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The implementation of EMAS in Europe:

A case of competition between standards for environmental management systems

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FOREWORD

This report is an outcome of *The Implementation of EU Environmental Policies: Efficiency Issues* (IMPOL) project. The IMPOL project involved four research institutes (CERNA, Ecole des Mines de Paris, SPRU – Science and Technology Policy Research Unit, University of Sussex, CSTM, University of Twente, UFZ-Centre for Environmental Research Leipzig-Halle), and was funded by the European Commission's DGXII under its Environment and Climate Programme (contract ENV4-CT97-0569) and national institutions (including ADEME, the French environmental agency). As its name suggests, the project concerned the implementation of EU environmental legislation. It sought to answer questions such as:

- Does implementation result in the attainment of the environmental goals set out in EU Directives?
- How does implementation affect the cost effectiveness of a particular environmental policy?

The core of the project consisted of the *ex post* evaluation of the implementation outcomes of selected pieces of EU legislation in four Member States (France, Germany, the Netherlands and the United Kingdom). Three cases studies were evaluated: the Directive regulating emissions from existing domestic waste incinerators (89/429); the Directive on emissions of SO₂ and NO_x from large combustion plants (88/609); and, the Council Regulation on the Eco-Management and Audit Scheme (1863/93) or EMAS.

IMPOL research reports are available at <http://www.cerna.ensmp.fr/Progeuropeens/IMPOL>.

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EXECUTIVE SUMMARY

This report describes how the European Eco-management and Audit Scheme (EMAS) was implemented in France, Germany, the Netherlands and the United Kingdom (UK) and explains the varying number of EMAS participants in the four countries as a result of the different implementation processes. Against the background of low participation rates in some Member States, the report also addresses whether EMAS has so far been a successful policy instrument and how the current revision of the EMAS Regulation (EMAS II) will influence the scheme's future.

As EMAS is voluntary, the success of the scheme depends on the decision of companies to join it. This does not only require a company's decision to establish a standardized environmental management system (EMS) but also to choose EMAS and not its main competitor, the international EMS standard ISO14001. Obviously, a company's choice between EMAS and ISO14001 depends on the net benefits it gains by participating in the different standards.

The way EMAS was implemented in the four countries significantly influenced these benefits. In Germany, EMAS was made more attractive for companies than ISO14001 by granting regulatory relief exclusively to EMAS registered companies and by providing EMAS participants with more and higher subsidies than ISO14001-certified companies. Furthermore, the involvement of business organizations in the accreditation and supervision system for verifiers and the registration system for companies led companies to trust the system and business organizations to promote EMAS.

By contrast, in France, the Netherlands and the UK, authorities do not provide preferential treatment to EMAS participants and business organizations do not support EMAS more than ISO14001. Therefore, the only advantage EMAS has over ISO14001 is the validated environmental statement which enables companies to improve their communication with external stakeholders. However, most companies considered this advantage to be insignificant. Some French and UK companies even completely rejected the idea of disclosing information about their environmental performance to external stakeholders. As companies value the advantages of the ISO standard, world-wide recognition and lower costs, higher, it is not surprising that in these three countries EMAS participation is low and well behind ISO14001.

Nevertheless, EMAS can be considered a successful policy instrument, because all in all the benefits it generates appear to exceed the costs. Those companies that decide to register under EMAS obviously gain a net benefit; otherwise they would not participate. In addition, there exist substantial net benefits for society due to EMAS registered companies' improved environmental performance. By contrast, costs born by the government (and thus society) in the overall EMAS system are negligible.

Based on our analysis of the implementation of EMAS in the four countries, we conclude that EMAS II will not significantly increase participation in EMAS. While it eliminates some of the disadvantages of EMAS against ISO14001, EMAS II does not create sufficient additional benefits to make participation in EMAS more attractive for companies than participation in ISO14001.

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1 Introduction

The Council Regulation (EEC) No. 1836/93 on the Community Eco-management and Audit Scheme (EMAS) of 29 June 1993 is one of the market based instruments that were introduced by the European Commission in the context of its Fifth Environmental Action Programme "Towards Sustainability". In short, EMAS is an environmental management system (EMS) standard which opens voluntary participation to companies in the industrial sector. In contrast to other standards, EMAS requires companies to publish an environmental statement, and provides for a certification system with independent environmental verifiers and registration bodies.

The most striking outcome of the EMAS implementation in Europe is that participation figures in the scheme greatly differ among EU Member States. This can to a great extent be attributed to the existence of other environmental management system standards. Right from the start, EMAS had to compete with national standards such as BS7750 (British Standard 7750 1994, Specification for Environmental Management Systems) and from October 1996 with the international standard ISO14001 (EN ISO14001 1996, Environmental management systems, Specification with guidance for use). Obviously, a company's choice between EMAS and another standardized EMS depends on the net benefits it gains by participating in the different standards. The varying net benefits of EMAS in the Member States and thus its position in the competition with other standards are decisively influenced by the different implementation processes of the EMAS Regulation in the various countries.

This report aims to describe how the EMAS Regulation was implemented in France, Germany, the Netherlands and the United Kingdom (UK), and to explain the varying number of EMAS participants in the four countries as a result of the different implementation processes. Against the background of the low participation rates in some Member States, the report additionally addresses the questions whether EMAS has been a successful policy instrument and how the current revision of the EMAS Regulation will influence the future of the scheme.

The report is structured as follows. Chapter 2 provides some background information. This encompasses a short description of the political genesis of the EMAS Regulation at the European level, a portrayal of EMAS and ISO14001, an assessment of the participation rates in the four countries under review, and a discussion of EMAS as a policy instrument from an economic perspective. Chapter 3 contains a description of the main features of the

implementation processes in Germany, France, the Netherlands and the UK. Chapter 4 explains the different participation rates in the four countries by analysing the varying advantages of a French, German, Dutch and UK company's participation in EMAS and ISO14001. Based on companies' and society's costs and benefits related to EMAS, Chapter 5 discusses whether EMAS has been a successful policy instrument. Chapter 6 assesses future participation in EMAS taking into account the revision of the EMAS Regulation. The last chapter summarizes the main results.

2 Background

2.1 The political evolution of EMAS

The first idea of a European Eco-Management and Audit Scheme emerged in the Commission in 1990¹. It led to the publication of a consultation document in December 1990 which called for the mandatory participation of companies in the Scheme. Industry responded strongly and homogeneously. It targeted its main criticism at the mandatory approach as it felt it was an undue interference in business affairs if the government prescribed which management tool a company should use. Strong resistance by industry led the Commission to accept a voluntary approach and it published a new proposal in March 1992. Industry responded in two ways. Firstly, with the exception of German companies, industry was less interested in the political process. Secondly, while the German industry and government continued to oppose the Scheme, the attitude of industry and governments from other Member States was now mostly supportive.

German industry continued to oppose EMAS for several reasons. One important one was that the approach of German industry towards environmental problems was different from that adopted in EMAS. EMAS is management-oriented. The idea is to improve the environmental performance of a company by implementing management tools. German industry was 'engineer-driven': to improve its environmental performance, a typical German company tried to develop or install a new technology. The EMAS culture was therefore alien to German companies. In addition, the Scheme does not take into account the different environmental standards of the Member States. It was perceived as unfair that a company which must

¹ The description of the political evolution of EMAS follows Franke and Wätzold (1996), some additional points on the position of UK industry are taken from Eames (2000).

comply with ambitious environmental legislation (German companies believed that German legislation was ambitious) could use the same statement of participation as a company in another country with lower standards. Furthermore, German companies expected that they would have to take part in the Scheme due to high public pressure in environmental matters in Germany.

By contrast, the UK government was an active supporter of EMAS. It hoped that UK industry would gain a competitive advantage. The UK was the first country to develop an environmental management system with BS7750 and there was already a high number of companies working to implement this standard. Apart from supporting UK industry, the UK's Conservative government was keen to promote voluntary environmental action by industry, as part of its wider deregulatory and market-driven philosophy. The promotion of EMSs, external certification and environmental reporting were seen as fostering informed competition in the marketplace. UK industry was more divided on EMAS. While a voluntary scheme was generally welcomed, some sections of industry continued to oppose the scheme on the grounds that it went beyond the requirements of BS7750. It was especially criticized that the environmental statement disclosed information to the public.

The Dutch government was very active in promoting EMAS, too, for reasons similar to those of the UK government. Dutch companies had gathered considerable experience with EMSs, many of them using BS7750. Moreover, EMSs were considered to play an important role in deregulation efforts of the Dutch government in the context of environmental policy.

France supported EMAS as well, but kept a low profile during the political process. Although a French environmental management standard had been developed in NF X 30-200 (Norme Francaise Expérimentale; X indicates that it is a preliminary standard), there was relatively little interest in and experience of EMS compared to the UK and the Netherlands. However, bearing in mind that participation in EMAS is voluntary and no pressure for companies to join EMAS was anticipated, industry saw no need to lobby for or against EMAS (Franke and Wätzold 1996 and Schucht 2000).

At the Environment Council Meeting in March 1993 it became obvious that all Member States except Germany were in favour of the regulation. Germany knew that it could only delay but not prevent EMAS, as the final ratification of the Maastricht Treaty would enable EMAS to be ratified by majority voting. Therefore, it gave in to the pressure of the other Member States and EMAS was adopted at the Environmental Council Meeting in June.

2.2 EMAS and ISO14001

2.2.1 The main features of EMAS

In simple terms, the EMAS-Regulation is a site-related environmental management system standard which additionally requires companies to publish an environmental statement and provides for a certification system with independent environmental verifiers and registration bodies. All companies operating one or more industrial sites are invited to sign up with the standard.² Participation in EMAS is voluntary, but once a company has decided that it wants a site to become registered under EMAS, it has to meet the provisions of the Regulation, i.e. it must go through the procedure shown in Figure 1.

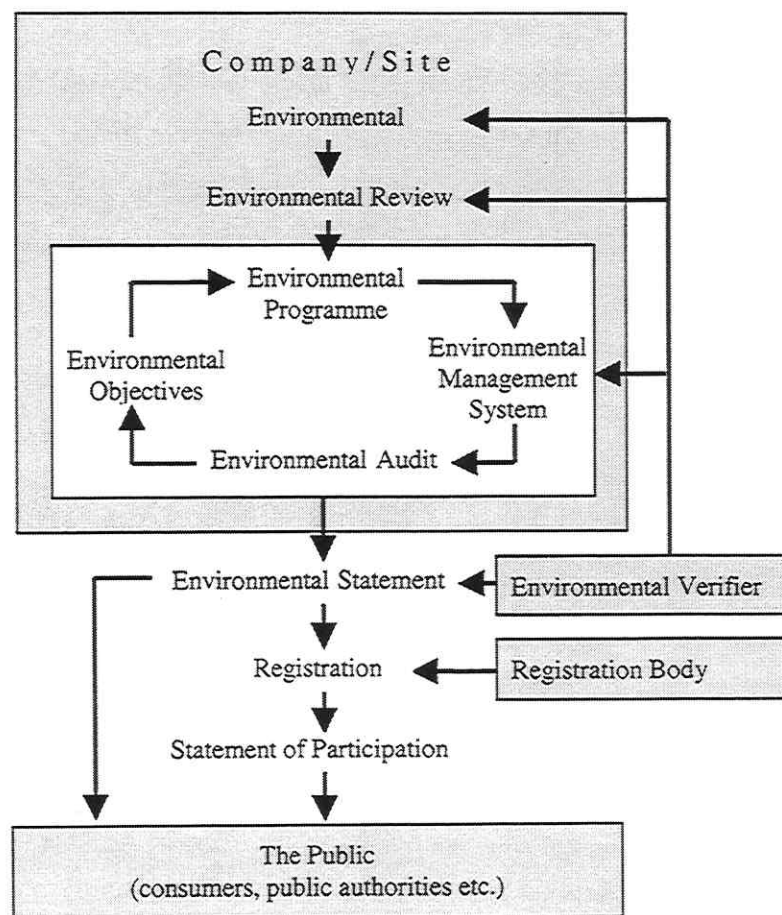


Figure 1: Procedure of participation in EMAS

² The current draft proposal for EMAS II (common position of the Council of February 2000) stipulates opening EMAS to non-industrial sectors. Furthermore, all kinds of organizations that have their own functions and administration shall be allowed to participate in EMAS. This means that not only sites but also entire companies as well as parts or combinations thereof can be registered. In anticipation of this development, we will often speak of companies instead of sites in the following.

