

Приложение №4: Резюме на обучителен модул „Системи за управление на околната среда“ на английски език



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1 Environmental Management Systems

The implementation of Environmental Management Systems is now an urgent need for businesses. An Environmental Management System (EMS) is a structured management framework designed to help a business reduce its impact on the environment using a variety of business practices. This section addresses the causes that led to the development of environmental management systems, their implementation methodology and problems that may arise and affect their effectiveness, while it explores the incentives and benefits of adopting an integrated environmental management system. It discusses the structure that an EMS needs to have in order to ensure the continuous improvement of the environmental perfection of a company.

With the aim of accreditation, the parameters that must be included in order to ensure the optimal operation, the various strategies that companies can follow in order to establish an EMS and the challenges that arise during the integration of an EIA in the company are examined. The ways of categorizing and predicting the effectiveness of different environmental management approaches through systems modeling are recorded and different case-examples are presented of how different companies have implemented their environmental management systems, their approaches and the problems they encountered.

Complying with the ever-growing public interest in environmental sensitivity and the legal requirements of each country, businesses are gradually recognizing the benefits of environmental protection. Thus, the environmental management system becomes necessary for companies in order to reduce their environmental risk. The performance of each business in the environment affects its share price, its accessibility of funds and its business reliability.

EMS is a useful tool that ensures that the environmental improvement goals set by the company are achieved. The different ways in which companies commit to environmental improvements suggest a wide range of incentives for them, which may differ from case to case. Specifically, these include: (a) energy efficiency, (b) waste minimization, (c) business prestige, (d) competitive advantage, (e) pressure from

supply lines, (f) current legislation for the protection of the environment, (g) employee morale and, (h) corporate social responsibility.

Every organization that introduces an EMS to serve the environmental requirements must first understand what exactly the environmental requirements are that concern it. In addition to improving the company's environmental performance, an effective EMS will offer other benefits, depending on the company's willingness to (a) take precautionary measures and (b) increase its capabilities in education, innovation and environmental integration.

The positive environmental contribution of the EMS stems from the fact that it is a systematic approach to environmental management. Its implementation is a detailed integration of environmental issues in every aspect of the company's management. The impact of environmental actions on the operation of the company is significantly influenced by the existence of a standardized environmental management system, the ultimate goal of which is to produce a corporate environmental plan that will lead to the improvement of the environmental performance of the company.

Monitoring and evaluating the effectiveness of the EMS and consequently the continuous modernization of the environmental plan of the company is the key to the successful environmental improvement of the company. For this purpose, the EMS measures (a) the use of verification checks - both internal and external, (b) the active understanding of the dimensions and effects of the business and (c) the establishment of objectives with the ultimate goal to achieve the corporate environmental plan. In order for a company to achieve continuous environmental improvement, its environmental plan must be systematically checked and reviewed. The reviews should cover the whole EMS and not focus on individual issues.

Various issues may arise during the implementation of an EMS, which can either facilitate or complicate it. A review of existing environmental management systems suggests that a potentially significant barrier may be the management mentality and the extreme focus on management, while companies that achieve growth and innovation in environmental performance are usually those who give their employees the freedom to act on their own. The successful implementation of the EMS is based on its integration into existing business activities and management. Thus, the

unsuccessful and incomplete integration of the EMS in the company involves a high risk while usually the managers who undertake the environmental management do not have the required training. On the other hand, companies that trust the responsibility of their employees usually succeed in adopting a culture of environmental improvement, with innovation always being the key to developing long-term solutions to environmental problems.

The environmental management system offers a framework of action and certification for each company to develop continuous environmental improvement, but the specific environment of each company and the different obstacles it encounters require a different environmental strategy per company. In addition, there are companies that perceive environmental protection as a threat and only comply with local environmental regulations. Still other companies spontaneously introduce environmental management in order to achieve steady improvement and gain a competitive advantage through it. The categorization of different business behaviors and the assessment of their environmental performance arise from the need to understand the aspects of environmental management and the ways in which the problems and motivations of each business affect it.

The implementation of the EMS leads to lower environmental risks, and minimizes operational disadvantages, but companies in which the application for some reason 'freezes' or fails to obtain full certification face increased environmental risk. Loss of certification usually results from inadequate monitoring and verification of EMS procedures and data. In this case, all the effort and all the resources that were channeled for the adoption of the EMS are lost since this cannot guarantee the compliance of the company with the environmental requirements.

In the case where the EMS is applied partially and not as a whole in the company, there is a lack of communication and commitment to the overall strategic goal by the individual departments and the administration gave less importance to it than to the operational requirements of their department. This usually leads the strategy of achieving continuous environmental improvement of the business in failure.

2 Theory of environmental management systems

Every organization that adopts an EMS to achieve its environmental objectives must first understand which the environmental requirements are. This is not always easy, otherwise there would be more commitment to developing environmental management systems and identifying the elements that the system must include in order to achieve its goals (Kirkland and Thompson, 1999).

