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Environmental strategy types among manufacturing enterprises in Hungary

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1. Foreword

As an environmental expert, I often think we, environmentalists, would be really successful, if our job became superfluous after a while. This would mean that finally, people manage the resources of our planet in a sustainable way. Until that becomes reality, a lot remains to do for responsibly thinking people. I would like to express my sincere thank to my advisor, professor emeritus Dr. József Kindler and to the chair of my department, university professor Dr. Sándor Kerekes who have played a decisive role in my becoming aware of this personal responsibility since the very beginning of my professional career and who have given me professional and personal support in my work related to environmental protection. I thank my colleagues and friends at the Department of Environmental Economics and Technology, Tamás Kocsis, Eszter Kovács, Mrs. Nemcsics Ágnes Zsóka and Gyula Zilahy, with whom I could always collaborate in a creative and cheerful atmosphere and whose professional help was very important to me during my research. Finally, I am grateful to Dr. Kálmán Dabóczi, who, while doing excellent professional work, spared time to establish a workshop for Ph.D. students where they could discuss research problems and ideas and receive help for their progress.

And now a few words about the research. Nowadays government and the public more and more closely scrutinize the environmental performance of companies. The accession of Hungary to the European Union is increasing the environmental pressure on companies, and, in the near future, customers' environmental demands will most probably play a significant role in corporate success on the market, as well. Therefore, it is useful to learn in more depth the capability and willingness of domestic companies to respond to environmental challenges. As a result of examining corporate rexponsiveness, one can see what kind of improvements are necessary in the environmental strategy and performance of companies.

In this research, we wanted to identify the types of strategic responses domestic companies give to environmental challenges. A sample of 152 companies from the manufacturing industry have been analyzed to identify the strengths of corporate environmental institutions, the character and efficiency of organizational measures to reduce environmental burdens, and the willingness (and ability) to react to outside pressure. On the basis of the examined factors, we identified groups of company

characterized by particular environmental strategies. Those strategic groups are as follows: 1. the “strategy” of ignoring the environment; 2. “minimalist” strategy (doing only what is absolutely necessary by law); 3. “environmental marketing”; and 4. “strong environmental institutions and intensive environmental activity”. On the whole, the results of the research are consistent with the conclusions of certain other researchers. Our analysis was one of the few studies examining not only the “attitudes” of companies, but also their concrete environmental performance. This greatly helped to avoid the distortions arising when only attitudinal variables are used in an analysis. The research covered the possible connections between general corporate orientation (corporate strategy) and environmental strategy. Environmental protection has not proven to be an important factor within corporate strategy; therefore, the examined companies have a lot of potential for improvement as regards integrating environmental considerations into corporate strategy.

2. Introduction

It is not easy to define the meaning of "corporate strategy" and "environmental strategy". The strategic literature contains the ideas of various schools of thought, whose definitions of strategy differ from each other. According to Mintzberg and Lampel (1998), the representatives of the different schools are like the blind people in the parable trying to imagine an elephant by touching it from different sides. „We are the blind people and strategy formation is our elephant. Each of us, in trying to cope with the mysteries of the beast, grabs hold of some part or other; and, in the words of John Godfrey Saxe's poem of the last century:

Rail on in utter ignorance
Of what each other mean,
And prate about an Elephant
Not one of [us] has seen!"

(Mintzberg-Lampel, 1998, p. 21.).

For everyday thinking the nature of strategy does not seem problematic. The word strategy originates from Greek *strategos*[1] (military leader), therefore, once strategy meant war plan, and today it means any plan a person or an organization wants to realize. That would probably be the opinion of a person who has never thought about the semantic changes of words and who has never taken a look at journals of organization theory. However, etymological considerations advise one to be careful. If in ancient Hellas, the word "idiot" still meant a private person "who, due to his vocation, is not bothered by public affaires" (Wolle, 1989), the word "strategy" may have had a similar fate. Etymologically, the word strategy means "command an army". In other words, „the art of war, especially planning of movements of troops and ships etc. into favourable positions; plan of action or policy in business or politics etc. (*economic strategy*)" (Allen, 1986 – italics in the original).

This last definition shows that, in general, by strategy we mean some preliminary plan. Naturally, corporate strategy can be regarded as such a plan. But

[1] The word „strategy" (that is, being a leader of an army) originates from „stratos" (army) and „agein" (to command) (Ayto, 1990).

what if the external circumstances or the characteristics of the organization change while executing the strategy? Should managers insist on the original concept? If the plan should be changed, will the result be a new strategy, or will the result be still the same old strategy, or something between the two, "a revised and updated version"? Has a strategy ever come true in the way its designers had dreamed it up at the desk, or has a strategy ever been born that had not been planned at all? Does "building a strategy" mean the process of planning, or the result of the planning process (that is, the concept), or does it include the realization of the strategy, too? These questions as well as countless similar dilemmas characterize the literature on strategy.

In the research on the *environmental* strategy of companies, some authors regard strategy as an elaborated concept or plan, and assume that in strategy-making companies should follow an obligatory development path.[2] If one accepts this assumption, nothing else remains but to work out the technical details of strategy. Concentrating on the technical details sometimes results in a trade-off leaving more important questions in obscurity (for example, the goal of the strategy, possible strategic alternatives, circumstances under which it wise to follow a certain type of strategy). Other authors suggest differring strategies for different organizations depending on the companies' internal and external circumstances (Steger, 1993; Kerekes et al., 1996; Azzone et al., 1997; Csutora 1999).

In connection with this second school of thought, our research assumes the existence of several types of environmental strategies. In the analysis of strategy, we have utilized the descriptive schools of management theory, that is, we have tried to answer theoretical questions from empirical grounds.[3] To answer certain questions of the research, we have regarded the realized strategy (that is, not the deliberate, planned, or expressed strategy) as being of primary importance. In relation with other researches, our first goal was to give more accurate, or perhaps new, definitions for the existing environmental strategy types. Our second goal was to clarify the differences

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[2] A good overview of these schools is provided by Csutora (1999).

[3] This corresponds to the recommendation of Mészáros (1998) that strategy theories should be built upon the experiences of corporate practice, in other words, reality should not be forced to match theories.

between deliberate and realized strategies with the help of case studies. The third goal of the research was to affirm the hypothesis that environmental excellence is not necessarily a must for every company. Since the theoretical studies on environmental strategy usually do not investigate their objects in a corporate organization theory context, we have a given more serious consideration to organization theory aspects in the first part of the dissertation.

3. The evolution and the development of the phenomenon of corporate strategy

3.1 The evolution of the corporate strategy in Western Europe and in the United States

In the strategy literature the following types and eras of conscious corporate strategy can be identified[4] (Bakacsi et al., 1991; Mészáros, 1998).

The period between the 1920s to approximately 1950 was the time of short-term financial planning, which was a corporate management method viable in a stable market environment. The period between 1950 and 1970 was the era of long-term planning. This period was characterized by fast technical development, mass production, the steady growth of the economy, and the predictability of the developments of the organizational environment. The concept of "corporate strategy" has spread worldwide since the 1960s. At that time came out the two main schools of corporate strategy theory (which are still valid); the normative and the descriptive schools of thought. The former prescribes the corporate strategy to be followed, whereas the latter describes (that is, wants to understand) the nature of the existing corporate strategies.

The period between 1970 and 1980 – as opposed to the previous period when the formation of the strategy was based on the organizational learning of the companies – mainly was the era of *strategic planning* based on theoretical grounds (Porter, 1980). It was the time when the portfolio models (the "market share – market growth" matrix of the Boston Consulting Group and its upgraded versions) as well as the scenario method for planning possible future actions appeared. The importance of research and development, diversification and marketing has increased as a consequence of the radical change in the environment, of the slow-down of economic growth and of the decline of demand. Due to the appearance and strengthening of corporate stakeholders (for example, environmental groups), businesses also started to

[4] The periodization of the evolution and development of strategy provides a good overview on the process though all periodizations inevitably contain some inconsistencies (see also: Mészáros, 1998).

link other aspects (for example, social responsibility) to their profit goals (Marosán, undated; Kovács, 2000). Future was no more unpredictable; the production-centered approach became unsustainable; openness and adaptation to the environment became important factors in corporate success. A serious default of the era of strategic planning was that the design and the implementation of the strategy were separated: corporate behavior often differed from what had been planned due to the separation of the organizational members who designed the plans and those who implemented them.

Around 1980 the concept of strategic management emerged, which suggests that strategic planning and operative management should be connected. The role of organizational structure, culture, communication, and internal interests and power relations are important for the implementation of decisions (Balaton, 1988; Kindler, 1991; Angyal, 1997). The concept of core competencies appeared (Prahalad - Hamel, 1990) as well as the idea of radically reengineering the corporate processes. Two complementary approaches appeared regarding the basis of strategic advantages. On the one hand, following Porter (1980), the industrial organization school claims that strategy is the preactive or reactive adaptation of the company to the environment. On the other hand, Prahalad and Hamel (1990) stresses the importance of competitiveness based on strategic resources and capabilities.[5] The sources of competitive advantage are those resources and capabilities which are both valuable and scarce and cannot be perfectly copied or substituted (Bakacsi et al., 1991).[6] In strategic management the design of the strategy and its implementation in particular situations are interrelated. The latter one is not a routine task either. Ideally, implementation is characterized by iteration and spiral progress; the actors repeatedly return to the phase of setting the

[5] Porter (1996) does not agree with this view. He suggests, for example, that operational efficiency cannot be the basis of strategic advantage, and instead strategic positioning is needed. We agree with his view, and add that environmental research should also apply more comprehensive categories than pure operating efficiency. See, for instance, those factories, which operate in a clean and efficient way but produce health-damaging products (for example, tobacco).

[6] In this context, value is not to be measured in monetary terms but with the ability of utilizing the environmental opportunities as well as of preventing dangers. All strategic advantages wear off after some time, therefore, the continuous renewal of strategic resources is necessary.

objectives and the objectives as well as the methods of implementation will be corrected.

Corporate environmental strategy may appear at two levels within the overall corporate strategy. On the one hand, as a broadly defined objective, on the other hand, as a partial strategy within the overall strategy. In other words, environmental protection may appear at the policy level (even in the corporate mission), or in the business plans, in action goals and within the functional strategies.[7] In the latter case, the environmental strategy may bear the same characteristics as the overall corporate strategy. It can be reactive (responding the external pressures), or preactive (anticipating or even influencing the changes); it may strive for cost-leadership, positioning, or concentration (Porter, 1980), or other strategic options. A substantial question for our research was how environmental protection is built into the comprehensive corporate strategy and whether environmental protection plays a strategic role at the investigated companies.

3.2 The evolution of corporate strategy in Hungary

It was not customary in the "socialist" political-economic system to prepare comprehensive organizational strategies. In the 1970s a few companies started long-term planning, and in the 1980s strategic planning (long-term, complex, and inflexible plans) appeared in many companies.[8] Before privatization the former state-owned companies avoided strategic decisions, shelving the problems, saving positions as well as fear of making mistakes were the prevailing behavioral pattern. "The era of post-socialist recession does not favor the development of innovative and entrepreneurial strategies. It is very common that ... restrictive strategies are born, for example, to improve short-term profits, the management reduces the amount of available resources (capacity, laborforce) and partially down-sizes the enterprise. Companies rarely try to expand their product lines, services or markets" (Balaton, 1994, p. 14.). The majority

[7] Barakonyi (1998) and Varsányi (1998) provide a good overview of the hierarchy of corporate objectives and plans.

[8] Balaton, 1994 gives a good overview on the strategic development of the domestic companies.

of the companies did not know the theoretical basis of the scenario technique or of logical incrementalism, although in practice they applied the simplified versions of those methods.

In the 1990s Hungarian private enterprises had a conscious intention to grow. All the growth strategies were present among Hungarian businesses: increasing the market share; market development (appearing on new markets); development of new products/services; diversification (simultaneous market and product development). The making of strategic decisions was informal. In the companies founded before 1990 the dominant coalition could clearly be identified; adaptiveness, learning and autonomic strategy making were characteristic of those businesses. In the case of companies founded after 1990 there was no dominant coalition; spontaneity and intuition were present; there were no formal processes; the management was incrementalistic; thos enterprises adopt and apply new technologies much easier than the formerly state-owned enterprises.

The aim of the joint ventures was to utilize the favorable conditions (wages, tax allowances etc.). There was a power disequilibrium in those enterprises; the foreign partner had a decisive role in strategy making; virtually, there was no mutual learning between Hungarian and non-Hungarian members of the organizations.

4. Organization theory as the background of strategy research

4.1 Prescriptive schools

The experts of corporate strategic management represent different schools of thought.[9] These schools overlap to a great extent although they can be separated from each other quite well. In certain cases, however, it is not clear whether the different approaches (for example, strategy = planning, strategy = learning, etc.) should be considered as different concepts of the same phenomenon, or the approaches refer to the different time phases of the same process. In any event, we agree with Barakonyi (1998) and Mészáros (1998) that the new, emerging strategies or "philosophies" do not render the former methods unnecessary. Different kinds of strategies can be effective at the different stages of the lifecycle of companies and even within one company different strategic approaches may co-exist and support each other (synergy). We think that the different schools represent the different dimensions of the strategy that can be present in the organization at the same time. It is like when a geometrical body has three dimensions: all the dimensions are valid at the same time yet each of them differ from the others; furthermore, one dimension alone fails to give a picture on the shape of the body but all dimensions together provide the whole picture. The evolution and the development of strategy is a permanent process and the result of the interaction of innumerable different factors. In this process the organizational environment, the organizational structure, the characteristics of organizational members, the organizational behavior as well as the performance are in relation with each other and with the strategy. The result of this network of relations is a strategy making process where different strategy approaches can play a more significant part at

[9] Mintzberg and Lampel (1998), for example, determine ten strategic management schools. These are the following: design, planning, positioning, entrepreneurial, cognitive, learning, power, cultural, environmental, and configuration schools. This classification necessarily bears the marks of the strategy approach of the authors and it is only one of the possible classifications since there are overlaps and interrelationships between the individual schools. Antal-Mokos et al. (1997) distinguishes the entrepreneurial, cognitive, learning, political, cultural, and environmental strategy approaches.

different times. In this case the different strategy approaches may be considered as the different phases of one process.

Strategic literature contains both prescriptive and descriptive approaches or schools of thought regarding strategy. The former aims at prescribing the instruments to be used and the path to be followed during the process of strategy making. The latter, however, aims at understanding the way strategy evolves and gets implemented. Mintzberg and Lampel (1998) regard the design, the planning and the positioning school as prescriptive theories. The aim of the design school is to make the internal features of the organization fit the organizational environment: "top management [creates] clear, simple and individual strategies that are born [in the course of a thinking process] that is neither formally analytical nor informally intuitive (p. 22). The most famous expert of this model is Chandler (1962) who suggests that strategy is nothing else but the response to the challenges of the environment. This response contains the determination of the long-term objectives, of the actions to fulfil them, and of the way resources sould be allocated.[10] Strategy does not only mean the selection but also the implementation of the objectives. Chandler outlined a corporate development path, which he considered as general and in which strategy means a kind of corporate growth (Antal-Mokos, 1990).

According to the *planning* school „*strategy is a plan* – a consciously planned series of actions, program (or set of programs) to manage a situation" (Mintzberg, 1987a, p. 1.; italics by the author). Strategy is a concept of the desirable future of the organization and the identification and the systematization of the steps necessary to reach the desirable future (Chikán, 1989). The conception of "strategy as a plan" can be found at Sun Tsu, a Chinese military leader (400 B.C.) and is also used today (Ackoff, 1981).

The *positioning* school hallmarked by Porter (1993) considers the determination of the position to be taken by the company as the most important

[10] According to Chikán (1997) the functions of the strategy are: 1) the determination of the corporate mission (for example, making excellent quality products) and the designation of the operational scope (for example, industrial sector); 2) providing permanent competitive advantage; and 3) providing synergy between corporate characteristics and activities.

function of the strategy. Here strategy means that the enterprise selects the appropriate "niche"[11] in the organizational habiat and stays there for an appropriate time. The basis of the positioning school is the preliminary, rational analysis focusing on the characteristics of the competitive situation and investigating the market position of the products and the features of the industrial sector. After the analysis the company should choose the optimal type out of the "set" of the possible strategies and then the organization should adhere to the chosen strategy. (Porter, 1980; 1993; 1996; Porter-van der Linde, 1995).

The starting-point of the prescriptive approaches is that the organizational strategy is a rational and concrete notion of the future that managers should develop then they should have it implemented by the organization. The creation of the strategy is based on a clear methodology (or at least a "schedule") that should be followed by the managers otherwise the organization will fail. According to Dobák (1996), between the external conditions and the organizational structure is located the strategy, which is "an evaluating and goal-setting activity" (p. 40.). Furthermore, based on Chikán (1989), he interprets strategy "as the entirety of ideas concerning the future objectives of the organization and the ways of implementation thereof" (ibid.). According to Chikán (1997), the role of corporate strategy is, among other things, to determine the corporate mission and the operational scope. It deserves our attention that here the concept of strategy may refer not only to a preliminary plan; this suggests that it is possible to change the strategy due to the changing conditions.

The logical incrementalist model of Quinn (1980), which considers the gradual advancement as realistic in the course of strategy development, criticizes the rational strategy development model. Mintzberg (1978) distinguishes the *a priori* (plan) and the *a posteriori* (sequence of decisions, actions) types of strategies and he claims that the latter is more frequent in practice. "Mintzberg (1994) considers formalized planning only as the 'programming' and the elaborated 'articulation' of the creative strategic ideas, and he assigns the analytical tasks to the planners *around* the process

[11] In ecology niche means the section of the habitat that is suitable to maintain an organism, a population, a species, or an ecosystem. Mintzberg adapts this concept to the market: „niche" can be, for example, a product-market combination, or a special way of resource use.

of ‘strategy making’ and not *within* the process.” (Antal-Mokos et al., 1997, p. 38.; italics by Á. B.)

4.2 Descriptive schools

The descriptive schools, as opposed to the prescriptive ones, do not want to give formulae to elaborate the adequate strategy but they attempt to *understand* how strategies are formed in reality. They do not want to form reality on the basis of strategy theory but they wish to elaborate the theory of strategy making on the basis of reality. Mintzberg and Lampel (1998) classifies six schools as descriptive theories. The *entrepreneurial* school does not consider planning and formal analysis as of decisive importance in the development of the strategy but the management’s intuition. The importance of the corporate vision and the description of the world by metaphors, which is based on the creativity of the top management, come to the forefront. The *cognitive* approach analyses the thinking-perceiving processes of managers, and it explores from the psychological side the understanding and the conception-making abilities of strategy makers. The most important areas of the research include the ability to corehend, the boundaries of processing information, the development and structure of knowledge, and the method of developing a picture of the world. The *learning* school stresses that companies do not follow perfectly elaborated conceptions in their operation but managers have an initial image on the role and future of the organization, which image will continuously be adjusted to the changing conditions. The two wings of *power* school deal with power processes within (micro-level) and between (macro-level) the organizations. The micro-level analysis investigates the power bargains, interest conflicts and games within the organizations whereas the macro-level analysis aims at identifying the ways of putting pressure on other organizations. “Hold up power to a mirror and its reverse image is culture” – say Mintzberg and Lampel (1998) on the approach that they call *cultural* school. „Whereas the former focuses on self-interest and fragmentation, the latter focuses on common interest and integration – strategy formation as a social process rooted in culture.” (ibid. p. 25.) The *environmental* school (including contingency theory, population ecology and the institutionalist theories) deals with the organizations’ possible responses on the environmental challenges.

The *configuration* school says that all (that is, prescriptive and descriptive) strategy interpretations are relevant, and always the most appropriate strategy approach should be chosen for the different organizations and for businesses in different stages of their life-cycles. In our research we have utilized the concepts of both the positioning and the environmental schools (contingency theory), in other words, we have applied the conceptions of both the deliberate and the realized strategy.

5. The applicability of the "deliberate" and the "realized" strategy conceptions in the research

The reason for the different strategy definitions of the literature is that the authors, on the one hand, have different understandings of the content of strategy and, on the other hand, they focus on the different stages of the evolution of strategy. Still, it is a common feature of the strategy definitions that strategy is not considered as an operative action but a future-oriented phenomenon focusing on fundamental questions; strategy is not regarded as an operative plan but as an image of the future and the multitude of adaptation conceptions as well as a kind of preparation for the unexpected situations (Antal-Mokos et al., 1997). It can even mean – in Mintzberg's conception – a given *behavior*, which does not require formal strategic planning. Figure 1 shows the different strategy approaches.

Figure 1: Classification of the different strategy approaches

Strategy	1. Process	2. Content
1. Conception	1.1. Strategic planning (irrespective of formalization) →	1.2. Deliberate strategy (ex ante strategic plan, objectives) ↓
2. Action	2.1. Strategy making (strategic management, organizational features) →	2.2. Realized strategy (ex post behavioral pattern)

Source: Antal-Mokos (1990), p. 6. (with changes)

According to one approach, strategy is a preliminary *conception* (deliberate strategy). The second approach considers not only this conception but also the process of its creation as the part of the strategy (strategic planning). According to the third

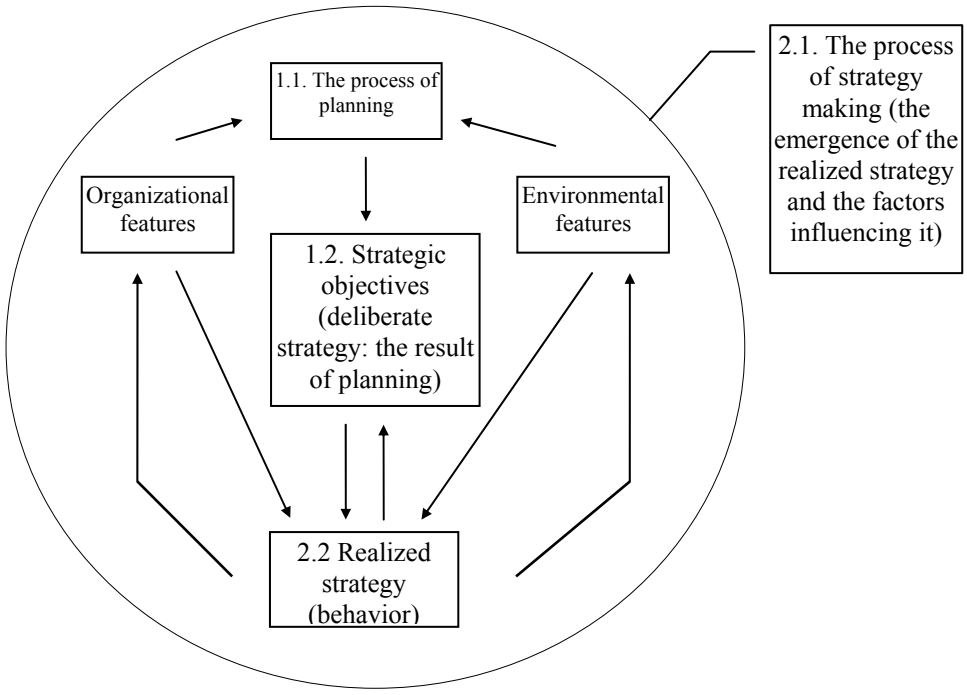
approach, strategy is not necessarily based on planning; strategy means the behavior of the organization on which the organizational features, for example, structure, control processes or power relations have an effect (strategy making). The fourth definition considers as strategy the "pattern", the "regularity"[12] that can be a posteriori recognized in the actions of the organization (realized strategy).[13]

As mentioned earlier, on the one hand, the various definitions can be perceived as different approaches of the same phenomenon, that is, as complementary concepts (Antal-Mokos, 1990; Antal-Mokos et al., 1997), on the other hand, they can also be regarded as the different stages of one process. Figure 1 contains not only the different definitions of corporate strategy but also shows the temporal development of the strategy. The first column stresses the two interdependent aspects (processes) of the development of strategy while the second column presents the results of these processes developing along the horizontal arrows. The figure partly also shows the relation between strategy as a preliminary conception (deliberate strategy) and the realized strategy (vertical arrow). We have to make two remarks in connection with the figure: 1. the represented processes cannot be totally separated from each other in reality; 2. for the sake of transparency, only a couple of the possible relations are shown in the figure. We have not shown, for example, that *strategy making*, strategic management, organizational features, and power relations affect *strategic planning,* and that the *realized strategy* affects the *deliberate strategy* (feed-back). The links between the strategy components are shown in a more comprehensive way in Figure 2.

[12] „Pattern of a stream of decisions", „pattern in a stream of action" (Mintzberg, 1978). „This pattern reflects the regularity, the common orientation of different actions." (Antal-Mokos, 1990, p. 6.)

[13] Ex ante strategy, which is defined as a conception, is also called "management-strategy" and strategy interpreted as action (ex post recognizable strategy) is also called "organizational strategy" (Antal-Mokos, 1990, p. 6.).

Figure 2: The links between strategy approaches and the emergence of the realized strategy



The "realized strategy" approach – as opposed to the "preliminary conception" approach – interprets strategy *a posteriori*: "strategy is a pattern in the past actions of the company and in the positions evolved as a result, which can be recognized and analyzed a posteriori" (Antal-Mokos - Kovács, 1998, p. 23.). Reinhardt (1998) – by assessing corporate environmental strategies – also links the success of the current actions to the past corporate strategy as well as to the comprehensive organizational strategy of the company. He shows that the success of the environmental positioning of the products heavily depends on the characteristics and on the success of the company's earlier positionings and on whether the environmental positioning matches the comprehensive strategy of the organization.

Mintzberg (1979) examines the different methods of strategy making, in other words, the organizational conditions and the *processes* through which the strategy

develops. According to his approach, the structure and other features of the organization should be formed in such a way that the organization will be able to develop and implement the adequate strategy. Here we have to add that recently Mintzberg has stressed nearly only the requirement that such a structure should be established which promotes the development of an adaptation strategy[14], thus he focuses on the *way* of the development of strategy not on the content of strategy. This approach can be partly justified by the fact that one of the most important corporate objectives is adaptation to the environment. "In a changing, complex environment, which became characteristic of a relatively greater number of businesses in the 1980s, (...) it gets more important to make the organization itself capable for quick adaptation without providing management guidelines regarding the particular content of the strategy, without preliminary strategic plans, or action programs elaborated at the top of the organization" (Antal-Mokos, 1990, p. 13.). Of course, in many cases it is not only adaptation that is carried out but also influencing the environment, including the establishment of good relationships with the authorities, lobbying efforts, and the organization of different interest groups.

> We can approach the conception of strategy from many other points of view. For example, one can differentiate and analyze separately the corporate-level and the branch-level strategies. The former refers to the relationship between the *entire company* and its environment. Corporate strategy determines the company's scope of operation and the branches to be developed or to be ceased. Branch-level strategy, on the other hand, can be interpreted in the relationship between the individual *branches of the company* and their sectoral environment. This is the strategy of competition; it determines how and with which instruments the company competes in a particular sector. The allocation of resources among the individual branches is implemented in the framework of the portfolio strategy "located" between the corporate and the branch levels and which "does not appear

[14] Besides the organizational structure there is another set of factors affecting the development of strategy; the system of human relationships. This set includes organizational culture, informal relationships, unspoken agreements, coalitions, individual and organizational learning processes, and individual psychological features. Richard M. Cyert and James G. March have examined interest conflicts within organizations, the process of resource allocation through bargaining, and the phenomenon of negotiated organizational environments. (Pugh-Hickson-Hinnings, 1980).