At first, the company must adopt an environmental policy in which its overall environmental aims and principles of action are fixed. In its policy, the company commits itself to complying with all relevant environmental regulations and to continuously improving its environmental performance. Afterwards an environmental review is conducted. This is an initial comprehensive analysis of the environmental issues, impacts and performance which are related to the activities of the site to be registered.

On the basis of the general goals of the environmental policy and the results of the environmental review, an environmental programme is introduced. The programme describes specific goals, along with measures and deadlines for their realization. Furthermore, an environmental management system has to be established which encompasses the organizational structure, responsibilities, procedures and resources of the site's environmental activities. Once the EMS has been implemented, an environmental audit is performed which evaluates whether the system is suited to secure compliance with all relevant regulations and the company's own environmental goals. In the light of the audit findings, appropriate corrective action is taken and new environmental objectives are set.

In order to inform the public³ about the environmental activities of the company or the site, an environmental statement is prepared. The statement has to include a description of the environmental policy, programme and management system as well as an assessment of all significant environmental issues related to the activities of the site. If appropriate, the environmental issues are to be presented in the form of quantitative figures on pollutant emissions, waste generation, energy consumption etc. Finally the company has to commission an independent environmental verifier with the examination of the environmental policy, programme, management system, review or audit procedure and the validation of the environmental statement. Afterwards the company can apply to be registered under EMAS.

When registration is granted, the company has the right to use a so-called statement of participation and employ it for advertising purposes. However, the statement may not be used for direct product marketing. Registration is granted for three years. If the company or site wants to remain registered, it has to repeat the environmental audit, to update the environmental statement, and to arrange for another examination and validation by an environmental verifier.

³ The public includes consumers, neighbours, commercial clients, authorities, banks and insurance companies, i.e. the companies' stakeholders.

2.2.2 ISO14001 as EMAS's main competitor

Almost parallel to the formulation of the European EMAS Regulation, the ISO (International Standards Organization)⁴ prepared an international standard for an environmental management system. Preparations began against the background that a number of national standardization organizations already had started to launch their own national standards. The most popular one was BS7750, which had been published in 1992. Standards in Ireland, France, South Africa and Canada followed.⁵ In 1992, the Strategic Advisory Group on Environment (SAGE) of the ISO recommended developing a standard for an environmental management system. To this end a technical committee (TC 207, Environmental Management) was set up which presented first Committee Drafts in 1994. The "Final Draft International Standard" was published in August 1995.⁶ After an international process of reconciliation, ISO14001 was finally agreed in September 1996.

Although ISO14001 is a certifiable standard (a "specification"), it does not include provisions for a certification system. The verification of environmental management systems was integrated in the already existing certification system for ISO standards. Compliance with ISO standards is secured by accredited certification organizations. Accreditation is carried out by special accreditation bodies which base their decisions on the requirements laid down in ISO norms 14010 and 14011.⁷ In contrast to the EMAS Regulation, the ISO Standard is neither site related nor restricted to industrial sectors. Every organization (company, authority or institution, or part or combination thereof) which has its own functions and administration may implement an EMS consistent with the ISO14001 and have it certified. Figure 2 depicts the model of the EMS provided for in the ISO14001.⁸

⁴ The ISO is a non-governmental institution which serves as an umbrella organization of the national standardization organizations.

⁵ BS7750 can be regarded as a kind of precursor of the other standards (see Thimme, p. 266).

⁶ Cf. Müller 2000, p. 111.

⁷ Cf. Thimme (1998), p. 281.

⁸ In contrast to the EMAS Regulation, the EMS of ISO14001 includes the entire process from the environmental policy and programme to review and corrective action. This definition corresponds to the usual understanding of an EMS. In the following we use the term EMS in this broader sense.

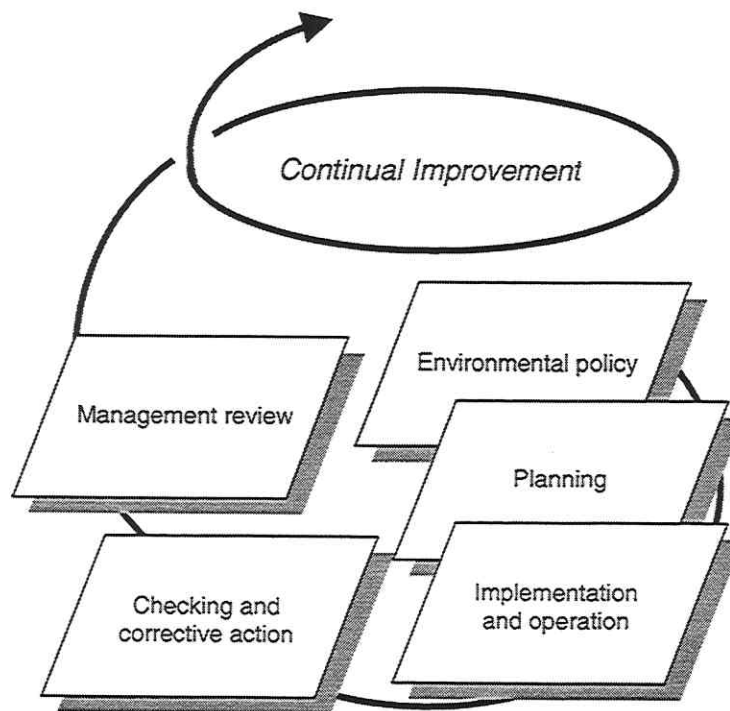


Figure 2: Environmental management system model of the ISO14001

Source: EN ISO14001 1996, p. 4

The starting-point of the EMS described in the ISO14001 is the definition of an environmental policy. Similar to the EMAS Regulation, the ISO standard demands that the environmental policy includes commitments not only to comply with relevant environmental regulations, but also to continually improve and prevent pollution.⁹ The second step, planning, requires the organization to introduce procedures to identify the (significant) environmental impacts of its activities, products or services. Unlike the EMAS Regulation, the ISO14001 does not provide for an obligatory environmental review. However, the ISO standard explicitly demands procedures to identify the legal requirements applicable to the organization. At the end of the planning stage, the organization must set environmental objectives and targets and establish an environmental management programme for their realization. The programme encompasses the means and time-frames by which the objectives and targets are to be achieved.

During the next stage, implementation and operation, provisions are made to shall ensure that the programme is effectively put into action. To this end the organization defines structures

⁹ In contrast to the registration under EMAS, the realization of environmental improvements is not a necessary condition for becoming ISO14001 certified.

and responsibilities, trains its employees to support their environmental awareness and competence, and establishes procedures for internal communication. The ISO14001 only requires the organization to consider processes for external communication on its significant environmental aspects, but unlike the EMAS Regulation does not include any publication requirements. This is one of the major differences between the ISO standard and the EMAS Regulation. In the course of the implementation and operation stage, the organization additionally documents its EMS and establishes procedures for document and operational control as well as for emergency preparedness.

Once the necessary structures and procedures have been implemented and put in operation, they are checked and corrected regularly. The ISO14001 demands that the organization monitor and measure the key characteristics of its ecologically relevant activities, track conformity with its environmental objectives and targets, and evaluate its legal compliance. If non-conformity is detected, corrective and preventive action is taken. Finally, the organization must arrange for periodic EMS audits and top management reviews of the system.

As mentioned above, the organization may have its EMS certified by an accredited certification organization. If certification is granted, the organization is entitled to use the logo of the certification organization (not the ISO logo) in order to demonstrate that it has established an ISO certified EMS. Analogous to the statement of participation, the logo must not be used for product marketing. In contrast to the EMAS Regulation, the ISO certification system neither provides a registration of certified organizations nor any involvement of public authorities.

2.2.3 Participation rates in the four Member States

Participation rates in EMAS and ISO14001 significantly differ in the four countries under review. In order to be able to compare the number of participants in those countries, the figures need to be normalized. We have to take into account that because the countries vary in size and industrial structure, the number of companies, i.e. the number of potential participants, is different. As an indicator of the number of potential participants, we use the number of companies from the manufacturing sector with more than 20 employees. The number of companies for which it is possible to become EMAS registered or ISO14001 certified is much higher,¹⁰ as it includes smaller companies as well as companies and organizations from outside the manufacturing sector. However, there is no comparable data

available that includes all potential participants in the four countries. In addition, participation has been largely restricted to manufacturing companies with more than 20 employees.

Table 1: EMAS and ISO14001 registered sites in April 2000

	No. of potential participants*	EMAS		ISO14001	
		No. of registered sites (industrial)**	In % of potential participants	No. of certified organizations**	In % of potential participants ¹¹
France	24 671	36	0.15	550	2.23
Germany	37 413	2432	6.50	1950	5.21
Netherlands	6 404	26	0.41	606	9.46
UK	29 608	73	0.25	1014	3.42
All Member States	-	3325	-	7140	-

Sources: * Eurostat – New Cronos Datenbank 12/98

** <http://www.ecology.or.jp/isoworld/english/analy14k.htm> (16 June 2000, 10:29)

Table 1 shows that Germany has by far the most EMAS registrations, both in absolute and relative terms. Altogether, Germany accounted for approximately three quarters of the total number of EMAS registrations in Europe. In terms of absolute figures, ISO14001 is also most widespread in Germany. However, when participation in ISO14001 is regarded in relation to the size of the economy, it is highest in the Netherlands followed by Germany and the UK and France. Germany is the only country where more companies are registered under EMAS than ISO14001 certified. In all the other countries ISO14001 is by far the dominant EMS standard.

2.3 EMAS as a policy instrument: some insights from an economic perspective

In order to explain the purpose of EMAS as a policy instrument from an economic angle, we separately analyse its two central functions. The first function is to integrate environmental aspects into the organization and management processes of a company with the help of the EMS (2.3.1). The second function is to improve the communication of a company with its external stakeholders by providing credible information through the validated environmental

¹⁰ For example the German Ministry of Trade and Industry estimated that in 1998 there were 300,000 potential EMAS participants in Germany.

¹¹ When assessing ISO14001 participation, it should be borne in mind that ISO is not limited to industrial sites.

statement (2.3.2). On the basis of the analysis of these two functions we derive conclusions on the optimal number of EMAS participants from an economic point of view (2.3.3).

2.3.1 The purpose of an EMS

Until now there has been little analysis and understanding of EMS among environmental economists. The reason might be the environmental economists' view of firms which Gabel and Sinclair-Desgagné (1998, p.89) describe as follows: "It is a perfectly rational and efficient black box firm which maximizes profits given whatever technological, market and regulatory policy constraints are imposed on it." In such a perspective, environmental problems can only be caused by externalities, i.e. market failure which occurs if the decision-makers do not bear all the costs of their decisions. This failure can be remedied using various instruments such as tradable permits, environmental taxes or standards. In this context, the purpose of an EMS cannot be understood.

The underlying view of the firm is, however, not adequate, as firms are complex organizations and profit maximization is far from being trivially easy. Gabel and Sinclair-Desgagné (1998) open the black box and suggest that a firm should be understood as an organization that has a titular principal, its chief executive officer, but is actually run by vast numbers of agents, to many of whom may be delegated a great deal of autonomy to manage their day-to-day activities. In order to transform the principal's objectives (i.e. profit maximization) into the agents' actions and to help work to proceed quickly and efficiently, a network of management systems and standard operating procedures is established. These systems are rigid and feature in-built inertia to change, so that once they are installed, "they can act as a constraint on the firm's objective of profit maximization" (Gabel and Sinclair-Desgagné 1998, p.98). They may prevent the firm from identifying and reacting to new threats or opportunities which would be evident to an unconstrained company. This is what Gabel and Sinclair-Desgagné call 'organisational failure'.