The EMS not only improves environmental performance, but also offers additional benefits, depending on prevention or the willingness to grow in knowledge, innovation and environmental integration of each business. The different ways in which each business seeks environmental improvement suggest that there are different incentives for environmental improvement on a case-by-case basis (Gonzales-Benito and Gonzales Benito, 2005).

Various incentives such as legislation, lawsuits, government policies, banks, investors, accounting systems, employees, the market, costs, the public, environmental NGOs, industry standards, self-restraint and international factors have been identified by Kirkland and Thompson (1999). These can be classified into seven categories:

- 1) Energy efficiency
- 2) Waste minimization
- 3) Corporate green prestige
- 4) Competitive advantage
- 5) Supply chains
- 6) Environmental protection legislation
- 7) Employee morale and corporate responsibility

The incentives for each business are so different that some companies do not even recognize their need for environmental management (Walley and Whitehead, 1994)

Energy efficiency

Energy efficiency is the most logical reference for companies interested in starting with something that is widely known, it has minimal costs and will provide them with short-term benefits. A simple review of the use of fuel (liquid or gas) and electricity can become the basis on which resources will be saved in the near future. Thus, the adoption of an energy efficiency program is a good way to introduce an environmental responsibility program to the company. A company's environmental policy must guarantee its commitment to the increasingly efficient use of energy. Its main objectives may, for example, be to reduce energy consumption by 10% in the first year, which can easily be estimated simply by the bills the company pays for the energy market. Potential energy efficiency strategic investments that can lead to a reduction in the energy resources used and achieve significant savings are divided into non-investment strategies, low investment strategies and high investment strategies. The former include simple energy saving programs in which the identification of problems can begin with a simple investigation of the company's costs for electricity and fuel, water and runoff, as well as the pricing policies of providers, to ensure cost minimization. With this strategy, a business can reduce its costs, but there is no immediate benefit to the environment. However, the company is trained in the supervision of energy bills and this is a first step towards environmental resource management.

Strategic low-cost investments, on the other hand, involve the supply of audit equipment and optimizers, such as thermostats that will turn on and off heating and air conditioning systems depending on the external environment and the business needs, as well as the seasonal conditions. Replacing light bulbs with energy-saving light bulbs is also an important step as it can lead to the use of 8 to 10% of the required electricity compared to conventional incandescent bulbs.

Finally, high-cost strategies involve investing in more efficient units and equipment and may require significant capital. Replacing air conditioning systems, for example, with new and more efficient ones, if designed properly, will lead to improved energy efficiency of the facilities, reduced operating costs and significant savings in business costs. It will also lead to compliance with modern legal requirements for the environment.

Waste minimization

Many companies spend a significant amount of their development budget on improving production and increasing sales. However, if they pay the same attention and invest in improving their waste management, they can achieve a higher return on investment (ROI), up to 10% of the turnover. Reducing waste improves profitability and saving resources directly improves competitiveness. Thus, a waste minimization program will immediately improve the efficiency of the business and at the same time reduce its environmental footprint. Simple reviews of product and process design can ensure that natural resources in the final product are minimized to avoid waste: Waste should be considered as product failure (Castledine, 2001; Ackroud et al., 2003).

Waste minimization can be achieved, for example, by identifying all the points where a recycled or at least recyclable resource can be used and applying the use of such, instead of using virgin natural material, as well as recycling and reusing materials within the company where this is possible.

Corporate Green Prestige

Businesses are constantly seeking to differentiate themselves from their competitors in order to gain a competitive advantage. All products and services are usually inextricably linked to environmental benefits, and various industries are now realizing that other businesses and the general public prefer, where possible, to engage with companies that are willing to operate within the framework of environmental responsibility. (McBoyle, 1996).

Actions that can increase the environmental prestige of a company include full transparency of the company to customers and employees, internal communication of the company's environmental efforts with repeated training seminars for employees, the inclusion of suppliers and subcontractors in the company's environmental plan, the publication of annual environmental reports on the environmental problems that have arisen and the actions taken to be solved, as well as their results, together with the other annual corporate reports.

Competitive advantages

Any improvement in a company's efficiency in the use of resources, mainly in production processes and in the management of energy and water, will create competitive advantages over its competitors that maintain their processes unchanged (Gonzalez-Benito and Gonzalez-Benito, 2005). Inside the business environment, the optimization of air conditioning and lighting systems and the safe management of hazardous materials leads to greater profitability, improved working conditions and enhanced employee morale. All this together will probably help to create a competitive advantage for the company. Although the adoption of an EMS is optional for every business, the companies that install EMS are becoming more and more since in this way they please the consumers (Hui et al., 2001). Although competitive advantages are the most indistinguishable of the benefits of EMS (Marrow and Rondinelli, 2002), they appear in companies that actively seek environmental innovation as a competitive advantage. This advantage becomes more and more apparent as more and more companies require ISO14000 certification from their suppliers (Cochin, 1998).

