

Chapter 2

**THE EUROPEAN EXPERIENCE ON ENVIRONMENTAL
MANAGEMENT SYSTEMS AND THE THIRD
REVISION OF THE “ECO MANAGEMENT
AND AUDIT SCHEME” (EMAS)**

*Fabio Iraldo^{a,b}, Francesco Testa^a, Tiberio Daddi^a
and Marco Frey^{a,b}*

^aSant'Anna School of Advanced Studies, Piazza Martiri della Libertà, Pisa, Italy

^bIEFE – Institute for Environmental and Energy Policy and Economics, Milano, Italy

1. INTRODUCTION

In recent years, based on the voluntary commitment and the pro-active approach of organizations, the certification framework has gained a crucial role amongst the instruments of the European environmental policy.

Voluntary instruments (such as EMAS and the “twin” regulation Eco-label) were designed by introducing concepts and mechanisms that, for the time being, led to a radical change in the environmental policies of the European Commission. The application of these patterns, in fact, originated a highly innovative policy trend, based on voluntary certification as a marketing tool providing a competitive edge.

The Commission's purpose was clearly to attract the interest of companies and convince them to spontaneously mobilize their financial, technical and management resources towards a path of continuous improvement in environmental performance.

The inspiring criterion was the belief, stated in the European Commission Fifth Environmental Action Programme, that manufacturing sectors and, more generally, all private (and public) actors whose activities had an environmental impact, could not only be seen as a part of the “problem” but also as a crucial part of the “solution”, and therefore it was necessary to encourage them to participate and cooperate in building sustainable development paths.

The guiding principle behind the definition and the implementation of EMAS and Ecolabel was very simple: if the most active players on environmental improvement had been granted official recognition as a marketable value or in social relationships as a guarantee of their credibility, then two ambitious goals were achieved: first, the increase of their competitive edge and, secondly, the improvement of the environmental performance in the economic and productive industry.

Participation in EMAS is entirely voluntary, determined as it is by competitive and social pressures perceived by organizations, rather than by binding regulatory requirements. For this reason, the framework does not set quantitative limits, technology standards or emission thresholds, but it outlines the characteristics that a system of environmental management of an organization must have to be granted a public recognition of its correctness and efficiency. The basic steps an organization must take to participate in EMAS are the following: adopt an environmental policy; carry out an initial review of the existing environmental aspects; set the objectives and targets and establish a program to improve its performance; adopt a management system aimed at achieving the program objectives; perform audits to verify the functioning and the effectiveness of the system, and then draft an environmental statement to prove its commitment to the community.

It may be interesting here to briefly describe the stages of development and dissemination of EMAS, to which the competitive pressures described above have given rise.

The framework, issued by EC Regulation 1836 of 1993, required several years of preparation, due to the need to establish supervising national bodies and define the appropriate set of rules as provided by the EU: the first registrations in Europe date back to August 1995. After a very rapid development, particularly in Germany and Austria, the spread of EMAS suffered a slight slowdown in the early 2000s, partly for the implementation of the new guidelines, issued according to EC Regulation 761/2001.

Once at full capacity, the new version of EMAS Regulation clearly produced a further acceleration in the participation of small and medium-sized businesses, public sector organizations and services, especially in tourism. To encourage the involvement of these organizations, the Regulation introduced some major changes intended to correct some critical issues resulting from the previous EMAS experience and enhanced the opportunities for development and dissemination of the framework.

This chapter aims to describe the European evolutionary path about EMAS and how European institutions attempted to evaluate hindrances, starting from the main evidences emerging from literature, and identify favoring factors and efficient solutions to overcome them. A particular focus will be devoted to the description of new requirements of the EMAS III Regulation and which are the main differences from another formal scheme, such as ISO 14001.

2. EVALUATION AND PERSPECTIVES OF EMAS REGULATION

In 2006 the European Commission formally started the review of EMAS, which ended in late 2009. To fulfill this important stage in the evolution of the EU voluntary instruments, the Commission started a debate on the effectiveness of the framework, especially on the main

expected results, such as increased competitiveness and improved environmental performance of registered organizations and, consequently, of the entire economic and productive system.

The revision carried out by the Commission focused on the preliminary assessment of a framework aimed at providing a set of clear guidelines for the sensitive decision-making processes. This study was commissioned to a team of international consultants and research institutions coordinated by IEF Bocconi, such as SPRU University of Sussex, the IOEW of Heidelberg, Adelphi Consult and Valor and Tinge. The study, called Ever (Evaluation of EMAS / Ecolabel for their Revision) had a twofold objective:

1. To perform an in-depth assessment of EMAS effectiveness specifically in terms of environmental improvement and marketing opportunities and, more generally, as a growing factor for the community.
2. On the basis of the previous phase, to develop and advance ideas and concrete proposals for the review of EMAS, to outline scenarios the Commission may pursue in the expected review process.

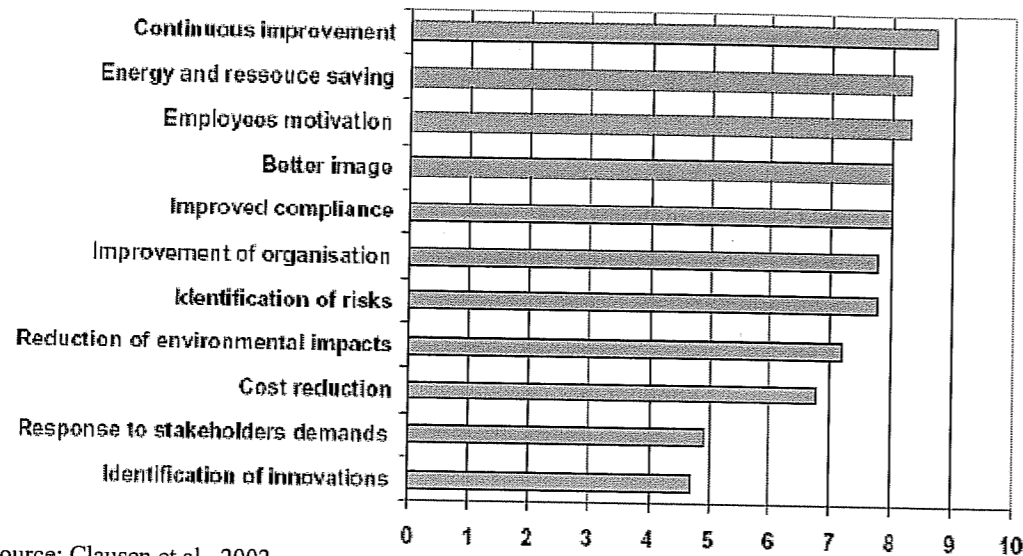
The following sections introduce the main findings on literature about the factors influencing the adoption of Community regulations on eco-management, as well as the barriers and the obstacles that involved organizations must deal with.

2.1. The Main "Driver" for EMAS Adoption

The literature that since the mid-nineties has analyzed the reasons that drive organizations to obtain EMAS registration, produced a wealth of information about drivers that prove most effective in encouraging the adoption of the Regulation. A first indicator is the extreme heterogeneity of factors "driving" companies towards Environmental Management Systems - EMSs (and, specifically, towards EMAS). These vary significantly in connection with different aspects, like the size of the organization (SMEs vs large companies), its sector (e.g. manufacture vs Public Administration), national or regional contexts, and so on.

For instance, drivers can be either economic/strategic or "environment-led"; they can deal with the internal sphere of an organization (e.g. optimization of organizational activities), or be "external", such as the desire to gain a competitive advantage or benefit from fiscal/normative incentives and facilitations.

According to the outcome of a German UBA research (Clausen et al, 2002): economic and competitive motivations (such as energy/resources savings, better image, etc.) are very important. However, the lack of homogeneity of literature data makes it difficult to establish a well defined ranking in terms of potential efficacy or to prioritize internal economic variables, as external economic and strategic drivers seem to play an equally important role. An example refers to a pilot project carried out in Saxony-Anhalt. According to this study, companies were equally motivated by the expected improvement of competitiveness and corporate image, as well as by the reduction of energy or water consumption, and by the significant decrease of waste production (Schmittel, et.al. 1999). Moreover, it is noteworthy to mention that drivers can play a strategic and economic role even if they do not necessarily translate into quantifiable benefits or "monetization".



Source: Clausen et al., 2002.

Figure 1. Reasons leading to EMAS registration.

For instance, Perkins and Neumayer (2004) agree that cost-reductions, benefits and profitability of EMAS are major drivers, but they are unlikely to be the only ones, as companies often adopt organisational innovations based on management quests for external legitimacy, and specifically, for the need to conform to widely held beliefs of rational and efficient business practice. Hence, the participation in EMAS is likely to be shaped by two sets of factors: those influencing financial costs, benefits and profitability of the scheme, and "ideational forces" such as the requirements of external stakeholders.

A peculiar and very important "external" driver is represented by the communicational dimension of EMAS.

As reported by the relevant literature on environmental reporting and EMAS statements (e.g.: Gorla et al. 2001, Imperial College, ISO 14001 solutions and IEFÉ 1999, Grafé 1996, Jones et al 2000), the willingness to communicate with the stakeholders can be a powerful driver for EMAS participation. Some of the analyzed studies put an emphasis on the fact that, in some cases, EMAS has been preferred over ISO 14001 thanks to the possibility to use and disseminate credibly validated environmental information (Gorla et al. 2001).

Other studies place greater emphasis on environment-related drivers. As shown by a research conducted on registered French organizations, (Schucht, 2000), the improvement of environmental performance is the main justification supporting EMAS participation, relatively more important than strategic factors such as corporate image, cost reduction, staff motivation, etc.

Starting from a wide and diverse literature scenario, the EVER study aimed at collecting specific and updated empirical evidence, by means of a field investigation carried out through direct interviews with EMAS participating and non-participating organization and with involved stakeholders. The field survey partially confirmed the literature, whereas in many cases it revealed significant discrepancies.

Table 1. The main driver of Emas adoption

The main driver of Emas adoption	Relevance (da 1 a 5)
better management and guarantee of legal compliance	4,0
Improvement of our environmental performance	3,9
better risk management and environmental liability prevention	3,7
Improvement of our organisational and managerial capabilities in the environmental area	3,6
improvement of the relations with our stakeholders and the local community	3,5
improvement of competitive capabilities or satisfaction of a specific request by customers	3,4
keeping up with our main competitors/members of our trade association	3,2
satisfaction of a request by our corporate headquarters	3,1
benefits from regulatory relief	2,9
increase of our rating in having access to public funding or procurement procedures	2,3

Source: Ever study.