> independently but is a part of the corporate strategy and 'surmounts' the individual branch-level strategies at the same time" (Antal-Mokos, 1990, p. 7.).
>
> It is common to examine the logical and the temporal relationships between organizational structure and strategy. The statement of Chandler (1962) "structure follows strategy" seems to fail today. Research evidence suggests that either of them can be a cause or an effect depending on the particular situation; the continuous flow of action and reaction between the two factors is frequent; moreover, there might even be no relationship between the two factors (Antal-Mokos, 1990). The authors in the 1970s already do not emphasize the temporal relationship between strategy and structure but they stress that their matching is necessary and and their interaction is important. Miles - Snow (1978) consider organizations as integrated strategy-structure units, associating them with the different types of the environment. "Strategy … is a variable determined by the organization and (also) by its structure. At the same time, considering strategy as a way of adaptation to the environment (and not restricting it to, for example, the forms of growth and not limiting it to plans and concepts), and regarding the shaping of the organization, with good reason, as one of the most important component of adaptation, the organization and its structure seem to be determined by (among other things) strategy"(Antal-Mokos, 1990, p. 12.).[15]

In short, strategy types and the other organizational factors are separate variables but they also overlap. Therefore, an integrated approach of strategy is useful to understand and utilize corporate strategy. An approach that recognizes the different colors of reality; different types of strategies can be adequate in each stage of a company's life-cycle and also for different types of companies. Mintzberg demonstrates the relationship between the single strategic schools with a metaphor of a tree: the branches of the "tree" of the strategy theory are separated but they also grow into each other; both the roots (the fundaments of strategy theory established by the famous authors) and the branches (the latest results and schools) are important; and

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[15] Nevertheless, we agree with the opinion of Antal-Mokos (1990) that the separation of strategy and structure is fruitful in practice. Corporate managers can analyze which component should be modified or they can separately elaborate the stages of the development of the strategy (for example, planning, implementation, and communication). However, in a quickly changing environment the development of an adequate structure can be expedient, which will then "create" the strategy. The reasons for and the nature of the differences between the deliberate and the realized strategy can also be examined as well as the steps necessary to harmonize them.

both of the two “main branches” of the “tree” (prescriptive and descriptive schools) are important and essential to describe and develop reality.

Accordingly, our research is linked to both schools of thought; to determine the types of corporate environmental strategies, we have analyzed the realized strategies (more exactly, their consequences), wherea the relationship between the deliberate and realized corporate strategies have been examined by comparing the explicit strategy and the realized behavior.

Realized strategy contains a certain part of the deliberate strategy components as well as unintended components – and in certain cases the latter ones are dominating. It is characteristic of the deliberate and the realized corporate strategy that “some kind of realized strategy can be found in all organizational operations [but] not all businesses have strategic plans or strategic objectives developed and discussed previously at least at top management level, which would be a ‘deliberate strategy’” (Antal-Mokos - Kovács, 1998, p. 23.). One of our research goals has been to present that in the field of environmental protection companies genarally do not follow a perfectly elaborated conception but, through a learning process, they continuously readjust the actions of the organization to the changing environment.[16]

The “logical incrementalism” of Quinn (1980) stresses the importance of learning. According to Quinn, companies do not follow strategies elaborated for the long-term but they try to solve the emerging problems continuously, through a set of reactive steps. Due to their cognitive limitations[17], managers are not able to foresee and plan all situations, therefore, it is also important to maintain, besides planning and analyzing,

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[16] All strategy theories, even the learning school, acknowledge the importance of the conception about the future. Although Mintzberg’s opinion about such a concept seems to vary from time to time, after all, he also seemes to recognize the inevitable existence of a certain preliminary concept about the future. However, there are serious debates between the authors as regards the extent to which the process of developing a concept about the future is formalized; how strongly the concept is elaborated; and to what extent the original concept remains the same over time. These issues result in different definitions of strategy.

[17] Logical incrementalism applies the notion of bounded rationality, however, according to Quinn, successful managers do not stop at the first satisfactory solution when they are considering possible decisions but they consciously generate and consider further alternatives (Quinn, 1980).

the organization's capability to respond to challenges flexibly. According to logical incrementalism, strategy is not simply a conception but an orientation developing through a learning process, as a result of interactions. Managers leading the strategic changes of large organizations do not follow the approaches described in the highly-formalized textbooks during long-range planning, goal-setting and strategy development. Instead, like artists, they combine formal analysis, behavioral methods, as well as power-related and political elements to develop a coherent, step-by-step process towards the final goal, which is broadly defined but continuously redefined as new information appears (Quinn, 1980). This integrating method is called "logical incrementalism".

Kapás (1998) suggests that Quinn considers "the chain of reactive steps as strategy in which process learning and the maneuvres of management play an important role" (p. 51.).

Henry Mintzberg represents, to a certain extent, different points of view in his works regarding the role that planning and learning plays in the formation of strategy. Certainly, Mintzberg does not consider strategic planning as a panacea; moreover, he thinks that the expression "strategic planning" itself is self-contradictory.[18] In his opinion strategy (that is, the route to be followed by the company) cannot be planned at the desk since future cannot be foreseen. For a company the strategy is a kind of initial *conception* regarding the tasks of the organization, which should be operationalized later on (and over time the original strategic conception is continuously changing); on the other hand, the *behavior* of the organization should be considered as strategy, too. Thus, two things are mixed in the strategy definition of Mintzberg: "conception" and "action", though the emphasis is on action. As regards the conceptional nature of the strategy, according to Mintzberg, strategy is a preliminary conception in whose elaboration not planning but intuition plays the decisive role. Mintzberg suggests that the changes of market demand, the behavior of competitors, and technical development, in short, the future, cannot be planned, therefore, planning does not play a role in strategy making but it does play a part in

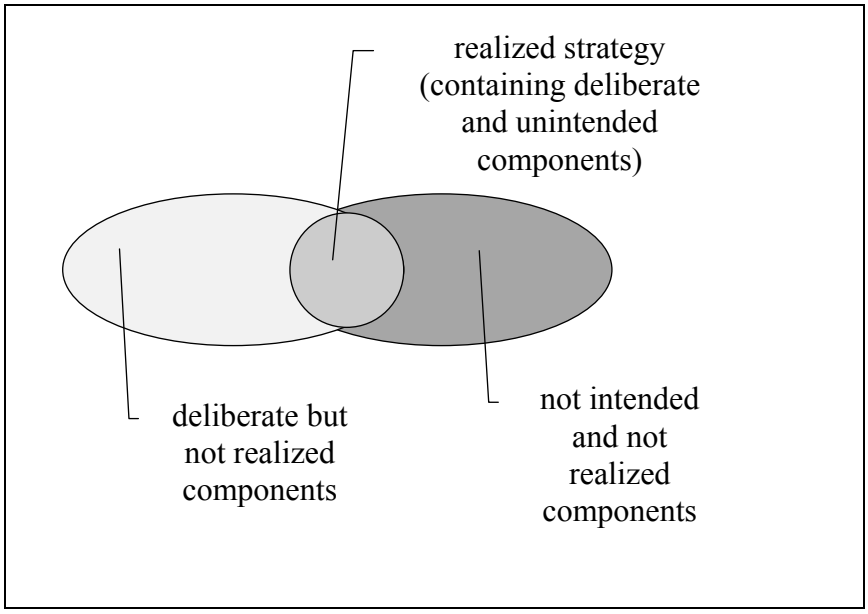
[18] Mintzberg recommends the use of the expression "strategic programming" instead of "strategic planning" since the former would show that planning means the translation of strategy to programs.

converting strategy into concrete action programs and budget appropriations. Strategy itself cannot be developed and planned by formal methods since strategy should be modified according to the changes of the circumstances (Mintzberg, 1996a, 1996b; Vogl, 1999). Mintzberg, who sometimes completely refuses the idea that the future can be planned, contradicts many other researchers (for example, Barakonyi, Dobák, Chikán, Porter, Lorange, Varsányi) who think that companies possess the capability of strategic planning, moreover, this activity is not just possible but vital. Even Mintzberg himself admits in a few instances (for example, Mintzberg, 1987a; Mintzberg-Lampel, 1998) that several valid strategy definitions, among them planning, may exist – though he seems to stick to the definition of "strategy as action". In my opinion the future of companiew can be planned to a certain extent and there is "only" one thing in which researchers do not agree – to what extent. By transforming it, one may paraphrase here the famous saying of Ogilvy on advertisement costs: a certain part of the efforts aiming at planning the future is futile, we just do not know which part.

As regards "strategy as action", Mintzberg suggests that corporate strategy is practically the same as the actions of organizations. Every company has its own unique behavior, this guarantees the survival of the organization, thus, behavior corresponds to a "niche" in the organizational habitat (Mintzberg, 1987a). Mintzberg distinguishes *deliberate* and *realized* strategies. The realized strategy of an organization never corresponds to the planned, preliminary strategy of the organization; strategy always occurs as a mixture of planned and spontaneous components (Mintzberg-Waters, 1985).[19] Not all of the components of the deliberate strategy gets realized and the realized strategy contains also components not included in the deliberate strategy (Antal-Mokos - Kovács, 1998; Kapás, 1998; Mintzberg-Waters, 1985; Quinn et al., 1988; Vogl, 1999). This is illustrated in Figure 3 and Figure 4.

[19] In order to demonstrate this, Mintzberg applies the following method: „When I ask ... executives, I give them three choices: One, were the intended strategies they set forth five years ago realized perfectly? If they say *Yes*, suspect their honesty. Two, did what they realized as strategies have nothing to do with what they intended? If *Yes*, suspect their behavior. Choice No. 3 is a little bit of both. I've found that, in any executive group, nobody says zero percent and nobody says 100 percent. Everybody say somewhere in between." (Vogl, 1999, p. 39.)

Figure 3: The content of realized strategy

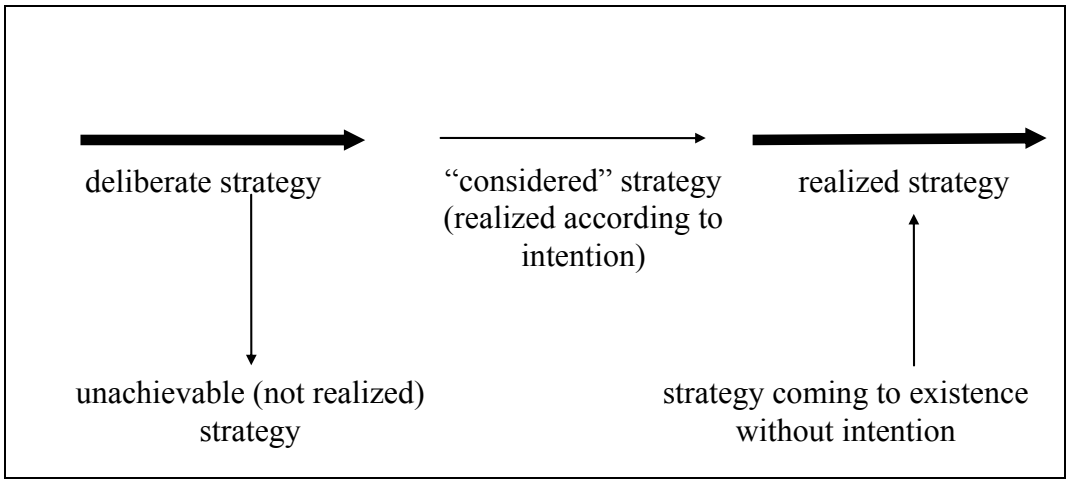


Antal-Mokos (1990) characterizes realized strategy in the following way: "Some kind of realized strategy can be found in all organizational operations [but] not all businesses have strategic plans or strategic objectives developed and discussed previously at least at top management level ... In the absence, or even in spite of [a pre-developed concept by management], the actual, 'realized' strategy of the organization, which can be recognized ex post, may evolve" (p. 6.). In other words, an organization follows a strategy, even if there is no formal evidence of this.[20] If we observe the behavior of an organization, then the pattern, which becomes visible, may reveal what kind of strategy the organization follows. As seen earlier, if we illustrate the "strategy as action" approach by an ecological metaphor, Mintzberg (1987a) regards strategy as a "niche" occupied in the organizational habitat. This is apparently the consequence of the fact that Mintzberg defines strategy as a series of *actions*, which results in the fact

[20] Mintzberg also in this regard opposes the approaches that overestimate the importance of planning. It must be noted, however, that in the skirmishes against the omnipotence of planning he does not hesitate to exaggerate, which sometimes means a total rejection of planning. Mintzberg does not regard his own exaggerations as problematic; he claims the danger of "too much learning at the expense of planning ... continues to remain remote" (Mintzberg, 1996b, p. 99.).

that a particular behavioral pattern (strategy, in Mintzbergian terms) can be considered as a niche in the set of the infinite number of possible strategies (niches).[21]

Figure 4**: The process of the evolution of realized strategy**



Source: Antal-Mokos (1990) p. 6.

"Considered strategy" is that part of "deliberate strategy" which is implemented according to the preliminary conception. It is important to see that here strategy is interpreted as action not as a conception, that is why the notion of "unintentional strategy" (namely behavior) may exist in this context.

Mintzberg (1979) analyzes the different methods of strategy making, in other words, the processes through which strategy comes to existence. Mintzberg "partly detaches from the fundamental question of the strategy-structure relationship [, in his conception] it is not structure that should be adjusted to strategy but the structure and other features of an organization should be formed so that it enables the organization to develop and implement the appropriate strategy" (Antal-Mokos, 1990, p. 12.). It must be noted that, recently, Mintzberg has been close to stress only the requirement that a structure should be developed that promotes the evolution of the strategy

[21] This strategy definition may be difficult to understand because it handles two different concepts as identical. The two notions are, on the one hand, niche, which is a quasi-static notion relatively well confined in time and space, on the other hand, strategy (interpreted as action), which is a process. Nevertheless, this definition entirely corresponds with the strategy definition of Mintzberg.

providing adaptation[22], in other words, he has not focused on the content of the strategy but on the way of its development.

Mintzberg, it seems, stands for organizational learning and spontaneity instead of planning. He considers the realized behavior of any organization as "realized strategy". Although he emphasizes the importance of planning in his writings, in fact he argues for a continuous, learning-based strategy, which he considers as reality-based and manageable. He does not conceal his indignation when he mentions the authors elaborating strategies on the top of a desk, often deatched from reality, and possibly bringing organizations to ruin (Mintzberg, 1996a, 1996b). Though he claims that planning and learning are of equal importance, his message in some of his works can be summarized as follows: "Be open to learning and never let yourself deceived by formalized analytical techniques".

In several instances Mintzberg cites the example of Honda's strategy[23] (the company did not prepare a preliminary strategic conception but examined the market demand and reacted accordingly). However, Mintzberg's example provides only a functional explanation for the nature of corporate strategy. Functional explanations "deduct the cause of a phenomenon from the phenomnenon's consequences ... Functional explanations are incapable of explaining why not such institutional solutions have been developed which are different from the actually realized ones" (Kieser, 1995, p. 30.). When describing a phenomenon, functional explanations are unable to provide experiences that could be generalized. For example, if phenomenon "B" assists in solving problem "A", that still does not automatically mean that "B" was created in order to solve problem "A". There may have been other reasons for "B"s coming to existence, therefore, we cannot deduct backwards, to find the reasons why "B" has evolved. Besides not knowing whether "A" will automatically result in "B", we do not know either whether "A" has played at all a role in "B"s coming to existence. A third problem is that we do not know why exactly "B" (and not another theoretically possible phenomenon) has occurred in the case of the existence of "A".

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[22] Besides organizational structure, the other source of organizational processes is the system of human relationships, for example, organizational culture and learning processes.

[23] Mintzberg (1987a), (1996a), (1996b).

Mintzberg's example on the strategy of Honda is such a functional explanation; nothing ensures that in the same situation other companies would or should behave (that is, learn) in the same way. Furthermore, the example does not disclose whether similar reactions of other companies would be successful in the market. This example demonstrates only that Honda did well that the company had learned. However, we are not even able to foresee what Honda would do in another type of situation. Certainly, the company would learn and from that fact we can draw a general conclusion – every company should learn. However, this statement does not refer to the content of the desired behavior but only to the way of the behavior, therefore the statement cannot be taken as a recommendation of strategic nature. This is like the instruction of a physician telling his patient: "If you want to live for a long time, take care of your health" – without advising the patient what to do.

The argumentation of Kieser (1995) serves to save the validity of functional explanations; one should consider these explanations as "containing the tendency of the evolution of certain situations, of a phenomenon or of an institution" (p. 33.). In other words, a statement is made that "in a particular situation the given developments have occurred". This is not a very attractive prospect for scientific research. A certain kind of solution may be the standpoint that functional explanations "do not want to give comprehensive causal explanations since that is totally impossible" (Kieser, 1995, 35. o.), thus, the analysis does not have the task to point out regularities but to map a system's possibilities for variations. This kind of analysis "largely helps to understand the functions, the impact mechanisms of social systems even if the analysis does not want, and is not able, to provide an entire causal analysis." (ibid. p. 36.) In this case, the aim of functional analysis is to map the equi-functional solutions for the actors in a given situation, in other words, to reveal the equally applicable solutions. Nevertheless, this latter definition of functional explanation also requires the identification of the contents of possible actions (for example, strategy = positioning, formal planning etc.), not only its method (namely strategy = learning). In a sense, our research provides a functional analysis in that we identify environmental strategies developed in certain situations and we deduct from their evolution to the initial circumstances. However, our investigation is more than a functional analysis since we have taken into account and used the strategy types defined as the result of earlier research works.

In the organizations the adequate ratio of planning and learning should be ensured. Mintzberg stands for learning and fights for his standpoint because he has seen what happened, when the scooter industry "had been invaded by hordes of management consultants. When these experts had doctored the industry, the large volume scooter market had disappeared." (Hopwood, 1981, p. 181.; quotes: Mintzberg, 1996b, p. 97.). At the same time we also have to see the real danger, namely that "Mintzberg may claim that his prejudices are necessary to counter the prejudice of others in favor of the planning school. ... But there is equal danger in going too far in the other direction" (Goold, 1996, p. 94.).

In this research we apply Mintzberg's "realized strategy" concept. In the determination of the corporate strategy, first of all, we would like to know what directions organizations follow in practice. In the course of this analyis it is not important whether planning is necessary for developing the strategy but the fact that the actions of a company informs us about the organization's strategy regardless of corporate behavior being based on planning or not. However, we do not use the broadly defined (thus, for us, useless) statement, suggested by Mintzberg, that strategy is equal to learning.

The strategy typology of Porter provides a clear framework[24] for strategic analysis (Porter, 1980, 1993; Marcus, 1996). The spread of his model reinforced the view that companies have to choose between given strategy types. The given types can be not only the cost-leader, the differentiating and the focusing strategies defined by Porter but also other varieties may emerge (see, for example, Miller, 1986). The important fact for us is that, according to this approach, there exist given strategy types. The existence of such types is relevant in the case of a certain approach towards strategy, namely, when one defines strategy as a pre-composed concept. As we have seen earlier, this is not the only possible strategy definition. Mintzberg provides five different definitions of strategy that do not refer to the different components of strategy but rather to strategy's multi-layer nature (Mintzberg, 1987a). In other words, unlike the 4P concept of marketing, the five different types of strategies do not describe the

[24] However, many times that is an oversimplifying model, which may lead to the formation of an unrealistic strategy (Mintzberg, 1996a, 1996b).

individual components of strategy but they provide possible different interpretations of strategy. Strategy can be interpreted as a plan, a ploy, a pattern, a position or a perspective[25]. According to this view, the Porterian model (strategy = positioning) is only one of the possible strategy approaches. Therefore, the typologies based on the Porterian strategy concept represent a certain approach but there are other strategy interpretations, too.

As we have seen, according to Mintzberg, strategy can be defined as plan, pattern, position, perspective and ploy. If we interpret strategy as the actions of an organization (which is the essence of Mintzberg's approach), then, *per definitionem*, ploy is a strategy, not to mention such actions that start as tactical ones and then prove to be of strategic importance (Mintzberg, 1987a). However, one should be careful not to render the notion of strategy pointless by the expansion of the meaning of strategy. We can consider all actions of an organization as strategic manifestation but then we may easily end up saying that anything an organization does is strategy. If all organizational phenomena count as strategic, then the notion of strategy itself will vanish in the end since nobody can differentiate between strategy and other organizational phenomena such as structure or culture any more. Porter (1997) also opposes the excessive expansion of the notion of strategy: " If strategy is stretched to include employees and organizational arrangements, it becomes virtually everything a company does or consists of. Not only does this complicate matters, but it obscures the chain of causality that runs from competitive environment to position to activities to employee skills and organization." (p. 162.) But Mintzberg and Lampel (1998) defend the expanded interpretation of strategy: " why can't strategy be 'everything a company does or consists of'? Is that not strategy as perspective – in contrast to position? And why must there be such a chain of causality, let alone one that runs in a single direction?" (p. 26.)

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[25] Mintzberg (1987c) refers to this as the 5P concept of strategy theory. The importance of pattern shows up among Mintzberg's five strategy interpretations. Although the author presents all the five approaches as relevant strategy definitions his writings reveal that he considers pattern as the realistic definition. One can explore the pattern within the behavior of an organization by examinig the history of the organization.

Both Mintzberg's and Porter's points of view contain true components but both of them are prone to exaggerate concerning his own truth as well as ignore the true elements of the other view. Regarding Mintzberg's point of view, it can be said that perspective is really of key importance part of strategy but it does not give all the actions of the organizational members a strategic feature (in certain cases corporate perspective has nothing in common with the individual actions of members). Continuous learning within the organization is a necessary but not a sufficient condition of the long-term survival of the organization. As regards Porter's view, positioning can orient a company but only in the case, if the organization has a non-formalized, preliminary perspective and organizational members are willing to take efforts to implement it; positioning has a sense, if the changes of the environment of companies can be foreseen to a certain extent. As regards the content of strategy, the integration of the Mintzbergian and Porterian views approximate reality. The range of possible strategies is not limited to just a couple of strategy types (as Porter suggests) but there are several other possibilities to choose from. However, on the other hand, not all organizational actions can be considered as of strategic importance (as opposed to Mintzberg's opinion). Similiarly to the elephant in the parable, the five definitions given by Mintzberg simultaneously match strategy but none of them alone is suitable for the overall description of strategy.[26] Our research, as a mixture of the two different strategy approaches, is based on the following hypothesis: there exist strategy types (groups of strategies) in the field of corporate environmental protection and those types can be identified from corporate actions and from environmental performance but one cannot attach prefabricated "labels" to the strategy groups. In our analyses we have examined the interrelationships between environmental protection activities, fundamental organizational features and environmental performance. Contingency approach has provided the theoretical background for such an analysis. This theory highlights, besides organizational structure, environment and behavior, the connection between corporate strategy and performance. Through these examinations we have determined the realized environmental strategy types as well as the interrelations of

[26] Antal-Mokos (1990) also comes to the same conclusion by examining the different strategy theories from other dimensions.

strategy and environmental performance in manufacturing companies of the statistical sample.

6. The organization theory background of the examination of environmental strategies

6.1 Contingency approach

During the examination of corporate environmental strategies we have relied on certain interrelations of the process model[27] developed from contingency approach. We are examining the following components of the contingency approach: natural, economic and social environment; certain forms of the inter-organizational relationships; characteristics of organizational members; scope of activity; company size; technology; certain elements of organizational structure (environmental management); strategy; environmental performance. We do not apply the original contingency model, which seeks to reveal deterministic interrelations between organizational structure and organizational conditions, but rather we investigate the strategy-performance correspondence, which has been clarified by the refining of the theory.

Contingency approach was developed at the beginning of 1970s after the failure of the prescription-like solutions provided by the "management by..." organization theories prevailing in the 1950-60s. The theory examined the relationship between the conditions (contingencies) of operation and the organizational structure.[28] Three kinds of one-factor models were developed that examined the structure-shaping effect of environmental features[29], technology and organization size. Multifactorial models were also developed which analyzed, for example, the joint effect of environment and size of the organization on businesses. The initial models pursued to reveal a deterministic relationship between corporate structure and the contingencies (Woodward, 1958; Burns-Stalker, 1961; Lawrence-Lorsch, 1969).

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[27] The complete model tries to explain the interrelations of environment - strategy - structure - behavior - performance.

[28] Contingencies altogether are also referred to as the context of organizations.

[29] Environmental features are changeability, complexity, and limiting factors.

The great achievement of contingency approach is that the theory gave up "universal" organizational-management formulae and tried to demonstrate that under different conditions different organizational structures may be viable and necessary. Later the critics of contingency approach pointed out the shortcomings and weaknesses of the theory. One of those weaknesses is that the original version of contingency approach mechanically interprets the contingency – organization relation: it does not take into account that organizations always have certain opportunities to choose from alternatives (Schreyögg, 1980, 1982). In other words, the relationship between the contingencies and organizational structure is not deterministic. A further criticism claimed that the approach applied a static organizational image, the theory did not deal enough with change, however, besides structure, the examination of processes would also be necessary. The approach does not examine the impact of power relations (Croizer - Friedberg, 1980; Wood, 1979; on the importance of the power relations see Balaton, 1988); the role of the individual is irrelevant (Schreyögg, 1980); the theory examines cause-and effect relations only with quantitative methods.[30]

A part of the criticisms, namely the rejection of the existence of a deterministic relationship shook contingency approach fundamentally, therefore, many researchers turned away from it (Schreyögg, 1980, 1982). Donaldson (1982), however, defends it by saying the approach does not become useless by rejecting the existence of deterministic and unambiguous causal relationships. According to this point of view, the approach can be capable of explaining organizational phenomena through integrating new aspects (for example strategy, organizational behavior, and manifold relationships). According to Schreyögg (1982), however, the essence of contingency theory is the search for deterministic interrelations between contingencies and organizational features. He claims the approach looks for rules similar to those in natural sciences to explain the development of organizational structures (viz. in the case of certain contingencies a given type of organization will develop). Furthermore, he suggests, the theory does not acknowledge the possibility of functional equivalents, in other words, the possibility for different organizational solutions under the same contingencies. This kind of approach does not allow for organizations to deviate in the

[30] See Kieser (1995) for further critical remarks.

long run from the one and only organizational form adequate in a given situation. Mintzberg and Lampel (1998) classify (among other things) contingency approach under the label of the "environmental school". They also consider the environmental school as deterministic, therfore, they regard it as of small importance. According to Mintzberg, the science of strategic management examines "how the organizations use their degree of freedom to maneuver in their environment" (p. 25.). The authors consider the environmental school important only in that "it indicates the importance of the environmental demands" (ibid.).

On the contrary, Donaldson (1982) argues like this: according to the contingency approach an organization really should match the given context but the organization is able to achieve that match through more than one organization type. The goal is to developm an organization type that is located in an appropriate range of match. Accepting this view the following problems arise: if this range is too broad the theory becomes meaningless (we have also pointed out a similar danger at Mintzberg's expansion of the strategy definition). However, if the range defined by the theroy is too narrow, then even such organizational solutions can develop in practice, which were not forecast by the theory, which shows the uselessness of the theory again (Schreyögg, 1982).

This research does not aim at deciding whether or not the contingency approach is able to define the abovementioned range.[31] For us it is important that the contingency approach draws our attention to the significance of the accommodation to the environmental and other conditions, and that the theory dismisses the approach that only one correct management method exists for all companies.