Thus, for example, when the consumers are convinced that food packaging must meet certain safety standards that protect the environment and health, companies that supply this type of food packaging have a competitive advantage over their competitors, just like the companies that produce this kind of packaging.

Supply chain

This is exactly what motivates the so-called 'supply chain pressure'. In their quest to address environmental issues 'from resource to consumption', more and more companies are increasing their demand for their suppliers to install EMS. Car resellers are currently experiencing the greatest demand for tracking car industry's environmental policy (Gonzalez-Benito and Gonzalez-Benito, 2005). In addition, a large number of suppliers involve their customers in reviewing the features of their products so that the active protection of the environment and actions in this direction are evident.

The pressure on the supply chain can take the form of requiring certified EMS in its entirety, up to and including obtaining raw materials from the environment at the beginning, but it can also be a simple but comprehensive questionnaire requiring

detailed descriptions of environmental policies and supplier performance (Ramus, 2002). Production advantages and pressure on the supply chain are becoming increasingly common as consumer demands for compliance by all suppliers with environmental requirements increase. Thus, as companies require ISO14000 certifications from their suppliers, the competitive advantage of green entrepreneurship becomes more and more apparent.

Environmental protection legislation

Where management does not pursue it on its own, legislation comes in and requires the pursuit of rational environmental strategies (Azzone et al., 1997). Legal requirements are the most decisive factor in business commitment to environmental and health protection (Khanna and Anton, 2002). Penalties for companies for violating environmental law start with significant fines and even lead to the imprisonment of company executives. Companies that used to pollute recklessly can no longer avoid the responsibility of protecting the environment. The "polluter pays" principle is at the heart of environmental legislation and ensures that pollution from the past remains the responsibility of the companies that committed it.

Most of the big organizations aim at improving their environmental management and minimizing their exposure to environmental risks (British Standards Institute, 1992) while the penalties for violating environmental legislation are high and comprehensive (Balland 1997). Thus, many companies subscribe to an "environmental charter" with the governments of the countries in which they operate in order to demonstrate their compliance with environmental issues. Nevertheless, despite the growing pressure for environmental responsibility, many executives still have the impression that pollution is more profitable than preventing pollution (Walley and Whitehead, 1994).

Employee morale and corporate social responsibility

An indirect benefit of implementing an EMS is to increase employee morale. Although this cannot be a direct incentive to implement the system except in companies that demonstrate and rely on social sensitivity (Gonzalez-Benito and Gonzalez-Benito, 2005), it is slowly gaining priority for companies that want to

demonstrate "corporate social responsibility". Just as a 'green profile' can increase consumer satisfaction and preference, compliance with environmental conditions increases workplace satisfaction and staff loyalty. Although employee morale is not valued by environmental management systems, there are indications of its importance in literature (Morrow and Rondinelli, 2002). Employees feel empowered when they can come up with methods that can lead to improved corporate environmental performance, which leads to new innovative resource-saving ideas (Cochin, 1998).

Continuous training and motivation for employees to change and improve their work habits on a daily basis is of great importance. Finally, it is indicated that the initiative of the staff increases its morale and results in increased productivity of the company. At the same time, companies are taking advantage of staff skills that can lead to improved business environmental compliance. Finally, the willingness to excel at the environmental performance of the staff motivates all of them to participate in the environmental management process and to continuously improve the system.

2.1 Incentives and interventions

Businesses are moving towards environmental management either because they fear penalties for violating the law or because they realize that improving their environmental performance is an opportunity to improve the business itself. The type of interventions that the management will make in the company also depends on the driving force behind the willingness for environmental compliance (Khanna and Anton, 2002).

In the first case, where the company is simply afraid of the law, it mainly adopts internal management procedures such as development of compliance policies, checks, institutionalization of corporate criteria, budgeting of funds for mandatory compliance costs and insurance, and assigning environmental responsibility to the staff. The actions of these companies usually stop here.

However, if the company perceives environmental performance as an opportunity to improve, then it proceeds to extroverted interventions in its processes, such as the revision of its supply chains, while increasingly involving its suppliers,

employees and even its customers or authorities in each area in which it operates, in improving environmental performance through training seminars, publishing environmental reports and producing environmental policy. However, keeping contact with customers and strengthening innovation and competitiveness require actions and interventions in both directions mentioned above.

2.2 Economic success or environmental improvement?

Therefore, while the main goal of economic development is to gradually improve the lives of today and future generations, the goal of environmental protection is to avoid, or reduce the problems of pollution, neglect and desertification, loss of ecosystems and wildlife, arising precisely from the improved standard of living resulting from human activity. So when the cost of preventing environmental degradation is considered restrictive for economic activity, companies that adopt this short-term perspective feel limited and in conflict with the environmental sensitivity of the world.