A first important aspect to point out is that interviewees seemed to attach great importance to "compliance" and "environmental" issues as drivers for EMAS registration. Indeed, "better management of legal compliance" and "improvement of environmental performance" are singled out as the most effective drivers, with 4 and 3,9 scores.

Considering, for example, the environment-related driver, more than 37% of interviewed organizations identified it as "very important", and an extra 33% rated it as rather or somewhat "important", while the figures depicting a scarce importance of the environmental issue are statistically not relevant.

According to EVER interviewees, together with "compliance" and "environmental improvement", other key drivers seem to be more of "internal" nature, dealing with better organisation and overall level of the activities. Contrary to the literature review findings, competitive variables lag behind (the improvement of competitive capabilities is indicated only as the seventh driver in terms of importance, and the willingness to keep up with competitors as the eighth).

It is worth noting that these strategic/economic drivers, even if they lag behind other motivations, have nevertheless achieved fair "overall" scores: indeed, all drivers seem to have a "positive" motivational effect on companies (with scores higher than 3), exception done for those drivers that are closely linked to the public sector and the environmental regulation (regulatory relief, public funding, green public procurement, etc.), since these potential benefits are currently rather scarce and perceived as such by the interviewees.

2.2. The Barriers to the Dissemination of EMAS

Barriers to EMS adoption are generally categorized into external and internal to an organization (Milieu Ltd and Risk and Policy Analysis Ltd, 2009). Different “keys of interpretation” apply to such a broad issue: indeed, barriers are heterogeneous in nature and form: they can be further classified into smaller groups according to different criteria, as hindrances can be either internal or external, organizational or economic, general or category-specific (e.g. SMEs), and so on.

The literature review shows, firstly, that the cost of implementation is a considerable drawback for smaller organizations, which suffer greater shortages of financial resources (Hillary, 1999, 2004; Biondi et al. 2000). Several studies agree in highlighting the crucial role played by this barrier: a survey of 2005, for example, shows how the lack of financial resources (33%) and the cost of certification (23%) are among the main hindrances to ‘implementation of an environmental management system (ISO, 2005).

On the other hand, studies on EMS costs (Hamschmidt and Dyllick 2001, Milieu Ltd and Risk and Policy Analysis Ltd, 2009) suggest that the above mentioned figures might be underestimated. The discrepancies in the outcome of different investigations are due to many factors, not least the fact that most organizations do not have a system for the accounting of environmental costs. The table below collected evidence from previous studies on the costs of EMAS implementation in different countries.

The evidence gathered (Biondi et al. 2000, Cesqa and Sincert, 2002) suggests that external consulting and verification costs have a stronger impact on organizations, and are felt like a heavier burden compared to other costs such as those related, for instance, to the necessary modifications regarding production processes, or linked to product innovations.

The costs relating to EMAS registration, for example, are generally low, although they depend on each national Competent Body. In some countries the cost is related to the site dimension and turnover, in a positive attempt to knock down a financial barrier for SMEs. For example, in Italy the cost varies from 50 €, for small firms, to 1500€, for larger firms.

On the one hand, to give an idea of the financial resources required, it is worth mentioning the “EMAS toolkit” (European Commission, 2000), which provides figures and average expenditures for different size-categories of organisations:

- € 10,000 for very small companies (< 10 employees)
- € 20,000 for small companies (< 50 employees)
- € 35,000 for medium companies (50 <250 employees)
- € 50,000 for large companies (> 250 employees)

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Moreover, the previously mentioned Cesqa Sincert study shows how the average annual investment for the implementation of an EMS amount to about 1,9% of sales revenue for SMEs, and 5,2% for larger organisations. The problem rises from the coupling of two factors,

Table 2. Studies on the costs of EMAS implementation

Size Country	Small < 100 emp	Medium < 500 emp.	Large >500 emp.	Average
Austria (BMUJF 1999)	109.000€	225.000€	153.000€	
Denmark (Kvistgaard, 2001)				62.000€
Germany (UBA 1999)	37.000€	84.000€	85.000€	59.000€
Switzerland (Dyllik and Hamschmidt, 2000)	56.000€	93.000€	322.000€	172.000€
Hungary (INEM 2001)	3.200€-6.2.00€	5.800€-11.000€	>11.000€	
EU member States (Ec, 2009) ¹	21.000€- 38.000€	17.000€- 40.000€	38.000€- 66.000€	26.000€- 48.000€

like the relevance of the costs for a business activity and the uncertainty of their precise entity. This is consistent with the evidence emerging from the EVER study, which argues that one of the main problems faced by SMEs when considering the possibility of registering in EMAS is the existence of “a priori” undefined costs, mostly related to the implementation phase (IEFE et al. 2006).

One of the few variables that are indirectly “linked” to the evaluation of the costs of registration, that can be gathered from literature, concerns the time-length organizations take to implement or to maintain an EMS.

In a recent study on the costs and benefits of EMAS (Milieu Ltd and Risk and Policy Analysis Ltd, 2009), registered organizations were asked to indicate the number of person-days (of either their own staff or outside contractors) required to first implement EMAS. The range of responses was quite varied. External consultancy was used by most respondents to implement EMAS (59%). There may be a trade-off between the complexity of the EMAS system (lower in smaller organizations) and the expertise available (also likely to be lower in smaller organizations). The most time-consuming tasks for internal staff are the environmental review, EMS development and internal audit.

The lack of public recognition and interest affecting EMAS (and its logo) is well known, and most studies and surveys are in line with such assumption (Ends surveyed that only 6% of respondents admit EMSs being the main environmental factor orientating purchasing habits). Obviously, scarce awareness means scarce market response.

This goes for all kinds of organizations, but is probably more tackling for SMEs, which have to put a greater effort to implement the scheme, due to their limited resources. Participants of a workshop on SMEs and EMAS arranged during the EVER project argued

¹ The second amount refers the first year cost; the first amount refers the yearly cost after the first year.

Table 3. External barriers according to "in-field" research

External barriers	Relevance (from 1 to 5)
Lack of competitive rewards and advantages	3,2
Lack of recognition by the public institutions (including regulatory relief)	3,2
Lack of economic incentives (including funding)	3,1
Lack of recognition by the stakeholders	2,9
Lack of recognition at the international level (outside the EU)	2,9
Too expensive (including costs of verification and registration)	2,7
Difficulties in communicating EMAS to stakeholders and customer	2,7
Too difficult to maintain the EMS under the organisational and managerial point of view	2,6
Difficulties linked to the role of the CB	2,2
Difficulties linked to the role of the verifier	2,1

that "an important proportion of SMEs who have invested the effort and resources to register in EMAS do not receive any relevant benefits or appreciation... and finally drop out with a negative impression of the scheme".

Brouhle (2000) goes a step forward analyzing as well the scarce level of EMAS knowledge that characterizes firms themselves. He mentions a research study by UNI/ASU, establishing that over one quarter of executive managers did not know about EMAS (Freimann and Walther, 2001), and another study by the Institute for Research in Social Choices, which identified 33% who had no knowledge of EMAS and another one third who claimed to know it only partly.

Finally, the EVER study revealed that a major disadvantage is the lack of competitive advantage and recognition by public institutions, whereas costs seem to be marginally important.

Internal barriers can be defined as obstacles preventing or impeding EMSs adoption/implementation (Hillary, 2004). They are a vast category, including factors such as lack of resources (time and human capital), difficulties in understanding and perceiving the EMS framework, drawbacks in its implementation, organizational internal culture, and so on.

For instance, according to the relevant literature (Biondi et al. 2000) a first substantial hindrance on the way to EMAS registration, is the difficulty in effectively understanding the framework and its requirements and in identifying relevant environmental aspects. Indeed, it appears that many organizations are unable to accurately understand EMAS, especially as far as the Initial Environmental Review and the EMS are concerned. Those difficulties are highlighted by many studies (Hillary et al 1999, Hillary 2004). Zackrisson et al. (2000) shows that 49% of companies find it challenging to identify relevant environmental aspects, and more than 1 out of 4 fail to identify some significant environmental aspects. Moreover, it has been assessed by some studies that many companies evaluate the relevance of environmental aspects by the so-called "rule of thumb", and not by an objective and reproducible method (IEFE et al. 2006). For many companies, the drafting and the diffusion of the EMAS

Table 4. Internal barriers according to "in-field" research

Internal barriers	Non participants	Stakeholders	Participants
Difficulties originating from the set up and functioning of the EMAS scheme	2,5	3,1	2,7
Difficulties in implementing the requirements	2,3	3,2	2,6
Difficulties related to disclosure through the Environmental Statement	2,2	3	2,3
Difficulties in involving, motivating or obtaining the commitment of personnel	2,2	2,6	2,8
Lack of human resources and competence	2	3,5	2,9

Source: Fonte: Iraldo et al. (2006).

statement represent other difficult requirements in the implementation process. This is often due, especially within SMEs, to a lack of competences and knowledge within the organization (Biondi et al., 2000).

However, other studies assert how this is not merely a matter of lack of competences. The problem can assume a different connotation: MacLean (2004) defines it a matter of "harmony" within an organization (e.g: interaction between business executives and EHS managers) on business priorities. No surprise if, given such situation, it is very difficult to set performance objectives and to hence recognize relevant aspects within EMAS to be dealt with.

3. THE THIRD VERSION OF EMAS REGULATION

By publishing the Regulation of the European Parliament and of the Council 1221/2009/CE in the Official Journal on 22nd December 2009, the Community institutions have complied, in extremis, to the public commitment taken on many occasions to complete the second review of EMAS by the year 2009. The new Regulation expressly repeals the earlier 761/2001/EC (EMAS II), but also the Commission Decision 2001/681/EC, which contains guidelines for its implementation; the Decision 2006/193/EC laying down rules on the use of the logo, as well as two accompanying Recommendations (2001/680/EC and 2003/532/EC), thus summarizing the official text of all the requirements for its implementation.

The Regulation, called EMAS III, entered into force on 11th January 2010, becoming immediately binding in its entirety and directly applicable in the Member States with a transitional period, during which the organizations registered according to the 2001 Regulations continued to figure in the EMAS register.

For a correct interpretation of the innovations introduced by the new Regulation, it should first be understood that it meets targets for significant expansion of the numbers of EMAS, on the one hand, and to strengthen the credibility and the guarantees offered by the registration, on the other.