The contemporary version of contingency theory focusing on the connections between environment – strategy – organization – behavior – performance has been developed in debates by recognizing emerged fresh points and interrelations. According to this model, the efficiency of organizations depends on the following

[31] Certainly, the contingency approach rightly makes statements like this: diversification and divisional organization structure generally appeaar together (Balaton - Tari, 1996); in static (non-dynamic) industries mechanic organizations can function well (the possibility of cost-reducing strategy); in dynamic industries innovation-supporting strategy and structure provide advantages etc. Thus, certain tendencies, regularities can be discovered but these are not scientific laws.

factors: structure, match of processes, management principles and methods, and the existence of a supportive culture. In accordance with the core idea of the contingency approach, these factors "largely depend on the environmental conditions and on corporate capabilities that can be considered as stable in the long run. ... For practice this approach suggests that in the establishment or transformation of an organization one cannot abstract from those concrete conditions among which the given organization operates; a management and organizational solution that is successful among certain conditions can be totally inadequate among other conditions." (Dobák et al., 1996, pp. 23-24.)[32] According to the new version of the theory, contingencies can be changed in the long run, therefore, the organizational context does not determine the companies but assigns tendencies for them.

The different types of contingencies can be modified to different extent. "For the organizations the environment is the least changeable factor (particularly if the organization is not a monopoly, the market has many actors and/or the managers are weak to enforce corporate interests against the external environment). Changing the capabilities of a company in the short run is not easy either but the majority of these factors can be modified in the medium run (size can be increased or reduced, new technology can be applied etc.). The basic activities (scope of activity) of an organization can be considered as given in a certain moment but the modification or changing of this factor stands often in the center of strategies (particularly in those of competitive strategies)" (Dobák et al., 1996, p. 26.).[33]

On the basis of the contingency approach, Dobák et al. (1996) consider the interactions of the following factors as important: 1. environment (for example market, scientific-technical environment, cultural environment, and inter-organizational

[32] Even in the case of single organization units or functional activities different contingencies may be the most important ones.

[33] For example, the measures known as "low-hanging fruits" in the literature of cleaner production (for instance, the careful handling of materials) as well as the the fruits that can be "picked" in a more difficult way (viz. the more significant change in technology and raw material) can be integrated into the basic operational tasks.

relationships)[34]; 2. characteristics of organizational members (for example expertise, management philosophies, disposition to communicate); 3. nature of the basic tasks of the organization (for example, scope of activity); and 4. capabilities of the company (for example, size, technology, origin, resources, and organizational structure). On the basis of these four factor groups – whose interactions we have also examined in our research – are formulated the relevant decision criteria and later on the strategy. Due to the constant interactions of strategy, structure, corporate operation, and the environment the development of the strategy and other factors is continuous.[35]

In spite of, and thanks to, the numerous criticisms the contingency approach has enriched organization theory with useful aspects and today it is often referred to by researchers (Antal-Mokos-Kovács, 1998; Bakacsi et al., 1991; Dobák et al., 1996). "Strategy cannot be interpreted without environment, strategy gains reason in the relation of the company and its environment. The strategic objectives representing the deliberate strategy express the positions to be achieved in the environment (in relation to customers, competitors, state etc.); strategic decisions aim at influencing the relationship with the environment; the strategic types of organizations differ according to their method of accommodation to the environment etc. Strategy means the relationship of a company with its environment. This relationship is based on intention. It is not 'neutral', not without an orientation . The environment influences the orientation of the strategy; strategy represents a will to form and to influence the organization's position in the environment. The feedback from the environment modifies the strategy making process" (Antal-Mokos, 1990, pp. 6-7.). Thus, the contingency approach stresses the interaction between the organization and the environment as well as the importance of the accommodation to the environment. Our

[34] It is remarkable that the impacts of the political and natural environments are missing from the list unless the authors include such pressures into the cultural environment. However, even in that case the physical limits originating from the scarcity of environmental resources are missing from the model.

[35] Obviously, this does not mean that, for example, strategy changes every day profoundly but that the above mentioned process does not occur once but strategy is continuously forming in the permanent interactions and feedback mechanisms.

research has utilized these two findings when it examined the concrete answers of companies to environmental challenges.

6.2 Environmental strategy types in the management literature and their relevance in developing an environmental strategy typology

Our research aimed at examining the environmental strategies of Hungarian manufacturing industry companies: we wanted to map what types of environmental strategies exist in the examined corporate sample. In the course of the research out of Mintzberg's strategy approaches (deliberate and realized) we laid stress on the realized one. This means that in mapping corporate environmental strategies, in the first round, we did not examine the appearing formal strategic objectives but we focused on corporate behavior and on that basis we tried to determine the strategies of the organizations.[36]

One group of theories dealing with environmental strategy (for example Petulla, 1987; Brockhoff et al., 1999) seems to be based on the principle that, to survive in the long run, all companies have to follow a path leading to "environmental excellence"[37] (comp. Csutora, 1999). The theories as well as the empirical researches of Roome (1992), Walley and Whitehead (1994), Kerekes et al. (1996) and Csutora (1999), however, show that, in certain situations, the strategy of merely complying with environmental laws is enough for companies to survive. Therefore, it is not necessary for all companies to follow a general "development curve"[38] to stay alive in the market. In an organization it is worth elaborating an environmental strategy that corresponds with the organization's circumstances, for example, the risks and the opportunities associated with environmental protection.

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[36] Our research is not historic but an analysis taking a "snapshots" of industrial samples. The historic examination is the task of further researches of which this research can be a starting-point.

[37] Environmental excellence includes going beyond compliance with environmental laws, striving for pollution prevention instead of using end-of-pipe technologies, anticipation of future environmental challenges, innovation, and participation in voluntary environmental agreements.

[38] This development curve ranges from the "neglecting environmental polluter" type to the "highly environmentally aware" as well as "innovative" etc. types. Numerous such scales exist but almost all of them distinguishes between reactive and proactive behavior and highlight the necessity to develop from the former into the latter one.

The authors accepting the existence of several possible environmental strategies identify the following strategy types (Table 1).

Table 1: Environmental strategy types in the management literature

Authors	Roome (1992)	Steger (1993)	Kerekes et al. (1996)	Azzone et al. (1997)	Boda-Pataki (1997)	Brockhoff et al. (1999)
Factors determining strategies	Risks, opportunities, state environmental policy, corporate limits and management skills	Risks and opportunities	Endogenous and exogenous risks	Corporate environmental culture; environmental skills; strategic orientation; infrastructure	Risks and opportunities	Reaction to regulations; utilization of new markets; abandonment of the current activity; preparation for new regulations
Strategy types	Not complying with regulations, indifferent or resistant	Indifferent	Reactive	Passive	Indifferent	Sleeping, escaping
	Defensive, complying with regulations	Defensive	Crisis preventing*	Reactive	Defensive	Defensive
	Offensive, going beyond compliance	Offensive	Proactive*	Anticipating green	Offensive	
	Financial and environmental excellence; leading innovative	Innovative	Environment of strategic importance	Innovative	Innovative	Activist

*The crisis preventing and the proactive strategies cannot be ranked related to each other. The former one should be applied in the case of "low endogenous and high exogenous risks", and the latter one in the case of "high exogenous and high endogenous risks".

By comparing the single strategy types it can be seen that in several instances identical categories (or at least similar ones) occur at several authors. This suggests that – though all companies react to the environmental challenges in its own way – "it makes sense to attempt to give a kind of ideal-typical classification of corporate environmental strategies" (Boda-Pataki, 1997). It is also true that the subjective judgment of researchers can also play an important role in naming the particular strategy types and in determining their content. Even the borders between strategies within the particular typologies are not always clear: "it is problematic how you define and measure the criteria along which you define groups of strategies. Certainly, the weighting of the criteria also affects to which group a researcher assigns a certain

company" (Kerekes-Szlávik, 1996, p. 205.). For instnace, if we give the "environmentalist" label to those companies that have strongly institutionalized environmental protection (they have an environmental division, an environmental policy, environmental programs, issue public environmental reports etc.), we will exclude the majority of small companies from the "environmentalist" category right from the start. The reason: due to their size, small businesses do not need many of the abovementioned, formal environmental institutions. Similarly, if we define "environmentalist" by certain criteria and smoe businesses happen to be good environmentalist but from other aspects, those companies will surely not qualify as "environmentalists" in our classification. This tendency is reinforced by the fact that the environmental strategy literature mainly focuses on large companies (see for more details: Csutora, 1999; Noci - Verganti (1999).

Table 1 compares the names of environmental strategy types. Besides the names it is worth comparing also the contents of the strategy types since they show certain similarities. In general the classifications contain the environmentally indifferent (or resisting) "strategy"; the strategy of mere compliance with the regulations; the strategy anticipating the challenges of the law and the market and responding to them to a certain extent; and, finally, the strategy of pioneering and environmental excellence.[39] Table 2 summarizes the different types and the characteristics of companies that apply them.

[39] The method of classifying environmental strategies into four types is attractive because the four categories of a 2x2 matrix are automatically gained at a two-dimension evaluation. Steger (1993) provides such a two-dimension evaluation by identifying environmental strategies, on the one hand, according to companies' opportunities due to environmental friendly products, and, on the othe hand, corporate environmental risks. In Hopfenbeck (1993) the basis of classification is the magnitude of the opportunities and threats. Kerekes-Szlávik (1996) as well as Kerekes et al. (1996) determine the environmental strategies to be followed on the basis on the endogenous and exogenous risks of companies.

Table 2: The characteristics of companies applying different environmental strategies

Strategy type		Corporate features*
1.	Roome (1992): *not complying regulations*	indifferent or resistant behavior; operation has low risks; little market opportunities for environmental protection; environmental demands are considered as temporary; no resources for environmental protection; lobbying against environmental regulations
	Steger (1993): one type of *defensive* strategy	risks are denied or underestimated, not complying with regulations
	Steger (1993): *indifferent*	low environmental risks, little environmental market opportunities; environmental protection is not a strategic issue
	Azzone et al.(1997): *passive*	little mobile resources; due to earlier developments they do not want fresh investments; mere compliance with the regulations; slowing down the development of environmental demands
	Brockhoff et al. (1999): *sleeping,* or *escaping*	low environmental risks and little environmental market opportunities; or company escaping from the threats to new markets
2.	Roome (1992): *complying with the regulations*	not more than complying with the regulations
	Winn-Roome (1993): *complying with the regulations*	complying with the regulations
	Steger (1993): another type of *defensive* strategy	complying with the regulations, end-of-pipe environmental protection methods
	Kerekes et al. (1996): *reactive*	low endogenous and exogenous risks, goal: complying with the regulations, environmental function is at the middle-level management
	Azzone et al. (1997): *reactive*	low operational risks, complying with the regulations, reacting the external expectations
	Brockhoff et al. (1999): *defensive*	strongest reaction to regulations, anticipating regulations

* A company can be characterized by several items separated by semicolon.

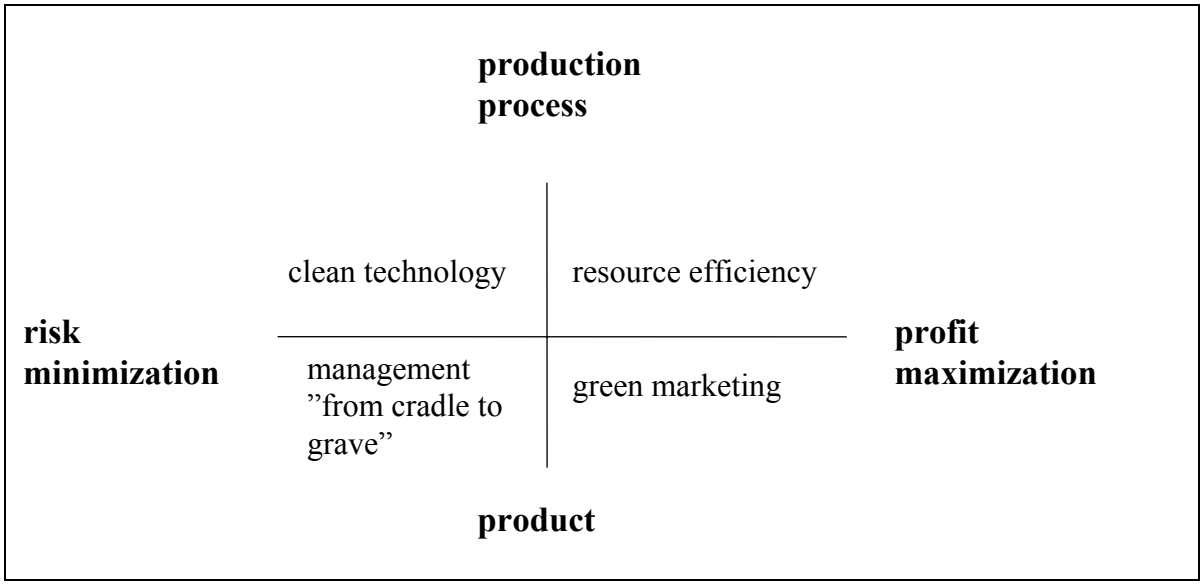
Table 2 (continued): The characteristics of companies applying different environmental strategies

Strategy type		Corporate features*
3.	Roome (1992): going *beyond regulatory compliance*	does more than required
	Winn-Roome (1993): *beyond compliance*	integration of environmental management into the corporate structure and systems
	Steger (1993): *offensive*	beyond compliance with regulations, environmental change in products and technology development, communicating the results toward external stakeholders
	Kerekes et al. (1996): *crisis preventing* or *proactive*	crisis preventing: communication toward external stakeholders, technological solutions to limit the pollution (which is small); proactive: anticipation and adjustment to environmental regulations, technology and public opinion
	Azzone et al. (1997): *anticipating green*	preparation for financial and environmental regulations, timed anticipation
	Brockhoff et al. (1999): *activist*	preparation for the regulations, new markets are important
4.	Roome (1992): *excellent* as well as *leader*	excellence from environmental and business aspects, environmental protection is a source of competitive advantage
	Winn-Roome (1993): *excellent*	excellence from environmental and business aspects
	Steger (1993): *innovative*	pursuit of fundamental changes in products and processes, environmental protection is a source of competitive advantage
	Kerekes et al. (1996): *strategic*	beyond compliance with regulations; environmental protection is at the level of strategic management; environmental protection is important not because of the regulations but because it is an a priori strategic objective
	Azzone et al. (1997): *innovative*	environmental innovation (new market, new technology) is a primary source of competitive advantage
	Brockhoff et al. (1999): *active*	integrated environmental concepts, taking into account the effects of product use

* A company can be characterized by several items separated by semicolon.

Companies belonging to the different strategy types cannot always be sharply separated. This is illustrated by Figure 5 that presents the characteristics of four different environmental strategies from four different points of view.

Figure 5: Environmental strategies based on risks and benefits linked with production as well as products



Source: Welford (1996), p. 20. (quoted by Boda-Pataki, 1997, p. 20.)

Figure 5 shows that environmental strategy categories cannot be sharply separated from each other. Based on the figure, the overlaps between the individual strategy types can be summarized as follows.

1. Certain interpretations of "clean technology" contain resource efficiency (for example, waste minimization, which means saving raw materials).
2. The expressions "cleaner production" and "cleaner technology" do not necessarily mean the same thing. The former is a broader category, which contains non-technological elements, too – cleaner production, however, is not included in the figure. The reason for this may be that this category contains both resource efficiency and the application of cleaner technologies, and, in a certain sense, even the lifecycle principle, which monitors the impacts of the products "from cradle to grave", can be considered as a part of cleaner production.
3. Not only risk minimization but also profit maximization can be the motive of cleaner production. It is important to know here that avoided damage or punishment are also included in the benefits.
4. The "from cradle to grave" principle takes into account not only the products but also the way of production; this is one of the essential goals of the principle.

5. “Green” marketing can also aim at risk minimization, namely, when a polluting company wishes to improve its corporate image. In this case the enterprise’s “green” advertisement will not necessarily inform the public about the products but about the company and its way of production.
6. The “from cradle to grave” approach should be an important component of industrial ecology. Industrial ecology, however, would also deeply affect the production system, thus, lifecycle analysis would refer not only to products.

According to the surveys, in corporate environmental protection the most important motivating factor is not market partners but regulations (comp. Csutora, 1999; Brockhoff et al., 1999). Besides ever stricter emission limit values and sanctions, “regulations” may also mean laws making environmental protection economical, or establishing the possibility of voluntary environmental agreements and flexible permitting system. Thus regulation contains both the threat by legal sanctions and the economic incentives (though the former one is much more frequent). The importance of regulations shows that the state plays a much stronger role in encouraging corporate environmental activities than the competitors, consumers or other stakeholder groups. According to the survey of Brockhoff et al. (1999) on American and German chemical industry, the largest companies are defensive in the field of environmental protection. The reason is that large companies have strong influence on the development of new regulations, furthermore, the sunk costs of established technologies and products are high at these companies. According to Kerekes-Szlávik (1996), Kerekes et al. (1996) and Csutora (1999), the employment of defensive strategy is not necessarily the indication of the underdevelopment of the company but it can also be the sign of the appropriate recognition of the situation (for example, because the risk of the company’s activity does not require serious environmental efforts).

In connection with Figure 5, we pointe out the overlaps among strategic directions and tools. Nevertheless, independently of this, the dominant environmental strategic direction can be demonstrated at a given company (comp. in general strategy context, Chikán, 1997 and Porter, 1993). The main goal of our research was to explore such kind of directions among the domestic companies. Beyond that we have also looked for an answer to the question what roles regulations and other factors (industry,

company size, technology etc.) may play in choosing a particular strategy, futhermore, we tried to map the linkages between overall corporate strategy and environmental strategy. We have assumed that regulations represent the number one environmental incentive for companies but we wanted to know how strong the pressure from different stakeholder groups and of economic motivations were (for example, in the employment of cleaner production) in forming corporate environmental protection. We summarize the results of our examinations in the following chapter.

7. Empirical research

7.1 Research methodology

A questionnaire survey was the basis of the empirical research that was conducted between January and May 1999 on the environmental activities of manufacturing industry companies (see the questionnaire in the Appendix). The examined strategic variables partly correspond to the variables examined in the international literature but, of course, the majority of our questions were aimed at the environmental situation of companies and the behavior deriving from that situation. In the field of organization research the linking of strategy typology and measuring environmental performance is in an initial state.[40] This research wanted, among other things, to serve the linking of these two scientific areas.

By following one of the main methods of domestic and international researches on strategy, we endeavored, with the help of factor and cluster analyses, to find patterns in the environmental behavior of the companies in the sample. Factor analysis served to determine the major components of environmental strategy types, and the goal of cluster analysis was to identify the strategic groups. The research essentially was not historic but the company interviews enabled us, to a certain extent, to make also time-based comparisons. The primary goal of making interviews was to examine the relationship between the deliberate and realized environmental strategies as well as to collect information on the relationship between the overall corporate strategy and the environmental strategy. A short questionnaire was the backbone of the interviews made with the managers of companies differing in size and in the industries in which they operate (the questionnaire can be found in the Appendix).

The real basis of the research, a 23-page questionnaire, was compiled on the basis of the experiences of international and domestic surveys. The questionnaire was put together and it was processed from basic statistical points of view by researchers, including the author, of the Department of Environmental Economics and Technology at the Budapest University of Economic Sciences. We have summarized the basic

[40] The work of Csutora (1999) can be evaluated as a significant step towards this direction.

statistical results in a study paper titled *The evaluation of the environmental performance of domestic companies* (Kerekes, Baranyi et al., 2000). For some basic statistical analyses of the present research (distribution by industries, correlations of certain variables etc.) certain tables and conclusions of the abovementioned study have been used, completing and developing them according to the requirements of strategy research. In the course of our research we examined the distribution of the companies by industry, size, ownership and other basic features; we mapped the frequency of different measures aiming at environmental management and cleaner production; and we examined certain relationships between the basic features (size, industry etc.) and the types of environmental measures. The nature of the questions also made it possible to conduct deeper analyses which, in the present case, means the empirical identification of the environmental strategies of the companies.[41]

Out of the questions of the questionnaire we used the following ones in this research:

- types of the organizational solutions aiming at environmental protection and the extent those solutions are widespread;
- measures aiming at reducing the environmental burden of production;
- the position of environmental protection within the organization;
- success in reaching environmental objectives;
- companies' perception of the environmental expectations of the society.

[41] The Appendix contains the statistical calculations of this chapter.

7.2 Basic features of the examined sample

We attempted to examine a sample that is representative by industry and company size, thus the sample was compiled with the help of the Central Statistical Office. The number of interviewed companies was 152. The sample is representative by industry, however, it is not entirely representative by size: larger companies are a bit over-represented compared to their real proportion, nevertheless, wood and paper industry, metallurgy and printing industry are representative by size, too. Due to the small number of companies from the printing industry in the sample, we have left out that industry from the analyses. From the point of view of activity, half of the companies produced for private consumption and another half for corporate and institutional use. Table 3 shows the distribution of the companies in the sample by industry as well as size expressed by the number of employed people.

Table 3: Number of companies by industry and by the number of employed people

Industry	Number of employed people			
	50-249	250-499	over 500	Altogether
food industry	16	6	7	29
wood and paper industry	7	2	0	9
textile industry	20	7	3	30
metallurgy	5	2	0	7
machinery	36	11	7	54
construction industry	5	0	1	6
chemical industry	9	3	3	15
printing industry	2	0	0	2
Altogether	100	31	21	152

Certain industry categories have been cretated by merging several industries. The categories contain the following industries:

- food industry: production of food and beverages;
- wood and paper industry: wood and paper processing; production of paper and paper products; furniture production and production of other manufacturing industry products;

- textile industry: production of textiles; production of clothes, fur finishing and dyeing; leather-finishing, production of leather products and footwear;
- metallurgy: metallurgy;
- machinery: production and reparation of machines and equipment; office machine and computer production; production and reparation of electronic machines and appliances; production and reparation of telecommunication products; production and reparation of mechanical and electronic instruments; production and reparation of other vehicles; production of metalworking;
- construction industry: construction industry, production of non-metallic mineral products;
- chemical industry: oil processing and coke production; production of chemical raw materials and products; production of rubber and plastic products;
- printing industry: edition and printing industry activities, copying of sound and image recording.

We will gain a very heterogeneous picture, if we analyze the sample by several basic features (industry; majority ownership; number of employees; characteristics of customers; market type; and environmental sensitivity of technology). Table 4 shows the characteristics of the sample.

Table 4: The basic features of the industries represented by the sample

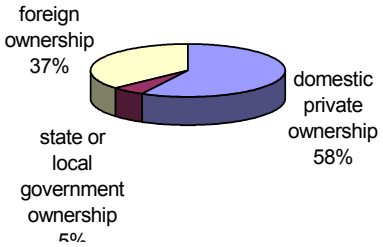
Industry	Majority ownership and the number of employed people	Customer features	Market	Sensitivity of technology
Food industry	Small companies are prevailing at both the foreign and the domestic ownership. At medium-size companies the foreign, at large companies the domestic ownership are characteristic in the sample.	The majority of the companies produce to private consumption.	Market is primarily domestic.	Technology is of dividing sensitivity at the most companies.
Wood and paper industry	All the foreign-owned companies are small, there are medium-size ones among the domestic companies.	The proportion is 50-50 between companies producing to private consumption and corporate further use.	Divided between the domestic and the EU markets.	Technology is of dividing or low sensitivity at the most companies.
Textile industry	Domestic-owned companies dominate, small companies are prevailing. Size is more divided at foreign-owned companies.	The proportion is 50-50 between companies producing to private consumption and corporate further use.	Companies produce primarily to the EU market, to private consumption. Corporate further use dominates at companies produce to domestic market.	Technology is not environmentally sensitive at the most company.

Industry	Majority ownership and the number of employed people	Customer features	Market	Sensitivity of technology
Metallurgy	No large company in the sample. The only foreign-owned company is small, domestic-owned are divided 50-50 between small and medium sized ones.	Companies produce only to corporate further use.	Divided between the domestic and the EU markets.	Technology is of dividing sensitivity at the most companies.
Machinery	50-50% of foreign and domestic majority ownership. At domestic ones the proportion of smaller companies is higher. At medium-sized companies foreign ownership is threefold.	The majority of the companies produce to corporate further use.	Divided between the domestic and the EU markets.	Similar proportion of non-sensitive, dividing and sensitive technologies.
Construction industry	The only large company is foreign-owned, the other ones are small.	Companies produce only to private consumption.	Divided between the domestic and the EU markets.	Similar proportion of non-sensitive, dividing and sensitive technologies.
Chemical industry	Companies with foreign majority ownership are divided by size; domestic ones are mainly small companies.	The proportion is 50-50 between companies producing to private consumption and corporate further use.	Market is primarily domestic, mainly with small companies. Medium-sized and large companies produce to EU market, too.	Similar proportion of non-sensitive, dividing and sensitive technologies.

Source: Kerekes, Baranyi et al. (2000), p. 12.

In the sample the domestic private ownership companies dominate (58%), the proportion of foreign majority ownership companies is also significant while the proportion of state majority ownership companies is very low. Figure 6 shows the division by ownership.

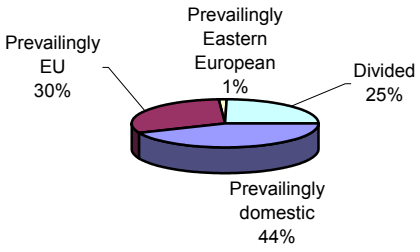
Figure 6: The division of companies by majority ownership (%)



The majority of the companies (44%) are orientated primarily towards the domestic market and the proportion of those who sell in the European Union is also significant (30%). The export market restructuring is well demonstrated by the fact that at the time of the survey the proportion of the companies oriented *primarily*

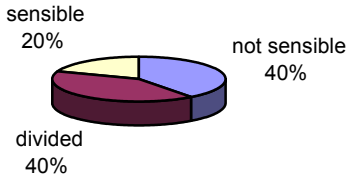
towards Eastern European markets was negligible, although this area is also a relevant sales market for the majority of the companies. Figure 7 demonstrates the market orientation of companies.

Figure 7: Market orientation of companies (% of companies)



We have asked the companies what proportion of their activity they consider as environmentally sensitive (i.e. as a possible source of danger to the environment)[42]. The answers tend towards "not sensitive" (see Figure 8).

Figure 8: Environmental sensitivity of technology (% of cases)



The result correspods with the results that demonstrate the environmental risk perception of companies: 43% of the companies do not perceive the impacts of risks

[42] The interpretation of the sensitivity categories is the following. *Not sensitive*: the majority of the applied technology is not environmentally sensitive. *Divided*: the applied technology is divided among "not environmentally sensitive", "moderately sensitive" and "sensitive" parts. *Sensitive*: the majority of the applied technology is environmentally sensitive.

deriving from technology and from the possibility of environmental accidents and the other respondents most often consider this risk as weak or average. (Only 3 companies considered the risks of the applied technology as high.) In the sample it is not possible to reveal obvious connections between the evaluation and handling of environmental risks and the internal and external environmental risk levels of companies. There are companies whose activities are characterized by high environmental risks as well as whose technology is sensitive environmentally and the companies do not care about the risks. Other companies claim they assess and handle their risks although their risk levels do not necessarily justify it.

7.3 The examination of major corporate factors determining environmental strategy

The coercive strength of the environmental regulations is one of the main incentives to the environmental activities of Hungarian companies. In this sense we might say: the environmental strategy of domestic companies is to comply with the regulations. The companies, however, can attempt to comply with the regulations through different measures. Such measures can be the application of some equipment to reduce the environmental burden, or the establishment of a central environmental division to monitor the regulations and to control the company from an environmental point of view. The environmental activities of the companies – depending on the nature of their activities, risks, and stakeholder groups – is heterogenous. It was assumable on the basis of literature that in the sample a part of the companies respond to the environmental challenges by reorganization, others focus on pollution prevention, and still others try to benefit from environmental challenges by producing environmental friendly products or by improving their corporate image.

