be conducive to market leadership based on these low costs.

Strategy #3: Beyond-Compliance Organizational Practices

The adoption of schemes such as *CERES principles* or *Responsible Care*¹¹ can eventually differentiate corporations from competitors as well as produce some positive outcomes for the firm. Corporate image, for instance, might be enhanced, influencing a positive public opinion about organizational practices. But can these types of strategies lead to first-mover advantage? In traditional terms, first-mover advantage is obtained when a particular action is taken by the organization, which might result in direct or indirect gains. Consumer loyalty might be more easily achieved if the company is the first to launch a new product. Earlier returns of investments in research and development can reduce the financial costs of the corporation, representing a first-mover advantage. However, can organizational processes generate similar conditions for this type of advantage? By obtaining the ISO 14001 certification a firm might differentiate itself from its competitors but does this represent a first-mover advantage for the firm? If so, can it be sustained?

If conclusive answers need to wait for more empirical evidence, it is already clear that specific conditions for such an advantage do exist. The need to establish a distinction between the types of consumers served by a company when developing strategies based on product environmental differentiation was also emphasized by Forest Reinhardt, previously mentioned. The circumstances found in consumer markets normally differ substantially from those of industrial markets, and differentiation strategies developed for one context normally cannot be transplanted to the other. This distinction also seems to be useful for the case of process differentiation (see: Box III in Figure 1).

Specific circumstances favoring the development of differentiation strategies based on organizational processes are expected to depend on the type of market served by the corporation. For companies supplying products or services to other corporations (industrial markets), the certification of their environmental management systems represents a source of competitive advantage when the company is selected as a supplier on the basis of its commitments towards environmental improvements in its processes. Automakers *Ford*, *General Motors*, and *Toyota*, for instance, have made it mandatory for their suppliers to certify their environmental management systems (EMS) according to ISO 14001 by year 2002¹². Auto suppliers have faced not only the pressure to cut costs but they need to do so while committing themselves to improving the environmental performance of production processes. In this case, even if the EMS certification does not represent a first-mover advantage for the suppliers, not having it will certainly represent a disadvantage (Nehrt 1998). Obtaining certification simply makes business sense. Hence, one can expect that

¹¹ For a thorough review of ‘business codes of environmental practice’, such as CERES – Coalition for Environmentally Responsible Economics, and Responsible Care, see: Nash and Ehrenfeld (1997).

¹² *Business and the Environment’s ISO 1400 Update*, 1/11 (November 1999): 1.

competition in such markets will promote the diffusion of beyond compliance environmental practices among auto suppliers.

Would the same situation apply for firms selling their products to final consumers? The answer is a classic one: it depends. Organizational processes that go beyond compliance might exert indirect influence on the image of a firm and eventually impact on its market performance. But this influence depends on particular circumstances. When European consumers rejected the decision of *Shell* to dump oilrigs in the North Sea, there was a clear ‘yes or no’ situation, making it easier for them to boycott the products of the company¹³. In that particular circumstance, a slump in sales resulted from the rejection of the organizational practices that were not directly related to the products sold by the company. The Brent Spar case showed that the overall environmental performance of *Shell* was becoming increasingly important to stakeholders. The incident in the North Sea and the outcry about the allegation that *Shell* was involved in the conspiracy that culminated in the execution of the environmentalist Ken Saro-Wiva in Nigeria certainly contributed to an evident change in *Shell’s* communication strategy. The company now considers environmental reporting an essential communication tool to address such concerns. By pursuing a strategy based on beyond-compliance organizational practices, *Shell* currently leads the companies that have significantly improved the image consumers and shareholders have about their operations (Kolk 2000).

Yet, the Brent Spar case also showed that consumer response is more prone to happen when an *issue* is created around a specific concern. In order to respond to a particular environmental matter that relates to production processes, the public needs to be ‘sensitized’. Competitive advantage resulting from focusing on organizational processes is subject to a particular set of circumstances. Among the multitude of variables influencing consumer behavior, environmental concerns will eventually become important to consumers when an *agency*, such as a charismatic leader or a controversial event, is able to mobilize public opinion (see: Orssatto and Clegg 1999).