Transferred to the environmental arena, this means that firms find it difficult to avoid violations of environmental regulations or to realize cost-saving opportunities such as reductions in water or energy consumption if their management system is unable to adequately deal with the environmental repercussions of the firm's activities, i.e. if they do not have an EMS in place. If organizational failure leads to a waste of resources and a violation of environmental laws, it does not only impede profit maximization, but also contributes to environmental problems.

To alleviate organizational failure, public policy can play an important role by setting (environmental) management performance standards and disseminating information on best practice. Management practices and standards are public goods from which exclusion might prove difficult. If a firm invests to develop industry best practice, other firms may observe and adopt these practices without paying the costs of developing them. This can undermine a firm's incentive to develop new systems and procedures. The development of such procedures by state organizations (as in the case of EMAS) or centralized non-governmental organizations (as in the case of ISO14001) might help to solve this problem (Gabel and Sinclair-Desgagné 1999, p.113).

2.3.2 Economic aspects of external communication

Besides improving the internal structure and organization of a company EMAS also serves to improve the external communication with relevant stakeholders such as consumers, neighbours, authorities, banks and insurance companies. The core element of this aspect is the environmental statement which discloses information about the environmental performance of the company. The independent verifier who validates the environmental statement and verifies that a company complies with all relevant EMAS requirements adds credibility to the external communication.

In economic terms the need for (credible) external communication arises because "asymmetric information" exists between the company and stakeholders. While the company is in general well informed about the environmental effects of its products and production, stakeholders are not – but it would influence their decisions if they were. In order to assess the contribution of EMAS to the reduction of asymmetric information, it seems useful to distinguish between 'markets' where the company sells its products and buys inputs for its production process, and the 'political arena' where the institutional framework under which the company acts is shaped.

With respect to the market, it is important to note that buyers with environmental preferences are interested in the environmental effects which arise along a product's life cycle, and this information may influence their decision to buy the product. If this information is not available (or only at prohibitively high costs), buyers cannot act according to their preferences. In contrast to a situation with symmetric information, the demand for (and hence also the market share of) environmentally superior products is too low. This indicates market failure (Karl and Orwat, 1999). However, the contribution of EMAS to mitigate this market failure is limited. This is mainly because EMAS is directed towards a specific site or company

and not a specific product. To assess the environmental effects of products, other schemes such as the German “Blue Angel” Environmental Labelling Scheme and the European Environmental Labelling Programme (Council Regulation 880/92/EEC) seem more suitable¹².

However, there are cases where business partners are interested in the environmental performance of a specific site or a company in general. For example, some European car manufacturers are interested in the overall environmental performance of their suppliers, which can be documented by their participation in EMAS and by providing an environmental statement. Another example of business partners interested in the environmental performance of a site are insurance companies which have to assess the ecological risks and the potential for accidents. Here, EMAS can help to reduce asymmetric information¹³.

EMAS can also serve to deliver information to stakeholders that are relevant with respect to the shaping of the institutional framework in which the company acts. It enables those stakeholders to base their decisions on a higher level of information and, thus, increases the rationality of the political process. The relevance of these stakeholder decisions and resulting actions becomes evident from examples of the 1980s when several severely polluting chemical plants were closed down due to a combination of pressure from the neighbourhood and administrative action (Franke and Wätzold 1996, p.179).

2.3.3 How many companies should be EMAS registered and how many ISO certified?¹⁴

In order to answer this question from an economic angle, we have to recall what ISO14001 and EMAS have in common, and what their *crucial* differences are. The similarity is the establishment of EMS-related company internal instruments (to simplify our argument we assume that the EMS requirements of the two standards are equal). The crucial differences are the improvements in the external communication EMAS provides for with the publication of a validated environmental statement (for simplicity's sake we assume that this is the only difference)¹⁵. We start by analysing a company's choice between ISO14001, EMAS or no standardised EMS at all, and derive as a second step the socially desirable solution.

¹² Cf. Karl and Orwat (1999, pp. 144–150) for a short description of the schemes.

¹³ However, the two cases mentioned have so far not played an important role.

¹⁴ The arguments of the following paragraph are taken from Wätzold and Bültmann (2000), where they are also presented in a formal model.

¹⁵ Other differences such as the varying emphasis on legal compliance do not seem to have played a similar significant role in practice.

Following the above simplifications, a company participates in ISO14001 if the company's benefits of implementing the company internal instruments (B_I) are higher than (or equal to) the corresponding costs (C_I) for the company, i.e. $B_I \geq C_I$, but the benefits from improved external communication (B_C) are lower than the corresponding costs (C_C), i.e. $B_C < C_C$. However, a company chooses EMAS instead of ISO if $B_I \geq C_I$ and $B_C \geq C_C$. A company also participates in EMAS if the net benefit of implementing the company internal instrument is negative ($B_I < C_I$), but the company's net benefit of implementing the internal instrument plus the improvement of external communication is not ($B_I + B_C \geq C_I + C_C$). Figure 3 graphically illustrates the calculation of the company:

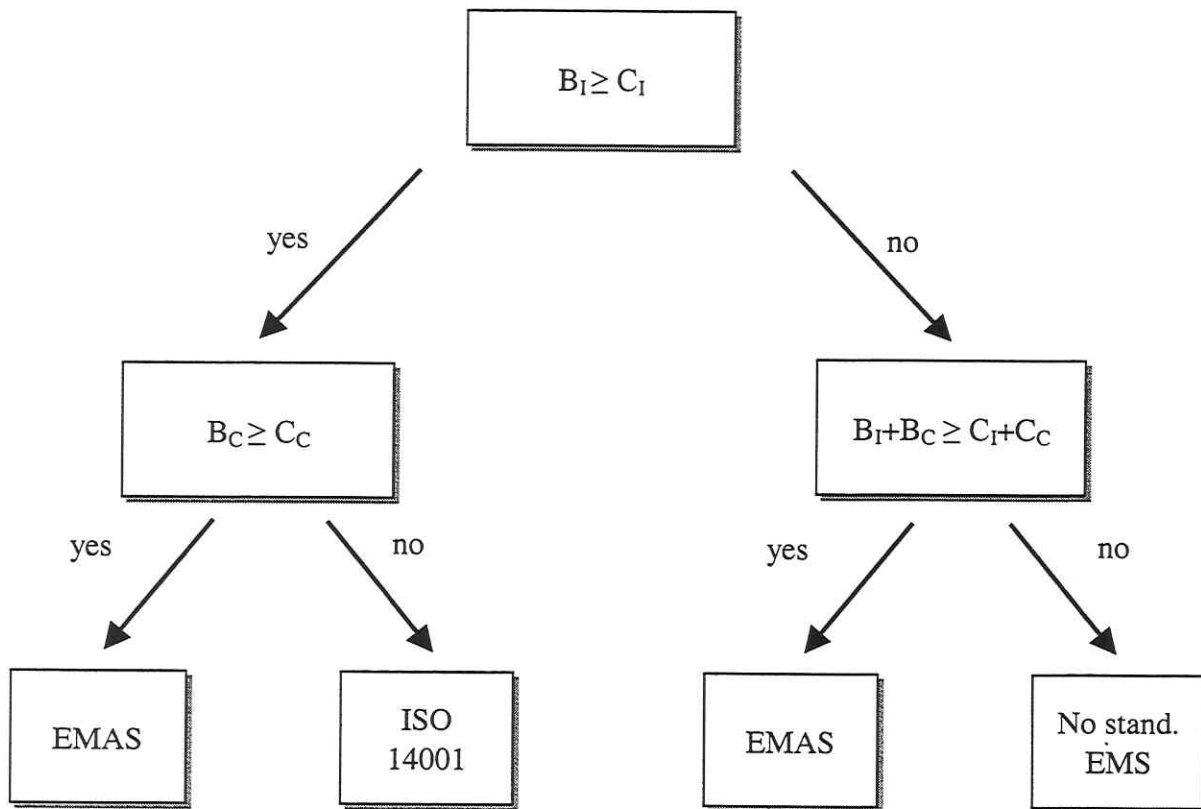


Figure 3: Variables determining a company's choice of standardized EMS

However, a company's decision does not reflect the *socially desirable* solution, because a company's participation in ISO14001 and EMAS leads to environmental improvements from which others benefit. As the market often does not adequately reward the company for providing these benefits (for example through a higher demand for its products), they have the characteristics of positive externalities. Taking externalities into account, the conditions change under which the decision for EMAS, ISO14001 or no standardized EMS at all is optimal.

A company's participation in ISO14001 is socially desirable if the companies' benefits of implementing company internal instruments (B_I) plus the positive externalities from this implementation (E_I) are higher than (or equal to) the corresponding costs (C_I) for the company ($B_I + E_I \geq C_I$), but the company's benefit from an improved external communication (B_C) plus the positive externalities from these activities (E_C) are lower than the costs (C_C), i.e. $B_C + E_C < C_C$. However, a company's choice of EMAS instead of ISO is socially optimal if $B_I + E_I \geq C_I$ and $B_C + E_C \geq C_C$. A company's participation in EMAS is also socially desirable if the total net benefit of implementing the company internal instrument is negative ($B_I + E_I < C_I$) but the total net benefit of implementing the internal instrument plus the improvement of external communication is not ($B_I + E_I + B_C + E_C \geq C_I + C_C$). The conditions for a socially optimal choice are illustrated in Figure 4.

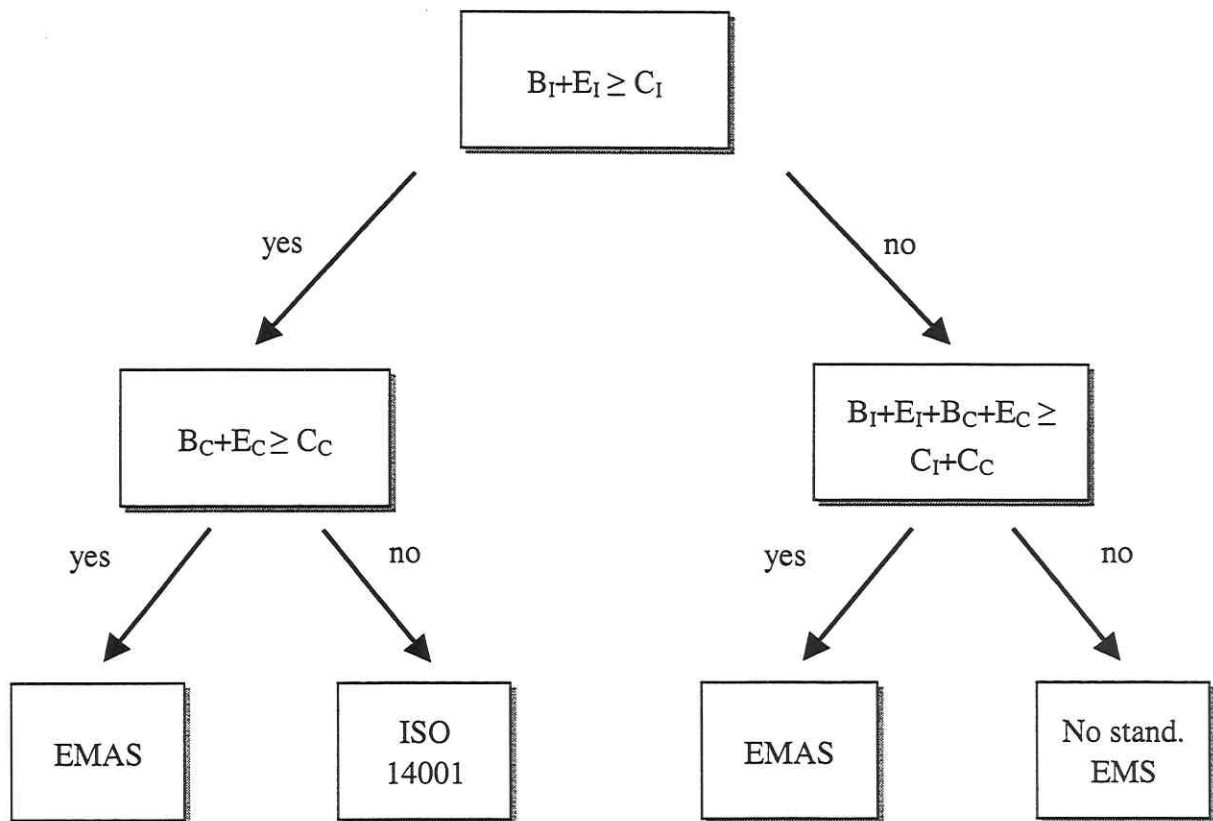


Figure 4: Criteria for the socially optimal choice of a standardized EMS

In order to assess the desirable participation rate in reality, information about the benefits and costs for companies as well as the size of the positive externalities is needed with respect to both EMAS and ISO14001 participation. Obviously, this information does not exist or is (prohibitively) costly to collect. However, the analysis has revealed several important aspects. Firstly, it may be desirable from society's point of view for a company not to install a