However, as the problems of depletion of natural resources and pollution become more visible, companies realize that in the long run the benefits of environmental protection outweigh the financial costs. However, a lack of environmental awareness and misunderstanding of the company's operating principles can lead executives to the misconception that environmental management cannot be a significant corporate activity. Thus, the required interventions find an obstacle on the lack of commitment and acceptance of the need for environmental management and responsibility by the company. That is why the authorities, in addition to environmental legislation, must point out the benefits that environmental management offers to businesses and the benefits of reducing waste, reusing resources, recycling and improving energy efficiency, thus leading to integrated environmental management systems.

2.3 Managing the environment

The general public and all managers are now familiar with the term "environmental management", but do not have a complete picture of its importance

or use, its benefits and its proper implementation. The business world is moving fast and managers are not finding the time to train themselves on new ideas and techniques. Moreover, although environmental management is another business management strategy that leads to improved efficiency, the lack of basic knowledge for its introduction to the company is obvious. This is mainly due to the lack of environmental education and the corresponding literature from the training course of managers (Ackroyd et al., 2003).

Thus, while the business management manuals describe the management's obligation to provide stability to the business and to ensure a satisfactory level of revenue and profitability with the least possible disruption to the company, this cannot be applied in the case of environmental management. The main role of environmental management, in direct contrast to the above, is to make changes, not to manage stability. However, the management department of the environment needs the support of the other departments of the individual departments of a company in order to achieve its goals.

2.4 Corporate environmental plan

In addition to reducing environmental risks, developing an environmental management plan helps a business discover new business opportunities. As a communication tool, the corporate environmental plan can include all the company's management actions related to the environment in a coordinated action plan that is easily transferred to all executives of the company. In addition, it helps the management to make explicit and detailed informed decisions, and through systematic processes leads the company to gain a significant position and prestige, to live long and grow and to obtain sustainable competitive advantages within predetermined timeframes.

Every successful environmental management plan must:

- Reduce environmental risks and improve management audit for the future of the business,
- Give directions and instructions for the introduction of innovative products,

- Indicate the benefits of innovation in product design and processes to replace existing ones,
- Contain thorough information on the company's environmental management objectives, activities and directions so that the required actions by the employees or the management are implemented correctly and daily, where required,
- Provide thorough information on the environmental actions of the company to all employees and describe the importance of environmental management for the development of the company,
- Encourage team spirit and strengthen the corporate identity, increasing the motivation of all employees, whether or not involved in environmental management through the process of the company's environmental plan,
- Be ahead of competitors.

2.5 Development of environmental management systems

The introduction of environmental legislation has pushed companies to look for ways to reduce their exposure to environmental risks. The introduction, in all their business activities, of an integrated management system is the most effective way of managing and minimizing environmental risks, minimizing the use of resources and creating an organization chart of 'environmental responsibility' (Huietal., 2001; Gonzalez-Benito and Gonzalez-2005). By definition, the environmental management system is "the organizational structure, responsibilities, practices, procedures and resources needed to implement environmental policy".

Security check

In order to reduce the environmental risk, many organizations, in response to the growing pressure for environmental prudence, adopt the practice of environmental control (Welford and Gouldson, 1993). In the industries and especially in the petrochemical industry, it was clear from the beginning that the various problems that could arise in the production process could cause injury to workers and

therefore the first and main move in this direction of environmental management was safety check. (Local Government Management Board, 1991). Although this check is certainly a separate issue in environmental management, it cannot be an environmental strategy in itself.

Total environmental quality management

At a later stage, environmental compliance was considered a quality issue and measurable standards such as total environmental quality management were introduced. At this level, the operation of the system was included as an extension of the overall business quality management system (ISO9000, BS5750) but had a low priority in the day-to-day operations of the company (Tinsley and Melton, 1997).

The development of environmental legislation and the increased costs of running and complying of businesses is the lever that drives companies to move beyond simple pollution control and see environmental investment as a way to reduce the cost of environmental compliance. It is now becoming apparent that the benefits of importing EMS go beyond the mere reduction of production costs and even increase the market share held by companies. Lack of management commitment, as well as the inability to communicate the benefits of intensifying environmental investment, has led to the abandonment of environmental strategies by some companies, where others with greater commitment to environmental systems have succeeded (Shelton, 1994). In these cases, the severity of the penalties eventually led to the adoption of an EMS aimed at managing the environmental risk.

Ecological audit

Environmental audit is the third phase of the development of the EMS. This has led to the creation of 'eco-management audit' frameworks, such as ISO14001, BS7750 and EMAS, which are designed to meet national and international standards (Commission of the European Communities, 1993; ICC, 1994). ToISO14001 eventually prevailed over the rest, while EMAS is applicable only to purely industrial enterprises or public sector organizations, and only within the European Union (Welford, 1996).