The examples used in this section suggest that corporate environmental strategies based on beyond-compliance practices have the potential to generate competitive advantage (or, at least, avoid a disadvantage) in firms supplying other firms (industrial markets) that are under pressure to improve their environmental performance. Suppliers of car components represent a didactic example of such strategy. The case of *Shell* suggests that beyond-compliance strategies will also benefit multinational corporations that are susceptible to shareholder pressure in their home country in particular, and public opinion in general.

More empirical research is certainly necessary to determine when corporations generate competitive advantage out of beyond-compliance practices. Nonetheless, one can expect that exporting companies that have to cope with non-tariff environmental trade barriers are candidates to benefit from having outstanding environmental performance in their processes. Their (business) customers might use environmental prerogatives as a selection process. Such considerations lead to the final possible strategy: ecologically-oriented products.

¹³ In 1995 *Shell* wanted to sink obsolete oil rigs in the North Sea but the subsequent outcry lead by *Greenpeace* enticed consumers to boycott Shell petrol, resulting in a 60% downfall in sales in Germany alone. The pressure from consumers and the general public induced Shell to shift its strategy and the oil platform, Brent Spar, instead of being sunk in deep-sea waters, was dismantled on land. See: Dickson, and McCulloch (1996).

Strategy #4: Ecologically-Oriented Products

Marketing differentiation based on environmental attributes of products constitutes the most straightforward strategy of the four possibilities presented in Figure 1. Today, ecologically-oriented products represent a defined market niche explored by firms worldwide (Kotler 1999). *Konsum*, a Swedish supermarket chain, for instance, developed its own brand – *Änglamark* – to commercialize a portfolio of ecologically-oriented products. More than 300 food and other domestic products, such as coffee filters and washing powder, use the *Änglamark* brand to communicate the image of environmental responsibility. Consumers in Sweden pay a price-premium when acquiring products that allegedly cause less impact during their life cycle than those which do not present the eco-label established by *Konsum*.

Although the scope for environmental improvements of the products and services currently supplied by organizations is considerable, as the previous sections emphasized, only a fraction is expected to attain competitive advantage on the basis of environmental prerogatives. Justification for this assertion finds its roots in the conditions that satisfy the differentiation of any product, as well as the specific requirements for sustaining competitive advantage in the environmental front. In broad terms, “a firm differentiates itself from its competitors when it provides something unique that is valuable to buyers beyond simply offering a low price” (Porter 1985). Differentiation in these terms requires at least one strong motivation for buyers to acquire the product that does not relate to its price. In the specific case of ecological prerogatives, differentiation will occur when a product is able to provide greater environmental benefits, or imposes smaller environmental costs than similar products.

The satisfaction of these generic requirements for product differentiation cannot be extended to every product or service. In simple terms, differentiation implies distinctiveness, an attribute that by its very nature is only achieved by a minority. Once again, the conditions that satisfy the ecological differentiation of products depend on variables ranging from the structure of the industry, the regulatory framework, and the capabilities of the firm. These generic conditions provide the broad context in which a corporation might decide to explore environmental product differentiation strategies. But a propitious context for the development of such strategies does not guarantee successful marketing results. Fundamentally, firms that intend to generate competitive advantage from strategies based on eco-oriented products need to observe three basic pre-requisites: consumers must be willing to pay for the costs of ecological differentiation; reliable information about product’s environmental performance must be available to the consumer; and the differentiation should be difficult to be imitated by competitors¹⁴.

The willingness of consumers to pay for the ecological attributes of products is the first pre-requisite for environmental product differentiation. Basically, most consumers need to perceive a clear benefit for their purchase. In the case of industrial markets, the benefits are normally translated into cost savings, better performance of the product (as an input for other industrial processes), and cost reduction of risk management. For instance, equipment and machinery that consume less energy and reprocess by-products might reduce the costs of operation for the client. The vendor can commercially explore these

¹⁴ Forest Reinhardt has previously articulated the specific conditions for successful ecological differentiation strategies. For this reason, the examples used in this section only intend to summarize the considerations that have been sufficiently elaborated elsewhere, and eventually make it easier for those who are not so familiar with the pre-requisites of ecologically differentiation of products. See: Reinhardt (1998; 1999a; 1999b).

ecological attributes (less environmental impact) that result in gains during product use. In case the company is not working in a price-sensitive market, a price-premium can be obtained. On the other hand, for consumer markets, as the example of the Swedish *Änglamark* has shown, the attributes associated with the products allow companies to charge higher prices than competitors who lack such a label. However, in both cases – industrial and consumer markets – it is essential that the consumer is willing to pay for the ecological differentiation presented by the product.