Preliminary studies (first of all the EVER study), outlined the failure to achieve the framework potential especially in terms of its circulation, and the difficulties of SME to participate as well as the lack of advantages and benefits arising from EMAS application.

3.1. Simplification for Small Organizations

As anticipated, one of the main objectives of the review process dealt with the enlargement of the number of registered organizations. To achieve this, the changes introduced were designed primarily to break down the barriers to registration for small organizations which, notably, represent a majority target than larger enterprises (SMEs account for 99% of European companies and generate 57% of value added products).

A major change concerns the duration of certificates and the frequency of audits for SMEs. Article 7 provides that a small organization may require the competent body to extend the maximum period of three years of registering up to four years, and the annual frequency of surveillance for up to two years provided that the verifier confirms that they have complied with the following conditions:

- There are no significant environmental risks;
- The organization does not plan significant changes;
- The organization does not contribute to significant environmental problems at local level.

Small organizations could thus reduce the regular audit by the accredited verifier from 4 (3 "monitoring annual" checks and 1 renewal) to 2 (1 'annual monitoring' verification and 1 for renewal), with consequent and significant cost savings.

Nonetheless, small organizations receiving the extension must prepare and submit annually their updated environmental statement, although not validated, to the competent body.

The new Regulation also proposes specific recommendations for the monitoring of small organizations, providing, under art. 26, that the verifier should accept exemptions and exceptions to the conventional structure of an environmental management system based on written procedures and formalized organizational procedures, enhancing rather typical aspects of smaller businesses, such as: direct communication and informal multifunctional staff (who covers more functions, environmental and otherwise), training provided through coaching in the workplace and, above all, limited documentation.

Other simplifications for SMEs are encompassed as support and incentives, as treated below.

3.2. Environmental Management System Requirements

The new Regulation considers EMAS registration as the culmination of a "journey towards excellence" in the field of environmental management, against which other forms of certification may represent only "intermediate steps". There are many innovations that are aimed at realizing this vision.

First, EMAS III continues to be based on the environmental management system introduced by ISO 14001, but complements specifically a distinctive set of requirements, starting by strengthening the mechanism to ensure compliance with environmental legislation.

The attention towards this aspect emerges promptly in many aspects of the new Regulation. Article 2, for example, defines for the first time compliance with regulatory obligations, such as full implementation of the obligations applicable to the organization being certified, including the requirements contained in permits. Furthermore, it clarifies that the initial environmental review has to provide not only a comprehensive framework of obligations under applicable law, but also describe how the organization works to ensure compliance. The Regulation states that organizations submit material or documents certifying compliance with all applicable legal requirements in environmental matters.

The focus on regulatory compliance is also apparent from the requirements for the Internal Auditor, among which it is particularly emphasized the need to assess the management system for compliance, and also compared to the policy and the organization's environmental program in relation to the applicable legal requirements. It then explicitly states that the internal audit must be designed to also respect the laws.

The continuous emphasis on ensuring regulatory compliance of the EMAS applicant organizations has led the author of the new Regulation to include all over again the "legal requirements and permit limit" even in the non-exhaustive list of environmental aspects to be considered in the EMAS process. See Annex I, Section 2 (in addition to the use of additives and processing aids, as well as semi-finished). It is clear that such integration is dictated by the Commission's desire to emphasize the importance of compliance itself, rather than the idea that this really represents an environmental aspect, an aim which is methodologically misleading with respect to the same definition of the feature ("element of an organisation's activities, products or services that has or can have an impact on the environment").

To counterbalance the considerable effort required to organizations in terms of concrete security and sustaining regulatory compliance, art. 32 of the new Regulation introduces the request to Member States to offer assistance in fulfilling their regulatory obligations, in terms of ease of access to information related to these obligations, and activation of communication channels (e.g. to obtain clarification) among the organizations interested in EMAS, and the authorities responsible for such obligations. This role can be played directly by the competent organizations or other entities of support appropriately identified by Member States.

In this respect, there is an immediate connection with the Environmental Compliance Assistance Program for SMEs (ECAP) of the European Commission, that as a curious sleight of hand, indicates precisely in the EMAS one of the most effective tools to support small organizations in keeping up to date on (and fulfilling) legal requirements.

With regard to new management system, there should also be noted that the new Regulation combines in a single annex (Annex II) system requirements derived from ISO 14001 and the additional information which the organizations implementing EMAS should take into account (previously included in an annex), thus improving the effective integration and, at the same time, highlighting the distinctive characteristics of the EMAS process.

In addition to the role played by the initial environmental review, and to importance for regulatory compliance, for continuous improvement and widespread communication and transparency (as hereinafter specified), Annex II gives special attention to training and to the

involvement of the organization's personnel, whose active participation continues to be a prerequisite and a vital resource, both to the functioning of the system and to improving environmental performance.

By this logic, as well as extend the provisions contained in the former Annex IB, Section 4, the new text makes it, in fact, mandatory part of the guidelines related to participation of employees as part of EMAS, as already suggested by the Recommendation 2001/680/CE.

The innovations quoted above are accompanied by brief clarifications on the environmental management system, that is in its practical implementation by many verifiers throughout the EU were well established by experience. Just think of the need in view of the first registration, to plan and launch, but not to complete, an audit program (at least about the most significant environmental impacts).

3.3. Reference Documents

An important innovation in introducing EMAS III regards the "reference documents". These are documents that describe best practices for environmental management, i.e. the most effective means by which an organization may apply a management system able to produce the better environmental performance in specific economic and technical conditions, besides those indicators that best measure these benefits in a given sector. The Commission will develop these reference documents, with the primary objective to promote the homogeneous implementation of best management practices.

The use of reference documents is not compulsory but, if available, organizations should at least take into account what they reported, both in the deployment of their management system, and in preparing the environmental statement. Besides, the verifiers are also required to use them as a benchmark to evaluate the effectiveness of a system, especially for the evaluation of the organization's environmental performance. These facts show that organizations may well justify a failure to properly align to what has been reported in the reference documents applicable to their business sector.

Originally, in the intention expressed by the European Commission in the "Explanatory Memorandum" (the strategic lines of the revised EMAS), the reference documents should be also "intersectorial" and refer to the methodological and operational aspects of the scheme under further consideration. This would fill some obvious gaps of the new Regulation, and to provide guidance that, although expected by many, it is in fact ignored.

Consider the issue of "indirect" environmental aspects, very complex for some sectors, which EMAS III offers only a confirmation about approaches already established in the practice implementation of many Member Countries. On the one hand, the regulation confirms the interpretation that the indirect aspect is what "results from the interaction of an organisation with third parties", and that it can "to a reasonable degree be influenced by an organisation". However, it also demands that the same organization assesses the significance of this aspect, by considering how much influence it can exercise on them.

On the other hand, it simply states that for those organizations that are not part of the industrial sector, as local governments or financial institutions, it is essential that they consider the indirect aspects related to their main activity and that, in this case, an environmental review and a management system limited to the "physical" structures (and the way they are managed) are absolutely insufficient.

Another aspect on which much was expected from EMAS III, especially after the enactment of Guidelines in 2005, regarded the integration of the EMAS management system with the product dimension and of services belonging to an organization. On this issue, innovations compared to EMAS II are almost untraceable: we find evidence about the size of the product among the skills that auditors should have, while it is reported verbatim the "life cycle" between the indirect aspects of Annex I and, finally, in the group of elements to consider when evaluating the significance of environmental aspects we have the following: design, development, manufacturing, distribution, maintenance, use, reuse, recycling and disposal of products of the organization.

3.4. Tools and Incentive Mechanisms

Innovations that relate more directly to implementing the requirements of EMAS by the organizations concerned, have been accompanied also by a set of important changes introduced by the new Regulation concerning the role and responsibilities of other actors involved in the scheme: the competent bodies, the Member States, environmental verifiers, etc.. From an in-depth reading about the innovations planned for these subjects, it emerges that some actions (under their responsibility) could have very positive implications on individual organizations. It is essentially a set of measures of support, encouragement and promotion of EMAS, aimed at increasing membership to the scheme to facilitate and make more "tangible" the benefits that are associated with registration. See Table 3 for a more detailed examination of these measures, in the following paragraph we simply highlight some of the main keys issues.

First, the review clearly shows its intention to "empower" the Member States concerning the initiatives to support EMAS: from the request to introduce incentives for certified organizations, such as access to funding or tax relief (it is advisable to link it to the ability to demonstrate a real improvement in environmental performance by the beneficiaries); to the obligation to develop and implement ways to simplify legislation for certified organizations, to the full enhancement of EMAS in terms of legal rules, control and management of tendered contracts and public procurement.

Second, a series of innovations designed to encourage and facilitate the completion of the EMAS process to achieve registration, relying on other forms of interim certification or feeding it through cooperation and networking.

On the one hand, the Regulation requires Member States to propose a staged approach to organizations, and initiates an interesting procedure for the recognition by the European Commission (on proposals of the Member States themselves), of "other" systems of environmental management in conformity, in whole or in part, to the requirements of EMAS. If the European Commission recognizes the equivalence between "another" management system-based certification scheme (national or regional) and the new EMAS Regulation, the organizations that already adhere to (and that are certified in accordance with) it, should not refer to the relevant requirements of further verification, because they will be automatically considered compliant in the first EMAS registration.

On the other hand, the new Regulation proposes the approach, also known as "EMAS Cluster", which was developed mainly in Italy, thanks to considerable supportive work by the Committee Ecoaudit-Ecolabel, of Apat (today Ispra) and by the Network

Descartes/CARTESIO (promoted by the Regions Emilia Romagna, Lazio, Lombardy, Liguria, Sardinia and Tuscany). Once more, however, there are positive and negative aspects of it: although there is a recognition of the effectiveness of the cluster approach and the request to Member States to encourage its development, it should be noted that it is not expected to be a real cluster registration, thus in the text are missing those useful, albeit meager, operating instructions introduced in the Decision 681/2001/EC that has been repealed.

As already noted, this type of methodological shortcomings may eventually be filled by specific "Reference documents".