standardized EMS at all. Secondly, relying on a company's choice alone whether to implement a standardized EMS does not necessarily lead to the socially desirable solution. Generally, the inclusion of positive externalities increases the optimal participation numbers for ISO14001 and EMAS, because it makes the benefit side rise while the costs remain constant. Following Pigous' (1920) suggestion that subsidies should be used to internalize positive externalities, it is justified to subsidize companies' participation in a standardized EMS. However, the size of subsidies depends on the responsible government's assessment of the positive externalities generated by a company's participation in EMAS or ISO14001. And thirdly, whether EMAS is superior to ISO14001 from society's point of view depends on the additional costs and benefits (including positive externalities) of the improved external communication.

3 Implementation processes in the Member States

As a Regulation, EMAS is directly binding in all member states. Consequently, translation into national law was not necessary. However, national authorities had to establish a system of institutions and organizations to make EMAS fully operational no later than April 1995. The main tasks of the Member States were to establish a system for the accreditation and supervision of independent environmental verifiers and to appoint a competent body for the registration of the sites participating in EMAS¹⁶. Moreover, the Regulation mentions a number of optional measures, e.g. member states may promote companies' participation in EMAS, especially the participation of small and medium-size enterprises (SMEs).

The implementation processes in the Member States have been diverse due to different experiences with EMS, different backgrounds with respect to company culture and environmental policy as well as existing institutional and organizational frameworks. In the following we will describe the main features of the implementation processes in the four countries under review. The description and analysis of the national implementation processes follows the case studies by Schucht (2000) for France, Bültmann and Wätzold (2000) for Germany, Lulofs (2000) for the Netherlands, and Eames (2000) for the UK¹⁷.

¹⁶ In the following we will call this the accreditation, supervision and registration system.

¹⁷ Other comparative studies on the implementation of EMAS include, for example, Hillary (1998) and Gouldson and Murphy (1998).

3.1 France: government intervention in a voluntary scheme

The French implementation of EMAS is marked by the strong influence of government in the accreditation, registration and supervision system. However, this influence has not led the government to significantly grant regulatory relief in exchange or to actively promote EMAS. As there is also little or no market or other pressure for joining EMAS, participation rates are low and companies turn to ISO14001 instead or develop their own EMS without having it officially certified. Recently, the government is trying to correct its policy by delegating more responsibilities to industrial organizations.

3.1.1 Establishment of the accreditation, supervision and registration system

The French Ministry of the Environment (currently called MATE) started preparations for the implementation of EMAS in spring 1992. It was decided that the Ministry would organize an experimental phase in co-operation with the Assembly of the French Chambers of Industry and Commerce (ACFCI) and other organizations that were either interested in the development of EMAS or had experience relevant for the implementation of the scheme. The goal of this phase was to gain experience with respect to the implementation of EMAS at the level of industrial sites and the verification procedure. Moreover, it served to find the suitable organizations to carry out the accreditation, supervision and registration tasks.

The first pilot phase ran from May 1993 until February 1994 and involved 14 industrial sites. As there was considerable interest from industry to take part in the pilot phase, it was decided to conduct another pilot phase with the goal of investigating the application of EMAS to SMEs and to enlarge the test to companies from industrial sectors that had not participated in the first phase. Thirty-four sites took part in this second pilot phase, which lasted from March 1994 until March 1995.

A “technical committee” was set up with the objectives of selecting the verifiers, specifying the verification process and examining the verifiers’ reports. Furthermore, it answered the enterprises’ questions related to the establishment of an environmental management system and was the forum for discussing problems. This committee consisted of the enterprises participating in the pilot phase, ‘clients of environmental protection’ (green associations, insurance companies, banks, municipalities, and so on), and both technical and legal experts. As of December 1993, the Environmental Agency (ADEME) was represented on this committee as well.

One of the main aims of the pilot phase was to find the organizations best suited to carry out the tasks of the accreditation and supervision body and the competent body. Basically, all institutions participating in the pilot phases wished to gain a place in the system. It seems that at least as far as the competent body is concerned, the MATE was determined right from the beginning to have a strong influence on it. However, this was not officially announced by the MATE, as it needed the experience (such as with management systems) of the other organizations during the pilot phase. Instead, the official decision was only taken at the end of the pilot phase. When the choice was to be made, there were three candidates for the competent body: the MATE, the ADEME together with the French association for standardization (AFNOR), and the ACFCI. The final choice was based on a study by the law firm Maître London ordered by the Ministry itself. This study supported a decision in favour of the MATE. There has been no public discussion about the choice of the competent body. However, the ACFCI was clearly disappointed about the auto-designation of the MATE. To support the MATE by giving advice with respect to the registration of sites and the development of the EMAS system in general, the Comité d'Eco-Audit was established which largely consisted of members of the former technical committee.

In 1994, the French Accreditation Committee (COFRAC-Comité Français Accreditation) was set up following the decision of the Ministry of Industry to create one single organization responsible for all accreditation tasks in France. When a decision on the accreditation and supervision body had to be taken in 1995, it was therefore clear that the COFRAC would be chosen as the accreditation body. Additionally, it took on the tasks of the supervision body as well.

3.1.2 EMAS's unsuccessful take-off

French industry had pointed out very early on that it would only get involved in EMAS on a large scale if its effort was rewarded by being granted regulatory relief. Soon, EPE (Entreprises pour l'Environnement, the lobby of huge firms with a pro-environmental approach) started a debate on the subject of regulatory relief for firms EMAS registered. Without coming up with specific suggestions about how to facilitate general administrative requirements, it pointed out the necessity to lighten the regulatory burden on sites participating in EMAS.

The Ministry of the Environment heads the French environmental enforcement authorities, and is thus the organization empowered to officially decide whether to grant regulatory relief. The MATE did not set up formal deregulation opportunities for EMAS registered sites. It

argued that it would be unfair to set up a formal framework for regulatory relief as all firms should be treated equally before the law. Furthermore, the MATE pointed out that not all registered sites achieved a comparable level of environmental protection and that regulatory controls covered not only the environmental performance of a plant but also other aspects such as measures directed towards the prevention of risks. In addition, the MATE has always regarded EMAS as an instrument allowing firms to advertise their environmental performance (i.e. a promotional instrument) and not as a regulatory instrument, and has avoided mixing these two approaches.

The current policy is that in a few regions, the local licensing and enforcement authorities take into account EMAS registration or ISO certification by reducing the frequency of the reporting requirements for those sites. Furthermore, as the authorities have insufficient personnel and have to set priorities concerning controls, they inspect EMAS registered and ISO14001 certified companies less often.

In addition to a lack of regulatory relief there was little promotion of EMAS. Originally, the MATE had tried to promote EMAS via the DRIRE. However, promotion via the 'environmental police' was not well received by companies. Later on, there have been attempts to involve the Chambers of Industry and Commerce (CIC) into promotional activities. It seems that at the regional level, although some activities to promote EMS exist, their emphasis is more on ISO14001 than on EMAS. Overall, the level of promotional activities is low.

The position of industry towards EMAS was also influenced by the existence of ISO14001. French industry mostly preferred and still prefers ISO14001 to EMAS mainly because the former is a globally recognized standard, whereas the latter is only a European standard. Furthermore, companies complained that EMAS lacks clarity and is therefore difficult to apply. Additionally, companies already ISO9000 certified found it easier to establish ISO14001 as the systems have some similarities. Another reason for companies' preference of ISO14001 was the strong involvement of the MATE in the accreditation, supervision and registration system, which was regarded as an undue interference into companies' affairs.

The potential advantage of EMAS over ISO14001, the environmental statement as a means of external communication, seems of little relevance in the French context. Companies fear that communicating their environmental efforts deteriorates their image. This is due to a perception which partly exists among the French public that the firms publicly emphasizing their environmental improvements must be companies that are highly polluting or that have a

‘bad conscious’. Thus, writing an environmental statement simply makes EMAS participation more costly, without any additional benefits.

The absence of public interest in a firm’s participation in an ‘official’ management standard, relatively little other market pressure and no official regulatory relief for either EMAS or ISO14001 participants led many firms not to opt at all for an official standard. They established their EMS without having it certified at all, thus saving the costs associated with these procedures.

While ISO14001 clearly won the competition against EMAS, EMAS influenced the French interpretation of ISO14001. The French interpretation of ISO14001 is closer to EMAS than the original ISO standard. Normally, EMAS is more outcome-oriented than ISO, aiming at an improvement in the environmental performance, while ISO14001 instead aims at an amelioration of the system. By contrast, the French interpretation of ISO puts emphasis on environmental improvements as well.

3.1.3 Current developments: planned adaptation of the system

Currently a reform of the French EMAS system is envisaged, under which parts of the competent body and related tasks will be passed on to the ACFCI. Depending on the final degree of involvement of the CICs and the reduction of the MATE’s influence, this may constitute a major reform, a switch from the centralized structure of the MATE to the decentralized structure of the CICs and from public to business organizations. However, discussions on the final model are still under way at the time of writing this report.

The main reason for this profound change is that the low participation of companies was partly due to the fact that industry did not have much confidence in an EMAS system strongly influenced by the MATE. The Ministry has acknowledged this and decided that it was worth testing a different model. Furthermore, the transfer of responsibilities to a business organization is only consistent with its view that EMAS is a voluntary instrument by industry and not a regulatory instrument.

However, given the MATE’s maintained involvement in the EMAS system, it is doubtful whether the firms’ trust in the French EMAS system significantly increases, and that, even if firms confidence in EMAS rises, this will lead to a significantly higher participation rate. An analysis of costs and benefits of EMAS and ISO14001 participation may still make many firms decide in favour of ISO14001.

3.2 Germany: EMAS's surprising success

The establishment of the accreditation, supervision and registration system in Germany was marked by a strong conflict over business organizations' influence in the system. Finally a system was agreed in which business organizations hold a strong position. This is one important reason why Germany reached a relatively high level of EMAS participation. Recently, the rise in the number of EMAS participants has slowed down and ISO14001 has become more popular among companies.

3.2.1 The conflict about industry's influence in the accreditation, supervision and registration system

The implementation of the accreditation, supervision and registration system in Germany was marked by a conflict over the degree of influence business organizations should have in the system. The conflict was dominated by two opposing parties, i.e. the BMU (*Bundesministerium für Umwelt/Federal Environment Ministry*) and environmental groups on the one hand, and business associations and the BMWI (*Bundesministerium für Wirtschaft/Federal Ministry of Trade and Industry*) on the other.

The BMU wanted public authorities to have decisive influence on the whole system. It was convinced that the credibility and acceptance of the system would be reduced if it was organized by business associations. It believed that business associations were likely to come into role conflicts if they had to control their own members. The environmental groups pursued similar ideas to the BMU, but wanted to have even less business influence.