Credible information is the second pre-requisite for environmental product differentiation. Scandinavian countries, in particular, constitute a demonstration case of the increasing importance of eco-labeling schemes as a tool for supporting marketing strategies of product differentiation. In Sweden, more than 3,200 products use the KRAV (*Kontrollföreningen För Ecologisk Odling*), the eco-label for organically grown food, as a way to differentiate themselves from competitors. Corporations are able to charge between 10% to 100% higher prices than similar products that are not certified by KRAV. The fact that KRAV is accredited by the International Federation of Organic Agriculture Movement and controlled by the Swedish Board of Agriculture confers a high degree of credibility to products with this label. The relative success of KRAV to differentiate organically grown food is, among other factors, a result of the credibility of the information embedded in this eco-label¹⁵.

The final requirement relates to barriers to imitation. If product environmental differentiation is to be successful in market terms, environmental innovation should not be easily replicated. Once other firms are able to reproduce the innovation, the focus of competition will tend to return to costs. Environmental product differentiation requires a high level of technological and managerial innovation to create products with environmental attributes that entail substantial organizational capabilities for their replication. In a similar fashion, barriers to imitation require substantial efforts to associate the corporate image of environmental responsibility with the products sold by the firm. The ecologically oriented products commercialized in Sweden, such as *Änglamark* brand of the supermarket chain *Konsum*, characterize this point. Although competitors could easily replicate most products sold with *Änglamark*, the image associated with the eco-label is unique to products sold by *Konsum*. Hence, it is an attribute that is not easily imitated by rivals.

A natural objection for the distinction between strategies based on the differentiation of organizational processes and ecologically-oriented products (strategies III and IV in Figure 1, respectively) may be raised when one identifies the main ecological attributes of the products. Since most of the *Änglamark* products, for instance, are consumables, their main attributes are located in their methods of production – more specifically, in the agricultural (i.e., organic food) or industrial (i.e., unbleached paper for coffee filters) production processes. Hence, there is a clear correlation between the possibility of exploring the environmentally-sound characteristics of the products and the processes used in their production. As the next section will explore, there is certainly a close relationship between both. Nonetheless, one can imagine that some suppliers of *Konsum*'s products sold with the *Änglamark* brand may not present outstanding environmental practices in all processes (industrial and organizational). Considering that eco-products are still a niche market for many firms, it can be expected that their output processes are adapted to the

¹⁵ For an overview of KRAV, and the general situation of organically grown cereals used for the production of bread in Sweden, see: Heidenmark (2000).

manufacture of traditional products. In this case, a scenario in which would not characterize beyond-compliance environmental practice in those firms.

The distinction between the overall organizational practices and the products sold by a firm is not just a theoretical exercise. It has direct implications for the way in which organizations might optimize their efforts in the environmental front, and focus on the type of generic strategy that makes sense for that business. Nonetheless, some corporations may be able to develop more ambitious strategies and explore more radical and riskier solutions. They can work in broader areas of action and explore 'hybrid' strategies.

Zones of Strategic Environmental Scope

Similar to any other stylization of reality, the boundaries between the four possible strategies are not rigid. The very nature of industrial production implies interdependency between organizational processes and products, and 'zones of strategic environmental scope' to connect the generic strategies. Efforts towards resource productivity in the industrial process can significantly help firms to develop strategies based on environmental-cost leadership. Likewise, beyond-compliance practices also have the potential to expose hidden opportunities in process-oriented resource productivity. Finally, the ecological differentiation of products can actually be based on the characteristic of the processes employed in their production.