Environmental audit is essentially a process of controls and balances that helps to improve the EMS itself (Elkington and Hailes, 1987). This audit can also lead to the

identification of risks but also to the identification of possible opportunities for cost reduction. Unfortunately, due to the high pressure to comply with the law, too many companies use these controls solely to demonstrate their environmental compliance (Welford, 1996).

Environmental management systems

Eventually the business world came to the development of integrated environmental management systems. These systems focus on management: control policies, internal resources, procurement, product and service design, information dissemination and staff training. Prerequisites are the evaluation of the effectiveness of the decisions taken by the environmental management department and their impact on the environment and the involvement of environmental management in the daily operation of the company.

Although various national and supranational organizations set standards to pave the way for business to environmental awareness, many companies view environmental engagement only in terms of compliance (Avila and Whitehead, 1993). Legislative requirements on "administration and regulation" push companies to address environmental issues partially and occasionally. The structure of the system ensures the management of the environment in terms of "quality standard", since the quality management systems and the EMS have many similarities. In this way, the management of the EMS acquires a familiar place of reference (Welford, 1996). Danger arises only if the quality system and the EMS are in direct contrast, so there is difficulty in determining the optimal choice (Tinsley and Melton, 1997).

It is obvious that depending on the company and its commitment to environmental protection the scheme may differ. However, the more complex an EMS is, the more difficult it is for companies to accept it (Roome, 1992). In addition, as the adoption of the EMS implies change, the more radical the changes it imposes, the greater the resistance it will find in other corporate structures, the more resources will be required to overcome this resistance and the greater is the uncertainty that will be introduced into the business. After all, this is evident from the fact that every new strategy that is introduced in a company always finds resistance. The possession

of the required resources, however, does not guarantee the successful adoption of the EMS.

Every effective EMS must promote the quality but also the commitment of each organization and its employees to the "environmental ethic" of the time. Many companies adopt the implementation of the EMS gradually, depending on the resources they have and the commitment of the management (Hunt and Auster, 1990). The structure of ISO14001 is designed to guide organizations to develop normalized management processes.

2.6 The standard ISO14001

Following the success of the ISO9000 standard for quality, the standard 14001 for environmental management was created in 1996 (Morrow and Rondinelli, 2002). One of its goals was to replace the many and often conflicting criteria of "environmental quality" that appeared in each country. The model does not simply address pollution reduction but includes the processes involved in creating, managing and eliminating pollution (Melnuk et al., 2003).

Table 1: The different standards of the ISO14000 family

<i>Standard</i>	<i>Description</i>
14000	Principles, systems and supporting techniques of environmental management
14001	Environmental management systems - specifications and methodology of use
14010	Environmental audit methodology - General principles
14011	Environmental audit methodology - Audit procedures
14012	Environmental audit methodology - Qualifications of environmental controllers

The introduction of the international standard ISO14001 led to the abolition of the individual standards or criteria that were applied per country. Table 2.1 shows other ISO14000 standards that apply simultaneously on an international level. ISO 14001 is essentially a process and not just a performance standard. It describes a whole system that will lead the company to achieve its environmental goals. It

believes that by helping the company to focus on its production process, it will improve its environmental performance (Melnik et al., 2003).

The latest innovation for achieving the ISO14001 certification is the gradual implementation of the EMS by the company. This provides greater flexibility in achieving the ISO14001 standard by dividing the overall environmental management process into small sub-sections. This follows six levels of integration of the EMS in the business:

- 1) Commitment to the standard and establishment of a recording base for continuous improvement.
- 2) Compliance with customer needs and legal obligations of the company.
- 3) Identification of significant environmental dimensions and impacts to enable the identification of the objectives of a management plan.
- 4) Management of the most important environmental dimensions by implementing the above management plan.
- 5) Audit document, review of the environment management system.
- 6) Extrovert communication with the aim of obtaining full certification through an internationally recognized standard EMS.

With the implementation of each phase of the scheme, the company can either carry out self-assessment through internal audits, or seek evaluation from its main customers, or turn to third parties that will evaluate it, to ensure that the prerequisites of each phase have been completed (Trust, 2005). External audit offers benefits to both customers and suppliers (if it is an intermediate link), since its results can be used by them to avoid further audits in their own supply chain (Gascoigne, 2002). Although full ISO14001 certification is not required to be a link in a supply chain business, adhering to the above gradual adaptation scheme is sufficient, more and more companies are seeking international certification to be recognized for their commitment to environmental issues.

The cost of introducing ISO14001 in the company is summarized below. It consists of direct and indirect costs:

Direct cost

It is easily calculated. It includes registration fees and annual check-in costs. The first one is the fee for signing up to join the system and covers administrative and bureaucratic costs. It is not refundable in case the process stops or if the accreditation company changes.