The BMU demanded that the relevant tasks be carried out centrally by one body, in order to ensure the nationwide uniform treatment of environmental verifiers and companies. It considered the UBA (*Umweltbundesamt/Federal Environmental Agency*) as the most appropriate candidate. The BMU knew that the success of EMAS was highly dependent on its acceptance by companies and the public. Therefore it was interested in developing a solution in agreement with all relevant groups. The first concept presented by the BMU already offered for the accreditation and supervision of environmental verifiers to be carried out jointly by the UBA and a business body. Additionally, the formation of an advisory council was proposed in which all relevant groups with an interest in EMAS were represented. The BMU planned to commission the German states to perform registration.¹⁸

¹⁸ Cf. Waskow 1997, pp. 111/112.

The BMWi was very involved in the debate about the implementation of EMAS in Germany, not least due to the business associations' urging. It regarded itself as the advocate of business within the government and expressed itself in favour of a model with as little state influence as possible. The BMWi emphasized that against the background of voluntary participation in EMAS, it was necessary to develop a system which considered the companies' interests and set incentives to become registered under EMAS.

The business associations were of the opinion that if participation in EMAS was voluntary and if the system was to be promoted as a business initiative, business organizations had to be responsible. They argued that the idea of environmental audits was originally developed by industry and thus the responsibility for its implementation had to remain with industry. Many companies feared that EMAS would be turned into an instrument which enabled the state to (additionally) interfere in business affairs.

Several business organizations presented their own concepts of how to implement EMAS in Germany. All these concepts can be regarded as counterproposals to the BMU's concept, as they all exclusively proposed commissioning business bodies with the accreditation, supervision and registration. The business organizations sought to push through their concepts by arguing that in case the responsibility was placed on public authorities, EMAS would not be accepted by companies and participation rates remained low.

At the end of 1994, the concepts of the business associations and the BMU stood incompatibly against each other and neither side was willing to make concessions. This situation could not be overcome until the Federal Minister of the Environment changed in November 1994. The new Minister, Angela Merkel, quickly recognized that the success of EMAS was dependent on its acceptance by companies and that it was thus necessary to yield more to the business organizations. In December 1994, the dialogue between BMU and BMWi was resumed and was soon expanded to representatives of business organizations, the German States, environmental groups, trades unions, and (potential) environmental verifiers. A compromise on the accreditation, supervision and registration system was finally reached in early 1995. The concept which was developed is largely identical with the system currently existing in Germany. The main features of the system are as follows.

A new body was founded for the accreditation and supervision of environmental verifiers, because it was not possible to agree on one of the proposed organizations. The DAU (*Deutsche Akkreditierungs- und Zulassungsgesellschaft für Umweltgutachter mbH*/German Environmental Verifiers Accreditation Company) was conceived as a limited liability

company in the hands of German business associations such as the DIHT (*Deutscher Industrie- und Handelstag*; umbrella organization of the German chambers of Industry and Commerce). However, the BMU still has a supervisory function over the DAU. The Ministry monitors whether the DAU acts in accordance with relevant legal regulations, and checks whether certain decisions are correct in terms of content. The latter is mainly aimed at cases in which the DAU revokes or temporarily suspends accreditation. To support and control the DAU, a pluralistic Committee, the UGA (*Umweltgutachterausschuß*/Environmental Verifiers' Committee), was established.

Responsibility for the registration of sites was placed on the CICs (Chambers of Industry and Commerce) for industrial sites and the HwK (Chambers of Craft) for tradesmen's sites. The registration procedure demands the Chambers to inform the relevant enforcement agencies of the German States and to give them the opportunity to intervene should the site not comply with environmental legislation. The compromise came into force on 15 December 1995 as the *Umweltauditgesetz* (Environmental Audit Act).

3.2.2 What factors made EMAS a success in Germany?

After the implementation of the accreditation, supervision and registration system, EMAS was quickly accepted by companies and many of them decided to participate in the Scheme. This is surprising considering that Germany was the only opponent of EMAS before 1993 (see Section 2.1).

German companies greatly benefited from the advantages brought about by the implementation of an environmental management system because they had hitherto neglected the importance of EMS. Ironically, the German "technologically oriented approach" which had initially led German companies to reject EMAS was now one of the reasons for the success of EMAS in Germany.

By giving business organizations a strong position in the accreditation, supervision and registration system, the companies' fear that their participation in EMAS would lead to additional controls from enforcement authorities or unnecessary bureaucratic efforts has been overcome. In addition, business organizations are interested in the success of a system in which they play a key role. The IHK and HwK have a particular interest in high participation rates. They have invested in equipment and personnel to prepare for their registration activities; these costs can only be covered if many companies ask to be registered and pay the registration fee.

Promotional activities for EMAS have been widespread in Germany. Nearly all of the State Ministries of Trade and Industry and State Ministries of the Environment as well as nearly all of the IHK and HwK have contributed to the promotion of EMAS. While the IHK and HwK have concentrated on the provision of information and advice, the State Ministries have also financially supported participation in EMAS. It is estimated that between 30% and 60% of EMAS participants have received subsidies.¹⁹ By contrast, financial support for companies certified with ISO14001 has been less frequently available and is lower than subsidies for EMAS participants.

German companies quickly called for deregulation in return for their participation in EMAS. As the German States are responsible for licensing, monitoring and enforcement, they were the ones who primarily responded to this call. Today, all the German States provide some form of a lighter regulatory touch for EMAS registered companies. Bavaria has been the pioneer with the "Umweltpakt Bayern" (Bavaria Environmental Pact) which was adopted in October 1995. We concentrate on the "Umweltpakt Bayern" as the first and most comprehensive attempt to include EMAS in the implementation of environmental policy. In order to illustrate the diversity of the approaches adopted by the German States, we also briefly describe the situation in North Rhine-Westphalia (NRW). In NRW, EMAS participants were granted less regulatory relief than in Bavaria. Furthermore, the measures were not integrated into some kind of 'alliance'.

The „Umweltpakt Bayern" is a comprehensive voluntary agreement between state government and Bavarian industry. The covenant means obligations for both parties. The companies involved guaranteed, for example, to increase the share of products they transport by rail and to intensify participation in EMAS. The agreement states that the number of 500 validated sites is to be reached in Bavaria by October 2000.²⁰ In return, the state authorities promised to financially support the application of environment-friendly technology as well as the installation of EMS, and to provide a lighter regulatory touch for EMAS registered sites. The regulatory relief is based on the principle of *funktionale Äquivalenz* (functional equivalence), which means the companies' measures to substitute the traditional reporting and monitoring duties need not be exactly identical to the traditional ones, but must be comparable in terms of scope and quality.

¹⁹ Please see Bültmann/Wätzold (1999a) for more details on the promotion of EMAS in Germany.

²⁰ This number was already reached in October 1999.

The basis for regulatory relief measures is the *Substitutionskatalog* (substitution catalogue) developed in close cooperation between the Verband der Chemischen Industrie Bayern (the Association of the Bavarian Chemical Industry) and the Bavarian government. The substitution catalogue contains detailed proposals for deregulation measures, most of which have been integrated in existing administrative guidelines. Regulatory relief for EMAS registered companies currently applies to reporting, documentation, and control duties, and covers the fields of waste, water and pollution control law.

NRW did not grant regulatory relief to the same extent as Bavaria, nor did it integrate it into a comprehensive voluntary agreement. It only enacted the *Substitutionserlaß* in May 1998 which exclusively deals with pollution control law. It instructs the competent authorities to use their discretionary powers to substitute companies' self-control mechanisms for control duties and to substitute documentation and information provided for in the EMAS Regulation for those required by the pollution control law.

Both states offer regulatory relief exclusively to EMAS registered companies and not to organizations certified with ISO14001. The reasons are that, unlike EMAS, ISO14001 does not make compliance with all relevant environmental legislation a necessary condition for becoming certified, nor does it provide for government involvement in the certification system. German policy-makers regarded both aspects as prerequisites for regulatory relief for legal reasons.²¹

Although it is hardly possible to ascertain the extent to which lightening the regulatory burden has influenced companies in their decision to participate in EMAS, comparison of the participation rates in Bavaria and NRW suggests that the Bavarian approach which provided for a higher level of regulatory relief and integrated deregulation into a comprehensive voluntary agreement was more successful in setting incentives for companies to become registered under EMAS²².

3.2.3 Recent developments: participation rates rise more slowly

Recently, the rise in the number of EMAS participants has slowed down. The main reason seems to be the increasing relevance of the competition of ISO14001. In September 1999 1450 companies were already certified with ISO14001. This number surged to 1800

²¹ Only in recent months have a few German states questioned this position and considered offering regulatory relief to ISO14001-certified organizations as well.

²² There were 548 sites registered under EMAS in Bavaria and 467 sites in NRW. This is 8.17% in Bavaria and 5.00% in NRW of all companies from the manufacturing sector with more than 20 employees in 1999.

companies in December 1999 and 1950 companies in April 2000, whereas the number of EMAS registered sites nearly stagnated.

The central reason for the former dominance of EMAS is that it was the first well-known EMS in Germany. When ISO14001 was introduced in October 1996, many companies had already registered under EMAS, were in the process of doing so or planned to participate. EMAS was initially actively discussed by industry and later on actively promoted by business organizations. Furthermore, at this time German companies had not been aware of the advantages of an environmental management system and EMAS was the first system that acquainted companies with it. For these reasons, EMAS became the dominant EMS standard in Germany.

However, recently ISO14001 has become more popular among German companies. Company surveys revealed a number of reasons explaining this development: ISO14001 is a global standard whereas EMAS is restricted to Europe, ISO14001 is closer to ISO9001, a system with which many companies are familiar, and the German interpretation of ISO14001 does not demand compliance with all relevant environmental legislation and the continuous improvement of the environmental performance. In addition, ISO14001 is less costly than EMAS as it does not include the publication of an environmental statement.²³ This factor is all the more important as many EMAS participants complained that the public showed only little interest in the environmental statement, and that the potential benefits had therefore not yet been realized.

3.3 The Netherlands: the integration of EMAS into a comprehensive voluntary approach

By contrast with France and Germany, EMSs were well-known and accepted in the Netherlands long before EMAS was adopted. Since the end of the Eighties they have become an important part of the Dutch environmental policy that aimed at a more cooperative relationship between government and industry. This led to a smooth establishment of the accreditation, registration and supervision system of EMAS which was integrated into the institutional setting built to prepare and implement voluntary agreements. Nevertheless, ISO14001 has become the dominant standard with EMAS being nearly marginalized.

²³ Cf. Forschungsgruppe FEU 1998, p. 6.

3.3.1 The tradition of environmental management systems in the Netherlands

In the Netherlands, the years 1980–85 were a period marked by the quest for deregulation. Economic growth was small, and the Dutch government believed that over-regulation was one of the reasons. The interest in deregulation also included environmental legislation. Industry perceived environmental regulation as fast-changing and too detailed. It needed legal stability in order to properly plan and carry out investments. Industry perceived self-regulation and environmental management systems as suitable strategies for deregulation. Although the government was interested in EMSs, it considered it inadequate for deregulation as such. It demanded uniform and trustworthy EMS. Standardization and certification were believed to be the preconditions for high quality a EMS. Industry accepted that a trustworthy EMS required a high quality and some government involvement in standardization and certification.

In 1989, the government issued a memorandum on environmental management systems which was written in close co-operation between government and industry. The memorandum on environmental management was accompanied by a ‘learning’ oriented programme of about 60 millions Dutch guilders financed by the government. It aimed at the stimulation of EMS in organizations, and included the development of checklists, handbooks and courses on how to implement EMS in companies. There were also some projects about standardization and certification of environmental management systems.