In general the researches aiming at the environmental activities of companies try to map or typify either the environmental performance of the organizations or their environmental strategies. However, it is rare that the two areas are connected. The domestic exceptions, Kerekes et al. (1996), Boda-Pataki (1997), Pataki-Radácsi (1998) and Csutora (1999), aimed at the strategic responsiveness to environmental challenges as well as at the environmental orientation of companies (environmental innovation, "green" marketing, environmental management, measures of cleaner production etc.), however, the physical environmental performance of companies was not really examined. Our empirical research was aiming partly at this latter issue. The objectives of the research were the followings:

- to map the measure types of the companies in the sample with which they attempt to respond the environmental challenges;
- to identify the environmental strategies of the companies on the basis of the environmental measures and the environmental performance of the organizations;

- to characterize the relationship between the general corporate strategy and the environmental strategy as well as the deliberate and the realized environmental strategies.

In order to identify the environmental strategies we applied factor analysis to determine the major components affecting the environmental activities of the companies. After this we examined which factors are strong in the different corporate groups hereby identifying the various environmental strategy types. The identification of general corporate strategies occurs through the same method, on the basis of the basic features of the companies (domestic market share, product quality and other variables). The examination of the relationship between the general and the environmental strategies as well as the deliberate and the realized environmental strategies occurred through interviews and further questionnaires as well as corporate environmental reports.

7.3.1 The currency of environmental management elements

Basically, companies can attempt to protect environment in two ways: by applying environmental management elements as well as measures to reduce pollutants and wastes (comp. Boda-Pataki, 1997; Pataki-Radácsi, 1998; Csutora, 1999; Kerekes et al., 1999). In general it is expedient – on the basis of the needs of stakeholder groups affected by the technology, resources and activities of the company – to apply some combinations of the management elements and the measures aiming at a more environment friendly production (Csutora, 1999). The management elements create the framework for the environmental measures but they do not improve the environmental performance in physical terms by themselves. The continuity of the concrete measures (for example the reduction of the quantity or hazardousness of wastes) could be ensured by a management system that renders possible both the development and implementation of environmental programs. The researches of Kerekes et al. (1996) as well as of Csutora (1999) confirm the hypothesis that it is not necessary for every company to apply the different tools of environmental protection (for example environmental management system or pollution prevention) in the same proportions: it is expedient to adjust proportions to the environmental risks and market opportunities of the company.

At first our examination researched the currency of environmental management elements (in other words, the environmental institutionalism) among the companies in the sample. From the point of view of our research environmental management is very important since this tool can formally represent the importance of environmental protection for the corporate members and the social environment. In the course of the examination of the environmental management we examined the incidence of the following tools and their correlations to each other and to other corporate features:

- written environmental policy,
- measurable environmental objectives,
- programs to achieve the environmental objective,
- corporate environmental organization,
- environmental communication toward external stakeholder groups,

- environmental communication toward internal groups,
- environmental measures taken in the functional areas of the company.

Table 5 shows the presence of the concrete environmental management elements in the single industries. Besides the industry affiliation, the application of environmental management tools was affected by the company size, the environmental sensitivity of the corporate activity as well as the nature of majority ownership. The growth of the company size goes together with the growing number of almost all management variables. Environmental marketing is an interesting exception that is in connection with rather the sensitivity of technology. The higher level environmental management system of the larger companies are justified by the – above mentioned – more complex scope of activity and organizational structure as well as the larger capital, too. The environmental sensitivity of the activity generally also went with the larger number of the environmental management elements. The presence of environmental training, however, it seems, is not linked up with the sensitivity of technology. Nevertheless, in the course of the examination of the factors motivating environmental protection the answers showed that the environmental sensitivity of technology has no effect on the majority of the companies, while has up to medium-size effect on the remaining part (see Table 6). So either there is no cause-and-effect relation between the sensitivity of technology and the level of environmental management (for example because there is a third factor in the background that is responsible for the co-moving of the former two), or the respondents were inconsistent when they evaluated the environmental sensitivity of technology. Since it seems that environmental training is not linked up with the sensitivity of technology, it may be assumed that starting and maintaining the training depend on rather the environmental awareness of the managers and the owners. This statement is indirectly underpinned also by the fact that the foreign majority ownership companies generally employ more environmental management elements than the domestic ones. It can be – since the owners are usually Western European – the effect of the environmental culture of the parent companies as well as the capital value thereof.

Table 5: Employment of environmental management elements in the single industries

	Food industry	Wood and paper industry	Textile industry	Metallurgy	Machinery	Construction industry	Chemical industry
Environmental policy (written)	+	0	0	+	++	+++	+++
EMS (ISO 14001, EMAS)	0	0	0	0	+	0	+
Measurable environmental objectives	+++	++	0	++	+++	+	+++
Environmental program	++	+++	0	++	++	+++	+++
Development of environmental organization (kvf = person responsible for environment, kvo = environmental division)	+++ (kvf)	+++ (kvf)	++ (kvf)	+++ (kvf)	+++ (kvf)	+++ (kvf)	+++ (kvf+kvo)
Examination of suppliers	+	++	0	0	+	0	+
Assessment and handling of environmental risks	+	+++	0	0	+	+	+++
Environmental audit	+	++	0	+++	+	+	+++
Communication toward the general public (*= many companies organize it casually but few have it regularly)	++*	++*	+	+	++*	+	++*
Environmental marketing	++	+++	+	0	+	0	+++
Environmental training of top managers	+	+	0	++	+	+++	+++
Environmental training of employees	+	+++	0	+	+	+++	+++
Communication within the company (*=many companies organize it casually but few have it regularly)	+	+	0	0	+	+	++*

Source: Kerekes, Baranyi et al., (1999) p. 22.

Key: 0: prevailingly missing; +: in progress and realized altogether less than 50%; ++: in progress and realized altogether (or many in progress is but only few realized, they are marked by *) is about 50%; +++: in progress and realized altogether are prevailing

The companies in the sample perceive that only a few social groups (authorities, consumers, environmental activists, etc.) affected by their activities have influence on them to take environmental measures. More than half of the companies do not feel environmental pressure from most of the stakeholder groups. The strongest incentives are the authorities of Hungary and other target markets[43] as well as the legal regulation. Corporate managers and owners also had strong influence. Table 6 shows that the environmental sensitivity of technology (endogenous environmental risk) as well as the market opportunities of environmentally friendly products do not encourage corporate environmental protection in most cases; if so, their motivation force is medium at most. At the judgment of the motivation force of market expansion and market competition there are serious differences and many irrelevant answers. The received figures are contradictory since only eight companies stated that they had environment-related market opportunities. It seems to be contradictory to this mentioned "weightlessness" of environmentally friendly products that respondents considered the role of environmental protection as important in several cases in the competition for market positions and market expansion. The reason behind may be that companies interpret staying in market competition that they should prevent their outplacing from the market not by environmentally friendly products but through complying with the regulations. The strength of the factors encouraging cleaner production (for example saving opportunity deriving from material economization) and of the ethical motivation showed large variability.

An other question that examined the importance of stakeholder groups showed that companies scored the influence of the majority of the stakeholder groups (including competitors, consumers and employees) as weak in a scale of 1 to 5. The evaluation of the impact of the municipalitys and the environmental NGOs is divided about evenly on the scale. The role of authorities proved to be important. The

[43] It should be noted that the motivation force of the EU legislation proved to be important when we asked the about the importance thereof *in general*. However, when we asked the knowledge of concrete EU directives, it turned out that the respondent did not know the majority of them. It is feasible that companies often perceive the consequences of the EU environmental regulations but they do not know the concrete regulation is relevant. It is possible that companies interpret the valid EU legislation as a kind of "general threat".

companies in the sample protect the environment not by reason of the direct market or social pressure but the environmental regulation force them to do this, and the owners as well as the managers (who are the same people in the case of small companies)are the transmitters thereof. We cannot leave out the ethical commitment of the managers and the owners (responsibility for the environment as well as the future generations), on which company interviews threw light in many cases. The primary importance of the regulations is reinforced by that the monitoring of material and energy flows on the basis of accounting data is present at three-quarter of the companies since it is a legal requirement for them. 89% of responding companies took into account environmental aspects during their investments in the past five years; it is also not surprising since it is compulsory to conduct environmental impact assessment in case of new activities or significant modification of activities. The effect of all stakeholder groups proved to be stronger at the companies in the chemical industry, wood and paper industry, food industry and machinery. Beyond this, in a couple of cases the nationality of the manager and the belonging to a corporate group also had influence on the nature and frequency of the communication with the stakeholders. It seems that foreign managers pay more attention to the citizens' complaints, the press and they provide environmental information in the annual report. All this indicates an environmental strategy focusing on complying with the regulations and of reactive nature, which not necessarily means the weak viability of the companies in the market. Market viability – in terms of environmental protection – is decided on whether the corporate actions are in concordance with the environmental risks and opportunities of the organization.

Table 6: The strength of the effect of motivation factors [44]

No effect at the majority	Large variability pertaining to the strength of the effect	Prevailing "strong" and "very strong" effect
the residue scatters • proximity of sensitive area • fine reduction • improving corporate image • expectations of foreign parent company (many of	• market expansion opportunity • competition for market positions • proximity of urban area • savings from material and energy economization • saving waste handling costs • social, ecological responsibility	• Hungarian environmental requirements • environmental requirements in the target country • EU environmental requirements

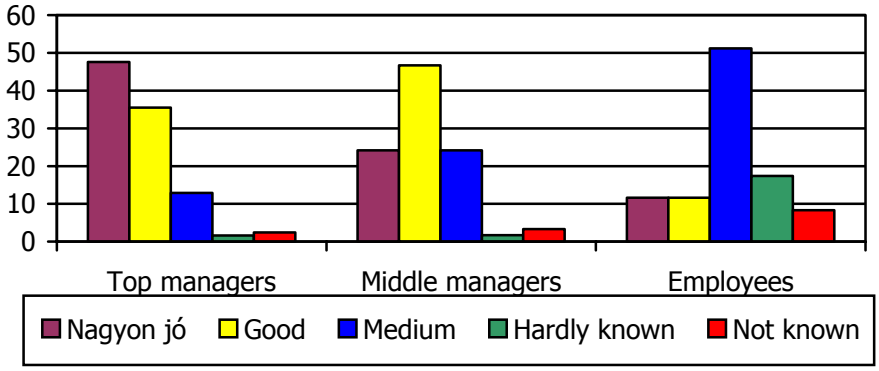
[44] We scored the effect of the motivation variables as it follows: 1: not felt, 2: weak, 3: medium, 4: strong, 5: very strong.

No effect at the majority	Large variability pertaining to the strength of the effect	Prevailing "strong" and "very strong" effect
them are irrelevant!) *many "weak" and "medium" effect at the residue* • proximity of school, hospital • risks deriving from technology • environmental accidents • sales of environmentally friendly product		

Source: Kerekes, Baranyi et al. (2000), p. 54.

According to the great majority of the respondents the top managers adequately know the corporate environmental objectives therefore more than half of the companies do not launch environmental training to them. On the contrary, the employees know the corporate environmental objectives much less and at least half of the companies try to deal with this information lack by training programs. The environmental training of top managers and employees did not increased significantly by increasing the number of employed. The internal corporate environmental communication is defective, too. The importance of training and internal communication proved to be an approach issue at the companies. The external communication is characterized by the fact that the companies – except for a couple ones – do not prepare public environmental reports, the publication of environmental policy is such a communication tool that was applied by only a couple of companies. A part of the companies regularly publish environmental information in the annual financial report. Figure 9 shows the currency of environmental objectives at the different hierarchy levels.

Figure 9: The currency of environmental objectives at the different hierarchy levels (%)



It is an important issue from the point of view of strategy research that the companies to what extent give evidence of environmental planning or any conscious environmental activities. The indicators of it in the area of environmental management: the written environmental policy, the measurable environmental objectives, programs for implementing environmental objectives as well as the existence of a manager / division responsible for environmental protection. Naturally, the high level of environmental management is more frequent at larger companies since these more complex operational and organizational structures require the hierarchical coordination of certain functions. So if we would like to measure environmental performance by the number of environmental management elements we have to know that this indicator is "biased" for large companies (Csutora, 1999). Nevertheless, in the framework of strategy research it is useful to review the frequency of the use of the single elements since for example the existence of the written environmental policy can be an indicator of strategic thinking at any rate. Table 7 shows the frequency of the environmental management tools applied by the companies in the sample.

Table 7: the frequency of the environmental management tools in the sample

Grouping aspects	Environmental management tools
Exists at the bigger part of the companies or in progress (generally about 50-50%)	• Measurable environmental objectives • Program to implement environmental objectives • Development of environmental organization (there is an environmental responsible person at the majority of companies)
Exists at the majority of the companies but only occasionally	• Communication with the general public
Does not exist at more than half (50-63%) of the companies	• Written environmental policy • Environmental training of top managers • Environmental training of employees • Environmental marketing • Evaluation and handling of environmental risks • Internal corporate environmental communication
Does not exist at the majority (over 70%) of the companies	• EMS (ISO 14001, EMAS) • Examination of suppliers in terms of environmental protection

Source: Kerekes, Baranyi et al. (2000), p. 16.

Written environmental policy does not exist at about two-third (61.8%) of the sample, in the case of 11.8% it is in progress and hardly over 25% indicated having written environmental policy. Even this proportion cannot be trusted since not all respondents understood or responded sincerely the question.[45] The lack of the standard environmental management systems was characteristic in the case of more than 70%. Still, the majority of the companies reported on measurable environmental objectives and the existence of programs implementing them. It suggests that the majority of the companies probably endeavor – even in lack of high level environmental management – to improve the physically measurable environmental performance. It is also possible, however, that "the measurable environmental objectives" are some kind of a posteriori quantified results in fact that were born by economic and not environmental reasons and it is also possible that the "programs" contain only several casual measures in fact.

According to the environmental policy as well as the measurable objectives and the cross-table analyses of the programs the measurable environmental objectives and programs occur in significantly more cases than their expected values, either the company has environmental policy or not. This – in accordance with the above

[45] There was such a respondent who said in 1999 and also in 2001 that they have written environmental policy and when we asked them to show the document they admitted that the written policy is under construction (that is true since the ISO 14001 environmental management system is going to be introduced in 2001).

mentioned – could mean two things: either it is not necessary to have a written environmental policy to apply the measurable environmental objectives and programs; or the measurable objectives and programs are not the results of a determined corporate policy, rational planning but casual measures. In the former case we can talk about environmentally aware corporate behavior (that is an "emerging" strategy by Mintzberg). The latter case, however, probably the "floundering" type of the reactive environmental strategies: "We do something but only if it is necessary".

It refers to the lack of really pre-quantified objectives that the monitoring of the material and energy flows (that is applied by more than three-quarters of the companies) only at the half of the companies is partly or entirely based on labor results and measurements (that is required for the exact control). 20% of the companies employ expert estimations in order to monitor the material and energy flows that obviously not result in exact account. More than three-quarter of the sample has no environmental organization, in about 5% of the cases it is in progress, in the case of 17% it exists. In the great majority of the cases the corporate environmental organization means the employment of an environmentally responsible person that is a legal requirement at the great majority of the companies so it is not the result of the autonomous initiative of the company. 94% of the companies do not have environmental division. It is surprising that the existence of the environmental division show a very weak, significant positive correlation with the company size (correlation coefficient: around 0.2 in the case of both the number of employees and the company size measured by revenue).

From the point of view of the environmental organization measures the obtained results may be inferred that the majority of the companies do not have environmental strategy that is based on the consideration of future and aiming at influencing the future but they try to stay in the market by focusing only on the current challenges. In other words, they do what is required by the regulations or perhaps by other stakeholder groups but they endeavor only to survive, they have no other perspective goals.

Table 8 shows the level (strength) of the environmental management in the single industries.[46] The level of the environmental management was defined by the number of "introduced", "in progress" and "not existing" elements. Environmental management is qualified as low level if the company has maximum three elements working as well as maximum six elements are in progress. The management of those companies received a medium qualification where 3-7 elements were working and/or more than six elements are in progress. Those managements received high level qualification where 7-13 elements were working. In terms of environmental management only the chemical industry proved to be excellent (47% of the respondents had high level, 33% medium level environmental management); this was followed by the wood and paper industry (with 22 and 56%). In the other industries medium level environmental management system was prevailing. The currency of the management elements is medium in the wood and paper industry and in the food industry as well as many elements are in progress. Half of the companies in the metallurgy, machinery and construction industry have only very few environmental management elements. Textile industry closes the rank where the low level of the environmental management is prevailing.

Table 8: Environmental management level in the single industries

Industry	Number of companies according to the environmental management level		
	low level	medium level	high level
Food industry	9 (31%)	18 (62.1%)	2 (6.9%)
Wood and paper industry	2 (22.2%)	5 (55.6%)	2 (22.2%)
Textile industry	25 (83.3%)	5 (16.7%)	0
Metallurgy	4 (57.1%)	3 (42.9)	0
Machinery	25 (46.3%)	21 (38.9%)	8 (14.8%)
Construction industry	3 (50%)	2 (33.3%)	1 (16.7%)
Chemical industry	3 (20%)	5 (33.3%)	7 (46.7%)

Source: Kerekes, Baranyi et al. (2000), p. 20.

We conducted a principle component analysis with the possible environmental management elements in order to define the most important factors determining the development of the variables. The following measures were included into the analysis:

- the existence of written environmental policy;

[46] We converted the code of the number of the applied, in progress and missing elements into a scale of 1-3 (= low level, medium level, high level environmental management).

- the application of a formal environmental management system (for example, ISO 14001, EMAS);
- there is a person responsible only for environmental protection in the top management;
- the existence of environmental organization;
- measurable environmental objectives;
- program for implementing the environmental objectives;
- the regular environmental audit of the company;
- examination of the behavior of the suppliers against the environment;
- public environmental report;
- environment-oriented marketing (environmentally friendly products, environmental labels, advertisements);
- environmental retraining for the employees;
- the evaluation and handling of environmental risks.

In the course of the factor analysis of these variables it turned that the measure types can be grouped around these major factors.[47]

1. *Environmental institutionalism*. Contains the existence of the written environmental policy, the development and operation of the environmental organization as well as the measurable environmental objectives and the environmental programs.

2. *Environmental approach*. This factor contained such components that showed the environmental commitment of the organization. We can find the following among the elements of the factor: there is a person responsible only for environmental protection in the top management[48]; the company conducts environmental audit by

[47] The factors explain 51.1% of the variance of the variables.

[48] We can think that the top manager responsible for only environmental protection is mainly characteristic of larger companies but it turned out that there is no correlation between the two variables.

internal and external experts; the company hold retraining for the employees dealing with environmental protection. As we could see it earlier, environmental training showed no connection with the sensitivity of the technology; it was the reason for the denomination of the factor.

3. Application of *environmental marketing* tools. In this factor only the correlation coefficient of marketing showed highly positive value. So this management tool is clearly separated from the other ones. The separation of marketing underpins such popular opinion that the environmental marketing activity does not necessarily go with the real improvement in environmental performance – at least in the area of environmental institutions.

7.3.2 The currency of the concrete, physical environmental measures

We defined concrete, physical environmental measures as such acts that are not of organizational (for example, management) nature but they somehow directly "materialize", for example they reduce the emission of air pollutants or install new material economizing equipment in the factory. One of the groups of concrete, physical measures aims at the reduction of environment-loading emissions, an other group aims at cleaner production. In order to measure the level of measures belonging to the first group we coded question G.1. (measures aiming at reduction of different pollutions, material economization, etc.) to a scale of 1-3 (1 = not existing, 2 = in progress, 3 = implemented).[49] By using this indicator, at almost two-third of the companies in the sample the measures aiming at reducing the loading of environment were frequent.

Out of the measures aiming at cleaner production we examined the application of the following: material and energy economization measures; presence of cleaner technologies; selection of wastes; substitution of raw materials by more environmentally friendly materials; external and internal waste utilization at the company; re-planning of processes and products. We re-coded the answers for the question G.8. on cleaner production from the original scale of 1-10 to 1-5 (and re-

[49] The answers "measure is not relevant" were coded as 1 (= "no such measure").

coding the "irrelevant" answers to 1), so we received a new indicator to all companies.[50] By measuring this the frequency of the measures aiming at cleaner production we found that 70% of the companies in the sample apply the tools of cleaner production to a small extent. If we take the original responses without re-coding[51] it is obvious that only 10% of the respondents gave himself/herself 48 or more points. 48 points could mean many measure combinations: for example out of its 15 measures the company applies three ones to maximal, one to medium, one to inperceptible extent, ten not at all. It is not a good phenomenon that 29.6% of the companies in the sample do not apply environmental equipment, the average age of the environmental equipment in use is 10-11years. At the same time it is encouraging that in 1998 about half (51.3%) of the companies realized some environmental investments.

Table 9 contains the results of the examination by industries. In the first column they are in sequence according to their currency and extent of their application. Those measures received 1 that was taken or applied to medium or large extent by at least two-third of the companies. Those measures got 2 that was taken or applied to medium or large extent by at least half of the companies. 3 is the score for those measures that occur in the case of less than half of the sample as well as this proportion of the sample apply the given measure to medium or large extent. 4 was given to those measures that were missing at three-quarter of the companies.

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[50] The indicator contains only 15 measures of environmental nature of G.8. question so does not include "risk parting" and "production translocation".

[51] In the case of the original answers the minimal score of a company is 15, which means that it does not apply any measures at all (all the 15 measures receive the lowest score, 1). The possible maximum score is 150 (viz. when the company applies all tools to the maximal extent).

Table 9: The incidence of cleaner production measures in the sample and in the single industries

	Measures	Food industry	Wood and paper industry	Textile industry	Metallurgy	Machinery	Construction industry	Chemical industry
1.	Energy saving measures	+++++	+++++	+++	+++++	+++++	+++++	++++
	Material saving measures	+++	+++++	++++	+++++	++++	+++++	+++++
2.	Presence of cleaner technologies	++++	+++	+	+++	++	+++	+++++
	Water saving measures	+++	+++	++	+++	++++	+++++	+++
	Waste selection	++++	++++	++	+	++	+	+++
	Raw material substitution	++	++++	+++	++	++++	+++	++++
	Waste recycling	+++	+++	++	++	++	+++++	+++++
3.	Process redesign	+++	+	+	++++	++++	+	+++
	Market creation for waste products	+++	+++	++	+	++	+	+++
4.	Product redesign	+	++	+	+	+	+	+++
	Renewal of production technology	++	++	+	+++	+	+	++
The level of cleaner production in the industries (on the basis of the summary of the measures)*		Medium at the majority of the companies	Medium at the majority of the companies	50-50% low and medium at the companies	50-50% low and medium at the companies	Medium at the majority of the companies	Medium at the majority of the companies	Medium at the two-third and high at one-third of the companies

Source: Kerekes, Baranyi et al., 2000, p. 40.

Key: +: not existing at the great majority of the companies; ++: not existing at the half of the companies; +++: exist at the half of the companies; ++++: exist at more than the half of the companies; +++++: exist at the great majority of the companies.

*By adding the cleaner production measures an aggregated variable is created from which we missed the elements of group 4 due to its low incidence. On the basis of this the qualification in the table indicates to what extent the cleaner production processes are present at the companies in the single industries.

Cleaner production means the prevention of wastes and other polluting emissions as well as the utilization of wastes. We asked that to what extent the cleaner (closed, waste minimizing) technologies were present as well as to what extent material use was efficient (since it represented well the presence or lack of cleaner technologies). The comparison of "the presence of clean technologies" and "the incorporation ratio of raw materials to the product" resulted in very weak negative correlation at medium significance level. On the basis of the received data there is a negative correlation between clean technologies and efficient material use. This contradiction is probably the attendant of the fact that respondents do not know precisely the concept of cleaner technology. There is a weak positive correlation – at low significance level – between "the presence of clean technologies" and "the proportion of saleable secondary raw materials". This by itself would indicate that waste utilization is thought of in the course of technological processes at companies with cleaner production (for example waste is separated by sort). There is a weak negative correlation – at medium significance level – between "the presence of clean technologies" and "the proportion of material loss". This shows that the more a company apply cleaner technologies the less material loss is characterizes the activity. In the case of two latter – logical – correlations it counsels prudence that a contradictory conclusion occurred at first question. All in all it seems that processes with efficient material use that are conducted not because of environmental reasons are not considered as part of cleaner technologies. In other words it is possible that respondents consider environmental protection as a separated area that is not necessarily integrated into business activity.

Out of the measures belonging to the range of cleaner production companies took resource-saving measures most frequently, the selection and utilization of wastes occurred to less extent. Very small number of the companies took measures on the redesigning of processes and products as well as on the renewal of production technology. The level of the application of cleaner production measures was affected by the company size, belonging to a larger company group as well as the sensitivity of the corporate technology.[52]

[52] There are inconsistencies among the answers. For example, as regards the frequency of application of the measures, there is not waste utilization after selection of waste but the substitution end reduction of the quantity of environmentally problematic raw materials. Moreover, even the "redesigning of processes" is before

In the application of the cleaner production measures the companies of chemical industry are in the first position. The bulk of the other industries apply the listed measures to a medium extent. Textile industry and metallurgy are the least characterized by cleaner production. In the sample textile industry companies had the lowest level of environmental management and of cleaner production; probably because the technology applied by the textile industry companies is not particularly sensitive in terms of environment protection. Textile industry companies are mainly in domestic ownership, most of them are small companies so in their case the environmental motivation by the strong foreign owners is out of the running, too.

Out of the companies that can be characterized by high level environmental management and cleaner production we examined the factors motivating the single measures (see Table 10). In the course of this the following picture showed up: keeping and expanding market positions play a role in the development of environmental management[53] while cleaner production is motivated by the direct financial savings and the obedience to ethical values. At this examination the paramount importance of the regulations is visible again: their motivating force was demonstrable in the case of both environmental measure types.

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the waste utilization within the company that does not seem realistic phenomenon. It is possible that companies resolved waste selection but waste utilization is still missing; but it is also imaginable that respondents were inconsistent or they did not understand the question as well as they indicated such a tool they do not apply.

[53] It is not clear, however, to what extent this result reflects to reality since only eight companies (0.5% of the sample) said that they have significant market opportunities in relation with environmental protection.

Table 10: The role of motivation factors in environmental measures

Motivates the introduction of environmental management elements	Motivates both ones	Motivates cleaner production
competition for market positions	Hungarian environmental requirements	Cost-saving opportunities deriving from material and energy saving
opportunity of market expansion	environmental requirements of the target market's country	opportunity to reduce fines
	EU environmental requirements	social and ecological responsibility
	expectations of the foreign parent company	

Source: Kerekes, Baranyi et al. (2000): p. 60.

We conducted a factor analysis with the variables of the concrete, physical environmental measures in order to render visible the factors significantly influencing the development of the variables. The examined variables were the following:

- the age of the environmental equipment;
- measures pertaining to environmental-loading types[54];
- taking into account the environmental aspects at investments;
- the application of the 15 types of measures of cleaner production;
- monitoring of material flows;
- the extent of the incorporation of the raw materials into products (efficient material use);
- the extent of becoming into saleable secondary raw material of raw materials;
- explicitly environmental investments;
- operation of environmental equipment and/or purchase of environmental service.

The result of the analysis was three factors again those explain 59.1% of the variance of the variables. The factors are the following:

[54] For example: "material economization measure: 1) there was not any and not either planned; 2) there was not any but we plan; 3) in progress; 4) it has already been realized".