Observing Figure 2, it can be noticed that the area between product-oriented strategies is the only one where there is no integration. The simple reason for such a situation relates to the impossibility of a product or service to obtain competitive advantage on both attributes (low cost and differentiation). As it was emphasized previously, even though a product has attributes of differentiation and low costs, competitive advantage can only be obtained in one. Of course, a firm can integrate both strategies in a portfolio of products and services, as marketing departments have traditionally done. For this reason, such integration does not constitute a novel zone of strategic environmental scope, as the ones explored next.

Insert Figure 2 About Here

Zone of 'Multiple Dividends'

The potential of firms to explore process-oriented resource productivity for the development of strategies based on environmental cost leadership in products/services is perhaps the clearest relationship in Figure 2. Cost reductions in production processes and utilization of materials can simply be transferred to products, resulting in a zone of influence between these two generic environmental strategies. The optimization or even the elimination of an industrial process, for instance, can contribute to the reduction of the final price of a product, increasing its chance to compete in the marketplace.

Consider the case of paint shops in automobile factories. Paint shops are not only the most polluting of the automobile assembly activities¹⁶. They also represent the highest investment of a car manufacturing plant – accounting for approximately 50% of the total

¹⁶ Painting – or, more generally, the surface coating operation – involves the capture and disposal of paint overspray and the emission of volatilized paint and carrier (VOCs - volatile organic carbon gases). The operation is energy intensive, since large quantities of air are necessary in modern painting systems. For a broad overview of the environmental impact associated with automobiles, see: Graedel and Allembly (1998)

costs. Installing a paint shop requires an initial investment ranging from \$300 to \$370 million, depending on the levels of automation, and the production of at least 250,000 cars per year to compensate the investment (Nieuwenhuis 1996). In simple terms, the sunken investment in this production process becomes an important factor for the automaker to explore economies of scale in manufacturing.

For most lay citizens (and automakers), the elimination of painting in car manufacturing might seem a bizarre idea. But the designers and engineers of the *Ecobasic*, the *Fiat* concept car mentioned previously, have proven that this is possible even when steel is used as the main material for the structure and body panels¹⁷. The *Ecobasic* presents not only a revolutionary design but it also innovates in the area of manufacturing technology. A cataphoretic treatment¹⁸ of the space-frame has been used in a novel way, resulting in paint being eliminated. This innovation reduces the costs of the vehicle by 60%, and the emissions associated with painting by 90%. Such costs reduction in the manufacturing stage certainly impacts on the final price of the product.

The *Ecobasic* uncovers a new facet embedded in the design of systems of production. Although attempts to lower the costs of production processes are not new, resource productivity and the overall environmental impact of a firm's activities have emerged as variables capable of amplifying both the need and the possibilities of redefining products and processes. Innovations in production processes that can improve the (environmental) performance and price of products clearly represent a *multiple-dividend* situation. Firms that are able to develop such capabilities will certainly increase their chances to profit from environmental investments. For consumers, innovations that can reduce the price as well as maintenance *and* environmental costs of products represents a 'triple dividend' in the demand side. This is the idea behind the concept of multiple dividends – a zone that has the potential to generate substantial rewards for producers and consumers. But mainly because this is a zone of high potential to generate (environmental and economic) costs savings, only firms that are able to radically redesign their organizational processes and products, are be able to explore its full potential.

Zone of Best Environmental Practices

In the traditional view of types of competitive advantage (of products/services), strategies based on low cost and differentiation have a mutually exclusive character, as it has been emphasized previously. Basically, the competitive advantage of a firm would result from obtaining low profitability from selling low cost products or obtaining higher margins from their differentiation, but rarely from both. Corporate environmental strategies focused on organizational processes, on the other hand, seem to allow a closer relationship between the two. Companies that put effort towards achieving best environmental practices create the conditions – or, in broader terms, the organizational culture – favorable to the

¹⁷ Body panels can also be manufactured with materials such as plastics that might make painting unnecessary. Colored, extruded plastic panels (which do not require paint) have been used in the TH!NK, a two seater electric car developed by the Norwegian *Pivco* company, bought in January 1999 by the American automaker Ford. Technical details of the car and the history of *Pivco* can be found in Schwartz and Maruo (1998).