4. BASICS STEPS TOWARDS AN ENVIRONMENTAL MANAGEMENT SYSTEM ACCORDING TO EMAS III REGULATION

4.1. Initial Environmental Review

The initial environmental review is a crucial phase in the implementation of EMAS, as the voluntary effort of self-assessment is not yet required by law (at least with regard to environmental issues), and EMS design is strictly bound to the outcomes of said analysis in terms of strategic choices, framework and management approach within the organization. Therefore, this review is the first and fundamental step to make when starting-up the process of complying with the EMAS Regulation. The initial environmental review is "an initial comprehensive analysis of environmental aspects, environmental impacts and environmental performance related to an organisation's activities, products and services" (art. 2). The main objectives of the preliminary environmental analysis are to:

- Identify, assess and document the key environmental issues associated with the activities performed by an organization;
- Study the interaction between these factors and the technical and organizational management of the activities
- Verify the compliance with laws and regulations;
- Draw up a preparatory assessment of environmental performance in the light of the environmental policy of the organization (if existing);
- On the basis of the above, provide information and advice to set priorities, objectives and define an environmental program;
- Set up a clear EMS framework to provide adequate ground and to detail the environmental policies of the organization in terms of compliance with the Regulation on the occasion of the first audit.

The initial review takes into account all environmental aspects of the organization (products, services, activities) to focus on those more relevant to the "assembly" of the different factors required by the Regulations (environmental policy, program, management system, auditing and environmental statement).

The environmental review should consist of basic activities such as:

- identify applicable laws and regulations and subsequently assess the organizational compliance;
- identify and analyze the overall environmental aspects of the organization associated with activities, products and services;
- evaluate and select the most environmentally significant aspects.

In order to correctly organize these activities, it is advisable for the organization to accurately review:

- Manufacturing processes and/or product and service portfolio;
- Raw materials, semi-finished products and purchased goods and services;
- Product and service portfolio in terms of actual or expected environmental impact.

Moreover, to implement an integrated reference framework, it is also desirable to collect data and information on:

- the updated corporate structure (including any parent organization) and its evolution;
- plants and infrastructure (e.g. production facilities for an industrial plant, the network structure in for energy retail companies, transport fleet for a forwarding agent or a carrier, etc.).
- the context of reference, in full detail spatial planning, urban settlement, landscape, socio-economic and environmental aspects (geology, hydrography...). the organization surroundings - as detailed as possible - with reference to territorial, urban, and landscape planning, socio-economic and environmental aspects (geology, hydrography).

In summary, the environmental review is the tool used by the organization to define its position on environmental issues. Therefore, the analysis is like a "snapshot" of the environmental conditions of the organization at the time when it is made, thus becoming the "point zero", against which the organization will evaluate the evolution of its environmental performance over time. At this stage, it is useful to examine more closely the factors leading to the "development" of this "snapshot".

1) Identification of the Applicable Legal Requirements Relating to the Environment

Legal compliance is one of the fundamental elements of the Regulation and a prerequisite to obtain the registration. Before everything else, the environmental review should verify that the organization is familiar with all relevant legislation and complies with it.

The basic requirements to which the organization must comply, may have a different nature and come from different legal sources. Environmental laws (EU, national, regional or local), for example, may relate to the specific production activities of the organization and its impact on the environment (air, water, waste, soil, noise, transport, etc.), the products and services provided, the specific area in which the organization operates. Further to considering legislative references, the analysis can dwell on the internal regulations already in place, the

organization's directives on the environment and all liabilities arising from voluntary agreements or on the participation to initiatives promoted by external parties (environmental groups, local associations, etc.). The Regulation, however, does not require the organization only to assess its state of compliance with the law by intervening in a timely manner to correct any deficiencies, but also to verify and ensure the maintenance over time of its legal compliance. This requirement can be satisfied not only by pursuing technological, engineering and production efficiency, but also by defining management methods and organizational useful to the continuous monitoring of the relevant legislative provisions and requirements. The implementation of the environmental review may represent an important element for the identification, completion and updating of the relevant legislation, and the set up of appropriate arrangements for its correct/proper "management".

2) Identification and Analysis of Environmental Aspects

The Regulation states that an organization should consider all aspects of its activities, of its products and services and decide on the basis of the criteria it defines, what aspects have a significant impact. The organization must therefore consider first of all the whole range of environmental aspects linked to its business, and only after they have been properly assessed, focus on what it considers the most significant ones (i.e.: those that have a significant environmental impact). The Regulation distinguishes between direct and indirect environmental aspects. The Regulation uses the concept of management control to distinguish between direct and indirect environmental aspects. We define as direct environmental aspects, in fact, those aspects under the management control of the organization and as indirect environmental aspects those on which it may not have full management control. Further to an in-depth analysis of the definitions offered by the Regulation, we can assume that the indirect aspects (i.e.: those aspects on which, according to the definition, the organization has only partial control) are also considered according to the contribution (whether conscious or not) of at least one other actor other than the organization - hereinafter referred to as intermediary - with whom it shares management control (Testa et al. 2010). Some examples will help clarify the above. The Regulation provides two lists (not exhaustive) of direct and indirect environmental aspects. With regard to the direct aspects, the Regulation requires that the organization takes into account at least the following:

- 1) legal requirements and permit limits;
- 2) emissions to air;
- 3) releases to water;
- 4) production, recycling, reuse, transportation and disposal of solid and other wastes, particularly hazardous wastes;
- 5) use and contamination of land;
- 6) use of natural resources and raw materials (including energy);
- 7) use of additives and auxiliaries as well as semi-manufactured goods;
- 8) local issues (noise, vibration, odour, dust, visual appearance, etc.);
- 9) transport issues (both for goods and services);
- 10) risks of environmental accidents and impacts arising, or likely to arise, as consequences of incidents, accidents and potential emergency situations;

11) effects on biodiversity.

The list, again not exhaustive, of the indirect aspects of the process include the following:

- 1) product life cycle related issues (design, development, packaging, transportation, use and waste recovery/disposal);
- 2) capital investments, granting loans and insurance services;
- 3) new markets;
- 4) choice and composition of services (e.g. transport or the catering trade);
- 5) administrative and planning decisions;
- 6) product range compositions;
- 7) the environmental performance and practices of contractors, subcontractors and supplier

As mentioned above, whereas the direct aspects are generated solely by activities and decision-making processes of an organization, those produced by indirect factors also depend on activities and decision-making powers of other entities, which are active parties in the interaction between the organization and the environment. Therefore, the analysis for the identification and assessment of the environmental aspects must include (Annex VI, paragraph 6.4):

- standard operating conditions (i.e. ordinary course of business and, for example, routine maintenance and extraordinary repairs of the facilities);
- non-routine operating conditions (including for example conditions of initiation and cessation of activities or cutback of facilities);
- incidents, accidents and predictable emergency situations (in this case the initial analysis should assess, together with the probability that the event happens, the possible consequences and preventive measures taken to prevent them);
- past, present and planned activities.

Special attention must be paid to this last issue. In fact, to faithfully describe the past activities of the organization, the initial environmental review must also include noncurrent operations or abandoned areas, still likely to exert environmental effects (i.e. an underground, disused and not reclaimed reservoir that may continue to leak polluting agents into the aquifer). As to the planning of new activities, products and services, their impact must undergo a prior evaluation in compliance with the national legislation in force on the subject of environmental impact assessment.

4. ENVIRONMENTAL EVALUATION AND IDENTIFICATION OF SIGNIFICANT ASPECTS

After the identification and the analysis of all the environmental factors revolving around its activities, the organization should focus on the most important ones, which should be pivotal in the outline of the environmental management system. The definition of the criteria for the assessment of environmental aspects is therefore left to the organization, and

represents a crucial element of the environmental review. The Regulation, however, makes it clear that these criteria should be "comprehensive, capable of independent checking, reproducible and made publicly available" (Annex I, Section 3).

For example, an environmental aspect can be considered significant under one or more of the following circumstances (the list is not exhaustive but only indicative):

- upon verification, environmental parameters often or constantly show borderline values;
- the preliminary analysis highlighted a particularly critical environmental factor in relation to magnitude, frequency or degree of reversibility of its impact;
- the environmental analysis detected local, regional or global weakness factors related to a specific environmental aspect;
- the organization records frequent reports from local stakeholders (surrounding communities, employees, public administration/government) on the persistence of particular unpleasant facts deriving from the its operations (e.g. air emissions of dubious nature, fish-plague, etc.);
- the organization envisages upcoming restrictions in environmental laws on given subjects and decides to concentrate its efforts on said subjects to forestall the legislative evolution.

In these cases, or in any other case involving significant issues, the environmental management system should pay special care and support the organization in dealing with them. In other words, the system must be "tailored" on the characteristics of the organization to ensure highly effective control over sensitive environmental aspects.

It is also important for the management system to ensure the review of environmental aspects in the presence of changing circumstances and conditions (introduction of new systems, products, process and organizational changes, lay-out modifications, new parameters monitored by law...) to guarantee the constant adequacy of the whole environmental framework in relation to production, organization and management features associated to environmental aspects.

4.2. Policy and Programme

Upon completion, the environmental review will provide a broad and in-depth information framework on:

- type and extent of significant environmental aspects associated with the activities of the organization;
- strengths and weaknesses in its organizational, managerial, technological, and operational procedures in dealing with these aspects;
- potential for improvement and priorities for action.

This framework provides the organization with all relevant information to set up a tailor-made environmental policy and an appropriate "action plan".

The environmental policy defines the commitment that the organization's management intends to make on environmental protection and sets out the purposes and principles of action (Article 2) that will guide all its actions in the management of environmental issues connected with the conduct of its business.

Given its strategic value, the environmental policy must be endorsed by the top management, must be consistent and integrated with all the principles and objectives representing values and identity of the organization and must inspire decision-making processes and governance. Moreover, it must be translated into specific objectives and concrete actions to improve the environmental management and its performance. In the case of complex organizations (e.g., multinational organizations and/or multi-site corporations) the environmental policy must be shared with the parent organization(s). The policy must also be formalized in writing, signed by the top management, made operational and maintained over time: the substantial and unequivocal involvement of the top decisional level of the organization is critical to the process of implementation and maintenance of the management system, ensuring the adequate follow-up of environmental aspects.

The EMAS Regulation also calls for environmental policy to be communicated to all staff and made available to the public: it cannot therefore be regarded as a mere formal act, but must be an explicit statement of commitment that the organization takes against employees - called to share and participate in its implementation - and external stakeholders.

As for the content of the environmental policy, the definition given by the Regulation refers explicitly to the commitments to "comply with "all applicable legal requirements relating to the environment" and to "continuous improvement of environmental performance" (art. 2). Although not mentioned in the definition, there are other aspects to which the Regulation pays a particular importance and that it identifies as being the key features of EMAS: external communication and dialogue and the participation of employees. Having identified significant environmental aspects and formulated, through its environmental policy, a commitment to prevent, manage and control these aspects, the organization should establish specific targets for improvement and plan appropriate interventions for their pursuit. The environmental policy, the most significant environmental aspects and the targets for improvement must be consistent with each other. The transition from overall objectives to specific objectives translates the commitment made by the top management into performance objectives to meet productive, organizational, technological and financial goals in terms of environmental aspects.