Indirect cost

The range of indirect costs depends on the mood of the business and the size of the environmental budget. It also depends on the size of the working group, the frequency of their meetings, and their duration.

One method for speeding up the implementation process and reducing the likelihood of failure is to precede stages 2 and 3 of an additional evaluation day. The pre-evaluation is done by a single evaluator and the benefit that results from it is found in the possible reduction of indirect costs due to the acceleration of the process. The extra day maintains the motivation of the employees even more, thus making the revision of the implementation schedule more unlikely.

Maintaining the standard and continuous improvement requires an annual audit, which introduces the annual audit costs. For the first two years after certification, the standard requires audits twice a year, so the annual budget must include two annual audits.

4 Implementing an environmental management system

4.1 *Commitment of the administration*

The success of the EMS presupposes the full commitment of the administration. The exclusive participation of at least one member of the management in the project is necessary, as well as providing the necessary staff and the necessary resources. When possible, it is necessary to hire an exclusive director for the working group of the EMS. The implementation of an EMS also raises a significant number of policy issues, which are more easily resolved when addressed by the same, specialized, environmental manager. On the contrary, a lack of management support will make the implementation of the process not only difficult, but also impossible.

Environmental policy statement

The company's administrative commitment is described in a signed environmental policy statement documenting the management's commitment to protecting the environment, preventing pollution and continuously improving the company's environmental performance. It is the backbone of the EMS and indicates, both within the company and to external institutions, that the company takes environmental protection seriously (Ramus, 2002).

The environmental plan described in this document may, for example, include energy and water consumption and the reduction of generated waste and emissions. It must explain precisely the actions that the company will take in order to achieve the institutionalized goals. For example, it can and should identify some of the following:

- Seamless provision of the required resources and personnel for the operation of the EMS,
- Actions that ensure that the staff have the appropriate training to understand their responsibilities in relation to corporate environmental policy,

- Actions that ensure full compliance of the company with the current environmental legislation,
- The framework for institutionalizing environmental objectives,
- The inclusion of environmental factors in the design of products and services in order to avoid or limit as much as possible environmental degradation,
- The continuous environmental performance monitoring systems,
- The procedures for controlling and reviewing the effective implementation of the company's environmental policy,
- Actions that force the improvement of the environmental performance of suppliers, contractors and subcontractors, where possible.

The statement must be signed by the management of the company in addition to the director of environment, in order to indicate the willingness and support of the administration in matters of environmental responsibility.

4.2. *Organizational barriers*

The general principles of each organization provide a good basis for studying the effect of EMS on business.

Table 2 Elements of the company that may affect the implementation of the EMS

Organization's structure	Departments, auxiliary sectors, hierarchy
The operating environment	Location, economic climate, legal framework
The decision-making process within the organization	Democratic or authoritarian administration, hierarchical structure
Employees	Employees' beliefs, priorities, level of education
The point of view on changes and their application	Management mentality, hierarchy, culture of the organization (preventive, counter-active or passive)

Source: Stone (2000)

While some of the technical barriers that introduce specific processes to the EMS are certainly obvious (e.g. equipment innovation), there are other key barriers to the organization's organizational structure and culture (Table 2).

5 Environmental management strategy and business strategy

Types of environmental strategy

Companies adopt a wide range of different 'green' strategies depending on their orientation towards environmental issues. Some choose to do more than they are asked to and become pioneers in environmental protection, while others stick to the letter of the law and the requirements of the consumer public.

There are companies that consider ecology a threat and implement strategies only where required by environmental law. Still others voluntarily initiate transformations in environmental management with the aim of gaining competitive advantages through their continuous improvement. There are also companies that adopt environmental strategies to increase their credibility in local communities or government agencies, although they do not benefit in other, commercial ways (Azzone et al., 1997, Gonzalez-Benito and Gonzalez-Benito, 2005).

Environmental culture and environmental response strategy are crucial to the sustainability of environmental policy. The categories of environmental strategies are the following (Azzone et al., 1997):

- *Passive, driven by political pressure:* Companies with a compliance strategy may even try to influence governments and the legislature to delay the implementation of new regulations. They view environmental improvement as a risk.
- *Counter-action:* External pressure from 'green movements', governments and laws, as well as other companies trigger counter-action by the company.
- *Precautionary:* Careful planning and timely implementation of environmental initiatives with a view to gaining a competitive advantage. From this strategy come new technologies that save resources in the long run.
- *Green innovation:* The environment is considered the most important competitive priority and innovation is the solution for environmental improvement and meeting the needs of the market with environmentally friendly products.