Since the early Nineties, the Dutch government has integrated EMS into its deregulation efforts. The general idea behind the approach by the government is that “pro-active” companies that internalize environmental values into their organizations and perform well should be treated differently from ‘laggards’ as far as monitoring, enforcement and licensing are concerned. Pro-active companies are trusted to properly perform measuring duties, self-reporting and self-control. An EMS is considered to be the tool to implement self-regulation and to produce the documents and data needed to convince the authorities of one’s environmental credibility. Having its EMS certified or verified helps a company to become a trustworthy partner.

3.3.2 The integration of EMAS in Dutch environmental policy

As there was a consensus on the role of EMS in the context of the Dutch environmental policy, the establishment of an accreditation, supervision and registration system went smoothly. The foundation SCCM (*Stichting Coördinatie Certificatie Milieuzorgsystemen/Co-ordination Certification EMS*) was established with the aim of implementing EMAS in the

Netherlands. Beyond this particular objective, the SCCM aims to (1) promote EMS and (2) promote the incorporation of EMS in permitting, monitoring and enforcement procedures by governments. The SCCM has also taken on the function of the Dutch registration body. It has to be interpreted as a joint action by government and industry. Its supervisory board consists of government and industry representatives. In case of substantial policy related issues, approval of the supervisory board is needed. Additionally, an advisory board was founded that consists of representatives from government, businesses and relevant 'third parties' such as environmentalists and labour unions.

The secretariat of SCCM is accommodated at the *Facilitaire organisatie Industrie*, which provides an institutional setting for industry and governments to communicate and prepare covenants. The SCCM was embedded in these structures as they were perceived as the right institutional setting to discuss voluntary systems such as EMS standards. The embedment of EMAS in the context of the covenants is reflected in the fact that the requirements for EMAS registration include not only compliance with all relevant legislation but also compliance with voluntary environmental agreements between an industry sector and government.

In order to have uniform and credible environmental management systems, the SCCM has established a *Scheme for Verifying EMAS* and a *Scheme for Certifying ISO14001*, and updates them regularly. These schemes provide blueprints for the verification and certification procedures and have to be used by the verifiers and certifiers²⁴. The tasks of the accreditation and supervision of environmental verifiers were delegated to the Dutch Council for Accreditation, a non-profit foundation established in September 1995.

3.3.3 EMAS and ISO14001

As mentioned earlier, it was a necessary condition for deregulation that the companies' EMS were standardized and of high quality. Therefore, the advisory board linked to SCCM decided to harmonize the requirements for certification with ISO14001 and registration under EMAS. This led to the rather unusual situation that government had some influence on the national interpretation of ISO14001. The harmonization of the two standards led to a rather progressive interpretation of ISO14001. This means that the Dutch NEN ISO14001 is more demanding for companies than the original ISO14001. Due to the coordination efforts, the

²⁴ The Scheme for Verifying EMAS, for instance, comprehends three substantial sections: interpretation of EMAS, internal organization of the verifying organization (including competence), and operating procedures for the verifying organizations.

additional requirements of EMAS on top of ISO certification are restricted to the publication of a validated environmental statement and the registration of participants.

Although environmental management systems are popular in the Netherlands, the overwhelming majority of companies prefer ISO14001 to EMAS. The large majority of EMAS participants is also certified with ISO14001. In the opinion of Dutch companies, the decisive advantage of ISO14001 over EMAS is that it is a globally accepted standard. The potential advantage of EMAS over ISO14001, which in the Dutch context is only the validated environmental statement, is generally not much appreciated by relevant stakeholders. Thus, participation in EMAS only leads to additional costs without providing any significant benefits for most companies.

3.4 UK: EMAS as a late comer

The implementation of EMAS in the UK has been markedly influenced by the fact that BS7750 existed prior to EMAS, and that both government and industry considered EMAS as something which could be done in addition to ISO14001 but not as a superior alternative. Thus, not surprisingly, participation in EMAS lags clearly behind participation in ISO14001.

3.4.1 The creation of the accreditation, supervision and registration system

Overall, the implementation process in the UK was without major conflicts. To oversee the implementation of EMAS, the UK government established an interdepartmental coordinating committee, with representatives from the Department of the Environment (DOE), Her Majesties Inspectorate of Pollution (HMIP) and the Department of Industry (DTI). One week after the EMAS Regulation was adopted by the Council in June 1993, the DTI and DOE jointly issued a public consultation paper which outlined the government's proposals for establishing accreditation systems for both BS7750 and EMAS.

The National Accreditation Council for Certification Bodies (NACCB) was to be asked to develop a system to accredit organizations to certify to BS7750, and in due course also to provide a mechanism for such organization to become accredited as EMAS verifiers. The accreditation system for BS7750 certifiers and EMAS verifiers were to be as compatible as possible, so that the audit teams could provide certification for both BS7750 and EMAS. Moreover, the EMAS Regulation requires that sites using a recognized national standard to meet the EMS requirements of EMAS must have their compliance with that standard verified by a body whose accreditation is recognized by the Member State in which the site is located. The UK government regarded this as a compelling reason for establishing an accreditation

system that covered both BS7750 and EMAS. At the time, the government also regarded continued rapid progress in implementing BS7750 as an opportunity to establish a competitive advantage for UK environmental consultancy and auditing firms. Firms may be accredited for BS7750 certifiers first and subsequently apply for additional accreditation as EMAS verifiers, when EMAS comes into force in May 1995.

In November 1993 the DTI announced as expected that NACCB had been awarded the role of accrediting organizations to both BS7750 certifiers and EMAS verifiers and also of supervising them. The NACCB subsequently changed its name to the United Kingdom Accreditation Service (UKAS) on the 1 August 1995.

The DOE announced on the 10 May 1994 that the Secretary of State for the Environment, assisted by a small secretariat within the Department, would fulfil the function of the competent body on an interim basis. In 1998 the competent body was finally handed over to the Institute of Environmental Assessment (IEA), a professional body to promote best practice in environmental assessment with the membership drawn from environmental consultancies, business, local authorities and academia.

3.4.2 EMAS as a late comer

Following its announcement as the responsible accreditation and supervision organization, the NACCB rapidly developed the accreditation criteria required to bring BS7750 into operation, with the aim of quickly getting as many organizations accredited as possible. Development of the accreditation criteria for EMAS verifiers was treated as a secondary task. In March 1995, the NACCB's environmental accreditation scheme was officially launched, and the first 8 accredited certification bodies for BS7750 were announced along with the first 20 companies to be certified to the standard. It was not until July 1995 that the NACCB's supplementary criteria *The Accreditation of Environmental Verifiers for EMAS* were published and the first three organizations to be accredited by NACCB as EMAS verifiers were announced. All had previously been accredited as certifiers for BS7750.

At that time the British government had hoped that EMAS could profit from the rapid development of BS7750. It considered certification to BS7750 as a 'stepping stone' to EMAS registration. Therefore, it wanted to obtain swift recognition of the British national standard as equivalent to the EMS requirements of EMAS. However, recognition of BS7750 was reportedly blocked by Germany in March 1995, who argued that the recognition of national standards should await agreement on an international standard. Indeed, it was not until February 1996 that BS7750 was finally recognized as corresponding to the equivalent

requirements of EMAS by the European Commission. At that time, BS7750 was soon to become obsolete, due to the development of ISO14001. Due to the initial uncertainty over the relationship between EMAS and BS7750, the drive for a good start for EMAS hoped for by the government was lost.

In comparison to ISO14001, EMAS is lagging significantly behind in terms of the number of participants. Furthermore, nearly all of the EMAS participants are also certified with ISO14001. Besides the fact that UK firms had already gained experience with BS7750 and its subsequent internationalization in the form of ISO14001, an important reason for the dominance of ISO14001 is that it is recognized worldwide, whereas EMAS is only accepted in Europe. Furthermore, ISO14001 is less demanding than EMAS, especially because it does not require the publication of an environmental statement. This is all the more important as in some branches of industry reservations towards the concept of public disclosure of environmental information existed and continues to do so.

3.4.3 Hardly any impulse for EMAS from promotion and deregulation

There was only little or even no impulse for an increase in EMAS participation from promotional activities, even though some activities existed. The UK had adopted a largely centralized approach to the promotion of EMAS, with responsibility for this task assigned to the Competent Body, although some limited collaborative activities were also undertaken with industry, environmental and professional bodies. With respect to industrial activities, the DOE's promotional strategy focused upon awareness raising, the provision of practical information, and the Small Company Environmental and Energy Management Assistance Scheme (SCHEEMAS). SCHEEMAS was established in November 1995, with the principal objective of encouraging EMAS registration among SMEs. However, it was abolished in July 1997 due to the poor uptake. Official promotional activities in the UK portrayed EMAS and BS7750 (and later ISO14001) as complementary, with the latter being viewed as a 'stepping stone' to EMAS registration. The DOE has not sought to portray EMAS as markedly superior or preferable to BS7750/ISO14001, which might be another reason for the dominance of ISO14001 over EMAS in the UK.

The possibility of linking EMAS registration (or BS7750/ISO14001 certification) to some form of deregulation has generated considerable debate within policy circles in the UK, but almost no concrete action. Furthermore, the public discourse in the UK largely treats EMAS and ISO14001 as equivalent. To date, the only formal way in which EMAS registration (and ISO14001 certification) is taken into account by the EA is as just one of a number of factors

used in the Agency's Operator and Pollution Risk Appraisal (OPRA) risk assessment system. The OPRA system is intended to provide an assessment of the operators' performance and the intrinsic risk of processes regulated under the UK's IPC regime. The OPRA system is supposed to be used to guide the frequency of inspection visits. EMAS registration is therefore one of a number of factors that may theoretically lead to a reduction in the number of such visits. However, the number of such visits is in many cases already minimal in the UK due to staff shortages amongst the inspectorate.

4 Explaining varying participation rates

The purpose of this chapter is to explain the central outcome of the EMAS implementation processes: the varying participation rates in the four countries under review. Based on the information provided in Chapter 3, we explain participation in EMAS as a result of the companies' choice between EMAS and ISO14001. Furthermore, we discuss the influence of the implementation process on some of the parameters that determine this choice.

4.1 Companies' choice between EMAS and ISO14001

Being a voluntary scheme participation in EMAS depends on the decision of companies to join it. This in turn depends on the net benefits companies expect from their EMAS participation and from the net benefits they expect from joining the alternative EMS standard, ISO14001. Companies will ultimately choose the standard with the highest expected net benefits, provided they are positive. As described in detail in Chapter 3, these benefits differ in the four countries under review depending on the institutional structure, the importance of external communication, and the informational as well as financial promotion of EMAS and ISO14001. Table 2 shows where which EMS standard is preferred (or where standards are considered equal) in terms of participation costs and various benefits by companies from the four case-study countries.

Table 2: Advantages of EMAS and ISO14001 from companies' perspective

	France	Germany	Netherlands	UK
Participation costs	ISO14001	ISO14001	ISO14001	ISO14001
International recognition	ISO14001	ISO14001	ISO14001	ISO14001
Clarity of EMS	ISO14001	ISO14001	Equivalent	ISO14001
Similarity to ISO9000	ISO14001	ISO14001	Equivalent	ISO14001
Regulatory Relief	Equivalent	EMAS	Equivalent	Equivalent
Involvement of business organizations	ISO14001	Equivalent	Equivalent	Equivalent
Promotion (information)	Equivalent	Earlier: EMAS Now: Equivalent	Equivalent ²⁵	Equivalent ²⁵
Promotion (funding)	Equivalent	EMAS	Equivalent	Equivalent
External communication	$EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$	EMAS	EMAS	$EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$
ISO14001: Advantages from ISO14001 participation are higher than from EMAS participation EMAS: Advantages from EMAS participation are higher than from ISO14001 participation Equivalent: Advantages resulting from participation are the same for both standards $EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$: Whether the advantages from EMAS or ISO14001 participation are higher varies from one firm to the next				

With the help of Table 2, the differences in participation rates can be easily explained. In France, the Netherlands and the UK the only advantage of EMAS over ISO14001 is that EMAS is better suited for external communication than ISO14001. This statement has to be qualified with respect to the UK and especially France. As mentioned earlier, in France, public disclosure of environmental information is sometimes seen as a sign that a company has to justify itself, thus turning the advantage of external communication into a disadvantage. It is a similar case (albeit to a lesser extent) in some branches of UK industry, where revealing information to the public is still seen as problematic. However, even French, Dutch and UK companies that see a possible advantage of improving their external communication via EMAS consider it as rather limited. This is partly due to the high reputation of ISO14001 especially in the Netherlands and the UK, but also partly due to the low public response to

²⁵ In the Netherlands and the UK, ISO 14001 profited from the fact that companies were well-informed about BS7750 which was in many respects similar to the ISO standard.