The Regulation also requires that the objectives are quantified where possible, and translated into goals, or in detailed goals and/or intermediate steps aimed at achieving the same objectives: quantification and articulation in goals allow, first, to have measurable indicators of results and, secondly, to have references to cross-check the progress of the environmental program. Based on the problems emerged from the preliminary analysis, specific objectives can be pursued either by means of technical interventions, aimed at preventing or reducing the environmental impact, or by a rationalization of environmentally-related operations to be carried out by the organization management. To achieve a specific objective (e.g. reduction of a particular pollutant in waste water), preventive actions acting on the causes (e.g. the replacement of manufacturing materials resulting in polluting byproducts) are preferable to protective measures acting on the effects (e.g. the improvement of the purification system).

It is also important that the organization makes an assessment of cross-media effects arising from an intervention: it is not infrequent, in fact, that the improved performance on an environmental aspect can cause the deterioration of others (for example, the introduction of a new system for the breaking down of a specific pollutant can cause the increase of sludge out of the purification process).

Once set the improvement goals and identified the steps needed to achieve them, the organization's management drafts the environmental program. A key aspect is the involvement of staff in the plan for environmental improvement. This may result in a minimal commitment to get the employees acquainted about their direct involvement, while establishing the roles, responsibilities and tasks for their prosecution at a later stage. In summary, environmental programs must:

- 1) be consistent and closely linked with the environmental policy;
- 2) act on significant issues in accordance with the priorities identified by the preliminary analysis;
- 3) define the implementation of tools and methods to attain the objectives;
- 4) define responsibilities and powers and adequate financial resources;
- 5) quantify the expected results and set the means and instruments for a constant monitoring of their progress toward the achievement;
- 6) take into account comprehensive environmental improvement programs (plans and programs at local, regional or national level, district or area environmental programs, action plans in the Local Agenda 21, etc.).

4.3. The Environmental Management System

The next step in the "planning", namely the definition of policy, objectives and programs, is to create an organizational structure and a management system consistent with all the previous steps. To do so, the organization must define a specific management, organizational and technical structure, as well as the environmental management system (EMS), which represents the "heart" and the engine of the activities and processes aimed at managing the environmental aspects, to actually implement the strategy for environmental improvement.

After defining the organizational structure it is also necessary to determine the training requirements for each part of the environmental management system, and define the operational conditions for the proper management of the significant environmental aspects, and for a proper functioning of the system (Iraldo et al. 2009).

By analyzing the definition of EMS provided by ISO 14001 Standards 2 it is easy to understand that in many cases, the design and implementation of an EMS require a rationalization rather than a revolution within the organization, as well as a systematization of some existing processes (i.e. the operating mode for the management of waste or air pollutants generated by the production process).

² Part of the management system of an organization used to develop and implement its environmental policy and manage its environmental aspects.

Provided the autonomy of the organization to adapt its structure to the requirements of ISO 14001 or EMAS according to technical and management requirements, when defining the system it is necessary to underline some items. In particular the organization shall:

- adapt its organizational structure by defining (and properly describe) the "structure" of the environmental management system and the functions involved, indicating the respective tasks;
- involve employees by supplying appropriate awareness tools, training and skills enhancement procedures for the management of environmental aspects;
- develop and implement effective ways of working for a proper environmental management, and appropriate response to emergencies;
- monitor the internal environmental performance and the system functioning and guarantee responsiveness in case of criticalities;
- define communication processes, both top-down and bottom-up, between different business functions and as to third parties;
- documenting the system and record performances.

Here following are some examples of implementation:

1) To define clear roles and responsibilities as to environmental management. Establish a clear and well-balanced structure, consistent with issues and objectives the organization must pursue for an effective environmental management system. First, it is necessary to grant responsibilities and define roles amongst all the subjects involved in environmental management in any capacity or to those parties whose activities may directly or indirectly lead to environmental issues. To provide departments and employees with detailed references and information so as to support them in the correct performance of the tasks required by the EMS, the organization must clearly define:

- the roles of each subject of the organization as to environmental management;
- the responsibilities conferred on subjects with regard to environmental issues;
- the duties and tasks assigned within the environmental management system
- working methods required to fulfill these tasks and duties.

Moreover, the organization must take into special account the balance between powers and responsibilities so as to guarantee to each delegated subject the proper role in decision-making processes on environmental issues. In doing so, the organization may adopt many specific tools, such as organizational charts, matrices of responsibilities, job descriptions, function charts, etc., which may provide an effective support to operations.

Secondly, the top management plays a key role in the proper functioning of the whole system. The direction must express and convey its commitment to environmental principles, enhance the awareness on these issues, and on the need to be consistent with these principles at all levels. To ensure a strong commitment, the top management must identify a representative endowed with adequate powers and decision making responsibilities. The representative of the top management (or representatives), irrespective of other responsibilities in the organization, must have well defined roles, responsibilities and authority order to:

- a) ensure that the requirements of environmental management system are established, implemented and maintained in accordance with ISO 14001 or EMAS Regulation; reporting to the top management on the performance of the system, in terms of its continuous improvement. In addition to the Representative of the Top Management, the organization must identify a figure to be entrusted with an operational role for the coordination of environmental management activities. This figure, usually the environmental manager or the "Responsible of the management system", should not be seen as the sole specialist in charge of the whole environmental management, with a full responsibility and related burdens, but rather as a support and stimulus to the Top Management (and therefore to all employees) in managing environmental issues³.

In order to maintain its EMS, it is essential that the organization ensures the availability of adequate resources, namely technical, financial and human resources aimed at achieving a proper and effective management of environmental issues. First, the organization must have the knowledge and technical equipment and technology to pursue the environmental improvement as its main objective. Second, the economic and financial planning, fundamental to the ordinary activities of the organization, should be extended to environmental management.

Finally, the *human resources* on which the organization relies for the implementation of the EMS, as well as all personnel involved in activities affecting the organization's environmental performance, must comply with the set objectives. Define who should do what (roles, responsibilities, duties and tasks), how to do it (working methods) and how to ensure the subject in question is able to do it (training, information and communication) are crucial factors for an effective and efficient Environmental Management.

2) *Awareness-building, training and participation.* An effective EMS is only possible if all the staff, regardless of tasks and functions, is adequately informed and trained. The primary objective of information and training procedures is to sensitize the personnel to actively engage in environmental management and to achieve improvement targets as well as to provide any person working for the organization or on its behalf, with the necessary skills to perform environmental-sensitive operations identified by the EMS.

The principles of the environmental policy, transferred to the employees at all levels, must be put into practice on a daily basis in their respective fields of operation. It is a process of "maturation" of the organizational culture affecting individual behaviour, and it calls for time and gradual development. Hence, it is reasonable, as well as appropriate, that training and awareness-building are designed and carried out in parallel with the implementation of environmental management system.

The EMAS Regulation (and ISO 14001 Standards) emphasize the need to spread environmental awareness to all workers, and in particular:

³ As for EMAS, in particular, with the adoption of the User Guidelines, prepared by the relevant offices of the EC, the Responsible person of the system becomes practically mandatory: "A Responsible of the EMS must be appointed by the organization manager. The role of this person is to make sure That all the system requirements are in place and updated as well as to keep informed the team about the general management system Functioning, Strengths and weaknesses and improvements needed for future actions"

- on the importance of compliance with environmental policy, procedures and requirements of the EMS;
- on significant environmental impacts, actual or potential, consequence of their activities and on environmental benefits due to improved individual performance;
- on the roles and responsibilities in achieving compliance with the environmental policy, on the procedures and requirements of the environmental management system, including emergency preparedness and response requirements;
- on the potential consequences of discrepancies from specified operating procedures and instructions.

The training of workers must be primarily designed to promote behavioural change through learning processes asking them to "put issues forward", rather than "to help solve them." This is why training should meet the learning needs of workers in cognitive (knowledge), operational (the skills) and behaviour (knowing how to be) areas. Each area needs dedicated tools and training and assessment for learning and change. On the basis of the learning needs different ways of training and information can be designed. These three areas of learning and staff development are complementary.

In particular, to ensure proper awareness to all staff whose activities may have a significant impact on the environment, the organization can train workers on:

- objectives and contents of the EMAS Regulation;
- principles and commitments outlined in the environmental policy;
- organization's environmental program;
- direct and indirect environmental aspects identified by the environmental review;
- responsibilities, duties and tasks, related to environmental management (including emergency management);
- technical management of the EMS;
- metrics, and systematic monitoring of environmental performance;
- proper implementation of procedures, operative instructions and procedures for managing the production process and/or the activities of the organization;
- possible environmental impacts of each activity and consequences related to the role perception and subsequent behaviour of the employee (e.g. Negative consequences of non-compliance of procedures and positive consequences of a correct application);
- information channels and participatory tools adopted by the organization in terms of environmental management (e.g.: procedures for reporting non-compliance).

In addition to training, it is also very useful, that the environmental manager draws up a monitoring system for the outcomes of training and learning. Training can be considered adequate if it had a positive impact not only on the level of *knowledge*, but also - and especially - on *skills* and *behaviours*, pivotal for the improvement of performances. The Assessment must be repeated regularly over time to ensure that training activities are geared to the evolving training needs. This Assessment can be performed, for example, through the distribution and collection of questionnaires or through direct observation of the trained employees. The training seminars and the evaluation of this training must be properly

documented and recorded. The head of environmental education may also be required to properly record and store all documentation, providing any personal files to reconstruct the basic curriculum for each professional staff.

The training workshops and the relevant assessment must be properly documented and recorded. The head of environmental training may also be required to properly record and store all documentation, providing any personal files to reconstruct the basic curriculum for each professional of its staff.

3) *Define and implement correct working methods for environmental management and emergency responsiveness.* One of the most important requirements of the environmental management system certainly concerns the ability of the organization to devise and implement methods for the *in field* application of the principles of the environmental policy, and the fulfilment of improvement objectives. The organization must therefore be based on the results of the environmental analysis to identify the activities associated with the most significant aspects (both direct and indirect) and define the most suitable actions and behaviours to minimize their environmental impact. Once the "mapping" of these activities is complete, correct working methods must be planned and applied in accordance with the following conditions:

- establishing and maintaining documented procedures to cover situations in which the absence of such procedures could lead to deviations from the environmental policy, the objectives and targets;
- stipulating the operating criteria of procedures;
- establishing and maintaining procedures related to significant (and identifiable) environmental aspects in relation to goods and services used by the organization, and communicating to suppliers and contractors the applicable procedures and requirements.