1. *Continuous activity* of environmental purpose[55]. This factor contains the reduction of environmental-loading effects, the tools of cleaner production, the monitoring of material flows, the operation of environmental equipment as well as the purchase of environmental services.

2. The efficiency or weakness of *raw material use*.[56]

3. Environmental *investment*. This factor is characterized by investments of explicitly environmental purpose and use of relatively new environmental equipment as well as the taking into account of environmental aspects at all types (so not only environmental) of investments.

7.3.3 The organizational position of environmental protection

We can examine the role played at the company and importance of the environmental protection from different points of view. If the management of a company take the environmental challenges – should they be obligations deriving from regulations or consumer expectations or requirements deriving from the inner commitments of managers – serious, the first step is to appoint a person responsible for environmental protection. So the existence of a person responsible for environmental protection is an essential indicator of the importance of environmental protection. This indicator, however, should be completed by other indicators, like (for example) how strong the environmental manager is in the developing process of the strategy. The question pertaining on the time spent on the development of the strategy

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[55] In this designation the key phrase is *continuous* that differentiates measures from the one-fold investment-type actions of large volume.

[56] It is interesting to have this as single factor since one could think that "the incorporation of materials into product" shows close correlation with cleaner production. (The reason for including the three variables investigating the route of the raw materials was to help identify an occurrent "cleaner production" factor.) This correlation, however, was not provable in the course of the analysis. It may be three reasons for it: 1) companies apply the tools of cleaner production but not efficiently; 2) there are many companies where the elements of G.8. question (cleaner production) are not relevant due to the nature of technology; 3) the respondents – in terms of measures – presented a false picture on the company. In the course of several factor analysis – by changing the pairing of J.13.a, J.13.b and J.13. c questions (route of raw materials) – we always received the same results: "the measures aiming at cleaner production" and "the weak efficiency in material use" are obviously the strongest elements of two different factors.

intended to measure this. If the activity of the company imposes high environmental risks and/or the market opportunities deriving from environmental protection are significant – and the size of the organization requires – the company may establish a central environmental division. In the case of widespread organizational operations the management may deploy environmental tasks to the single functional or regional units. So we examined the organizational position of environmental protection with the help of the following variables:

- does the company have a person responsible for environmental protection;
- does the company have a central environmental division;
- do all functional areas have environmental tasks;
- do all employees have environmental tasks;
- to what extent the employees at different hierarchic levels know the environmental objectives of the organization;
- what percent of the his/her time the environmental manager spends on the development of strategy.

The purpose of factor analysis was again the reduction of the number of variables without losing significant amount of information. The analysis again resulted in three factors with eigenvalues above 1 that explain 58% of the variance of variables. The factors are the following:

1. The *currency of the objectives*. It contains the extent to what the top and middle managers and the low level employees of the organizational hierarchy know the environmental objectives of the company.

2. The *distribution* of the environmental *tasks*. This factor contains the existence of a central environmental division (so not only a person responsible for environmental protection) as well as that all functional areas and all employees have environmental tasks (this is the order of the correlation coefficients of variables within the factor so the factor shows the degree decentralized state of the environmental activity – and in some cases the integration into production thereof).

3. The employment of *a person responsible for environmental protection*. This factor contains the existence of a person responsible for environmental protection and the time spent by this person on strategy making.

So in the course of the factor analysis it turned out that the currency of the environmental objectives and the decentralization of environmental tasks belong to two different factors. In the same way the separation of the employment of a person responsible for environmental protection and the other organizational solutions of environmental protection became distinctly visible.

7.4 Environmental strategy types

7.4.1 Identification of environmental strategy types using merged indicators

For the identification of the environmental strategy types in the case of the companies in the sample it seemed to be expedient to merge certain variables into such indicators on which basis the companies can be classified (comp. Boda-Pataki, 1997; Pataki-Radácsi, 1998). The following variables have been used for this purpose. (Table 11).

Table 11: Merged environmental indicators for identifying the environmental strategy types

Indicators	The content of the indicator
"c1_ems"	the number of environmental management components (see questionnaire C.1. question)[57]
"c1marketing"	the number of environmental marketing components (see questionnaire C.1. question)[58]
"g2funkc3"	the frequency of the measures taken on the functional areas (see G.2. question)[59]
"g1osszuj"	the frequency of the measures related to environmental-loading emissions (see questionnaire G.1. question)
"g8osszuj"	the frequency of the measures related to a cleaner production (see questionnaire G.8. question)[60]
"i4ossz"	four kinds of environmental investment in 1998 (see questionnaire I.4. question)[61]
"i7esi8"	the use of environmental equipment or service (see questionnaire I.7. and I. 8. question)[62]
"J.1.a"	the monitoring of material flows by laboratory results, measure (see questionnaire J.1.a. question)[63]
"J.1.c"	the monitoring of material flows with the help of computer model (see questionnaire J.1.c question)[64]
"J.13.a"	what percentage of the raw material builds into the product (%) (see questionnaire J.13.a question)
"J.13.b"	what percentage of the raw material becomes saleable secondary raw material (%) (see questionnaire J.13.b question)
"J.13.c"	what percentage of the raw material becomes waste (%) (see questionnaire J.13.c question)

[57] We have examined the existence of 11 environmental management components altogether. The possible scores for some components: 1 = not existing, 2 = in progress, 3 = exists. The number obtained at summarizing the scores given for the 11 components: $11 \leq n \leq 33$.

[58] We have examined the existence of 3 marketing components, the calculation method of the indicator corresponds to the method used above for "environmental management components".

[59] 0= not existing, 1 = low, 2 = medium, 3 = high. The missing answers have been coded to "0"value.

[60] The coding of this indicator corresponds to the indicator for "measures related to the environmental-coding" (there was no need for re-coding the missing values).

[61] Score of 0-4 according to the quantity of the investments.

[62] Operation of environmental equipment, as well as employing services is worth 1-1 point. The scale range is 0-2.

[63] Dichotomous variable: 0 = no, 1 = yes.

[64] Dichotomous variable: 0 = no, 1 = yes.

We have made a cluster analyses with the indicators seen above, increasing the number of clusters from two by one. Our purpose was that on the basis of the indicators to have different groups – relatively homogeneous – separated, groups that can be featured by one environmental strategy type. The analysis made on the basis of the indicators has not given such results from which the environmental strategy types of the companies in the sample could have reliably been identified. For two clusters 98% of the sample got into one group, which did not show anything about the environmental strategies, therefore the numbers of clusters had to be increased. For three clusters a strong, a medium and a weak group possessing environmental management showed up. In the case of the first and third group taking measures on environmental-loading emissions was characterizing. The big difference was that in the third group the rate of raw materials becoming waste is quite high compared to the first one, furthermore the use of the tools of environmental marketing was the strongest. The use of the environmental equipment as well as the employment of the services was characteristic of the second group, and the rate of the incorporation of the raw material into the product was really high (in average 90%) as well. According to this the following environmental strategy labels were given to the groups:

1) strong environmental management;

2) operation of environmental equipment and effective production;

3) environmental marketing.

As to help the further division of the groups, and the shading of the formed picture, the analysis was also done with four clusters. The structure obtained was not clearer; small differences showed up among the groups, but the absence of some indicators practically meant the absence of the explaining power. The analyzed sample was not too big, therefore identifying more than four clusters would not have been expedient. During the cross-table analysis the strategy clusters could not have been compared with the industry by chi-squared test, since there were too many (above 80% ratio) probable cells with a value less than 5. However, the extremely low value of lambda (under 0,01) showed that with the industry, being an independent variable it couldn't be forecast which company belongs to what cluster.[65]

[65] This was probably the result of the high number of the missing answers.

The above-mentioned indicators are the results of a prudent, but in the long run after all still an arbitrary choice among the variables. The research can never be conducted independently of the researcher's background assumptions (that would not be efficient, since without these it would be impossible to start any directions). Although the risks drawn down the arbitrary choice can be eliminated to a certain extent. The factors determining mostly the development of the variables can be verifiable by factor analysis with little information loss. So the factors earlier presented are usable for strategic analysis, and they characterize the environmental management of the company, the concrete environmental measures as well as the environmental structure position. We have done the cluster analyses with these factors, testing whether the effect of the factors in which environmental strategy group is strong or weak.

7.4.2 Identifying environmental strategy types by using factors

The names of the groups formed during the cluster analysis correspond to the environmental strategy types applied by the companies in the sample. At designation we tried to avoid such – frequently occurring in the literature – denominations like "top" or "medium level" since these represent not the *content* of the strategy but the strength or weakness thereof. We tried to name the groups on the basis of the strengths and weaknesses of the content of the clusters.

The fact that two clusters are probably not enough for an adequate knowing of the environmental strategy types could be presumed in advance regarding the number of clusters. At the beginning we worked up two clusters in the course of a non-hierarchic cluster analysis. At this time the cases were divided as 50-50% between the clusters. Those companies to which the institutionalized environmental protection was characteristic, but concrete environmental measures were not taken belong to the 1 group. On the contrary to this, the companies belonging to the group 2 took environmental measures and applied the marketing tools, but the institutionalized environmental protection was not characteristic of them. According to the material use the two groups cannot be separated.

Having increased the number of clusters by one, such a group was formed (cluster 1) of which we only know that within its parts the environmental protection was institutionalized to a medium extent and the environmental marketing tools were applied to a perceivable extent. There was no environmental division at the companies belonging to cluster 2, the relationship with the "employing a person responsible for environmental protection" factor was slightly

negative, too. The environmental marketing was missing, but surprisingly the "approach" factor was medium strong. (It is thinkable that here such small companies occur relatively stronger in numbers whose top managers – besides their several other tasks – deal with environmental protection.) The cluster 3 seemed to be strong in all aspects: the company members were familiar with the environmental objectives; the organizations took environmental measures, the environmental institutionalism was strong, and the use of the environmental marketing tools was characteristic. In the case of the three clusters the first group did not provide any important information, furthermore the fact that the following factors did not have really distinctive effort among the clusters caused a problem: "employing a person responsible for environmental protection", "the efficiency of the raw material use", "environmental investment". Increasing the number of the clusters was required.

In the case of four clusters the following groups could be identified.

Cluster 1: "without environmental protection". In this group no continuous environmental activity or environmental institutionalism can be observed. It is interesting that the waste resulted from the raw material use is quite low among these companies, which can probably arise from the nature of the technology.

Cluster 2: "minimalists". Here the employing of the person responsible for environmental protection is characteristic, the environmental protection is partly institutionalized, but the environmental objectives of the organization are not known by the employees working at different levels. The environmental measures do not bear any parts in the operation of this group. The companies belonging to this group supposedly comply with the legal measures (for example with naming the person responsible for environmental protection), but they do not attempt to do more.

Cluster 3: "marketing-focused". The role of the environmental marketing is really strong, and the members of the organization are far enough familiar with the environmental objectives in this group. The companies also take some environmental measures, but the efficiency of the raw material use is quite bad and they are really weak from the aspect of the environmental investments (and they do not take into account the environmental aspects either in the case of other investments).

Cluster 4: "strongly institutionalized, continuously taking measures". Within the companies of this group the environmental institutionalism and the division of the environmental tasks are very strong among the organizational groups as well as among the employees. In other words this means the decentralization of the environmental activity, occasionally the

environmental protection integrated into production[66]. This group is highly characterized by measures taken for minimizing the environmental emissions and by considering the environmental aspects of investments, so it is not surprising that the raw material loss is the lowest here. The outstanding results of this group can be the consequence of the strong environmental approach.

The relationship between some clusters and factors are shown in Table 12.

Table 12: The values of the environmental factors in the case of 4 clusters

Cluster	Knowledge of the environ-mental objectives	Division of the environ-mental tasks	The person responsible for environ-mental protection	Raw material loss	Environ-mental invest-ment	Environ-mental measures	Environ-mental institu-tionalism	Environ-mental marketing	Environ-mental approach
1	-.0380	-.7985	-1.0311	-.2815	.1441	-.6510	-.3506	-.8847	.5089
2	-.8702	-.1298	.6290	-.0858	-.0206	.0994	.2123	.0879	-.0993
3	.7214	-.2530	.2825	1.2313	-.4600	.6576	.3805	.9630	.0752
4	.4492	.8783	.2458	-.4795	.4677	.6572	.8278	.5707	1.0099

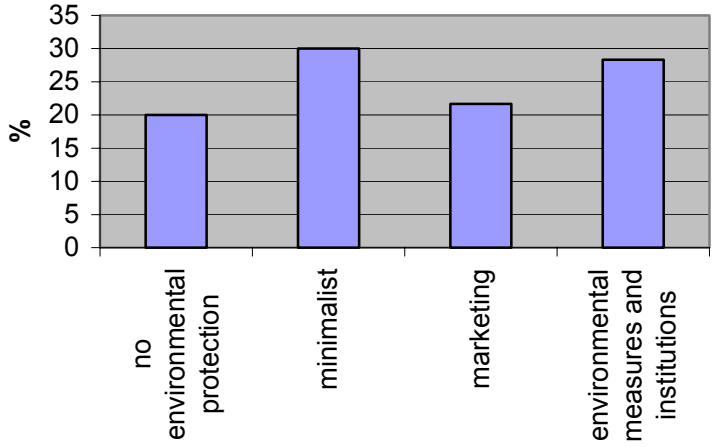
The distribution of the companies giving valid answers based on certain environmental strategy types shows, that the highest proportion (30%) was reached by the minimalist group, which supposedly does only in the field of environmental protection that is necessary on the basis of the regulations. Next in row the companies taking high-level environmental measures and institutionalism (28%) are, while the other two groups are almost the same proportion (20-20%). (The distribution of the companies based on certain environmental strategy types is shown in Table 10.) This indicates that the majority of the actual companies are able to stay on the market even without producing obvious environmental results. This reinforce the hypothesis of Kerekes et al. (1996) and Csutora (1999), namely that the "environmental excellence" (that is a requirement according to the literature) is not necessary for all the companies in order to survive. In other words, it is not compulsory to all the companies to

[66] In the course of the company interviews we also found such a company that belongs to this group and whose environmental manager quoted word-by-word the "environmental protection integrated in production" expression.

trace the same developmental pathway in order to stay on the market.[67] All this, of course, does not abolish the responsibility of the business organizations' members in the field of environmental protection, but it means that from *economic* view it is not necessary to all the companies reaching the high level of environmental protection.

[67] Sure, this does not mean that in the case of the change of the circumstances (for example the change of consumer expectations, more energetic protest of the environmental NGOs) the companies should not find a way to meet new challenges. Finally this means that the domestic companies have to move further to the improvement of the environmental performance, too. On a long run the progression on the developmental pathway can be imagined, but this alone still does not mean that the company has to become inevitably excellent.

Figure 10: The distribution of the companies according to the environmental strategy types (all the valid cases in percentage)



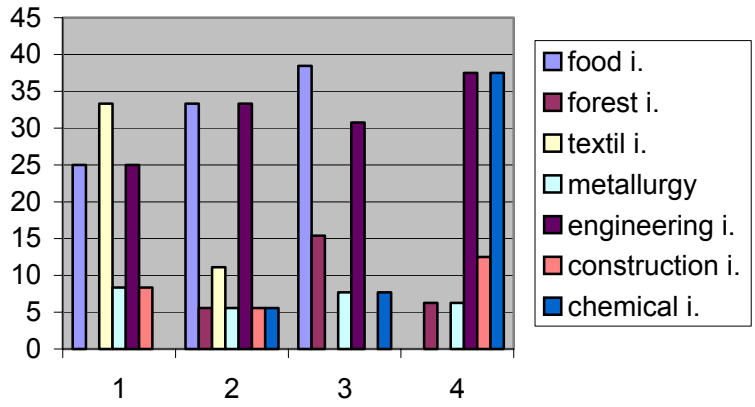
Because of the sample size the excessive increase of clusters was not practical, nevertheless we made an attempt at showing the institutionalism as well as the differentiation of the pollutant reducing measures among single groups by increasing the number of groups by one. However, in the case of five clusters no result supporting this hypothesis was also obtained, moreover the situation got more confused. Certain groups seemed to form, but it was not too clear at each company why "the migration" from the previous four clusters into the five new clusters took place, therefore the result consisting of the four clusters appeared to be more reliable.

> As a matter of curiosity we mention that in the case of five clusters the group of "verbal environmentalists" established that had a strong environmental marketing activity but its members operated very high raw material loss. A group "without environmental protection" started to be outlined of that the employment of the person responsible for environmental protection and the continuous environmental activity are not characteristic. (This group mainly consisted of small companies in food industry, textile industry and machinery.) Two clusters developed of those the continuous environmental measures and the relatively efficient raw material use were characteristic. While in the one group environmental institutionalism and the distribution of environmental tasks were very high level as well as environmental marketing was important in the other group proved to be very weak from this point of view. Finally occurred a group that was characterized only by the employment of a person responsible for environmental protection and the environmental institutionalism took place to some extent but all the remaining areas it proved

weaker than the other clusters. The weigh of the person responsible for environmental protection was the highest in this group but the cluster was particularly weak from the point of view to what extent the employees at the different hierarchic levels know the environmental objectives of the company.

In the course of the analysis of the relationship between some environmental strategy clusters and industries it turned out that among the companies giving valid answers – according to our previously done analyses – the lack of environmental protection or meeting the minimal environmental requirements are characteristic mostly of the textile industry companies. They are not even represented in the third and fourth cluster. The food industry companies were primarily found in the marketing based and in the minimalist environmental strategy types, but there was perceptible the "strategy" not dealing with environmental protection among them. The machinery companies were spread according to the environmental strategy aspect: they appear the most frequently in the minimalist group as well as in the 4th cluster which possesses a strong environmental protection, but their presence was also perceptible in the other two groups. Spreading can mainly arise from the fact that "the machinery" category contains fairly different activities as well as ownership structure. The other – spreading – companies could not really be evaluated because of their small number. The chemical industry got into the group, which can be characterized by the environmental institutions and activities. The percentage of the incidence rate of the industries in some environmental strategy types is shown in figure 11 (taking 100% the companies of the given cluster by the piece per clusters).

Figure 11: The distribution of different environmental strategy types according to the industries (%)



The clusters – measured by the employee complement – do not show correlation with company size.[68] From the company size measured with the employee complement and from the cross-table of strategy clusters it appears that in some clusters the different sized companies usually occur in number adequate to their expected values. However, we note that in the 2nd cluster (among the minimalists) the small companies occur with such a frequency, which exceeds their expected values, while in the 4th cluster that possesses a strong environmental protection they are under-represented according to their expected values. In the 3rd cluster among the companies following "the environmental marketing" strategy the medium sized companies, while in the 4th cluster the large companies occurred more in number according to their expected values. In all other cases the number of companies occurred correspondingly to the expected values. The size according to the sales revenue and balance-sheet footing could not be compared statistically to the strategy clusters because of the numerous missing answers.

7.4.3 The relationship between the corporate environmental strategy and general corporate strategy

Our research above all aimed at identifying the *environmental* strategy types of domestic companies. One of the associative directions of this topic is the connection between the general corporate strategy and environmental strategy. The number of the questions set to

[68] The level of significance was not sufficient to ignore the zero hypothesis related to the independence and the values of the correlation coefficients were also close to zero.

the respondents was finite due to the time-limit of the respondents (the filling time available for questionnaires ranged between two and four hours). The variables suitable for the overall characterization of the general corporate strategy of the companies were included only in restrained number in the questionnaire used for the research. These were completed with the questions related to the general corporate strategy set during the further interviews and questionnaire survey. The following results should be treated like they mainly characterize the general market behavior, the orientation of the companies.

With the help of their primary characteristics (industry, size, etc.) the companies were classified into groups in a way that the difference between each groups should be significant, while the groups themselves should be relatively homogeneous. Using the general characteristics of the companies as well as certain strategy-featured variables we made a cluster analysis, with which the groups separated on the basis of the general, market behavior nature could be identified. The variables applicable to this purpose are shown in Table 13.

Table 13: The variables featuring the general market behavior of the companies

Variable	Name of variable	Variable	Name of variable
iparág2	industry (question A4. code converted)	A10	market orientation
A6	number of employed people	A11	domestic market share
A7	type of the majority owner	A13	number of domestic competitors
A10	division of sales markets (%)	B1a	age of fixed assets
A12	corporate group membership	B5a	quality
A13	number of domestic competitors	B5b	price
I.1c	net sales revenue	C1b	ISO 9001
I 2c	balance-sheet footing	D13	industrial association membership

We aimed at choosing those 17 variables from the above table, which determines the development tendency of the variables. We determined the market characteristics of the companies and the main factors determining the market behavior through factor analysis. By grouping the companies with the help of these factors we can discover the major patterns residing in market behavior. In the course of the factor analysis seven factors with eigenvalue above 1 occurred, which explain the 74% of the entire variance of the variables. These are the following:

- company size[69];
- product distribution in EU[70];
- domestic market share as well as domestic competitors[71];
- company in foreign majority ownership[72] as well as membership in corporate group;
- existence of ISO 9002 quality assurance standard;
- age of the equipment, the product quality;
- product price.

In order to explore samples residing in the general market behavior we made a cluster analysis with the above-mentioned factors. We determined the appropriate number of the clusters by iteration and by a logical analysis of the results. In the case of two clusters 97% of the valid cases fell into one of the clusters, but having no demonstrative force, therefore we increased the number of the clusters. When we had three clusters the following groups came apart.

The members of the 1st cluster sell good quality products and they slightly orientate towards the domestic market. There is no sharp difference between the companies by domestic or foreign ownership. It can only be known that they are probably small companies. The members of the 2nd cluster orientate towards the EU-market. These companies produce

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[69] The size was measured by the employee staff, the annual sales revenue and the balance-sheet footing of the given year.

[70] The domestic market orientation shows negative correlation with this factor.

[71] The absolute value of the correlation coefficients of "the number of competitors" and "the domestic market share" factors is almost equal, certainly their signs are reversed. Nevertheless, if one of the companies denoted few competitors it does not necessarily refer to a big oligopoly but often to such small company which as the subcontractor of a big company does not compete with other companies for the "goodwills" of the given customer.

[72] We have to be careful at the conclusions pertaining to the nature of majority ownership since the possible answers in the questionnaire can be ranked in different ways. In the actual case the foreign majority ownership got 3 points at coding the answers, the state owned one got 2 points, the domestic private property got 1 point. Since the number in the sample of the majority state-owned companies is small, this scoring is available to – in the course of the analyses of the correlation coefficients – "pull away" the sample towards the Hungarian as well as the foreign private property direction.

high priced products with old equipment and the product quality is also poor. The long-run competitiveness of this group is questionable. Large companies with high domestic market-share can be found in the 3rd cluster, they try to compete with their low price and slightly orientate towards the EU-market. The fact that the product quality of these companies is effectively better than it seems to be according to the factor containing the quality cannot be excluded, since the factor value of the ISO 9002 quality assurance system is significantly high in this group. The results of this cluster analysis are shown in Table 14.

Table 14: The general market behavior of the companies

Cluster	Price	EU-market	Assets age and quality	Domestic market share	ISO 9002	Size	Owner
1	-.4729	-.1210	-.5095	.0645	-.0033	-.2138	-.0896
2	.7245	.1496	.6407	-.1334	-.0496	-.0363	.0971
3	-1.1419	.1722	.5876	.6058	.7035	4.2126	.3055

Tentatively we increased the number of the clusters to four, then to five, but this resulted in dissipation of the sample. In the case of four clusters a group possessing the characteristics of 1st cluster was originated. The companies belonging to another cluster possessing high domestic market share and offer their product at low prices. In the 3rd cluster there was only one foreign owned large company offering products at low prices on the EU market. The companies found in the 4th cluster appear on the market with low quality and high priced products produced with old equipment. When there were five clusters, a group considered to be medium from almost all points of view was originated, it had no explanatory force, nevertheless in this case the following groups showed up as well: companies possessing high domestic market share and companies competing with low prices; as well as small companies with low domestic market share and operating with old equipment.

We tried to compare the general market behavior patterns (or strategies) of the companies to the environmental strategy clusters, but it turned out that only a few of the companies (26) answered all those questions that defined two sets. This fact makes impossible the generalization, nevertheless we inform referentially that the smaller companies are slightly over-represented in the minimalist environmental strategy group; the users of the old equipment appear more in number in the environmental marketing cluster, while the

price-competing large companies are over-represented in the case of the environmental measures taking strategy.

7.4.4 Company interviews

The questionnaire survey related to the company strategy was completed with twelve company interviews, in the course of which we put questions concerning the feature of the general and the environmental strategies, as well as questions concerning the relationship between the two. During the interviews we visited the top management at companies which also appeared in the original questionnaire survey. Although we questioned companies belonging to different industries and size categories in the course of the interviews unequivocally turned up that the first-rate environmental objective of the companies is keeping the regulations. (This was completed with elements like "keeping the good relationship with the people" and "exploitation of the market opportunities residing in the products of environmental purpose".) It made us happy that the respondents often mentioned their personal responsibility toward the environment and the future generations as well among the factors motivating environmental activities.

On the basis of the interviews the relationship between the environmental strategy and the general corporate strategy usually seemed to be really weak. As concerns the clearance of environmental protection within the organization that is for the most part determined by the economical situation of the company. One of the engineering companies is an exception to this, since its foreign owner (an individual person managing a big company group) considers the environment protection matter as a question of approach. The energy for environmental measures did not wear down despite the high drop in demand of the products at this company. (The actual drop in demand otherwise affects the whole industry.) There was a company with environmental activity excellence – with good know-how – whose environmental manager did not give a definite answer after being repeatedly asked the "what is the role of the environmental protection at the company" question (viz. following regulation, increasing market share, etc.). To the question concerning the general corporate strategy he immediately replied the following: "produce benefit and stay/remain on the market", while he just listed the environmental measures taken by the company so far concerning the function of the environmental protection, in fact he said: "the objective of our company is to produce good products; in this procedure environmental protection does not play a role."

In the course of the interviews we came to know the following information about the companies.

1. Food industry, large company

The company has a three-year corporate strategy, its objectives are the cost reduction and production of good quality products. Environmental protection has a big importance in it (it got 4 points on a scale of 1-5). They have a written environmental strategy (for four years). This consists of general objectives and the importance of concrete environmental fields (for example, waste management). The corporate environmental objective: complying with the regulations, reducing the loading of environment (this probably also shows the importance of regulations). The environmental developments were done for reducing costs. In the last three years the economic situation of the company was improving as well as the physical (so not management)-featured environmental activity, while the environmental organization has not been changed.

2. Food industry, large company

The company has a three-year corporate strategy, its objectives are the cost reduction, provision of good quality and keeping the market share. Environmental protection has a medium importance in it (3 points). They have a written environmental strategy (for six years). This consists of the importance of some environmental fields and concrete objectives (quantitative tasks, deadlines). The general objectives of environmental protection are complying with the regulations and reducing costs. The latter objective is facilitated by environmental developments. Since 1999 the economic situation of the company has not been changed, the physical-featured environmental protection has been improved, the environmental organization has not been changed.

3. Machinery, medium-size firm

The company strategy is determined by the foreign parent company. Main corporate objectives are as follows: reducing costs, increasing the profit, increasing market share or appearing on a new market. The environmental strategy is in progress. The environmental considerations are not important at the company investments. The physical environmental performance (waste management) is getting better, despite that the economic situation of the company that has been changed for the worse for the previous year. There is no connection between the economic and environmental performance of the company: environmental measures are rather motivated by the owner's long-run approaches.

4. Machinery, small company

The objective of the company is remaining on the market. (The 80% of the company products are delivered to a single foreign customer.) Environmental protection is not important; there is only one environmental objective, namely complying with the regulations. According to them there is no need for product and technology change.