EMAS. It is therefore not surprising that the additional benefits of EMAS only outweigh its additional costs for a few companies, and as a consequence participation in EMAS has remained low.

Germany is the only country where EMAS provides other advantages besides external communications. For legal reasons, regulatory relief is only granted to EMAS registered companies, and in the mid- to late Nineties there was more information and funding available for EMAS participants than for ISO14001-certified companies. This led to high participation rates in EMAS, not only in comparison to other countries but also to ISO14001. Recently, however, this situation has changed and ISO14001 has been quickly catching up. This is mainly due to the facts that the level of companies' information about ISO14001 has risen, companies have become more aware of ISO's advantages such as worldwide recognition, and are partly disappointed about the benefits of improved external communication brought about by EMAS.

4.2 Influence of the implementation process on participation rates

One central aim of the IMPOL project was to analyse the link between the way the EMAS Regulation was implemented in the four countries and the outcomes of the implementation processes. Among the factors that influenced the choice between EMAS and ISO14001 in Table 2, only "international recognition" and "participation costs"²⁶ are not linked to the implementation process. All other factors have been or could have been influenced by it. Among these factors we can distinguish two groups.

The first group contains the factors where ISO14001 had an initial advantage over EMAS because it was closer to business, and not government-initiated. These factors are "clarity of EMS", "similarity to ISO9000" and "involvement of business organizations". Here, the implementation process could serve to eliminate the initial advantage of ISO14001 and to make both systems equally attractive to companies. For this to happen, the decisive requirement was close co-operation between government and business organizations.

In the Netherlands, for example, government and business organizations agreed to harmonize the EMS requirements of EMAS and ISO14001. Whereas this factor did not outweigh the other disadvantages of EMAS in the Netherlands, the integration of business organizations in

²⁶ One could argue that the costs for participating in EMAS are influenced by the implementation process, e.g. by charging no registration fees, but in this report this would be considered a subsidy and taken into account under this point.

the accreditation, supervision and registration system certainly contributed to the high participation rate in Germany. By contrast, in France, the strong influence of the government in the accreditation, supervision and registration system was one of the factors that led to the low number of EMAS registered companies.

The second group entails factors where EMAS gained or could have gained an advantage over ISO14001, but this depended largely on the decision of government to treat EMAS as superior to ISO14001 in the implementation process. The factors “regulatory relief”, “promotion of EMAS” and “external communication” belong to this group. For instance, public authorities could have granted more regulatory relief to EMAS registered than to ISO14001-certified companies²⁷. This was only done in Germany and is clearly one of the factors that led German companies to prefer EMAS to ISO14001. Additionally, government could have provided more information and funding for EMAS than for ISO14001. Here again, Germany was the only country to follow this approach. Finally, the government could have helped the external communication factor to be a real competitive advantage for EMAS by providing the public with information about the scheme. Only a public which knows about EMAS’ main contents and goals is able to appreciate a company’s participation in the scheme.

Overall, the implementation process obviously had a decisive influence on the number of EMAS participants. However, given the ‘natural’ advantages of ISO14001 over EMAS of lower costs and of being an internationally recognized standard, high participation rates required both close co-operation between government and business organizations in the implementation process as well as government, giving EMAS participants preferential treatment.

5 Was EMAS a successful policy instrument?

Against the background of the low participation rates in some countries the question arises of whether EMAS has been a successful policy instrument. Obviously, a definite answer to this question requires a comprehensive policy evaluation such as a cost-benefit-analysis. While such an assessment was not intended and could not have been carried out within the framework of the IMPOL project, we collected enough information and data to be able to give

²⁷ A detailed analysis of the Member States’ experience in granting regulatory relief to EMAS registered and ISO14001-certified companies is given in Wätzold et al. (2000).

a rough comparison of costs and benefits of EMAS²⁸. From this angle, EMAS can be considered successful if the overall benefits exceed the costs

$$B_P + B_S > C_P + C_{SS} + C_{SR}.$$

On the benefit side we distinguish between benefits for companies (B_P) and benefits for society (B_S) which result from environmental improvements brought about by companies' EMAS participation²⁹. Similarly, on the cost side we distinguish between costs born by companies (C_P) and costs born by governments which consist of subsidies for EMAS participants (C_{SS})³⁰ and costs incurred in running the accreditation, supervision and registration system (C_{SR}). In our assessment of the cost side, we concentrate on the costs for running the EMAS system for the following reasons: EMAS is a voluntary scheme, thus companies only participate when their benefits exceed their costs, i.e. $B_P > C_P$ must be true. This implies that companies participating in EMAS realize a positive net benefit ($B_{PN} = B_P - C_P$). We can therefore neglect the private costs and substitute B_P by B_{PN} . Similarly, the provision of subsidies by Member States is voluntary. This implies that once a government financially supports EMAS participants, it believes that the benefits from the environmental improvements they realise are higher than the subsidies. This means that $B_S > C_{SS}$ must be true,³¹ which implies positive net benefits for society ($B_{SN} = B_S - C_{SS}$). Consequently, EMAS can be considered successful, if

$$B_{PN} + B_{SN} > C_{SR}$$

We will discuss each of these benefit and cost categories in detail (sections 5.1 and 5.2).

²⁸ The data is taken from the individual case study reports. To gain the relevant data and information we conducted expert interviews, reviewed the relevant literature and carried out identical company surveys in all four countries. The survey is based on questionnaires which were sent to all EMAS participants in France, Germany, the Netherlands and the UK. In France, the Netherlands, and the UK the survey was conducted by the IMPOL team in early 1999. The German data are taken from a survey the Unternehmerinstitut e.V. carried out in mid 1997 (cf. Unternehmerinstitut e.V. 1997). At the time the questionnaires were sent out there were 32 EMAS participants in France, 22 in the Netherlands, 70 in the UK, and almost 700 in Germany. The return quotas ranged from about 20% in Germany to 63% in France, 68% in the Netherlands and 74% in the UK.

²⁹ We are aware that there is some overlap between B_P and B_S once the company is rewarded by a third party which benefits from the environmental improvements brought about by EMAS. The analysis will show that this area of overlap can be neglected as it does not influence the general result on the success of EMAS as companies significantly profit from benefits independent of third party behaviour (e.g. cost-savings).

³⁰ The subsidies for EMAS participants can be interpreted as the part of the participation costs borne by government, i.e. the sum of C_P and C_{SS} reflects the total costs incurred in a company's participation in EMAS.

³¹ With this position we assume that the state maximizes social welfare. Obviously, this postulation can be questioned from several perspectives. Governments might pursue other interests than social welfare maximization. Even if they did, they might not have all the necessary information to assess whether $B_S > C_{SS}$ is true. However, for the purpose of this section we can rely on this assumption.

5.1 Benefits of EMAS

5.1.1 Companies' benefits

With respect to companies' benefits from EMAS, we distinguish between benefits from the introduction of an EMS and benefits from improvements in the communication with external stakeholders.

Benefits from EMS

The benefits brought about by the introduction of an EMS are virtually nil in France, the Netherlands and the UK. The reason is not that companies consider the internal instruments as useless, but that the establishment of these instruments mostly did not take place in the context of EMAS. Nearly all Dutch and most UK companies already had an EMS (either internal or ISO14001) in place prior to their EMAS registration, and the large majority of French EMAS registered firms obtained ISO14001 certification together with their EMAS registration or were already ISO14001 certified beforehand.³²

For Germany, it is estimated that only 31% of EMAS registered sites are also ISO14001-certified (UBA 1999, p.57). Most German EMAS participants did not follow a systematic approach to environmental management or even had no environmental management at all before taking part in EMAS. Consequently, on average German companies rate all EMS-related elements the EMAS Regulation provides for as important and helpful (see Figure 5).

³² The benefits of the EMS requirements of EMAS and ISO14001 are similar in France and the UK and identical in the Netherlands. In fact, under the revised EMAS Regulation the EMS requirements of EMAS and ISO14001 will be identical, because the requirements of the ISO standard will be integrated into the EMAS Regulation (cf. common position of the Council of February 2000 and see Chapter 6 for details).

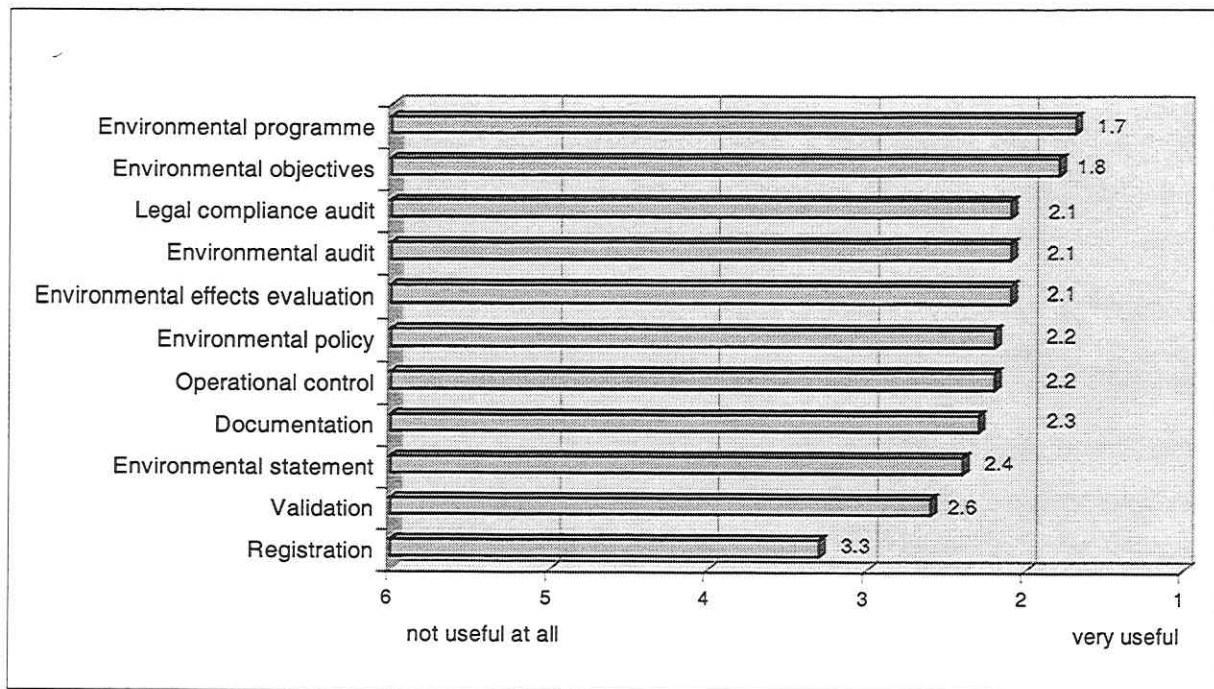


Figure 5: Importance of different elements of EMAS for German companies
Source: Unternehmerinstitut e.V. 1997, annex Fig. A49

Figure 5 presents the answers EMAS participants gave when they were asked to rank the importance of the different elements of EMAS on a scale from very useful (1) to not useful at all (6). The figure shows that the elements directed at companies' internal management and organization were all regarded as rather important. The formulation of an environmental programme (1.7) and environmental objectives (1.8) were regarded as most useful. The legal compliance audit, the environmental audit and the environmental effects evaluation were ranked as slightly less important, but were clearly regarded as more than medium useful. The same holds true for the adoption of an environmental policy and operational control (2.2). The environmental management documentation records were regarded the least useful EMS element (2.3). The external elements, i.e. the environmental statement (2.4), validation (2.6) and registration (3.3), all come at the bottom of the list.