¹⁸ Normally, car bodies are pre-treated and then subjected to electrophoresis to deposit a layer of paint on the body. Because the steel-frame of the *Ecobasic* is finished with two cataphoretic coats, no paint shop is needed in the assembly factory. To produce the surface colour on the space-frame, an additional tank to apply the second cataphoretic coat replaces the paint booth. See: Crosse (2000).

simultaneous development of both strategies: resource productivity in processes and beyond compliance organizational practices.

An industrial organization might use its ISO 14001 certification to differentiate from its competitors but the process of implementing an EMS might uncover potential areas in which an increase in resource productivity can be obtained¹⁹. Similarly, a company working towards improvements in process-oriented resource productivity can facilitate the development of an environmental management system, and reduce its overall implementation costs. This interdependence between environmental strategies based on organizational processes generates a zone of ‘best environmental practices’ (see interactions in Figure 2) where process-oriented resource productivity and beyond compliance organizational practices reinforce each other.

The potential for obtaining competitive advantage from the employment of process-oriented strategies, however, is a more complex matter. It depends on factors that normally are beyond the control of the company, such as the structure of industry and the perception clients have of the overall environmental performance of the company. For suppliers of industrial firms that are subject to high pressure to improve their environmental record and to reduce costs, efforts towards both resource productivity and beyond compliance practices might be the most sensible (hybrid) environmental strategy. Here, once more, the suppliers of car component represent a didactic example. In the past decade, carmakers have reassigned responsibilities to their first tier suppliers and transferred the pressure they have faced to improve their overall environmental performance. Hence, for a component supplier, it makes business sense to obtain ISO 14000 certification, for instance. But the possibility of such practice to become a source of competitive advantage will depend on other business issues, which do not relate exclusively to the environmental performance of the firm.

Zone of Eco-Institutional Differentiation

Many companies may be able to include eco-oriented products in their portfolio. Only a few, however, are capable of associating the environmental qualities of their products with the overall image of the corporation. Such outcomes certainly require substantially more effort than those employed in the four types of generic strategies, described in the first part of this article. An example of a business that tightly couples strategic decisions with commitments to reducing the impact on the natural environment is *Patagonia*; an American firm specialized in outdoor clothing and equipment. This commitment has transformed the company into a symbol of environmental correctness. The pioneer positioning in its industry resulted in many customers identifying *Patagonia's* products with the overall image of ecological responsibility. Company representatives emphasize that once products satisfy the demand of durability, performance, fit and styling, they are also willing to pay price-premiums for ecologically oriented climbing and fly-fishing clothing and gear. The description of *Patagonia's* trajectory to substitute organically grown cotton for traditional cotton, in particular, is a remarkable example of the hardship involved in the creation of eco-institutional differentiation. In order to implement the decision to convert to organic cotton, the company not only needed to re-educate its workforce, but also made a significant effort to educate and inform suppliers, related businesses, consumers, and general public. Today, *Patagonia's* cotton product line is

¹⁹ Charles Corbet and David Kirsh, “ISO 14000: an agnostic’s report from the front line”. *ISO 9000 + ISO 14000 News* 2 (2000):4-17.

identified with the overall commitment of the company towards organically grown crops and environmentally sound cotton products (see: Chouinard and Brown 1997).

More familiar to Europeans, *Ecover* – a Belgium producer of washing and cleaning products – is another (rare) successful case of eco-institutional differentiation. Since its foundation in 1979, the company adopted radical, beyond-compliance environmental practices. Such practices involved an innovative marketing campaign in which students and artists recycled unused paper from old billboards. The new factory, inaugurated in 1992, was built with renewable materials. Principles of ecologic architecture were used for illumination and ventilation, and the factory's grass-covered roof became an emblem of *Ecover's* values. Stringent ecological principles have been used in manufacturing, such as the guarantee of skin compatibility and the ultimate degradation of the cleaning products. Along its history, the corporation has accumulated several ecological prizes, being the only company to receive the "Global 500 Roll of Honour" award from the United Nations Environment Program (UNEP) in 1993. Such organizational trajectory spurred customers to identify *Ecover's* products with the overall image of the company²⁰.