To ensure the effectiveness and application of procedures, it is important to share their content with the workers directly involved in the related activities by means, for example, of consulting tools made available by the management. Additionally, the implementation of a new procedure and/or operative⁴ instruction needs a period of testing to verify its effectiveness, the degree of implementation with employees (also through appropriate forms of practice and training), the organizational and technical feasibility, and to identify any changes necessary to an effective implementation.

In general terms it is appropriate that the organization is equipped with:

- procedures and operational instructions regulating the activities carried out by both employees of the organization and by other subjects acting on its behalf;
- procedures for purchases and contracts to ensure that suppliers and those acting on behalf of the organization comply with its environmental policy;
- procedures for the control of the intrinsic characteristics of the process;

⁴ According to the definition of the EMAS User Guideline: "Working instructions must be clear and easy to understand. The content should contain: relevance of the activity, environmental risk associated to that activity, specific training for the staff in charge of it, and supervision of the activity."

- procedures for the approval of processes and for the maintenance of equipment used in operation;
- procedures to identify and respond to potential accidents and emergency situations and to prevent and mitigate perspective environmental impacts (the organization must review and revise, where necessary, these procedures, in particular after the occurrence of accidents or emergencies and should schedule regular drills, where possible);
- procedures aimed at communication and management of interactions with all stakeholders external to the organization from which can result in an indirect environmental aspect, namely the management of those activities that involve "intermediate" actors. procedures aimed at communication and management of interactions with all external stakeholders which may be involved in indirect environmental aspect, namely the management of activities related to intermediate actors.

An important aspect, emphasized by the EMAS Regulation (and by the standard ISO 14001), is the management and monitoring of suppliers and subcontractors. For example, the actions that an organization can adopt to manage relationships with its contractors may include:

- the introduction of rules and environmental performance requirements in tender specifications (as well as in subcontract clauses), and related contractual non-compliance clauses (e.g. exclusion of hazardous substances; use of machines with high environmental performance; contract provisions on the supervision of subcontractors);
- perform audits on contractors and subcontractors to verify compliance with environmental requirements of the contract of service (e.g., audit services for the maintenance of thermal systems, document checks on compliance statements);
- the installation of internal facilities and/or temporary structures (and the setting up of related management procedures), to facilitate the proper conduct of on-site contractors and subcontractors;
- the definition of internal procedures for selection, qualification and monitoring of contractors and subcontractors (e.g., including the presence of internal personnel to supervise technical services);
- consequent actions against suppliers as outcome of audits, control and surveillance (e.g. corrective action: reports, official communications; punitive actions: decrease in the rating of the qualification of suppliers, payment of penalties);
- the definition of shared plans and procedures for emergency management to be adopted by onsite contractors and subcontractors (code of conducts in emergency situations; emergency management training).

The procedures for operational control, as defined by the organization, should be:

- present for all activities that require a clear definition of responsibilities, duties and tasks;
- properly disseminated and available in places of use;

- known by the staff involved;
- periodically reviewed and updated;
- documented in a systematic way.

It is a widespread belief that the definition in writing of the working methodology, and the detailing of operational criteria may be useful for the organization. The goal in the formalization of the EMS should be to achieve a balanced degree of documentation, especially in relation to the complexity and the problems of the organization in managing its environmental aspects. It should be noted that:

- an organization can choose the degree of formality that befits the most, being neither procedures or operating instructions subject to any form of constraint or requirement regarding content, length and degree of detail, except to reflect the real situation in this organization and to be functional.
- in particular, a small organization is entitled to rely on established practices for certain activities (implicitly or explicitly shared by all players although not formalized) that are, in fact, part of an environmental management system.

The procedures should be proportionate to the needs of the organization's management system.

4) *Performance measurement, monitoring and improvement.* The EMAS Regulation and the ISO 14001 Standards provide that the organization shall establish and maintain documented procedures to monitor and regularly measure the key characteristics of its activities and its operations that can have a significant impact on the environment. This includes recording information to track the development of environmental performance, relevant operational controls and conformity with the objectives and targets. The task of measuring and monitoring thus allows to collect quantitative data, processed in the form of summary indicators that provide important information for the evaluation of organizational performance, the efficiency of the EMS and its ability to achieve environmental objectives.

In addition to audits, the organization must implement two different level of monitoring system

- monitoring of "management"
- monitoring of "performance"

The first category includes the periodic monitoring of the implementation of the objectives, and the effectiveness of controls. An organization should establish operating procedures to effectively monitor over time the level of achievement of improvements. This verification should be carried out at least every six months (including once in connection with the Management Review), in order to promptly intervene in case of difficulties in respecting the deadlines. The second category concerns the measurement of environmental performance to verify the achievement of targets by means of performance indicators (e.g. m² of removed asbestos roof, training hours per employee/task, etc.), the compliance with operational criteria, and to monitor incidents with potential environmental consequences. The tools and equipment used for monitoring and surveillance should be subject to calibration and

maintenance, while records of this process shall be retained according to the organization's procedures. The monitoring of environmental performance has also the objective to cross-check (and possibly confirm or reduce) the significance of environmental aspects previously considered as significant and to identify new ones, consistently updating the relevant register. It should be noted that the measurement and monitoring of environmental aspects must be carried out on a *regular basis*, in accordance with the agenda set by the top management, or whenever significant changes in internal or external environmental conditions to the organization so require. Under the EMAS Regulation and the ISO 14001 Standards, the organization should define responsibility and authority for handling and investigating potential non-compliances (NC), taking action to mitigate any impacts and to amend the course of activities or the equipment/ machinery that gave rise to the NC and prevent them from happening in future.

"Non-conformity" thus refers to a failure to meet one or more of the requirements defined by the organization through its management system, by the reference standards (ISO 14001 or EMAS), or by applicable law and regulation, which is likely to affect the environmental performance. Examples of failure are, for instance, wrong instructions given to employees (resulting in incorrect management of the temporary waste storage), failure to achieve a goal, misapplication of a legal provision (e.g. non-control of the quality of emissions on a given time), non-compliance to a specific requirement of the standard of reference (e.g. failure to identify the documents of external origin).

Therefore, it is advisable for the organization to introduce a procedure defining the methodology for the identification, documentation, evaluation and treatment of NC to manage any corrective and preventive actions. These actions are taken to prevent the recurrence of NC due to systematic factors, eliminating the causes and enabling preventative measures.

Any corrective or preventive action taken to eliminate the causes of NC, real or potential, must be appropriate for the problems and environmental issues in question. Therefore, the organization could introduce a procedure similar to the following:

- reporting of NC to be carried out on appropriate forms by employees in charge of the process;
- registration of the CN to be carried out by the Environmental Manager;
- analysis of NC causes, possibly in cooperation with other functions of the organization affected by the same NC;
- management of the NC as agreed with the Heads of the Departments concerned, possibly with the assistance of the person in charge of the report;
- implementation of any corrective or preventive action (if necessary) to avoid a repetition of the NC;
- assessment of the outcome of the implemented action (in case of failure, the process must be repeated).

5) *Communication processes within the EMS.* The commitment to an effective environmental management also requires the activation of an appropriate and systematic communication on environmental issues. The flow of environmental communication must be addressed both internally and externally. As to environmental aspect and EMS, ISO 14001 Standards and EMAS Regulation require the organization to:

- a) ensures internal communication among the various levels and functions of the organization;
- b) Receive, document and meet the requirements of external stakeholders.

To facilitate *internal communication*, the organization should set up suitable channels and tools, and identifies management methods, possibly by establishing a specific procedure. The tools and information channels should be efficient and effective (first, to ensure that the requests reach the right people and, secondly, to guarantee adequate and timely feedback). The flow of information and communication must be bidirectional, so as to enable the employees not only to be informed but also to express requests and suggestions, and receive appropriate and timely feedback in order to be involved and participate in environmental management. The following charts describe tools and methods to disseminate environmental commitments and objectives within the organization. The establishment and maintenance of relationships and opportunities for an external interaction on environmental issues, if properly set, can result in a profitable mechanism for exchanging information with the stakeholders. The external communication can take place through various channels and tools, depending on the target audience:

- *institutional communication*, i.e. intended for public bodies, ministries, public administrations and supervisory bodies, through, for example, meetings, conferences, and public awareness programs (e.g. the "open days");
- marketing communication i.e. participation in fairs/conferences, press releases in industry press, corporate brochures, environmental reports and sustainability reports
- *communication to suppliers* to introduce the organization, by editing descriptive brochures or brochures that summarize the characteristics of the management system implemented in the company, and the principles of its Environmental Policy;
- Communication to suppliers to introduce the organization, by means of descriptive brochures which summarize the characteristics of the management system implemented in the company, and the principles of its Environmental Policy;
- *communication to the stakeholders* such as associations, population and individual citizens, through direct meetings, attendance at public meetings, editing of brochures or leaflets, messages in the local press etc.

The organization, however, in addition to the flow of external information (external communication), should also provide tools and suitable channels to enable the implementation and management of all incoming information, useful for the functioning of the EMS. Only by enhancing this "bi-directional" value of communication and external relations, the organization can benefit from all the advantages of strategic information network. To achieve this result, the organization may implement a systematic complaint record in order to prevent any "side effects" (reporting, pressure on institutions, etc.), initiating, for example, a toll free number, issuing questionnaires designed to assess environmental perception and the degree of social consensus or, more simply, by drafting information sheets including blank fields for complaints, comments, suggestions, to distribute among local stakeholders (neighbouring communities, mayor, representatives of environmental associations, etc.). It is recommended that the organization willing to develop a strategy for internal/external communication, establishes (or identifies) a specific function

to be entrusted with the collection, analysis, development, reporting and recording of said information while in charge of managing input, and dissemination of the official communication flow among interested stakeholders.

6) *Document the system and record the performance: maintenance and document control.* The ISO 14001 Standards and EMAS Regulation provide for the organization to establish and maintain information, in paper or electronic form, to:

- describe the core elements of the management system and their interactions, and issue guidelines on the relevant documentation
- record the activities relevant to management, monitoring and control of the environmental significant aspects

The required documentation focuses on two types of documents:

- the so-called "management documents" describing the activities of the EMS, which are used as a reference for the proper conduct of environmental activities
- documents relating to "registration", aimed at demonstrating the proper implementation of the EMS, which provide an updated picture of environmental performance (as well as a "reconstruction" against the past performances).