5. Chemical industry, medium-size firm

The general objective of the company is keeping the market share. The company does not have written corporate strategy; they only prepare annual business plans, which summarize the objectives of the functional fields, of environmental protection as well. According to the environmental manager's words: "environmental protection is a matter of life and death for the company". The environmental objectives of the company: complying with the regulations (preparing for complying with the EU environmental regulations), reducing costs (avoiding fines, emission of less dangerous waste, waste recovery); getting into good relationship with the people/inhabitants (the company had serious environmental conflicts during the past years).

The company possesses an environmental policy, which can serve as a base for the ISO 14001 standard auditing. The environmental policy consists of general objectives (for example, "sustainable development"), and draws attention to some of the environmental measures taken by the company (for example, minimizing the generating waste quantity, energy-efficiency). The economic performance and the physical environmental performance are related: if the economic circumstances of the company are worse, in order to have the costs reduced, the environmental tasks are rescheduled.

6. Chemical industry, large company

The new owner of the company is a big foreign company group, whose management considers environmental protection of high importance. The examined Hungarian allied company presents public environmental reports. They have taken several concrete and useful physical measures, measures that are mainly related to a much cleaner production. The company aims at having environmental protection integrated into production. Despite of these the environmental manager did not know whether environmental protection is present in the general corporate strategy of the company, and he did not discover what is the environmental objective within the company (see complying with the regulations).

7. Machinery, small company

The corporate strategy is prepared for a period of 5 years. Its objectives are as follows: reducing costs and keeping the market share. Environmental protection has a low importance in it (2 points). The company does not have written environmental strategy and environmental policy. There were some environmental developments but only because they were subject to regulations. The environmental objective at the company is: complying with the regulations, furthermore reducing the environmental effect of the product. The economic situation of the company has been improved in the last two years; the environmental performance and environmental organization have not been changed.

8. Machinery, large company

The most important objectives of the company: keeping the high quality level of their products and producing several individual sorts of products. The chief environmental manager of this company, which has several allied companies, seemed that he did not know the definition of general strategy. Their environmental policy is in progress: it has not been elaborated yet, but there exists a concept about which things to be included in. Environmental protection serves the complying with the regulations, but production of products of environmental purpose is obviously important. The economic situation of the company is good, and as a result of this, environmental activity of the company is getting stronger.

9. Chemical industry, medium-size company

Environmental protection is present in an overall corporate strategy, but there is no written environmental strategy available. The essence of the corporate strategy is the differentiation of the product as well as increasing the good quality of the product and of the market share. The objective of environmental protection is complying with the regulations. There is no conscious planning in environmental protection, but they really pay attention to environmental aspects when the usable technology is chosen. They know that protecting our environment could mean savings. The director general prepares the strategy (or better say the market forecast) for two years. The quality assurance manager – who is the environmental delegate – did not know whether the company has written general strategy or not. The management gets information on strategy in words. The person responsible for the environmental matters has not too much power at determining the corporate strategy. The net income of the company is continuously growing; the company is profitable. The environmental performance is good.

10. Chemical industry, small company

The company does not have a formal corporate strategy: they follow trends arising ad hoc at managing board meetings. The main objectives of the companies: reducing costs, producing good quality products, flexible demand satisfaction. Environmental objectives: complying with the regulations (their activity has almost no damaging environmental effect). Their net income has not been changed since 1999, but their benefit has.

11. Machinery, small company

The company has no formal corporate strategy; the general director and the first engineer determine the errands. Environmental protection is not found among these errands. There is no devoted person at the company who is responsible for environmental protection. Because of their unique products they have only two competitors. The objectives of the company: to provide good quality products and services at competitive prices. Complying with the regulations is the only environmental objective at the company. The economic situation of the company is better (according to the income) than in 1999.

12. Textile industry, small company

The foreign owner of the company does not tell anything about the overall objectives or the strategy. The general objective of the organization is cost reducing and "being afoot." Their environmental objective is complying with the regulations and keeping the good relationship with the authorities. No changes have taken place relating to environmental protection since 1999.

The interviewed companies consider without exception that complying with the regulations is one of their most important environmental tasks. This corresponds to the earlier statistical observations and other research results (comp. Boda-Pataki, 1997; Pataki-Radácsi, 1998); moreover it reinforces the theoretical approach that uses the compliance with the regulations as a starting-point at defining the corporate environmental strategy. The questionnaire survey and the interviews helped taking a survey of the realized environmental strategies of the companies. Theoretically we can learn about the deliberate strategies of the companies on the basis of the written corporate documents. Unfortunately during the research period only a few of companies had public environmental reports, so they did not show any important information concerning the officially declared environmental objectives of the companies in the sample. On the other hand the lack of the public environmental reports was a denouncing sign: it showed that the majority of the domestic companies practically does *not have* deliberate environmental strategy – thereafter they want to comply with the regulations. This assumption is mainly confirmed by the answers of the interviewed managers in the

course of the interviews. Even the companies taking environmental measures said that in the life of their companies environmental protection does not really play a really important role. Despite of these the conception of the realized strategy was useful for us during research. According to this conception we tried to present a kind of environmental strategy trend/direction within the companies with the help of the positions emerged as a result of the preterit actions. All in all we can say that the pre-composed environmental strategy is rare phenomenon within the companies in the sample. The environmental issues are managed on the level of the everyday problems not as a distinguished area.

8. Summary

In our research we examined the environmental strategies followed by the organization in a sample consisting of domestic manufacturing industry companies. The survey primarily tried to identify the realized strategies of the companies with the help of the following factors: the nature and use frequency of the environmental management elements applied by the organizations; measures of physical nature taken to reduce the loading of environment; the position of environmental activities within the organization; as well as the environmental performance of the organizations.

The motivating force of the environmental regulations proved very strong in the case of all companies therefore we also looked for other distinctions beyond compliance with the regulations regarding the environmental strategy types of the domestic companies. So we examined what kind of tools and to what extent the companies endeavored to respond the challenges of the regulations as well as the other environmental requirements. In order to map the environmental strategy types we used mainly multivariable statistical analyses (factor and cluster analysis). In the course of it the following corporate groups became differentiable that provide the names of the environmental strategy types at the same time:

- companies without environmental protection,
- companies with minimalist strategy,
- environmental marketing-oriented organizations,
- companies with strong environmental institutions and efficient environmental measures.

These results coincide with the picture provided by other researches. In the corporate samples of the researches in general there is a group not dealing with environmental protection (“resistant”, “indifferent” and similar labels) as well as a cluster attempting to comply with the regulations (we call the “minimalists”). In this research the strategy based on marketing was separated from the others. It did not go together with high level environmental performance; it may be inferred that the real goal of the “environmental strategy” is not the protection of environment but to improve the corporate image as well as to produce environmentally friendly products. Finally we identified a cluster that can be characterized by

high level environmental institutions and activities. This group corresponds to the companies named as “excellent” or “top” by the literature.

In connection with the companies in the sample there are only few cases when we can talk about such environmental strategies that are conscious, reflect long-term approach, by chance based on market analysis. There are some exceptions: a couple of companies that belong to large foreign company groups and follow the general environmental policy and traditional environmental objectives of the group. This area, however, plays a larger role in the annual business plans. But this does not mean, however, that environmental protection is of strategic importance at the majority of the companies. When the economic positions of the companies worsen and they have to reduce the costs and delay certain measures, environmental protection is often the first area falling prey to these intentions.

The results of our research underpin the view that it is not necessary for all companies in order to stay in the market to run an obligatory development curve from the “careless polluter” to the “highly environmentally aware” types. This means that in a given case in order to survive it is enough that the company complies with the environmental regulations. In other words, at a given organization it is worth developing an environmental strategy in accordance with the risks and opportunities deriving from environmental protection.

In Hungary very few (about a dozen) companies prepare public environmental reports. The proportion of those companies in the sample that prepare environmental reports was minimal (2%). It was not characteristic of any of the interviewed companies that they would have a really conscious, foreseeing environmental strategy. The interviewed managers considered environmental protection as of very small importance when its role came in at the development of the corporate strategy. On the basis of the words of the personally visited people responsible for environmental protection the role of corporate environmental protection is defensive almost everywhere: the goal is to avoid the problems arising from polluting the environment. Only one or two companies were exception where the commitment – and perhaps marketing approach – of the owner is the decisive motivating force as well as where they produce products of environmental purpose.

It would be useful to know what kinds of motivations move the companies belonging to the different environmental strategy clusters. But at a certain part of the questions on motivation (for example on the importance of market opportunities or on the environmental sensitivity of technologies as well as on the risks of corporate activities) the inconsistent responding hindered the drawing of reliable conclusions. The questions on environmental

management were utilizable well in the course of the analyses while the answers pertaining to the measures aiming at cleaner production were inconsistent. Nevertheless – for example taking into account the material use efficiency of the companies – the information received from this area could also be utilized.

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10. Appendices

Code no. of interviewer

Code no. of questionnaire

A) Data of company

(Please, write down the answer or put an „x” into the appropriate box.)

Name of company**:**

.....

Address of headquarters:

.....

Address of plant answering the questions

.....

Date of foundation of company

.....

Economic sector:

.....

Type of core activity:

(Please, choose one.)

1□ production for end-consumer use

2□ production for further corporate or institutional use

3□ providing service

4□ other: .....

Number of employees:

1□ 50-249 people

2□ 250-499 people

3□ over 500 people

Majority ownership

1□ domestic private

2□ state or municipal

3□ foreign

Nationality of top manager

1□ Hungarian

2□ Foreign (specify) .....

What is the working language besides Hungarian?

1□ English

2□ German

3□ French

4□ other (specify):.....

Proportions of the company’s product markets:

domestic: .....%

European Union:.....%

Eastern-Europe:.....%

other market:.....%

Share of company in domestic market

.....%

Membership in corporate group:

1□ Yes (specify): .....

0□ No

Number of competitors in Hungary:

1□ no competitors

2□ 1-5 companies

3□ 6-20 companies

4□ over 20 companies

Organizational structure of company:

1□ functional* (go to A14.1)

2□ divisional (go to B.1)

3□ matrix (go to B.1)

4□ other: .....(go to B.1).

*If the organizational structure is functional:

no. of decision-making levels :.....

are there profitcenters within the organization?

1□ yes 0□ no

B) Technology and products

Average age of

production equipment .....years old

environmental equipment .....years old

(for example, waste water treatment equipment, scrubbers etc.)

Type of the applied technology:

1□ discrete 2□ continuous 3□ both

Please, compare your company with other companies in the industry according to the following aspects.

Aspect	*low level*	*lower than average*	*average among Hungarian companies*	*excellent among Hungarian companies*	*excellent among European companies*	*Do not know*
Modernity of technology	1	2	3	4	5	99
Extent to which capacities are utilized	1	2	3	4	5	99
Flexibility of technology	1	2	3	4	5	99

Considering the company's products and applied technologies what proportion of your activity do you consider as:

environmentally very sensitive: .....%

environmentally moderately sensitive:: .....%

environmentally non-sensitive:: .....%

How is the quality and price level of your main product group compared to products in the same product group in the market?

	relatively low	*below average*	*average*	*above average*	*high*	*Do not know*
Quality	1	2	3	4	5	99
Price	1	2	3	4	5	99

How significant are the environmental impacts of the company's products and service in the following phases of their life-cycles?

	Environmental impact						
	Very low				*Very big*	*Do not know*	*Not relevant*
Extraction, production of raw materials	1	2	3	4	5	99	77
Production processes of suppliers	1	2	3	4	5	99	77
Own production processes	1	2	3	4	5	99	77
Whole logistics (transportation, storage, packaging)	1	2	3	4	5	99	77
Product use	1	2	3	4	5	99	77
Managing waste from used product	1	2	3	4	5	99	77
Reuse / recycling of used product	1	2	3	4	5	99	77

C) Environmental management

Which of the following environmental management component exist at the company?

(Pleasee, circle the appropriate number. Please, indicate in the last column for how many years the respective component has been used by the company.)

	does not exist	*under development*	*For appr. how many years?*
Written environmental policy	1	2	
Quality ensurance according to ISO9001	1	2	
Formal environmental management system (for example, ISO 14001, EMAS)	1	2	
A person in top management who is responsible for environmental protection	1	2	
Organization for environmental protection wihin the company	1	2	
Measurable environmental protection goals	1	2	
Programs to achieve environmental goals	1	2	
Regular (at least yearly) environmental audits by the company's own experts	1	2	
Regular (at least yearly) environmental audits by outside experts	1	2	
Established system at the company for communicating with the public	1	2	
Examination of suppliers' environmental behavior.	1	2	
Written, public environmental report	1	2	

	does not exist	*under development*	*For appr. how many years?*
Environmental marketing (environment-friendly products, ecolabels, advertisments)	1	2	
Environmental training for employees	1	2	
Plan to avert accidents	1	2	
Processes to assess and manage environmental risks	1	2	
The partners of the company examine the company's environmental behavior	1	2	

Do you allow for us to refer, as an example, to the company's environmental management system by the company's name:

1□ yes 0□ no

To what extent do the following groups know the company's environmental goals (if there are such goals)?

	not at all				*very well*	*Do not know*
top managers	1	2	3	4	5	99
middle rank managers	1	2	3	4	5	99
employees	1	2	3	4	5	99

Which of the following items can be found at the company? **(„Yes" can be written into more than one cell.)**

environmental manager	1□ yes	0□ no
central environmental department	1□ yes	0□ no
environmental tasks are assigned to the management of each functional area	1□ yes	0□ no
environmental tasks are assigned to all employees	1□ yes	0□ no

What was the reason motivating the establishment of the company's environmental organization?

.....

What proportion of its time does the environmental department spend with the following activities?

(The sum of the percentages should be 100%.)

Data provision:.....%

Forming organizational strategy (technological innovation, pollution prevention etc.) :.....%

Operating environmental monitoring system:.....%

Organizing environmental training, communication ..... %

Other (specify):.....…….%

To whom should the environmental manager or environmental department report?

.....

.....

Which of the following department(s) collects the following types of information? **(Please, write in the cells the numbers of the appropriate information types. You may put more than one answer in each cell.)**

	Emission data	Waste management data	Environmental regulations	Environmental investments	Costs of environmental protection	Competitors' environmental activity	Examination of consumers'	Environmental complaints public
Environmental department								
Marketing department								
PR department								
Production department								
Energy department								
Investment department								
Controlling department								
Accounting department								
Other:								

Which department is responsible for environmental communication?

(The following group of questions should be answered by that department.)

.....

D) Environmental communication

How strongly do the following groups influence the planning and implementation of corporate environmental measures?

	No influence	*Weak*	*Medium*	*Strong*	*Very strong*	*Do not know*
Owners	1	2	3	4	5	99
Competitors	1	2	3	4	5	99
Managers of the company	1	2	3	4	5	99
Employees	1	2	3	4	5	99
Suppliers	1	2	3	4	5	99
Customers	1	2	3	4	5	99
Organizations of consumer protection	1	2	3	4	5	99
Banks / Insurance companies	1	2	3	4	5	99
Law-makers / authorities	1	2	3	4	5	99
Municipal government	1	2	3	4	5	99
Residents in the neighborhood of the company	1	2	3	4	5	99
Environmental organizations	1	2	3	4	5	99
Press / Media	1	2	3	4	5	99
Public opinion	1	2	3	4	5	99
Scientific institutions	1	2	3	4	5	99
Industrial associations	1	2	3	4	5	99

Please, indicate how frequently the company applies the following communication tools in environmental cases?

	never	*occasionally*	*regularly*
Publication of environmental policy	1	2	3
Dealing with complaints of the public / of residents	1	2	3
Informing residents before the occurance of disturbing events	1	2	3
Open days for residents / schools	1	2	3
Environmental news and information on company whiteboard	1	2	3
Newsletter containing also environmental news	1	2	3
Informing the press about environmental issues	1	2	3
Publishing an environmental part within annual financial report	1	2	3
Preparing public environmental report	1	2	3
Fora for residents	1	2	3
Operating residential advisory board	1	2	3
Environmental programs for schools	1	2	3
Environmental information on products	1	2	3
Environmental information in product advertisements	1	2	3
Publishing environmental information on the internet	1	2	3

Have banks or financial investors required environmental information from the company, if yes, what kind of information?

1□ never (go to D.4)

2□ occasionally (go to D.3.1)

3□ regularly (go to D.3.1)

Generally the following types of information are required:

.....

How is the relationship between the company and the municipality regarding environmental issues?

4□ co-operative

3□ neutral, contacts only in official cases

2□ conflicts sometimes occur but they are manageable within official framework

1□ conflicts often occur related to the following problem: .....

How is the flow of information between the company and the municipality regarding environmental issues?

1□ We provide information only in official cases.

2□ The municipality requests the following information additional to the official requests:

.....

.....

3□ We provide the following environmental information by ourselves:.....

How is the relationship between the company and the residents in the neighborhood regarding environmental issues?

4□ good

3□ neutral, no relationship

2□ conflicts occur but they are easy to manage

1□ conflicts often occur related to the following problem: .....

Does the company receive environmental complaints?

1□ never 2□ occasionally 3□ regularly

Does the company have formal procedures to handle complaints?

1□ yes 0 □ no

How is the relationship between the company and environmentalist organizations?

4□ good, co-operative

3□ neutral, no relationship

2□ conflicts occur but they are easy to manage

1□ conflicts often occur related to the following problem: .....

How is the flow of information between the company and environmentalist organizations?

1□ Generally, we do not provide information; information can be obtained from the authorities.

2□ We give them our publications upon request.

3□ We also react to other request, for example,

.....

4□ We provide the following information by ourselves:.....

How is the relationship between the company and the environmental authorities?

4□ co-operative

3□ neutral, only official procedures

2□ conflicts sometimes occur but they stay within official framework

1□ conflicts occur regularly related to the following problem:

.....

Did environmentally related lawsuit(s) or administrative procedures occur against the company? If yes, when and related to which problem?

0□ no 1□ yes (specify).....

Is the company a member of Hungarian or international industrial association(s)?

0□ no 1□ yes (specify) .....

Does / did the company participate in Hungarian or international environmental programs?

(For example, Responsible Care, Ökoprofit, TISOT 99)

0□ no 1□ yes (specify).....

Did the company participate in discussions with authorities related to the preparation of environmental regulations? If yes, when and related to which regulation? .

0□ no 1□ yes (specify).....

Does the company participate in environmental conferences?

1□ no (go to E.1)

2□ occasionally (go to D.16.1)

3□ regularly (go to D.16.1)

Do company representatives lecture or are they members of the audience?

1□ lecturers

2□ members of the audience

3□ both

E) Environmental marketing

To what extent do you agree generally with the following statements about consumers' environmental consciousness?

	completely disagree			*completely agree*		*do not know*
Hungarian consumers regard the environmentally friendly nature of products as very important.	1	2	3	4	5	99
Hungarian consumers are willing to pay 5% more for environmentally friendly products	1	2	3	4	5	99
Emphasizing the environmentally friendly nature of a product results in competitive advantage in the domestic market.	1	2	3	4	5	99
Emphasizing the environmentally friendly nature of a product results in competitive advantage in developed foreign markets.	1	2	3	4	5	99
Ecolabels increase product sales.	1	2	3	4	5	99
Companies can significantly contribute to the environmental consciousness of consumers by advertising the company's environmentally friendly products.	1	2	3	4	5	99

To what extent do you think the following measures are necessary in general to sell an environmentally friendly product?

	not necessary at all			*very necessary*		*do not know*
Environmentally friendly products should be advertised significantly more than substituting products	1	2	3	4	5	99
Sales promotion (for example, coupons) should be used to increase the sales of environmentally friendly products.	1	2	3	4	5	99
The quality of environmentally friendly products should be at least the same as that of competing, not environmentally friendly	1	2	3	4	5	99

	not necessary at all				*very necessary*	*do not know*
products.						
The price of environmentally friendly products can be higher than that of competing, more polluting products.	1	2	3	4	5	99
E.2d.1. If you agree, by appr. how many per cent? :.....%						
The price of environmentally friendly products should be the same as that of competing, more polluting products.	1	2	3	4	5	99
The additional costs of producing environmentally friendly products should be integrated in the costs of the company's other, less environmentally friendly products to make the environmentally friendly products competitive.	1	2	3	4	5	99
The state should support environmentally friendly products by providing tax allowances or financial aid.	1	2	3	4	5	99
The state should prescribe for particular productgroups in detail the phase-out time of more polluting products.	1	2	3	4	5	99

Other suggestion: .....

Has the company product(s) to which the official Hungarian ecolabel has been assigned?

1□ Yes (go to E.3.1)

0□ No (go to F.1)

If the company has product(s) to which the official Hungarian ecolabel has been assigned, please, rank the following factors according to their motivating power for obtaining the label.

penetrating into a new market segment

increasing the existing market share

reduced VAT

reduced product charge

the ecolabel was easy to obtain

If the company has product(s) to which the official Hungarian ecolabel has been assigned, how big is the group of consumers approached by the label?

1□ a narow, environmentally conscious group

2□ the same groups of customers as those of not environmentally friendly products.

F) Environmental risks

Please, rank the environmental risks due to the company's activity **(for example, risks due to the applied technology, employees' level of training, and input materials):**

1□ small 2□ medium 3□ big 99□ do not know

How big are the threats coming from outside according to the company's perception? **(For example, plant characteristics, NGOs, media, institutional system, and ecological characteristics):**

1□ small 2□ medium 3□ big 99□ do not know

How significant are the company's market opportunities related to environmental protection? **(For example, selling environmentally friendly products or technologies, environmental consultancy, and environmental services.)**

1□ small 2□ medium 3□ big 99□ do not know

G) Environmental measures of the company

Has the company made environmental measures in the following fields in the last 5 years?

	No, and not planned	*No but planned*	*In process*	*Realized*	*Type of measure*	*Not relevant*
Saving materials	1	2	3	4		77
Saving water	1	2	3	4		77
Saving energy	1	2	3	4		77
Decreasing air emissions	1	2	3	4		77
Decreasing discharges into water	1	2	3	4		77
Decreasing noise	1	2	3	4		77
Decreasing solid waste	1	2	3	4		77
Recycling / reuse of waste	1	2	3	4		77
Waste disposal	1	2	3	4		77
Conservation of soil quality	1	2	3	4		77
Risk reduction / Accident prevention	1	2	3	4		77

Has the company made environmental measures in the following functional areas in the last 5 years?

	No, and not planned	*No but planned*	*In process*	*Realized*	*Type of measure*	*Not relevant*
Purchasing	1	2	3	4		77
R & D	1	2	3	4		77

Production processes	1	2	3	4	77
Logistics	1	2	3	4	77
Organizational structure	1	2	3	4	77
Training of managers	1	2	3	4	77
Training of employees	1	2	3	4	77
Marketing	1	2	3	4	77
PR	1	2	3	4	77
Inside control	1	2	3	4	77
Accounting	1	2	3	4	77

Has the company considered environmental factors in making investment decisions in the last 5 years?

0□ no 1□ yes

What proportion of the company's energy costs could be saved by energy efficiency investments in the short run (1-2 years) and in the lung run (more than 2 years)? Please, indicate whether your answer is based on calculations or on estimates.

In the short run: .....% 1□calculation 2□estimation

In the long run: .....% 1□ calculation 2□ estimation

How did the environmental measures affect the following fields?

	Very disadvantageously				*Very advantageously*	*Do not know*	*Not relevant*
corporate competitiveness							
a1. in domestic markets	1	2	3	4	5	99	77
a2. in EU markets	1	2	3	4	5	99	77
a3. in other foreign markets	1	2	3	4	5	99	77

	Very disadvantageously				*Very advantageously*	*Do not know*	*Not relevant*
on corporate image							
b1. in EU	1	2	3	4	5	99	77
b2. in Hungary	1	2	3	4	5	99	77
market share							
c1. directly	1	2	3	4	5	99	77
c2. indirectly (for example, through quality improvement)	1	2	3	4	5	99	77
production cost of products	1	2	3	4	5	99	77
product quality	1	2	3	4	5	99	77
productivity	1	2	3	4	5	99	77
revenue	1	2	3	4	5	99	77
short-term profit	1	2	3	4	5	99	77
long-term profit	1	2	3	4	5	99	77
satisfaction of owners	1	2	3	4	5	99	77
satisfaction of top managers	1	2	3	4	5	99	77
motivation of managers and employees	1	2	3	4	5	99	77

In general, to what extent has the company been able to achieve its environmental goals?

1□ not at all

2□ appr. 1/3 of the goals have been achieved

3□ appr. 50% of the goals have been achieved

4□ appr. 2/3 of the goals have been achieved

5□ completely

What kind of inside and outside problems did the company face during the implementation of its environmental and energy efficiency goals, and how serious were those problems?

	*Problems during the implementation of **environmental** goals*				*Problems during the implementation of **energy efficiency** goals*			
	no such problem occurred	*not a serious problem*	*serious problem*	*do not know*	*no such problem occurred*	*not a serious problem*	*serious problem*	*do not know*
(a) Inside problems								
problem not recognized	1	2	3	99	1	2	3	99
too high costs	1	2	3	99	1	2	3	99
small benefits from measure	1	2	3	99	1	2	3	99
uncertainty of result	1	2	3	99	1	2	3	99
low prestige of efficiency measures	1	2	3	99	1	2	3	99
unsatisfactory education / approach of top management	1	2	3	99	1	2	3	99
unsatisfactory education / approach of employees	1	2	3	99	1	2	3	99
management was dedicated to other problem areas	1	2	3	99	1	2	3	99

	*Problems during the implementation of **environmental** goals*				*Problems during the implementation of **energy efficiency** goals*			
	no such problem occurred	*not a serious problem*	*serious problem*	*do not know*	*no such problem occurred*	*not a serious problem*	*serious problem*	*do not know*
resistance towards change	1	2	3	99	1	2	3	99
priority of other areas	1	2	3	99	1	2	3	99
lack of expertise	1	2	3	99	1	2	3	99
scarcity of human resources	1	2	3	99	1	2	3	99
decisions related to production and environmental protection are segregated	1	2	3	99				
unsatisfactory organizational conditions	1	2	3	99	1	2	3	99
conflict of interests within organization	1	2	3	99	1	2	3	99
lack of information about material and energy flows, about alternative processes	1	2	3	99	1	2	3	99
lack of technical conditions	1	2	3	99	1	2	3	99
lack of capital	1	2	3	99	1	2	3	99

	*Problems during the implementation of **environmental** goals*				*Problems during the implementation of **energy efficiency** goals*			
	no such problem occurred	*not a serious problem*	*serious problem*	*do not know*	*no such problem occurred*	*not a serious problem*	*serious problem*	*do not know*
lack of willingness of owners	1	2	3	99	1	2	3	99
lack of time	1	2	3	99	1	2	3	99
other:		2	3			2	3	
(b) Outside problems								
lack of governmental / municipal support	1	2	3	99	1	2	3	99
lack of demand for environmentally friendly / energy efficient products	1	2	3	99	1	2	3	99
low environmental consciuosness of consumers	1	2	3	99				
lacking or not well-established distribution channels	1	2	3	99				
lack support from distributors	1	2	3	99	1	2	3	99
insufficient regulations	1	2	3	99	1	2	3	99
disadvantages due to plant's	1	2	3	99	1	2	3	99

	*Problems during the implementation of **environmental** goals*				*Problems during the implementation of **energy efficiency** goals*			
	no such problem occurred	*not a serious problem*	*serious problem*	*do not know*	*no such problem occurred*	*not a serious problem*	*serious problem*	*do not know*
characteristics								
out-dated technology	1	2	3	99	1	2	3	99
other:		2	3			2	3	

To what extent does your company use the following instruments?