Patagonia and *Ecover* constitute examples of corporations working in the zone of eco-institutionalized differentiation. These firms were able to incorporate an image of ecological responsibility that bonds organizational practices to the products sold by them. Beyond-compliance practices have been so pervasive in the history of these companies that they became embedded attributes of their products. Today, *Patagonia* is associated with environmentally responsible outdoor garments in the same fashion that *Ecover* is identified with 'green factory'. Whether or not this is just another type of marketing niche is not relevant here. More importantly, these companies highlight both the possibilities of adopting ecological differentiation strategies, as well as the difficult trajectories firms may face to embrace them.

Final Considerations

The importance of evolving the debate from generic assumptions 'whether it pays to be green', to a more grounded analysis of the conditions in which environmental investments make business sense has been accurately emphasized by Forest Reinhardt. Although his work represents significant contribution to this debate in the emerging field of *Business and Environment*, he has chosen not to establish a distinction between products and organizational processes. As it has been emphasized in this article, this classification is fundamental for the identification of appropriate conditions that might justify the development of specialized corporate environmental strategies.

In the context of the emerging *natural capitalism*, business strategies developed around more productive use of natural resources are becoming increasingly important. Building such strategies requires businesses to amplify the scope of competences and identify circumstances favoring the adoption of environmental strategies based on both organizational processes and products/services. The development of these strategies will certainly not be an easy task for most organizations. This is the main justification for this article to present a framework categorizing the generic types of corporate environmental strategy: it has immediate implications for the practice of management. Fundamentally, the framework can be used as a tool for ecological capability building in firms. Used as a

²⁰ The information presented here was obtained during a visit to *Ecover's* factory in 1997, and updated with information from the company's home-page: <http://www.ecover.com/>

classification scheme, it can help managers to define and prioritize areas of organizational action, optimizing the overall economic return on environmental investments and the potential to transform these investments into sources of competitive advantage.

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FIGURE 1

Generic Types of Business Environmental Strategies

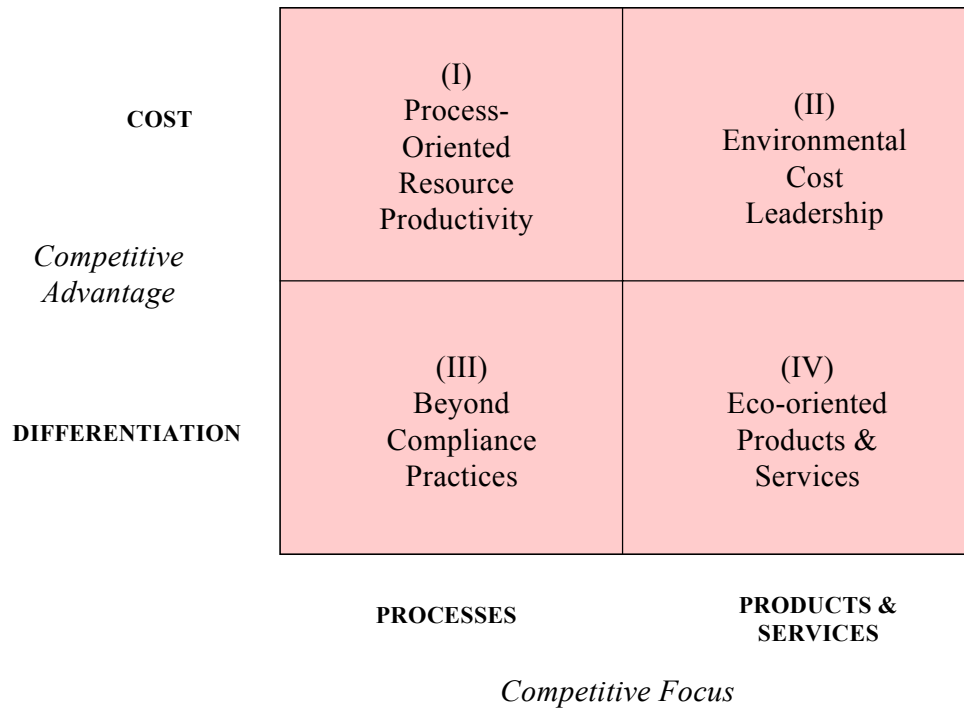


FIGURE 2

Zones of Strategic Environmental Scope