The latter two are those implemented by the most active companies, which in turn end up having the greatest chance of benefiting from the EMS, in a wide range of areas, even in that of competitiveness (Morrow and Rondinelli, 2002). The basic environmental policies of active companies are the following (Ramus, 2002):

- Written environmental policy with predetermined environmental performance improvement goals.
- Publication of environmental reports.
- Green supply/sale policy, including reduction of non-sustainable products.
- Environmental training of all staff.
- Assigning responsibility to staff regarding environmental performance.
- Life cycle analysis policy.
- Administrative understanding of sustainable development.
- Fossil fuel reduction policy.
- Policy to reduce the use of toxic chemicals.
- Use of the same environmental standards in both domestic and offshore facilities and activities.

Integrated approach

Traditionally, the environmental management strategy is focused on compliance with legislation and needs. Businesses were setting up a small environmental unit to deal with legislation and regulatory requirements. However, the effectiveness of this tactic is questionable. Besides, they did not have a direct influence on the operation of the company and the staff and were considered by the management to have nothing to do with the daily life of the company. They were, thus, given less priority and received less resources for the implementation of environmental procedures.

Environmental management must remain active and explain and demonstrate the benefits of environmental policy to the operation of the business. The goal of the environmental team may be right and rational, but it is not clear to management, whose mentality is to grow shareholder profit. Thus in practice a wall appears - the

green wall (Shelton, 1994) - between management and environmental management, due to different mentality and language of communication (Haven and Dorfman, 1999). Management usually felt that the environmental strategy was ineffective and instead of looking at the causes behind the inefficiency, it usually redirected resources and abandoned the environmental plan.

In practice, the 'green wall' is the result of the incompatibility of the environmental strategy with the strategy and the operation of the company, and the inability of the environmental management to "sell" the environmental benefits to the other executives of the company and the senior management. In this case, the company usually ended up in (Shelton, 1994):

- Shrinking its business activity,
- Extreme control of finances,
- Competitive strategies in management,
- Bad communication,
- Conflict of mentalities within,
- Insufficient planning of environmental initiatives,
- Unrealistic environmental objectives and
- Loss of credibility.

These factors oppose the implementation of the environmental strategy. Consequently, the environmental strategy will either follow a path of interaction and integration with the whole company or will be doomed to hit the green wall.

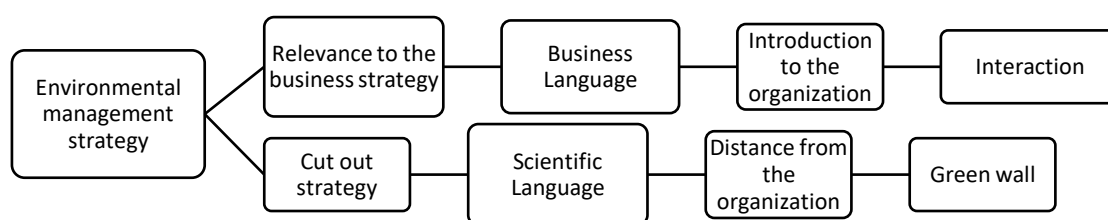


Figure 1: The two paths for environmental management

Business integration requires an effective understanding of the relationship between environmental and business objectives (Haveman and Dorfman, 1999). An environmental strategy that fits the existing business strategy uses business language

instead of technical and scientific terms and is an integral part of the day-to-day business, is easily accepted by management.

There are practically two levels of business integration. The first concerns employees' knowledge and empathy on environmental issues. In the context of ISO14001 this is treated as a target subject to scrutiny and reporting. The second concerns the integration of environmental interest and behavior into the core of the company's systems and into all of its processes (Havenman and Dorfman, 1999).

Certification 14001 requires companies to integrate the environmental strategy into the operation of the business through an effective EMS (Cochin, 1998). Because ISO14001 is a process and not a quality standard, it does not essentially dictate the company regarding its optimal environmental performance but describes a system that helps the company develop and achieve its own environmental goals (Melnuk et al., 2003, Ammenberg and Sundin, 2005). This enables each company to decide to what extent and at what pace it will pursue and implement its environmental policy. However, this means that obtaining certification does not imply an in-depth transformation of the company or the change of its mentality into more ecological practices (Ramus, 2002). If, however, the company has a limited perception of its environmental impact, it is likely that the EMS will be limited to actions that only concern its facilities.

The methods used in the operation of any business are an important factor in environmental transformation (Sundin, 2005; Gonzalez-Benito and Gonzalez-Benito, 2005). Some important factors for the environmental transformation of the company are:

- Emission filters and output regulation.
- Process and production planning and design and regulation to reduce consumption of energy and other natural resources.
- The use of clean technology.
- The preference of green products in the supply of materials.
- The environmental criteria for selecting suppliers.
- Clean methods in the transport of materials and products.
- The use of recyclable or even recycled material in the packaging.

- Resource recovery and recycling systems.
- Responsible disposal of waste and residues.

The operational transformation towards green entrepreneurship requires a change in the production process but also in the management.