	Not at all						*To a great extent*				*Not relevant*
product redesign: to reduce or eliminate environmental problems (production or recycling)	1	2	3	4	5	6	7	8	9	10	77
process redesign: to reduce or eliminate environmental problems	1	2	3	4	5	6	7	8	9	10	77
simplifying disassembly: transforming product or production process so that product disassembly and waste management becomes easier at the and of product life-cycle	1	2	3	4	5	6	7	8	9	10	77
substitution: material substitution with a material causing less burden to the environment	1	2	3	4	5	6	7	8	9	10	77
reduction of materials / components: reduction of the quantity of environmentally problematic materials and / or components	1	2	3	4	5	6	7	8	9	10	77
recycling: more intensive use of recycled components or manufacturing more easily recyclable products	1	2	3	4	5	6	7	8	9	10	77

	Not at all								*To a great extent*		*Not relevant*
reassembly: putting together a product again in which some parts are reused unchanged, some are renewed, and the rest is replaced by new ones	1	2	3	4	5	6	7	8	9	10	77
remanufacturing: the same as reassembly but here no completely new components are used	1	2	3	4	5	6	7	8	9	10	77
using at lower value within company: for example, incineration of packaging waste within the company to generate heat	1	2	3	4	5	6	7	8	9	10	77
lengthening use: reducing environmental problems by lengthening product use, product life-cycle	1	2	3	4	5	6	7	8	9	10	77
refundable packaging: applying packaging material that can be given back after use	1	2	3	4	5	6	7	8	9	10	77
distribution of risks: transfering risks on third person or organization that is able to manage the problem with more skill	1	2	3	4	5	6	7	8	9	10	77
market generation for wase products: waste is regarded as the raw material of a product that can be produced and sold profitably and waste is handled accordingly	1	2	3	4	5	6	7	8	9	10	77
separation of wastes: intermediate process where waste streams are separated into components, which is followed by recycling, reuse or use at lower value within the company	1	2	3	4	5	6	7	8	9	10	77
transposing: changing the location of a process or plant to benefit from less stringent environmental regulations or from better opportunities	1	2	3	4	5	6	7	8	9	10	77
alliance: co-operation with suppliers or customers in answering environmental problems	1	2	3	4	5	6	7	8	9	10	77
investments: integrating environmental considerations into investments	1	2	3	4	5	6	7	8	9	10	77

Which of the following fields, and to what extent, should be improved in the future to achieve environmental goals more effectively?

	not at all				*very much*	*do not know*
product development	1	2	3	4	5	99
purchasing materials	1	2	3	4	5	99
transporting material within or outside company	1	2	3	4	5	99
production processes	1	2	3	4	5	99
energy efficiency	1	2	3	4	5	99
emission of pollutants	1	2	3	4	5	99
waste disposal or recycling	1	2	3	4	5	99
equipment, infrastructure	1	2	3	4	5	99
training of employees	1	2	3	4	5	99
organizational structure	1	2	3	4	5	99
distribution	1	2	3	4	5	99
marketing	1	2	3	4	5	99
PR	1	2	3	4	5	99
inside control	1	2	3	4	5	99
accounting	1	2	3	4	5	99

H) Factors influencing the company

How strong is the influence of the following factors on the company?

	not perceivable	*weak*	*medium*	*strong*	*very strong*	*do not know*	*Not relevant*
Hungarian environmental regulations	1	2	3	4	5	99	77
environmental demands of the markets in other countries (if the company sells in other countries)	1	2	3	4	5	99	77
environmental regulations of the EU	1	2	3	4	5	99	77
competition for sustaining market position	1	2	3	4	5	99	77
opportunity to go to other markets	1	2	3	4	5	99	77
vicinity of residential area	1	2	3	4	5	99	77
vicinity of school, hospital or other sensitive public institution	1	2	3	4	5	99	77
vicinity of sensitive area (water base, natural values)	1	2	3	4	5	99	77
tensions due to the environmental risks of the technology	1	2	3	4	5	99	77
risks of environmental accidents	1	2	3	4	5	99	77
opportunities to reduce costs by efficient use of material / energy	1	2	3	4	5	99	77
saving money by reducing waste management costs	1	2	3	4	5	99	77
opportunity to reduce fines	1	2	3	4	5	99	77

	not per-ceivable	*weak*	*me-dium*	*strong*	*very strong*	*do not know*	*Not rele-vant*
additional revenue from new, environmentally friendly products	1	2	3	4	5	99	77
improving corporate image	1	2	3	4	5	99	77
expectations of foreign mother company	1	2	3	4	5	99	77
social and ecological responsibilty	1	2	3	4	5	99	77

Please, indicate, with which of the following EU directives the company should comply.

Directive	*Do you know the directive?*			*Does the directive affect the company?*		
	no	*partly*	*yes*	*no*	*yes*	*do not know*
IPPC 96/61/EC	0	1	2	0	1	99
EMAS (EEC/1836/93)	0	1	2	0	1	99
Seveso directive (96/82/EC)	0	1	2	0	1	99
Ecolabelling (880/92/EEC)	0	1	2	0	1	99
Large combustion plants (86/609/EEC)	0	1	2	0	1	99
Incineration of hazardous waste (94/67/EEC)	0	1	2	0	1	99
Incineration of waste (89/429/EEC, 89/369/EEC)	0	1	2	0	1	99
Discharging hazardous materials into water (76/464/EEC)	0	1	2	0	1	99
Classification, packaging and labelling of hazardous materials (67/548/EEC)	0	1	2	0	1	99

Directive	*Do you know the directive?*			*Does the directive affect the company?*		
	no	*partly*	*yes*	*no*	*yes*	*do not know*
Distribution and use of hazardous materials (76/769/EEC)	0	1	2	0	1	99
Export and import of hazardous chamicals (EEC/2455/92)	0	1	2	0	1	99
Road transport of hazardous products (94/55/EC)	0	1	2	0	1	99
Hazardous wastes (94/67/EEC)	0	1	2	0	1	99
Titan-dioxide wastes (78/178/EEC)	0	1	2	0	1	99
Waste oils (75/439/EEC)	0	1	2	0	1	99
PCBs and PCTs (96/59/EC)	0	1	2	0	1	99
Batteries (91/86/EEC)	0	1	2	0	1	99
Wastewater sludge (86/278/EEC)	0	1	2	0	1	99
Intentional discharge of genetically modified organizations (90/220/EEC)	0	1	2	0	1	99
Experimentations on animals (86/609/EEC)	0	1	2	0	1	99
Transporting waste (EEC/259/93)	0	1	2	0	1	99
Packagig waste (94/62/EC)	0	1	2	0	1	99
Lead content of gasoline (85/210/EEC)	0	1	2	0	1	99
Emissions from diesel engines (72/306/EEC és 88/77/EEC)	0	1	2	0	1	99
Emissions from vehicles (70/220/EEC)	0	1	2	0	1	99
Sulphur content of liquid fuels (93/12/EEC)	0	1	2	0	1	99

Directive	*Do you know the directive?*			*Does the directive affect the company?*		
	no	*partly*	*yes*	*no*	*yes*	*do not know*
Ozone depleting substances (EC/3093/94)	0	1	2	0	1	99
VOC emissions from storage and transport of gasoline (94/63/EEC)	0	1	2	0	1	99
Asbesthos (87/217/EEC)	0	1	2	0	1	99

I) Financial indicators

Net annual revenues:

1995.....HUF million

1997 .....HUF million

1998 .....HUF million

Total balance:

1995.....HUF million

1997 .....HUF million

1998 .....HUF million

Do you prepare financial reports in which the following items appear separately?

costs of environmental measures 0□ no 1□ yes

environmental investments 0□ no 1□ yes

cost savings due to environmental protection 0□ no 1□ yes

Did the company make environmental investments in 1998? If yes, for what amount?

construction, reconstruction or purchase of waste management equipment (incinerator):

0□ no 1□ yes, ... HUF

purchase or renewal of end-of-pipe equipment (filters, wastewater treatment equipment)

0□ no 1□ yes, ... HUF

renewal or change of production technology for environmental purposes, or applying new, environmentally friendly technology:

0□ no 1□ yes, ... HUF

investment into energy efficiency

0□ no 1□ yes, ... HUF

Did the company pay environmental fines in 1996, 1997 and 1998-ban? If yes, what amount?

1996: 0□ no 1□ yes, ... HUF

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company pay product charge in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company pay operation costs of environmental equipment (wastewater treatment equipment, waste incinerator) in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company use environmental services provided by third parties in 1997 and 1998?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company pay environmental management costs (salary of environmental manager, operation cost of environmental department) in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company save costs due to environmental measures in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company have to pay for environmental remedation in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Did the company establish financial reserves for future environmental tasks in 1997 and 1998? If yes, what amount?

1997: 0□ no 1□ yes, ... HUF

1998: 0□ no 1□ yes, ... HUF

Does the company have environmental liability insurance?

0□ no 1□ yes

If the company produces ecolabelled products, what was the rveneue from those products in 1998?

0□ we have no such products

1□ we have such products and the revenue was ..... HUF

What was the proprotion of energy costs compared to direct costs in 1998? **.....%**

What was the proprotion of raw materials costs compared to direct costs in 1998? **.....%**

What was the proprotion of waste management costs (of hazardous plus non-hazardous wastes) compared to direct costs in 1995 and 1998?

1995:.....%

1998: .....%

J) Data of emissions and wastes

Do you follow the material and energy flows of the company?

1□ yes (go to J.1.1) 0□ no (go to J.2)

How do you follow material and energy flows? (More than one „yes" is possible.)

laboratory results 1□ yes 0□ no

expert estimations 1□ yes 0□ no

computer models 1□ yes 0□ no

accounting data 1□ yes 0□ no

other:.....

The amout of energy use in 1995 and 1998:

Type of energy , unit of measurement	***Use in 1995***	***Use in 1998***
1.		
2.		
3.		
4.		
5.		

The emissions of the three main air polluters in 1997 and 1998:

Substance	***Emission in 1997 (t)***	***Emission in 1998 (t)***
1.		

2.		
3.		

The total amount of waste water generated:

1997:.....m^3

1998:.....m^3

The discharges of the three main water polluting substances in 1997 and 1998:

Substance	***Discharge in 1997 (kg)***	***Discharge in 1998 (kg)***
1.		
2.		
3.		

The amount of hazardous waste:

1997:.....kg

1998:.....kg

What proportion of the above amount do you consider as really hazardous waste?**.....%**

How did the total amount of emissions /wastes change compared to five years earlier?

1□ decreased

by ..... %

reason for decrease:.....

2□ did not change

3□ increased

by ..... %

reason for increase:.....

What proportion of the production wastes does the company utilize? **.....%**

What proportion of the communal waste does the company separate by waste types? **.....%**

Does the company separate waste water by types? **1□ yes** **0□ no**

How strong is the presence of cleaner technologies **(for example, closed-loop technologies, efficient equipment),** and other pollution prevention methods **(for example, careful material handling)**?

1□ They are not present

2□ They are occasionally present

3□ Their impact is perceivable

4□ They play a significant role

What proportion of the raw materials

are integrated into products? .....%

becomes marketable secondary raw material? .....%

becomes waste, evaporates etc.? .....%

Do you plan to apply clean technologies or pollution prevention methods in the future?

1□ yes (go to J.14.1) 0□ no (go to J.15)

If yes, when?

1□ within 3 years

2□ in more than 3 years

If you have comments related to the questionnaire, please, write them here.

.....

.....

.....

Data of the respondent

Name:.....

Position:.....

Telephone:.....

Fax:.....

E-mail:.....

Data of the interviewer

Name: .....

Date of interview: .....

Duration of interview:.....

THANK YOU FOR YOUR ANSWERS

BUES Department of Environmental Economics and Technology

H-1828. Bp. 5. POB 489

Name of company:.....

Name of respondent:.....

Position of respondent:.....

Phone:.....

Fax: .....

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1. Has the company a written corporate strategy?

Yes, for a period of ..... years No

2. The most important (written or not written) strategic goals for the next 3 years (max. 2)

A. cost reduction

B. differentiate the product / services from those of competitors

C. inexpensive and unique products /

3. Have the written strategic goals changed since 1999?

A. No

B. Yes (specify):

.....

.....

services for a few customer groups .....

D. excellent quality products / services .....

E. continuous innovation .....

F. maintaining market share .....

G. increasing make share / going to new markets

H. environmental protection

I. other: .....

4. Does environmental protection appear in the corporate strategy?

Yes No

5. If yes, how important is environmental protection within the strategy?

1	2	3	4	5
(unimportant)				(key issue)

6. Has the company a written environmental strategy or policy (for example, according to ISO14001)?

Yes No

7. If yes, since how many years? .....

8. If a written environmental strategy or policy exists, what kind of goals appear in it? (Marking more than one answer is possible.)

A. concrete objectives: the reduction of particular types of emission to a certain extent and by a given deadline;

B. emphasizing the importance of some environmental field(s), for example, recycling;

C. a general goal(s), for example, „the company operates according to the principles of sustainable development"

9. Did the company develop its technology or products for environmental purposes in the last two years?

Yes No

10. If yes, for what reason?

A. due to regulatory requirements

B. to reduce costs

C. to make the products more environmentally friendly

D. due to public complaints

E. other:.....

11. If no environmental development was made, what was the main reason?

A. lack of money

B. not required by law

C. consumers / business partners / public did not require it

D. other: .....

12. The main goals of the environmental activity of the company (max. 2):

A. legal compliance

B. lobbying to influence regulations

C. cost reduction[73]

D. to sell environmentally friendly products/services

E. product/service innovation

F. reduction of environmental burdens of operation

G. reduction of environmental burdens of sold products/services at the consumers

H. good relations with the authorities

13. Have the environmental goals changed since 1999? ?

A. No

B. Yes (specify):.....

.....

.....

[73] Például bírság elkerülése, kevesebb veszélyes hulladék termelése, alapanyagok hatékonyabb felhasználása, melléktermékek/hulladékok hasznosítása stb.

I. good relations with the public

J. other:.....

14. Since 1999 the economic position (net revenue, profit) of the company has:

Improved Not changed Worsened

15. Since 1999 the overall environmental performance of the company (emissions, wastes) has:

Improved Not changed Worsened

16. Since 1999 the environmental organization of the company (e.g., ISO14001 EMS, new environmental department):

Improved Not changed Worsened

17. Do you allow the publication of your company's name?

Yes No

Results of statistical analyses

Frequency of written environmental policy

C.1.AA környezeti politika (új)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not existing	,00	94	61,8	61,8	61,8
under development	,50	18	11,8	11,8	73,7
exists	1,00	40	26,3	26,3	100,0
Total		152	100,0	100,0	

Mean ,322 Mode ,000 Std dev ,436

Variance ,190 Sum 49,000

Valid cases 152 Missing cases 0

C.1.E Environmental organization within company

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not existing	1	118	77,6	78,1	78,1
under development	2	7	4,6	4,6	82,8
exists	3	26	17,1	17,2	100,0
,		1	,7	Missing	
Total		152	100,0	100,0	

Valid cases 151 Missing cases 1

C.4.B Environmental dept.

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	143	94,1	95,3	95,3
yes	1	7	4,6	4,7	100,0

,	2	1,3	Missing
Total	152	100,0	100,0

Valid cases 150 Missing cases 2

Correlation between environmental dept. and company size (no. of employees)

- - - - K E N D A L L C O R R E L A T I O N C O E F F I C I E N T S - - -

C.4.B ,2143

N(150)

Sig ,007

A.6

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

- - - S P E A R M A N C O R R E L A T I O N C O E F F I C I E N T S - - -

C.4.B ,2227

N(150)

Sig ,006

A.6

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

Correlation between environmental dept. and company size (revenues)

- - - -K E N D A L L C O R R E L A T I O N C O E F F I C I E N T S - - -

I.1.C ,1262

N(112)

Sig ,105

C.4.B

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

- - - S P E A R M A N C O R R E L A T I O N C O E F F I C I E N T S - - -

I.1.C ,1538

N(112)

Sig ,105

C.4.B

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

Crosstab: environmental policy and measurable environmental goals

C.1.AA környezeti politika (új) by C.1.FF mérhetõ célok (új)

```
          Count  "
          Exp Val "
          Row Pct "does not  under       exists
                                 exist    developm.
          Col Pct "                          Row
          Tot Pct "     ,00"     ,50"    1,00" Total
C.1.AA    """""""""""•"""""""""•"""""""""•"""""""""›
            ,00  "    60  "     9  "    23  "    92
does not exist     "  42,0  "  16,1  "  34,0  " 61,7%
                   " 65,2%  "  9,8%  " 25,0%  "
                   " 88,2%  " 34,6%  " 41,8%  "
                   " 40,3%  "  6,0%  " 15,4%  "
                   ß"""""""""•"""""""""•"""""""""›
            ,50  "     2  "     7  "     9  "    18
under dev.         "   8,2  "   3,1  "   6,6  " 12,1%
                   " 11,1%  " 38,9%  " 50,0%  "
                   "  2,9%  " 26,9%  " 16,4%  "
                   "  1,3%  "  4,7%  "  6,0%  "
                   ß"""""""""•"""""""""•"""""""""›
           1,00  "     6  "    10  "    23  "    39
 exists            "  17,8  "   6,8  "  14,4  " 26,2%
                   " 15,4%  " 25,6%  " 59,0%  "
                   "  8,8%  " 38,5%  " 41,8%  "
                   "  4,0%  "  6,7%  " 15,4%  "
```

-""""""""""□""""""""""□""""""""""~

Column	68	26	55	149
Total	45,6%	17,4%	36,9%	100,0%

Chi-Square	Value	DF	Significance
Pearson	39,10609	4	,00000
Likelihood Ratio	41,73004	4	,00000
Mantel-Haenszel test for linear association	26,40090	1	,00000

Minimum Expected Frequency - 3,141

Cells with Expected Frequency < 5 - 1 OF 9 (11,1%)

		Approximate		
Statistic	Value	ASE1	Val/ASE0	Significance
Kendall's Tau-b	,40823	,06631	6,05510	
Kendall's Tau-c	,35431	,05851	6,05510	

Gamma		,61147	,08348	6,05510
Somers' D :				
symmetric		,40702	,06612	6,05510
with C.1.AA	dependent	,37792	,06369	6,05510
with C.1.FF	dependent	,44097	,07097	6,05510
Pearson's R		,42236	,07061	5,64941 ,00000 *4
Spearman Correlation		,44108	,07076	5,95876 ,00000 *4

*4 VAL/ASE0 is a t-value based on a normal approximation, as is the significance

Number of Missing Observations: 3

Crosstab: environmental policy and environmental programs

C.1.AA környezeti politika (új) by C.1.GG környezetvédelmi program (új)

C.1.GG Page 1 of 1

Count "

```
          Exp Val "
          Row Pct "does not  under      exists
                                exist    developm.
          Col Pct "                        Row
          Tot Pct "     ,00"     ,50"    1,00" Total
C.1.AA    """""""""""•"""""""""""•"""""""""""•"""""""""""›
             ,00  "    69  "     9  "    16  "    94
 does not ex.     "  48,9  "  14,8  "  30,3  " 61,8%
                  " 73,4%  "  9,6%  " 17,0%  "
                  " 87,3%  " 37,5%  " 32,7%  "
                  " 45,4%  "  5,9%  " 10,5%  "
                  š"""""""""""•"""""""""""•"""""""""""›
            ,50  "     3  "     7  "     8  "    18
 under dev.       "   9,4  "   2,8  "   5,8  " 11,8%
                  " 16,7%  " 38,9%  " 44,4%  "
                  "  3,8%  " 29,2%  " 16,3%  "
                  "  2,0%  "  4,6%  "  5,3%  "
                  š"""""""""""•"""""""""""•"""""""""""›
           1,00  "     7  "     8  "    25  "    40
 exists           "  20,8  "   6,3  "  12,9  " 26,3%
                  " 17,5%  " 20,0%  " 62,5%  "
                  "  8,9%  " 33,3%  " 51,0%  "
                  "  4,6%  "  5,3%  " 16,4%  "
                  -"""""""""""□"""""""""""□"""""""""""~
          Column      79       24       49      152
           Total   52,0%    15,8%    32,2%   100,0%
```

Chi-Square	Value	DF	Significance
Pearson	49,54860	4	,00000
Likelihood Ratio	50,78144	4	,00000
Mantel-Haenszel test for linear association	39,22613	1	,00000

Minimum Expected Frequency - 2,842

Cells with Expected Frequency < 5 - 1 OF 9 (11,1%)

Statistic	Value	ASE1	Approximate Val/ASE0	Significance
Kendall's Tau-b	,49250	,06426	7,38338	
Kendall's Tau-c	,41863	,05670	7,38338	
Gamma	,70982	,06956	7,38337	
Somers' D :				
symmetric	,49165	,06415	7,38338	

with C.1.AA	dependent	,46435	,06359	7,38337	
with C.1.GG	dependent	,52236	,06749	7,38337	

Pearson's R	,50968	,06900	7,25543	,00000 *4
Spearman Correlation	,52766	,06792	7,60772	,00000 *4

*4 VAL/ASE0 is a t-value based on a normal approximation, as is the significance

Number of Missing Observations: 0

Crosstab of strategic clusters defined by environmental indicators and industrial sectors

K_IND_ST Page 1 of 1

Count "				
Exp Val "EMS+phy- env equipm. marketing+physical				
"sical				Row
"	1"	2"	3"	Total
IPARAG2	"""""""""•""""""""•""""""""•""""""""›			
	1 " 7 " 13 " 1 " 21			
food	" 2,8 " 17,8 " ,4 " 21,6%			
	š""""""""•""""""""•""""""""›			

	2	2	3	0	5
wood	,7	4,2	,1	5,2%	
	3	0	18	0	18
textile	2,4	15,2	,4	18,6%	
	4	0	3	0	3
metallurgy	,4	2,5	,1	3,1%	
	5	4	30	0	34
machinery	4,6	28,7	,7	35,1%	
	6	0	5	0	5
construction	,7	4,2	,1	5,2%	
	7	0	8	1	9
chemical	1,2	7,6	,2	9,3%	
	8	0	2	0	2
printing	,3	1,7	,0	2,1%	
Column	13	82	2	97	
Total	13,4%	84,5%	2,1%	100,0%	

Chi-Square	Value	DF	Significance
Pearson	22,08487	14	,07689
Likelihood Ratio	23,75277	14	,04907
Mantel-Haenszel test for linear association	6,85925	1	,00882

Minimum Expected Frequency - ,041

Cells with Expected Frequency < 5 - 20 OF 24 (83,3%)

Statistic	Value	Approximate ASE1	Val/ASE0	Significance
Lambda :				
symmetric	,05128	,04258	1,16272	
with IPARAG2 dependent	,06349	,05321	1,16272	
with K_IND_ST dependent	,00000	,00000		
Goodman & Kruskal Tau :				
with IPARAG2 dependent	,04439	,01725		,00806 *2
with K_IND_ST dependent	,15789	,06648		,00690 *2
Uncertainty Coefficient :				

symmetric	,11048	,03010	3,31512	,04907 *3
with IPARAG2 dependent	,07097	,02114	3,31512	,04907 *3
with K_IND_ST dependent	,24916	,05357	3,31512	,04907 *3

*2 Based on chi-square approximation

*3 Likelihood ratio chi-square probability

Number of Missing Observations: 55

Factor analysis of physical environmental measures (I)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Analysis number 1 Listwise deletion of cases with missing values

Correlation Matrix:

	B.1.B	G1OSSZUJ	G.3	G8OSSZUJ	I4OSSZ	I7ESI8	J.1
B.1.B	1,00000						

G1OSSZUJ ,08733 1,00000

G.3 -,15712 ,16883 1,00000

G8OSSZUJ ,27528 ,40702 ,07009 1,00000

I4OSSZ -,08440 ,31913 ,11688 ,01753 1,00000

I7ESI8 ,21992 ,37296 -,04353 ,24049 ,24688 1,00000

J.1 ,13252 ,26335 ,04509 ,34077 ,10361 ,16720 1,00000

J.13.A -,16740 -,23159 ,03697 -,10195 -,18440 -,18243 -,22233

J.13.B ,26473 ,26687 -,09765 ,16113 ,18536 ,17988 ,18808

J.13.A J.13.B

J.13.A 1,00000

J.13.B -,78952 1,00000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = ,63454

Bartlett Test of Sphericity = 168,14728, Significance = ,00000

1-tailed Significance of Correlation Matrix:

' . ' is printed for diagonal elements.

B.1.B G1OSSZUJ G.3 G8OSSZUJ I4OSSZ

B.1.B ,

G1OSSZUJ ,21062 ,

G.3 ,07306 ,05900 ,

G8OSSZUJ ,00493 ,00005 ,25944 ,

I4OSSZ ,21852 ,00129 ,14050 ,43599 ,

I7ESI8 ,02034 ,00019 ,34445 ,01243 ,01058

J.1 ,11056 ,00686 ,33918 ,00062 ,16979

J.13.A ,06060 ,01545 ,36694 ,17371 ,04365

J.13.B ,00661 ,00623 ,18411 ,06799 ,04282

Factor analysis of physical environmental measures (II)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

I7ESI8 J.1 J.13.A J.13.B

I7ESI8 ,

J.1 ,06083 ,

J.13.A ,04540 ,01924 ,

J.13.B ,04774 ,04053 ,00000 ,

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
B.1.B	1,00000	*	1	2,63525	29,3	29,3
G1OSSZUJ	1,00000	*	2	1,41902	15,8	45,0
G.3	1,00000	*	3	1,26822	14,1	59,1
G8OSSZUJ	1,00000	*	4	,98413	10,9	70,1
I4OSSZ	1,00000	*	5	,78989	8,8	78,9
I7ESI8	1,00000	*	6	,64732	7,2	86,0
J.1	1,00000	*	7	,60334	6,7	92,7
J.13.A	1,00000	*	8	,45608	5,1	97,8
J.13.B	1,00000	*	9	,19674	2,2	100,0

PC extracted 3 factors.

Factor Matrix:

	Factor 1	Factor 2	Factor 3
B.1.B	,40930	-,33449	,56419
G1OSSZUJ	,66153	,45260	-,02804
G.3	,02050	,60730	-,26990
G8OSSZUJ	,54200	,30121	,52941
I4OSSZ	,39223	,33790	-,54183
I7ESI8	,55427	,19950	,13521
J.1	,51289	,18739	,23400
J.13.A	-,69555	,45848	,37965
J.13.B	,72665	-,49341	-,29196

Factor analysis of physical environmental measures (III)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
B.1.B	,59773	*	1	2,63525	29,3	29,3
G1OSSZUJ	,64325	*	2	1,41902	15,8	45,0
G.3	,44207	*	3	1,26822	14,1	59,1
G8OSSZUJ	,66476	*				
I4OSSZ	,56161	*				
I7ESI8	,36530	*				
J.1	,35293	*				
J.13.A	,83813	*				
J.13.B	,85671	*				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.