As to the first first category, the key objective of the formalization is to closely fit to the actual needs of the management system (and to be verifiable by external auditors). The overall criteria is to pursue the most possible coincidence between the description given in the documentation and the actual operational system of the organization. Furthermore, the degree of formalization and complexity of management documents must be in line with the real needs of the organization and the employees. So, small organizations in particular, should avoid overly elaborate documents or procedures as they should simply describe (even through a simple list of actions) the various operating modes that the different companies involved must perform to comply with the standard requirements. This approach is also increasingly appreciated and valued for the purposes of third party certification under ISO 14001 Standards. It is clear that in these case, said verification will be primarily done by observing the conduct of employees, and by ascertaining their knowledge of the proper operating procedures by means of interviews.

As regards the second type, it should be noted that the ISO 14001 Standards and the EMAS Regulation require the organization to establish and maintain procedures for the identification, preservation and disposal of environmental records. These records must include data relating to training, as well as the results of audits and reviews. The organization, as previously highlighted, is granted complete discretion and flexibility in defining its own documental system, provided it ensures the effective management of the EMS. A third group refers to "operational" documents or operational instructions detailing the operations for the management of particular environmental aspects. These documents must necessarily arise from actual and special management needs. In order to ensure their proper and effective application, it is desirable that the definition of their content is edited with the active involvement of employees. It is also important to note that the contents of the operating instructions should in line with the skills and know-how of the various recipients. To this end,

it is possible to use a common terminology as well as industry specific language (including jargon, should the productive sector and the local situation requires it), as well as figures, diagrams, and explanatory images of various types to guarantee easier understanding and memorizing. This solution is particularly suitable if the organization employs foreign workers, who may be hindered by language barriers.

Whether they are system files, Systems files and registration files must be kept under control in order to ensure that: they are easily referable to the activity, product or service to which they relate. They are properly filed, and therefore can be easily located and retrieved, and protected against damage, deterioration and loss.

4.4. Audit

Once implemented, the EMS must be tested to assess its efficiency and effectiveness in ensuring the expected performances and in achieving the goals of the environmental program, in compliance with the system. Any organization willing to implement an EMS is therefore required to plan adequate procedures for the monitoring and internal control, to achieve basic environmental performances, and to effectively monitor the "virtuous circle" of a continuous improvement. The operational framework designed by the EMAS Regulation and by the ISO 14001 Standards attaches great importance to the role of auditing when it comes to the correct and complete implementation of appropriate environmental management systems. The EMAS Regulation III defines environmental audit as "a systematic, documented, periodic and objective evaluation of environmental performance of an organization, of its management system and processes devoted to environmental protection." Through auditing activities the organization aims at assessing:

- the "merits" of the environmental performances; the adherence to EMS criteria and principles, the adequacy of the productive, technological, administrative, organizational and managerial characteristics of the organization, as well as its ability to achieve objectives;
- "methods", i.e. the sound application of EMS and the compliance of conducts with the existing rules.

The assessment must be: systematic or based on certain and recognized methods; strict/objective, which means deriving from objective evidence, verifiable and reproducible in a systematic audit process; documented or based on the existing documents as a guarantee of the traceability of such evidence and consequently, of the its conclusions; periodical, or rather scheduled or performed regularly in order to set up and ensure over time the cycle of a continuous improvement.

Whereas the basic objective of implementing an EMS is the planned management of environmental aspects related to a task, a correct and developed audit program is an essential element for achieving this goal. From a management perspective, the ISO 14001 Standards and the EMAS require the organization to establish and maintain operating procedures for periodic audits, to be carried out starting from the results of previous audits and the environmental relevance of the activities involved.

In particular, these procedures should define the methods to adopt for:

- the training of internal auditors and/or the appointment of external auditors;
- the establishment of the group of auditors;
- the planning, the scheduling and implementation of activities
- the reporting and the use of outputs for the review of the EMS to be carried out by the management

The training of internal auditors or the choice of external one is a crucial step for the success of the auditing: the reliability of its process and the trustworthiness of its results are connected, to the independence and impartiality of the auditors and to their expertise. In general, larger companies with more units can support the auditor's team with internal EMS specialists usually operating in other departments and therefore not involved in the assessment of their own unit. This activity, also known as "cross-audit" (peer audit) can provide a degree of independence from the party carrying out the audit and, at the same time, competent support from EMS internal professionals. The auditing activity must also be properly prepared and planned, by identifying objectives and scope of each audit (or audit cycle). As to the audit frequency, the ISO 14001 Standards do not set restrictions of any kind, whereas the EMAS Regulation prescribes a complete audit cycle every three years or every four years in the case of small organizations with no significant environmental impacts, subject to simplifications established in art. 7 of the Rules. The audit cycle is the period in which all areas/activities/elements of an organization undergo auditing.

The program is very important to properly schedule the steps of the auditing cycle so as to ensure the verification of all EMS areas in the reference period. In some cases, for example, for the "start-up" of the management system, it may be necessary to schedule more frequent audits (certainly more often than once a year) in order to underline the commitment of the organization and its willingness to properly and rapidly implement the environmental framework.

In complex organizations, in terms of organizational, managerial and/or operational aspects, the auditing activity may be structured in a number of specific audits to be carried out in a sequence, defined in accordance with the auditing scope. In this case, the organization, further to appropriate and prior assessments, may decide to subject some sensitive areas / activities / elements to more frequent audits. In summary, prior to carrying out the audit, the organization must have:

- trained the internal auditors or have-selected the external ones;
- planned the stages of the audit cycle;
- appointed the audit team, that will provide, together with the organization, all the necessary work tools (worksheets, checklists, protocols, questionnaires, etc.).

At this stage, it is possible to start up the planning and implementing phase of one or more audits, as provided in the program.

4.4. Management Review

As previously seen, the definition of responsibility is a critical step in the structuring of the EMS, especially for the senior management which is in charge of strategic planning and decision-making. The executive level should first define the policy principles, setting objectives and decide on programs, ensuring appropriate resources. Besides, it should oversee the management and ensure the functioning of the EMS through the promotion, supervision, monitoring and review of objectives, programs as well as the overall system. In this context, the top management is required to regularly review the management system to assess its capability and effectiveness in implementing policy and programs.

In a logic of continuous improvement, the task of review essentially aims at identifying seeks improvement areas. Through these activities, the top management intends to ensure the relevance of the commitments supporting the policy in a changing environment, to assess performances with respect to objectives and to verify the consistency of said objectives in terms of commitment, resources and timeframe. The review will highlight needs and opportunities as to policy, objectives, programs and system. These needs may arise:

a) from cases of non-compliance:

- of performance against quantified program targets;
- of obligations with respect to corresponding law or regulation;
- of the EMS with respect to the objectives of improvement (adequacy and effectiveness of the organizational and managerial structure; correctness in the implementing rules, effectiveness of awareness building measures, information and training, etc.).

b) from internal changes like the introduction of new manufacturing technology to amend environmental aspects; from the achievement of a goal that changes priorities, from the launch of a new activity, product or service; or rather from a change in the organizational structure, etc.

- from changes due to external factors: for example, the introduction of a new legal requirement on the subject of environment; from the market availability of a new production technology reducing a specific environmental impact; or rather from special requests of various kinds coming from stakeholders, etc..

The review is carried out during regular inter-functional meetings, personally directed by the highest organization ranks (e.g. CEO). Frequency and methods of implementation, to be decided by the organization, should be defined in advance and described in a separate procedure. As to the frequency of meetings, in general, it is preferable that they are held at least once a year and in case of any abnormal situation or emergency calling for immediate action. Moreover, the management review should follow the completion of the audit procedures carried out in the EMS: the findings and reports of these audits may in fact be an important base of information - detailed, objective and documented - used by the organization's management to evaluate the adequacy and completeness of the measures taken, and to the capacity of the entire EMS to achieve the defined policy and programs. As regards

the review methodology applied, it is appropriate that the manager, in consultation with the leaders, sets the date for the meeting and, in due time, informs the participants in writing. The meeting should involve, as well as the top management (or its representative), the Environmental Manager, the main ranks of environmental management, the middle and upper management levels of the organization with specific tasks in the environment (e.g. the Production Manager), and, if necessary, HR Managers. The organization may implement the decisions taken at the meeting in many a way. Sometimes, the review is an opportunity to set new goals and new programs for improvement resulting from the meeting, and subsequently defined in detail. Once the previous "management cycle" is complete, and its results properly assessed, the management review serves also to provide impetus to a new management cycle by planning future activities.

4.6. The Environmental Statement

One of the main objectives pursued by the EC through the Regulation is the promotion of relational processes between the organization and its stakeholders. These processes must be based on trust, dialogue and transparency. A fundamental element of any relationship of trust between two parties is the willingness to provide clear, comprehensive and above all truthful information. The drafting of an environmental declaration according to the requirements of the Regulation, the acceptance of the mechanism of verification and validation of the data entered, the commitment to continual updating and dissemination to the general public should not be perceived simply as a sequence of steps towards registration, but as the willingness of making the declaration a tool for social control.

The Environmental Statement is a collection of information concerning the organization and its activities, the impacts that these activities have on the environment, the rules adopted for the pursuit of improved environmental performance and results, and the statement of objectives and programs defined for the future. This information must be updated every year and its amendments validated by the environmental auditor.

One of the distinctive features of the environmental statement, as a genuine means of communication, concerns the communication objectives that the organization can achieve through its application. The Regulation grants this tool a wider role than the one-way information channel. The Regulation, in addition to state that the environmental declaration is to "provide the public and other interested parties with information on the impact and environmental performance, and the continual improvement of environmental performance," adds that "it is also a tool to respond to requests from the interested parties ...». It is this bidirectionality, if properly pursued, which makes the document not only a channel of information but an opportunity for external dialogue.

A second issue concerns the possibility of using the environmental declaration as a communication tool to meet the information needs of various interest groups. The biggest issue in the definition of a communication strategy is the heterogeneity of the actors and their different know-how, scientific and environmental culture. This makes it relatively more difficult to define a common approach. It is evident, for example, that a basic technical information on a chemical process of an industrial plant is perfectly understandable for a "specialized" party, although it may not be so for the people living in the vicinity of that

plant. Hence, there are different type of audiences, with well defined characteristics in terms of perception of the information contained in the declaration, each of whom requires a different linguistic approach and tailored content.