Environmental design

It is a new design trend and leads to sustainable innovation and functional transformation. Practically, it is the adding of environmental and quality characteristics to products and services through their life cycle analysis. The integration of automation and the reduction of packaging materials are examples of environmental design.

Product-oriented EMS

Although the EMS is a process of introducing the environmental transformation of the company and the environmental design of its products, the prevailing trend is the integration of product design and development in the EMS. In this way, the EMS focuses on the continuous improvement of products by introducing ecological design in the company's strategy. It emphasizes life cycle analysis and product design, but the complexity of life cycle analysis and the lack of data and knowledge about it greatly complicate its implementation. Nevertheless, it leads to a better understanding of the flow of materials in the process and helps the functional transformation.

Integration of environmental policy in the company

Hutchinson (1996) describes a set of criteria for identifying the integration of environmental policy into business strategy:

- Statement of commitment of the board of directors to the integration of environmental management in the company's strategy and analysis of measures to achieve it.
- Priority over the health and safety of employees and the wider community, over profitability.

- Explicit application of environmental policy in product and process design.
- Green and socially responsible supply of materials, in order to avoid the use of scarce resources and support oppressive regimes, and protection of endangered species.
- Waste recovery policy, with the aim of reducing or reusing them as much as possible, and long-term commitment to a zero waste target.
- Reduction of pollution at the source and monitoring of outflows in order to permanently reduce pollution.
- Reduction of use of toxic substances and care for the management and disposal of toxic products of the production process that cannot be replaced.
- Recovery and reuse or recycling of packaging materials and the products themselves, where possible.
- Saving resources is a policy integrated into the company's budget and accounting.
- Environmental education.
- Integration in the staff evaluation system of a remuneration of the executives that promote the environmental performance.
- Continuous environmental improvement is considered equal to continuous business improvement.
- The cost of fixing environmental damage contained in the financial statements of the company.

Integrating environmental issues into the core of the business requires compromises, as not all environmental benefits can be achieved without cost (Haveman and Dorfman, 1999). For example:

- Reducing the packaging material may lead to a reduction in product protection.
- Environmental reforms can slow down production.
- Environmental changes require additional staff training.
- Eco-friendly materials increase production costs.

- Environmental modifications limit the capabilities of the equipment.

Strategic models

The complexity of environmental problems ultimately leads companies to organizational reorganization and review of political administration (Roome, 1994). The usual policy of assigning individual and collective responsibility for the environmental performance of the company must be replaced by more flexible organizational schemes, while environmental policy must overcome the inactivity of changing organizational structures when applied to companies with explicitly designed processes (Quinn, Mintzberg, 1987, Peters and Waterman, 1989).

The change of structure implies the organizational adaptation (Mintzberg, 1987, Ansoff, 1991), while, for its part, traditional administration prefers the gradual change of the organization (Quinn, 1978). It is usually considered that a well-planned gradual change can exceed the resistance of the company. However, in many cases gradual change is not enough to solve the problem in a reasonable time (Quinn, 1980). In these cases the administrative structure itself can lead to failure.

Before adopting an environmental policy, most organizations must establish their formal strategy and structure the communication within the company and the operational goals. The introduction of EMS challenges the traditionally conservative culture of most companies (Smith, 1990). Thus, organizations need to redefine their goals, change their organizational boundaries and structures, create new value systems, and recognize and support new types of management (Roome, 1994).

Strategy is the model from the past that leads to the plan for the future (Mintzberg, 1987). The behavior of each company is based on its pattern of action during its existence so far. Strategy may not initially display a pattern and / or new patterns may be created by the strategy itself, but ultimately strategy is an art that requires 'thinking and acting, controlling and learning, stability and change'. The goal of management when introducing a change is not to manage change, but to stabilize the company (Mintzberg, 1987). As stability is restored, the job of the management is to know when and how to bring about change.

Every organization's past offers important information for its future success. The management must maintain stability by introducing changes gradually. The evolution of the business and the revolution in methods are the defining elements of the change of strategy. These arise as the business grows in volume, organization and market share (Greiner, 1972, Mintzberg, 1987).

It is impossible to predict the forces and events that will determine the future of a business. The best strategy is built on a prudent use of resources and a corporate attitude that provides stability (Quinn, 1978). However, as management policy stabilizes at the top, senior executives are reluctant to deviate from the established course, especially if business performance is good (Boeker, 1997). In the literature, the implementation of new strategies is outlined as a series of independent components that must be taken into account. These include the relationship between strategy and structure, resource allocation, executive mentality, organizational theory, information systems, and company budget (Reed and Buckley, 1988, Gallarotti, 199, Tsai and Child, 1997; Tinsley and Pillai, 2006). It has not been clarified how these components relate to the implementation of the environmental strategy, or which of them play the most crucial role in each of the implementation phases.



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