VARIMAX converged in 5 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3
B.1.B	,46203	,18546	-,59149
G1OSSZUJ	,66341	,19759	,40509
G.3	,12505	-,19776	,62236
G8OSSZUJ	,80606	-,06866	-,10158
I4OSSZ	,14514	,33445	,65474
I7ESI8	,56493	,18959	,10103
J.1	,58136	,12065	,01980
J.13.A	-,12468	-,90696	-,00332
J.13.B	,17949	,90453	-,07956

Factor Transformation Matrix:

	Factor 1	Factor 2	Factor 3
Factor 1	,74103	,66468	,09526
Factor 2	,41536	-,56522	,71274
Factor 3	,52759	-,48859	-,69493

Factor analysis of the organizational position of environmental protection (I)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Analysis number 1 Listwise deletion of cases with missing values

Correlation Matrix:

	C.4.A	C.4.B	C.4.C	C.4.D	C.6.B	C.3.A	C.3.B
C.4.A	1,00000						
C.4.B	-,13026	1,00000					
C.4.C	,05672	,09645	1,00000				
C.4.D	-,09737	,24921	,19817	1,00000			
C.6.B	,08542	-,06606	-,00503	-,20648	1,00000		
C.3.A	-,04972	,20936	,12414	,21102	-,03278	1,00000	
C.3.B	-,05526	-,00354	-,01815	,07393	-,12345	,61273	1,00000
C.3.C	-,01895	-,02510	,13155	,08446	,06669	,38985	,46212

	C.3.C
C.3.C	1,00000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = ,58772

Bartlett Test of Sphericity = 96,03911, Significance = ,00000

1-tailed Significance of Correlation Matrix:

' . ' is printed for diagonal elements.

	C.4.A	C.4.B	C.4.C	C.4.D	C.6.B
C.4.A	,				
C.4.B	,10922	,			
C.4.C	,29665	,18154	,		
C.4.D	,17925	,00861	,02985	,	
C.6.B	,21038	,26694	,48113	,02479	,
C.3.A	,31989	,02320	,12051	,02233	,37887
C.3.B	,30146	,48672	,43222	,24308	,12184
C.3.C	,42923	,40663	,10693	,21302	,26496

Factor analysis of the organizational position of environmental protection (II)

- - - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - - -

C.3.A C.3.B C.3.C

C.3.A ,

C.3.B ,00000 ,

C.3.C ,00007 ,00000 ,

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable Communality * Factor Eigenvalue Pct of Var Cum Pct

*

C.4.A	1,00000	*	1	2,11464	26,4	26,4
C.4.B	1,00000	*	2	1,39629	17,5	43,9
C.4.C	1,00000	*	3	1,11558	13,9	57,8
C.4.D	1,00000	*	4	,96844	12,1	69,9
C.6.B	1,00000	*	5	,84190	10,5	80,5
C.3.A	1,00000	*	6	,67839	8,5	88,9
C.3.B	1,00000	*	7	,56430	7,1	96,0
C.3.C	1,00000	*	8	,32046	4,0	100,0

PC extracted 3 factors.

Factor Matrix:

	Factor 1	Factor 2	Factor 3
C.4.A	-,15733	,32589	,55693
C.4.B	,28212	-,60149	,06090
C.4.C	,24902	-,26474	,74026
C.4.D	,41390	-,61522	,15084
C.6.B	-,17812	,44332	,39981
C.3.A	,83317	,11093	-,00340
C.3.B	,78260	,34505	-,23589
C.3.C	,66227	,38962	,12431

Factor analysis of the organizational position of environmental protection (III)

---------- F A C T O R A N A L Y S I S ----------

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
C.4.A	,44113	*	1	2,11464	26,4	26,4
C.4.B	,44510	*	2	1,39629	17,5	43,9
C.4.C	,68008	*	3	1,11558	13,9	57,8
C.4.D	,57257	*				
C.6.B	,38811	*				
C.3.A	,70649	*				
C.3.B	,78717	*				
C.3.C	,60586	*				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.

VARIMAX converged in 4 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3
C.4.A	-,03968	-,05571	,66065
C.4.B	-,00134	,61404	-,26085
C.4.C	,06846	,65702	,49367
C.4.D	,10664	,71974	-,20779
C.6.B	,00057	-,23059	,57874
C.3.A	,80103	,24240	-,07800
C.3.B	,86804	-,07171	-,16894
C.3.C	,75567	,01560	,18598

Factor Transformation Matrix:

	Factor 1	Factor 2	Factor 3
Factor 1	,90518	,39759	-,15025
Factor 2	,42054	-,78654	,45221
Factor 3	-,06162	,47252	,87916

Factor analysis with basic corporate characteristics (I)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Analysis number 1 Listwise deletion of cases with missing values

Correlation Matrix:

	IPARAG2	A.6	A.7	A.10.A	A.10.B	A.10.C	A.10.D
IPARAG2	1,00000						
A.6	-,08520	1,00000					

A.7	-,03224	,21403	1,00000				
A.10.A	,18009	-,32949	-,03312	1,00000			
A.10.B	-,13359	,17922	,07927	-,87584	1,00000		
A.10.C	-,07468	,22216	-,13015	-,16142	-,23689	1,00000	
A.10.D	-,07526	,22863	,03581	-,33633	,06877	-,06909	1,00000
A.11	,27410	,11879	,29514	,12122	-,15042	,15441	-,13702
A.12	,08612	,09940	,48312	,03671	,00172	-,10229	,01117
A.13	-,13355	-,40547	-,30246	,27743	-,24090	-,05747	-,08266
B.1.A	,11686	,07332	-,34577	,06772	-,05457	,01674	-,07558
B.5.A	-,12013	,15816	,25510	-,27102	,27199	-,00391	,04591
B.5.B	-,10227	,21416	,21059	,02398	-,02929	-,04806	,07854
C.1.B	,11457	,17122	,11634	,08935	-,17043	,20251	-,03232
D.13	,16610	,12653	-,10235	-,00967	-,02686	,22120	-,18364
I.1.C	,03100	,53957	,24037	-,08666	-,09814	,49264	-,06926
I.2.C	-,05769	,52893	,11191	-,03344	-,13068	,39473	-,01022

	A.11	A.12	A.13	B.1.A	B.5.A	B.5.B	C.1.B
A.11	1,00000						
A.12	-,04175	1,00000					
A.13	-,43845	-,10440	1,00000				
B.1.A	,07424	-,11291	,07351	1,00000			
B.5.A	-,07545	,19206	-,16204	-,29228	1,00000		
B.5.B	,03934	,07178	-,14007	,03623	,23040	1,00000	
C.1.B	,21799	,21254	-,13677	,03224	,17153	,19789	1,00000

D.13	,21199	-,11962	-,06427	,12388	,03355	-,05258	,36909
I.1.C	,10832	,22517	-,23157	,04396	,19050	-,09885	,33635
I.2.C	,00305	,10740	-,12489	,00144	,06696	-,01368	,27736

	D.13	I.1.C	I.2.C
D.13	1,00000		
I.1.C	,20796	1,00000	
I.2.C	,19245	,77285	1,00000

Factor analysis with basic corporate characteristics (II)

- - - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
IPARAG2	1,00000	*	1	3,22488	19,0	19,0
A.6	1,00000	*	2	2,50351	14,7	33,7
A.7	1,00000	*	3	1,88072	11,1	44,8
A.10.A	1,00000	*	4	1,56921	9,2	54,0
A.10.B	1,00000	*	5	1,19771	7,0	61,0
A.10.C	1,00000	*	6	1,17264	6,9	67,9
A.10.D	1,00000	*	7	1,03681	6,1	74,0
A.11	1,00000	*	8	,90953	5,4	79,4
A.12	1,00000	*	9	,68531	4,0	83,4
A.13	1,00000	*	10	,67055	3,9	87,4
B.1.A	1,00000	*	11	,52540	3,1	90,4
B.5.A	1,00000	*	12	,50089	2,9	93,4
B.5.B	1,00000	*	13	,43410	2,6	95,9
C.1.B	1,00000	*	14	,30727	1,8	97,8
D.13	1,00000	*	15	,24979	1,5	99,2
I.1.C	1,00000	*	16	,13168	,8	100,0
I.2.C	1,00000	*	17	,00000	,0	100,0

PC extracted 7 factors.

Factor Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
IPARAG2	,00292	,33721	,23823	,48353	-,14165
A.6	,74246	-,14129	-,20322	,01635	,33795
A.7	,44728	-,23765	,66793	-,08312	-,07760
A.10.A	-,32733	,73745	,44647	-,23584	,11917
A.10.B	,12607	-,79742	-,25267	,32641	-,25207
A.10.C	,44783	,35036	-,42868	-,12261	-,06889
A.10.D	,08302	-,40544	-,10456	-,08318	,49771
A.11	,30500	,31282	,32413	,61362	,03491

Factor analysis with basic corporate characteristics (III)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
A.12	,31403	-,10424	,54621	-,28065	-,13877

A.13	-,54445	,20665	-,19248	-,51137	-,09142
B.1.A	-,08775	,31700	-,34041	,30940	,40471
B.5.A	,37980	-,41379	,19605	-,16164	-,22016
B.5.B	,18626	-,14227	,32086	-,02037	,63218
C.1.B	,49390	,33735	,17620	,03713	,03254
D.13	,30125	,37326	-,21384	,34866	-,25687
I.1.C	,80350	,27160	-,17996	-,24633	-,13932
I.2.C	,69863	,27612	-,26793	-,34847	,00331

	Factor 6	Factor 7
IPARAG2	-,19336	,37161
A.6	-,14203	,06247
A.7	-,17937	-,09353
A.10.A	-,01385	-,04386
A.10.B	,07618	,19205
A.10.C	,01437	-,37647
A.10.D	-,21577	,04847
A.11	-,14641	-,35394
A.12	-,13898	,49228
A.13	,20191	,18409
B.1.A	,01341	,48658
B.5.A	,47314	-,03877
B.5.B	,49709	-,08064
C.1.B	,46684	,18747

D.13	,44950	,08326
I.1.C	-,18296	,10101
I.2.C	-,15497	,06808

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
IPARAG2	,59982	*	1	3,22488	19,0	19,0
A.6	,75106	*	2	2,50351	14,7	33,7
A.7	,75651	*	3	1,88072	11,1	44,8
A.10.A	,92225	*	4	1,56921	9,2	54,0
A.10.B	,92838	*	5	1,19771	7,0	61,0
A.10.C	,66878	*	6	1,17264	6,9	67,9
A.10.D	,48575	*	7	1,03681	6,1	74,0
A.11	,82039	*				
A.12	,76751	*				

Factor analysis with basic corporate characteristics (IV)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
A.13	,72069	*				
B.1.A	,72052	*				
B.5.A	,65387	*				
B.5.B	,81155	*				
C.1.B	,64431	*				
D.13	,67234	*				
I.1.C	,87553	*				
I.2.C	,78620	*				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.

VARIMAX converged in 9 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
IPARAG2	-,13686	-,11465	,37330	,31574	,28222
A.6	,66596	,31225	,24969	,07267	-,19486
A.7	,10496	-,00061	,40899	,57694	-,12891
A.10.A	-,14504	-,93198	-,03447	,11342	,12145
A.10.B	-,15383	,94558	,00708	,06043	-,02433
A.10.C	,64805	-,09416	,07117	-,42494	,18542
A.10.D	,09144	,23519	-,00425	,00749	-,58141
A.11	,02524	-,18190	,86115	-,07394	,19818
A.12	,13142	-,02305	-,03694	,85933	-,01289
A.13	-,17612	-,31507	-,74915	-,09420	,05646
B.1.A	,04440	-,02311	-,05014	-,10267	,06025
B.5.A	,07396	,38227	-,09180	,23370	,25828
B.5.B	-,07151	-,05289	,08843	,03495	-,06492
C.1.B	,31017	-,10435	,08863	,21596	,54564
D.13	,19678	,09824	,11645	-,16386	,74088
I.1.C	,89110	,01246	,08418	,20728	,15554
I.2.C	,87800	-,04941	-,04212	,09325	,04798

	Factor 6	Factor 7
IPARAG2	,42826	-,25661
A.6	,13527	,29354
A.7	-,45365	,15149

A.10.A	,06180	,00327

Factor analysis with basic corporate characteristics (V)

- - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - -

	Factor 6	Factor 7
A.10.B	-,05070	-,06104
A.10.C	-,13017	-,05470
A.10.D	,13214	,25789
A.11	,01061	,01504
A.12	-,08975	,04080
A.13	,04421	-,12315
B.1.A	,83265	,08960
B.5.A	-,48800	,36657
B.5.B	-,02334	,88873
C.1.B	,07858	,42287
D.13	,17793	,05466

I.1.C	-,03021	-,07853
I.2.C	,00830	-,00509

Factor Transformation Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	,79522	,25818	,36439	,24361	,16993
Factor 2	,26143	-,77438	,08050	-,13183	,42962
Factor 3	-,37423	-,37426	,36239	,65341	,00792
Factor 4	-,34445	,32040	,70729	-,18540	,27475
Factor 5	,04358	-,19694	,08972	-,16467	-,53553
Factor 6	-,19648	,11263	-,31174	-,17552	,63753
Factor 7	-,00929	,19871	-,35202	,63564	,13327

	Factor 6	Factor 7
Factor 1	-,12807	,25214
Factor 2	,31873	-,14821
Factor 3	-,32316	,23899
Factor 4	,40557	-,06393
Factor 5	,42972	,67283

Factor 6 -,12478 ,63143

Factor 7 ,64254 -,04302

Cluster analysis with indicators defined by merging environmental variables (I)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	2,0000	4,0000	,0000	2,0000
2	2,0000	5,0000	3,0000	3,0000

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,0000	,0000	1,0000	1,0000
2	2,0000	1,0000	2,0000	,0000

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,0000	,1000	,0000	99,9000
2	,0000	100,0000	,0000	,0000

Cluster	J.8
1	3,0000

2 1,0000

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0000

Current iteration is 2

Minimum distance between initial centers is 141,3472

Iteration	Change in Cluster Centers	
	1	2
1	3,53E+01	2,01E+01
2	,0000	,0000

Final Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	1,5000	5,0000	1,0000	2,0000
2	1,7158	4,3895	1,1263	1,8211

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,0000	1,0000	1,5000	1,0000

2	1,2000	,8105	,9579	,4737

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,5000	25,0500	,0000	74,9500
2	,1579	83,9895	10,4253	5,6902

Cluster	J.8
1	2,5000
2	1,8737

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	2,0	2,0
2	95,0	95,0
Missing	55	
Valid cases	97,0	97,0

Cluster analysis with indicators defined by merging environmental variables (II)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	2,0000	5,0000	,0000	3,0000
2	1,0000	3,0000	,0000	,0000
3	2,0000	4,0000	,0000	2,0000

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,0000	2,0000	2,0000	1,0000
2	1,0000	,0000	,0000	,0000
3	1,0000	,0000	1,0000	1,0000

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,0000	15,0000	85,0000	,0000
2	,0000	100,0000	,0000	,0000
3	,0000	,1000	,0000	99,9000

Cluster	J.8
1	3,0000
2	2,0000
3	3,0000

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is 1,6731

Current iteration is 4

Minimum distance between initial centers is 120,3079

Iteration	Change in Cluster Centers		
	1	2	3
1	2,79E+01	1,49E+01	3,53E+01
2	8,37E+00	9,91E-01	,0000
3	9,19E+00	1,46E+00	,0000
4	2,32E+00	4,35E-01	,0000

Cluster analysis with indicators defined by merging environmental variables(III)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Final Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	1,9231	4,8462	1,0000	2,2308
2	1,6829	4,3171	1,1463	1,7561
3	1,5000	5,0000	1,0000	2,0000

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,2308	1,3846	1,3077	,7692
2	1,1951	,7195	,9024	,4268
3	1,0000	1,0000	1,5000	1,0000

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,0000	44,9231	49,0769	6,0000
2	,1829	90,1829	4,2976	5,6411
3	,5000	25,0500	,0000	74,9500

Cluster	J.8
1	1,8462
2	1,8780
3	2,5000

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	13,0	13,0
2	82,0	82,0
3	2,0	2,0
Missing	55	
Valid cases	97,0	97,0

- -

Variable Saved into Working File.

QCL_7 (Cluster Number)

- -

Cluster analysis with indicators defined by merging environmental variables (IV)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	2,0000	5,0000	,0000	3,0000
2	1,0000	6,0000	2,0000	2,0000
3	2,0000	4,0000	,0000	2,0000
4	1,0000	3,0000	,0000	,0000

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,0000	2,0000	2,0000	1,0000
2	1,0000	2,0000	2,0000	1,0000
3	1,0000	,0000	1,0000	1,0000
4	1,0000	,0000	,0000	,0000

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,0000	15,0000	85,0000	,0000
2	1,0000	50,0000	,0000	50,0000
3	,0000	,1000	,0000	99,9000
4	,0000	100,0000	,0000	,0000

Cluster	J.8
1	3,0000
2	2,0000
3	3,0000
4	2,0000

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0000

Current iteration is 3

Minimum distance between initial centers is 70,6825

Iteration	Change in Cluster Centers			
	1	2	3	4
1	2,29E+01	3,13E+01	,0000	1,26E+01

2	,0000	7,56E+00	,0000	3,15E+00
3	,0000	,0000	,0000	,0000

Cluster analysis with indicators defined by merging environmental variables (V)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Final Cluster Centers.

Cluster	KORNYME	C1MKTG	G2FUNKC3	G1OSSZUJ
1	2,0000	5,3333	,8333	2,6667
2	1,7059	4,6471	1,0588	1,7647
3	2,0000	4,0000	,0000	2,0000
4	1,6849	4,2740	1,1781	1,7671

Cluster	G8OSSZUJ	I4OSSZ	I7ESI8	J.1.1.A
1	1,3333	1,5000	1,1667	,6667
2	1,1765	1,3529	1,1765	,5294

3	1,0000	,0000	1,0000	1,0000
4	1,1918	,6438	,9041	,4521

Cluster	J.1.1.C	J.13.A	J.13.B	J.13.C
1	,0000	29,8333	67,8333	2,3333
2	,1176	64,1765	17,4118	18,4118
3	,0000	,1000	,0000	99,9000
4	,1918	92,5890	3,9370	3,6105

Cluster	J.8
1	2,1667
2	2,0000
3	3,0000
4	1,8219

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	6,0	6,0
2	17,0	17,0
3	1,0	1,0

4	73,0	73,0	
Missing	55		
Valid cases	97,0	97,0	

Cluster analysis with strategic environmental factors (I)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	,0074	1,7542	-1,5452	-,0778
2	-,1822	-1,1681	,9118	1,2740

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG
1	1,4584	-1,8843	1,1534	,6689
2	-2,8742	,5370	-1,5570	1,5169

Cluster	FAC_SZEM
1	2,0166
2	-,0025

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0737

Current iteration is 2

Minimum distance between initial centers is 7,2949

Iteration	Change in Cluster Centers	
	1	2
1	3,25E+00	3,30E+00
2	1,16E-01	1,09E-01

Final Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	,0615	,4153	-,1095	,0338
2	-,0316	-,4245	,3362	,0640

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG
1	,5646	-,1811	,6905	-,1874
2	-,4537	,6378	-,0695	,6269

Cluster	FAC_SZEM
1	,6768
2	,0720

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	30,0	30,0
2	30,0	30,0
Missing	92	
Valid cases	60,0	60,0

- -

Cluster analysis with strategic environmental factors (II)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	-2,8261	1,1959	,2033	-,1792
2	,9105	-1,2089	-,8824	,1672
3	,8903	-,1996	,2052	2,7695

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG

1	,1222	-1,5970	,0910	1,4167
2	1,3669	-,4627	,3875	-,4278
3	-1,0210	1,4984	1,7199	1,5635

Cluster	FAC_SZEM
1	-1,0781
2	2,4611
3	-1,1888

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0739

Current iteration is 5

Minimum distance between initial centers is 6,1306

Iteration	Change in Cluster Centers		
	1	2	3
1	2,82E+00	2,63E+00	2,70E+00
2	1,89E-01	2,21E-01	3,93E-01
3	2,62E-01	1,77E-01	3,05E-01
4	,0000	2,50E-01	3,15E-01
5	,0000	1,07E-01	1,22E-01

Final Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	-,9897	,5094	,3904	,2362
2	-,0616	-,5176	-,2000	-,3062
3	,7316	,3122	,3298	,3726

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG
1	-,1688	-,0593	,6227	,4218
2	,3368	-,2479	-,2238	-,4811
3	-,1540	,9959	,7788	,9624

Cluster	FAC_SZEM
1	-,0648
2	,5161
3	,4710

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases

1	13,0	13,0
2	26,0	26,0
3	21,0	21,0
Missing	92	
Valid cases	60,0	60,0

- -

Cluster analysis with strategic environmental factors (III)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	,4734	-,3110	-3,4014	-,9317
2	-2,8261	1,1959	,2033	-,1792
3	,8903	-,1996	,2052	2,7695
4	-,0212	2,7904	-,5691	-1,0962

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG
1	-,0714	-,8938	-,7077	-1,0660
2	,1222	-1,5970	,0910	1,4167
3	-1,0210	1,4984	1,7199	1,5635
4	-,0542	2,0748	1,0572	-,4615

Cluster	FAC_SZEM
1	-,5295
2	-1,0781
3	-1,1888
4	1,0560

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0978

Current iteration is 4

Minimum distance between initial centers is 5,7201

Iteration	Change in Cluster Centers			
	1	2	3	4
1	2,81E+00	2,96E+00	2,76E+00	2,98E+00

2	,0000	3,69E-01	2,80E-01	3,16E-01
3	,0000	2,53E-01	,0000	2,79E-01
4	,0000	1,35E-01	1,95E-01	,0000

Final Cluster Centers.

Cluster	F_CELISM	F_FAOSZT	F_FELELO	FAC_AG_V
1	-,0380	-,7985	-1,0311	-,2815
2	-,8702	-,1298	,6290	-,0858
3	,7214	-,2530	,2825	1,2313
4	,4492	,8783	,2458	-,4795

Cluster	FAC_BERU	FAC_FOLY	FAC_INT	FAC_MKTG
1	,1441	-,6510	-,3506	-,8847
2	-,0206	,0994	,2123	,0879
3	-,4600	,6576	,3805	,9630
4	,4677	,6572	,8278	,5707

Cluster	FAC_SZEM
1	,5089
2	-,0993
3	,0752

4 1,0099

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	12,0	12,0
2	18,0	18,0
3	13,0	13,0
4	17,0	17,0
Missing	92	
Valid cases	60,0	60,0

Cluster analysis with factors of general corporate characterisics (I)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-1,8024	,5831	,0858	-,5139
2	2,4908	1,2039	1,0569	,2035

Cluster	F_ISO900	F_MERET	F_TULAJ
1	,9503	4,7281	2,4267
2	-1,6308	,2176	-,9631

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0000

Current iteration is 2

Minimum distance between initial centers is 7,6663

Iteration	Change in Cluster Centers	
	1	2

1	2,63E+00	3,51E+00
2	,0000	,0000

Final Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-1,1419	,1722	,5876	,6058
2	,0374	-,0056	-,0193	-,0199

Cluster	F_ISO900	F_MERET	F_TULAJ
1	,7035	4,2126	,3055
2	-,0231	-,1381	-,0100

- -

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	2,0	2,0
2	61,0	61,0
Missing	89	

Valid cases	63,0	63,0

Cluster analysis with factors of general corporate characterisics (II)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-1,6963	-1,0804	-1,0313	2,6423
2	2,4908	1,2039	1,0569	,2035
3	-1,8024	,5831	,0858	-,5139

Cluster	F_ISO900	F_MERET	F_TULAJ
1	-,0343	-,6121	-,4144
2	-1,6308	,2176	-,9631
3	,9503	4,7281	2,4267

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0851

Current iteration is 3

Minimum distance between initial centers is 6,0495

Iteration	Change in Cluster Centers		
	1	2	3
1	2,94E+00	2,90E+00	2,63E+00
2	1,65E-01	1,94E-01	,0000
3	1,14E-01	1,34E-01	,0000

Final Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-,4729	-,1210	-,5095	,0645
2	,7245	,1496	,6407	-,1334
3	-1,1419	,1722	,5876	,6058

Cluster	F_ISO900	F_MERET	F_TULAJ
1	-,0033	-,2138	-,0896
2	-,0496	-,0363	,0971
3	,7035	4,2126	,3055

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	35,0	35,0
2	26,0	26,0
3	2,0	2,0
Missing	89	
Valid cases	63,0	63,0

Cluster analysis with factors of general corporate characterisics (III)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-,0450	-,0353	-1,9742	-1,1863
2	-1,6963	-1,0804	-1,0313	2,6423
3	-1,8024	,5831	,0858	-,5139
4	2,4908	1,2039	1,0569	,2035

Cluster	F_ISO900	F_MERET	F_TULAJ

1	,7020	1,1414	-2,8764
2	-,0343	-,6121	-,4144
3	,9503	4,7281	2,4267
4	-1,6308	,2176	-,9631

- -

Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0708

Current iteration is 3

Minimum distance between initial centers is 5,3890

Iteration	Change in Cluster Centers			
	1	2	3	4
1	2,83E+00	2,71E+00	,0000	2,74E+00
2	1,85E-01	8,35E-02	,0000	9,43E-02
3	1,05E-01	1,06E-01	,0000	,0000

Final Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	-,4714	-,2058	-,3671	-,6275

2	-,4369	-,2557	-,2041	,8120
3	-1,8024	,5831	,0858	-,5139
4	,8477	,3670	,4770	-,1654

Cluster	F_ISO900	F_MERET	F_TULAJ
1	,1326	,0853	-,7157
2	,0331	-,3424	,3914
3	,9503	4,7281	2,4267
4	-,1797	,0217	,1454

Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	19,0	19,0
2	20,0	20,0
3	1,0	1,0
4	23,0	23,0
Missing	89	
Valid cases	63,0	63,0

Cluster analysis with factors of general corporate characterisics (IV)

* * * * * * * * * * * * Q U I C K C L U S T E R * * * * * * * * * * * *

Initial Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	,6985	,7888	,5014	-,5566
2	-1,6963	-1,0804	-1,0313	2,6423
3	-2,4208	1,4547	,0021	-1,0539
4	2,0628	1,3756	-,9797	-,2615
5	-1,8024	,5831	,0858	-,5139

Cluster	F_ISO900	F_MERET	F_TULAJ
1	-3,1055	,2672	-,6727
2	-,0343	-,6121	-,4144
3	,2366	-,2608	-,8379
4	1,2429	-,5972	,2410
5	,9503	4,7281	2,4267

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Convergence achieved due to no or small distance change.

The maximum distance by which any center has changed is ,0000

Current iteration is 5

Minimum distance between initial centers is 4,6965

Iteration	Change in Cluster Centers				
	1	2	3	4	5
1	2,30E+00	2,36E+00	2,17E+00	1,99E+00	2,63E+00
2	1,65E-01	2,27E-01	3,31E-01	2,03E-01	,0000
3	,0000	1,20E-01	2,79E-01	3,00E-01	,0000
4	1,67E-01	,0000	1,50E-01	1,65E-01	,0000
5	,0000	,0000	,0000	,0000	,0000

Final Cluster Centers.

Cluster	F_AR	F_EUPIAC	F_GEPMIN	F_H_RESZ
1	,5927	-,0449	,1090	-,2663
2	-,4584	-,2011	,1183	1,2574
3	-,3865	-,0108	,4296	-,8280
4	,8628	,2765	-1,0223	-,0779
5	-1,1419	,1722	,5876	,6058

Cluster	F_ISO900	F_MERET	F_TULAJ
1	-1,3337	,3521	,0042
2	-,1500	-,3411	,0887

3	,4156	-,2825	-,3557
4	,5335	-,0699	,4149
5	,7035	4,2126	,3055

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Number of Cases in each Cluster.

Cluster	unweighted cases	weighted cases
1	11,0	11,0
2	16,0	16,0
3	21,0	21,0
4	13,0	13,0
5	2,0	2,0
Missing	89	
Valid cases	63,0	63,0