The basics and effective environmental communication shall include:

1. the organization and its activities;
2. the environmental aspects related to that activity, the nature of the impacts and environmental performance data;
3. the measures taken to avoid or mitigate those impacts, the commitments and intentions for the future improvement of its performance, and the means used for its pursue.

1) *The Organization and its activity.* First, the organization should provide a presentation in which to outline the business sector (NACE code), its history, the number of employees and the size of the business, its current corporate structure (including, in the case of multinational companies or multi-plants, the current relations with the parent company), and any perspective changes. The organization should also clearly express the field of application of the Regulation: this need has strongly increased further to the transition from the concept of site to that of organization, thus making the EMAS registration available to entities (organizations or parts thereof) that could be very complex and therefore in need of clear definition.

Whereas possible, it is important to maintain the local characteristics and apply the concept of site. The organization should provide information about its location, which includes the intended use of the area (residential, agricultural, industrial, commercial, recreational, environmental, etc.), and the surrounding areas, with particular reference to any constraints or requirements of natural interest (e.g. national parks), about the characteristics of the territory (flat, fitted, pre-mountain zone wet, dry, wooded, etc.), and if an area is subject to natural events of particular gravity such as earthquakes, floods, etc.), and some information on its geological as well as about any particular social and settlement patterns. If the organization is located in a sensitive environment (e.g. industrial areas, districts, companies subject to the laws of major accidents) it may be appropriate to mention the stakeholders of the nearby settlements, especially in relation to any agreements for emergency management.

The company should also describe its production in detail. The description of the type, nature and volume of products (and their possible uses as intermediate goods) or services offered, can raise the awareness of the interlocutor about their usefulness in everyday life, thus not to underestimate the role of a company when receiving information on environmental issues.

The description of the activities may include a simplified explanation of the manufacturing processes (and, if necessary, a description of the evolution of the manufacturing process). In addition to production facilities, the document should refer to auxiliary units (such as, for example, supply systems, sewage collection and treatment systems, emission control systems, utilities - steam, heating, electricity, etc.).

2) *Direct and indirect environmental aspects connected with the activity and its environmental performance.* By means of the environmental analysis the organization identifies the *most significant environmental aspects* and it is therefore in a condition to circulate them to the public and to describe the methods used to manage them and keep them

under control. The Regulation requires the organization to consider both the *direct* (not very relevant for some non-industrial sectors) and *indirect aspects*. There is also an explicit reference, also reflected in the Recommendation, to the *correlation between significant aspects* (e.g., the emission of carbon dioxide from combustion) and its *environmental impact* (global warming).

It is important that the exposition is truly complete and balanced, and does not neglect to underline, with the necessary accuracy, any significant aspects resulting from the preliminary analysis.

The need for balance and transparency is also present in the exposition of the quantitative data relating to the significant aspects. The regulation focuses on the significance of the data to be reported (linking it to the significance of the aspects to which they refer to), and their correlation with the objectives and goals pursued. Provide greater relevance to data of remarkable environmental performance whose importance is negligible, may be a futile exercise in persuasion of well-informed consumers. Similarly, to minimize significant aspects and deprive them of numerical feedback may eventually be harmful to the company, should these issues come to the attention of the public in all their importance. In this case, it may be preferred to admit the lack of or the delay in dealing with these issues, paying wide space to the introduction of the improvement programs that the company intends to adopt face to the problem.

It is also required that the data allow an *inter-temporal comparison* (at least three years) to offer the reader evidence of the trend of environmental performance. In the case of a significant change of data on environmental parameters under consideration or of negative performance of major importance, it is appropriate that the organization illustrates the *reasons of this trend*.

The *units of measurement* must be clearly represented, as well as any applicable *legal limits* to the environmental aspects considered, with a precise indication of its legislative authority or authorization.

It may also be appropriate, in some respects particularly significant (for example, the quality of water discharges), to provide monitoring systems, sampling rates and the list of monitored substances, including those not currently considered to be particularly significant for which, therefore, the organization does not consider to include specific data. Particularly interesting and effective in terms of commonly reported in diagrams, where applicable, beyond the limits of the law, any limitations/goals more stringent target set internally.

The discretion in the choice of indicators, however, suffered a decline. The Regulation requires that both the three-year environmental declaration, and its yearly update, the organizations report at least on key indicators specifically described in Section C of Annex IV. The Regulation requires that both the three-year environmental declaration, and its yearly update, must include at least the key indicators specifically described in Section C of Annex IV.

With regard to the key indicators (*Core Indicators*) the organization is required to report against a list of key environmental issues (*energy efficiency, material efficiency, water, waste, biodiversity, emissions*) "insofar as they relate to the direct environmental aspects." The reference to the direct aspects could mean that explicit requests for indirect environmental aspects would require, for certain organizations, such as those in the industrial sector, a significant deployment of resources. The calculation of the key indicators, as expressed in section 2, paragraph 2 of Annex IV of the Rules, can be summarized in the table below.

Table 5. Key Performance Indicators⁵

Environmental Issues	Consumption/ Yearly Overall Impact (A)	Total annual production (B)	Indicator (A/B) – Examples
Energy efficiency	Total annual energy consumption expressed in MWh or GJ	The indication of the total annual production is the same for all sectors, but it is adapted to different types of organizations, depending on the type of activity: i) for organizations involved in the production sector (industry), indicating the total annual gross value added in million € (EUR million) or the total physical production in tons per year or, for smaller organizations, the turnover or the total annual number of employees; ii) for the organizations involved in the productive sector (administration / services), refers to the size of the organization in terms of number of employees.	MWh / € added value GJ / ton of finished product
	% Total annual energy consumption (electricity and heat) produced from renewable sources		
Efficiency of materials / goods;	Annual mass flow of different materials used - in tons		ton/€ of added value ton/ ton/ N ° of employees
Water	Total annual water consumption, in m ³ ;		m ³ /€ of added value
Waste	Total annual production of waste, divided by type, in tons		waste ton / ton of finished product
	Total annual generation of hazardous waste in kilograms or tons;		tons of hazardous waste / € added value
Biodiversity	Land use, expressed in m ² of built-up area;		m ² /ton of finished product
Emissions	the "total annual emissions of greenhouse gases", expressed in tons of CO ₂ eq		ton CO ₂ eq / € added value CO ₂ eq/ton ton of finished product
	Total annual emissions including at least at least emissions of SO ₂ , NO _x and PM, expressed in kilograms or tons		kg NO _x /ton of finished product

The Regulation also requires the organization not to neglect the description of "other factors regarding environmental performance" of particular interest to the activities and relationships with the company stakeholders. Among these, for example:

- relationships with suppliers and customers, with special reference to conditions or political negotiations for the purchase of goods of environmental value (consider, for example to green procurement in the institutional context);
- relationships with business partners: relationships with neighbours and the local community (e.g., claims or actions of cooperation, awareness, information)
- current expenditure and investments in environment and safety
- any incidents, with the details of the procedures to react to them and actions taken to prevent their recurrence;

⁵ In addition to the listed indicators, organizations may also use other values to express the consumption/total annual impact in a given field.

- research and development that permit an improvement in environmental performance
- particular modes of internal awareness and involvement in the adoption of a safe and eco-friendly internal or external behaviour (e.g. incentive system) to the organization.

3) *The measures taken by companies to avoid or minimize environmental impacts, the proposals for the future improvement of its performance and the means by which it intends to consolidate them.* The presentation of the environmental management system consists in summarizing in a clear set the whole of practices, procedures, processes, responsibilities and resources that the company enshrines to achieve the set goals and implement the programs. The bulk of these requirements creates a great deal of flexibility, making it difficult for the organization to understand what information to provide and at what level of detail. For example, full information should include a brief description of the following aspects:

- 1) procedures enabling the introduction, the review and revision of the improvement programs;
- 2) the organization of staff, describing how the environmental liabilities have been allocated in line with the managerial needs of the company, that may be summarized in a chart;
- 3) initiatives set up to implement awareness and training of staff and to encourage its active participation in environmental management;
- 4) the measures taken by the assessment and registration of environmental aspects;
- 5) the summary of the practice and operational control procedures in use at the plant;
- 6) the methodologies used for the auditing of the plant and the audit programs;
- 7) The description of the potential environmental emergencies and procedures to manage them.

Furthermore, it is essential that, in addition to presenting environmental policy containing the principles of the corporate environmental strategy, the declaration sets out clear objectives (quantitative where possible) and the programs, with an indication of responsibilities, tools, resources and deadlines. The communication on the commitment of the organization is particularly effective if, on the one hand, it demonstrates the consistency and streamlining in front of real problems, needs and opportunities for improvement, and if it links the objectives and targets pursued to significant environmental aspects; and secondly, if it shows transparency and consistency, by offering the reader an account of the achievements (or the difficulties encountered) compared to the objectives set in previous years.

CONCLUSION

The third version of the EMAS Regulation comes at the end of a lengthy review process, which began in 2005 and developed from conducting a special evaluation study ("Study EVER - Evaluation of the EMAS and Ecolabel for Their Revision"), aimed at identifying and

analyzing, on a European scale, the strengths and weaknesses of applying EMAS, and to provide the Commission a number of options and recommendations in support of its review. These studies have identified three possible scenarios:

- maintaining the "status quo", scenario does not envisage substantial amendments compared to the current goals and contents of the scheme, unless administrative or institutional;
- the gradual "closing" of the scheme, in the medium term, having as a goal the elimination of EMAS;
- the strengthening of the scheme through key changes.

The last option has been identified by the Commission as the only viable alternative. The evaluation process has highlighted, in fact, the timeliness and validity of the principles of EMAS and its effectiveness, as a tool to benefit the environmental management of the organizations. Certainly, the challenge of the European Commission is very ambitious; both for the difficulty in combining the two objectives of a high growth in the dissemination and rigor in its implementation: and for the difficulty to act on a real enhancement of the SMEs.

The EMAS scheme, however, is in a position of excellence among the existing international standards of environmental management, in which integration (in business management, in the supply chain) and accountability are two key elements. This was confirmed by the new version of the Regulations, which reinforces this holistic approach, especially through the enhancement of the role of indicators.

The coming years are a crucial period to ascertain the true effectiveness of the changes adopted for the scheme, and the actual achievement of the ambitious objectives that the European Commission has set itself.

More crucial elements to the new EMAS are the passage from an communication-based approach to one firmly based on real stakeholders engagement, or rather the full involvement of other actors of the life cycle through the effective implementation of its indirect environmental aspects.

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