A company survey carried out by the *Umweltbundesamt* revealed that by systematically integrating environmental aspects into their management systems, German companies on average realized cost reductions of DM140,000, which exceeded the average participation costs of DM116,000 and thus led to net benefits of DM24,000 (UBA 1999, pp. 39 and 35). While this figure can only be considered a vague estimate, it nevertheless gives an idea of the magnitude of B_{PN} . The fact that companies achieved such significant cost reductions indicates that many of the activities they undertook in the context of their EMS implementation

consisted of what is described in the literature as “picking of low hanging fruits” (see e.g. Gabel and Sinclair-Desgagné 1998). Low-hanging fruits describe improvements that do not only reduce the environmental impact of companies but also lead to cost-savings with a relatively short pay back period e.g. a reduction of energy consumption and waste production. In addition to the monetary benefits, the introduction of an EMS has led to benefits not directly measurable in monetary terms such as a better knowledge of environmental regulations applicable to a company and the motivation of employees (UBA 1999, p. 37).

Benefits from improvements in the external communication

External communication can lead to benefits when it triggers positive reactions of the companies' stakeholders. In order to help companies to improve their external communication, the EMAS Regulation provides for the validated environmental statement. It enables EMAS participants to supply their stakeholders with credible information about their environmental performance.³³ The French, Dutch and UK companies explicitly registered under EMAS to improve their external relations. However, German companies hoped for positive communication effects as well.³⁴ As an indicator to what extent these expectations have been met, Figure 6 shows how important the companies value the environmental statement on a scale from very useful (1) to not useful at all (6).

³³ The credibility of the information provided in the environmental statements is based on the verification and registration system. The quality and strictness of the controls performed by the environmental verifiers mainly depend on two factors: the competence of the verifiers, and the supervision procedures to which the verifiers themselves are subjected. Although differences exist with respect to the accreditation and supervision of the verifiers, we found no indications that the competence of the verifiers is low or the supervision system is not working in any of the four countries. However, it should be borne in mind that this does not imply that the misconduct of verifiers is always detected (see e.g. Müller 1998) as a perfect supervision system would require eye-witness validation of all verifications. With respect to the registration systems of the four countries, we did not find any indications of systematic malfunctions either. For details of the national accreditation, supervision and registration systems, please refer to the country case studies.

³⁴ See (besides the national case study reports) for the UK also Strachan et al. (1997).

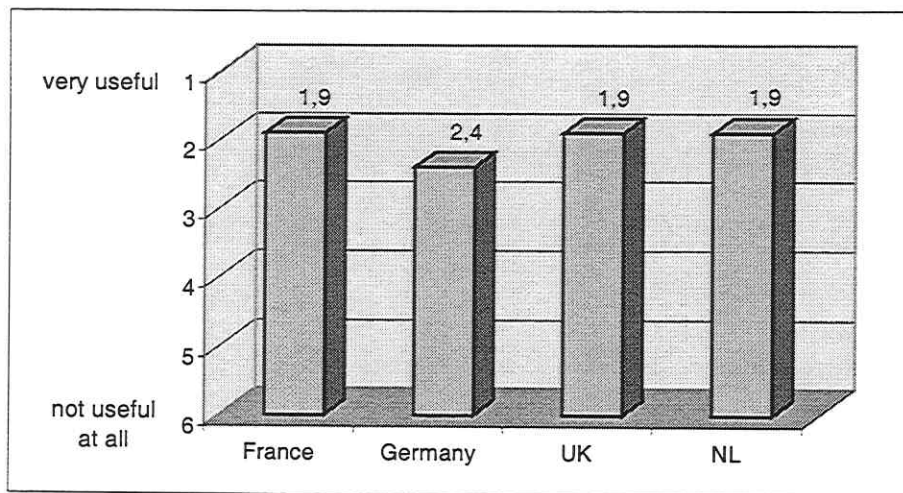


Figure 6: Usefulness of the environmental statement for companies in the four countries

Source: Unternehmerinstitut e.V. 1997, annex Fig. A49 and individual country case studies

Figure 6 indicates that the environmental statement has largely satisfied companies' expectations in France, the Netherlands and the UK. Although German firms clearly regard the environmental statement as more than medium useful, they appear to be somewhat disappointed. This result is confirmed by the survey of the *Umweltbundesamt*, which has revealed that in Germany those stakeholders that EMAS participants wanted to address and that could have provided them with substantial benefits have shown relatively little interest in the environmental statements (UBA 1999, p. 43).

5.1.2 Benefits for society

The benefits EMAS generated for society resulted from environmental improvements brought about by companies' EMAS participation. In order to assess ecological effects that have been reached, we again rely on the company surveys. EMAS participants were asked to indicate what ecologically oriented measures they have undertaken or intend to undertake in connection with their EMAS participation and whether these measures have brought about environmental improvements. The firms' answers with respect to the measures EMAS has triggered are depicted in Figure 7.

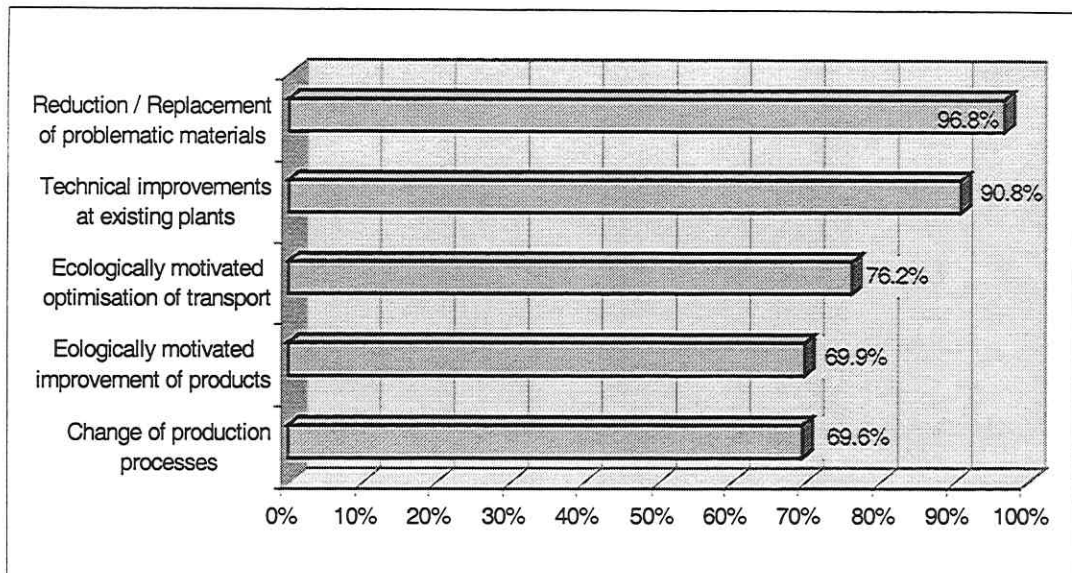


Figure 7: Measures companies have undertaken or intend to undertake within their EMAS participation (percentage of companies, geometric mean of the four countries)

Source: Unternehmerinstitut e.V. 1997, annex Fig. A27 and individual country case studies

Figure 7 shows that a large majority of companies is planning or has already undertaken the reduction or replacement of problematic materials (96.8%) and technical improvements at existing plants (90.8%). EMAS has also been fairly effective in encouraging the ecologically motivated optimization of transport (76.2%). Ecologically motivated improvements of products (69.9%) and production processes (69.6) have played the least important role. A comparison of the country-specific results reveals that EMAS has triggered most measures in Germany and least in the Netherlands. The difference can be explained by the country's different experience with EMS. As nearly all Dutch companies already had an EMS in place, it was difficult for EMAS to trigger additional measures.

The companies' answers to the question over what environmental improvements the measures have brought about have shown that they mainly resulted in the reduction of solid waste, energy consumption, water usage and effluent water. Companies from all four countries described the environmental effects that resulted from the introduction of the various measures on average as medium. When stating this, companies probably compared these effects with the effects of environmental legislation which – according to companies – is still the most important driver for environmental improvements.

While the companies' assessment of environmental improvements provides an overview of the benefits EMAS brought for society (B_S), for the evaluation of EMAS as a policy instrument we are interested in the net benefits for society (B_{SN}). Assessing B_{SN} on the basis

of the equation $B_{SN}=B_S-C_{SS}$, we face the difficulty that B_S is a qualitative assessment of environmental improvements whereas C_{SS} is a monetary term. A proper comparison of these two terms requires the monetarization of the environmental benefits, which is beyond the scope of our project. However, we are still able to determine more closely the size of B_{SN} with the available information. We know that in Germany³⁵ 40–70% of EMAS registered companies did not receive any subsidies. This means that the benefits for society arising from the improvements in the environmental performance of the participation of these companies in EMAS equals the net benefits for society. This allows the conclusion to be drawn that a substantial part of the benefits EMAS generated for society are net benefits.

5.2 Costs of EMAS borne by governments

The costs of the EMAS regulation which are born by government have arisen through administrative costs for establishing and running the accreditation, supervision and registration system. As it proved difficult to collect data on the costs of establishing the system, which happened some years ago, we restricted our assessment to the costs of running the system. As an indicator to assess these costs, we used the working time for running the system in the last five years, which we measured in man-months. As the period of our analysis stretches over several years, we faced some difficulties in collecting all the relevant data. Therefore, our assessment on the amount of administrative work in the four countries under review is to some extent based on estimates. Although this implies that our cost assessment cannot claim to be precise, it still indicates the scale of the actual administrative costs of EMAS. As the coverage of the costs of the accreditation, supervision and registration system includes contributions from government as well as accreditation and supervision fees from verifiers and registration fees from companies, we also assessed the percentage of the administrative costs that are borne by government. Table 3 summarizes our results.

³⁵ The other countries can be neglected, as approximately 95% of all EMAS registered companies in the four countries under review are located in Germany.

Table 3: Administrative work to run the EMAS system in the last 5 years (measured in man-months/mm)

	France	Germany	Netherlands	UK
Total administrative costs	57.1 mm	1204 mm	11.9 mm	36.7 mm
Overall administrative costs divided by no. of EMAS participants (average administrative costs per company)	1.59 mm	0.49 mm	0.46 mm	0.50 mm
% of total administrative costs borne governments	Approx. 30%	Approx. 15%	Approx. 25%	Recently 0% after a registration fee was introduced

Source: Individual country case studies, own calculations

Table 3 clearly shows that the administrative costs of running the accreditation, supervision and registration system are low.³⁶ Furthermore, in all four countries most or all (in the UK) of the costs are borne by verifiers or EMAS registered companies via fees. The reason for the low overall costs as well as low costs per EMAS registered company in the Netherlands and the UK is that the EMAS accreditation, supervision and registration system is largely integrated into the administrative system for ISO14001. In Germany, although overall administrative costs are significant, they are relatively low per EMAS registered company because of the high number of EMAS registrations. Average administrative costs per EMAS registered company are comparatively high in France, which is due to the low participation rate. A great part of the French administrative costs arises independently of the number of EMAS registrations. Thus, a higher participation rate would decrease the average French administrative costs per company.

5.3 Comparison of costs and benefits

At the beginning of Chapter 5 we stipulated that EMAS can be regarded a successful policy instrument if:

$$B_{PN} + B_{SN} > C_{SR}.$$

Although we were unable to precisely assess the size of each term, we still collected enough information to conclude that the inequation above is true. Companies' participation in EMAS brought them substantial net benefits (B_{PN}) because the average monetary participation benefits exceed the average participation costs. Additionally, other important benefits exists

³⁶ Compared to overall participation costs for companies the administrative costs are marginal (see 5.1.1. for an estimate of German participation costs).

which are not directly measurable in monetary terms, e.g. an improved knowledge of company relevant environmental legislation. Our analysis further indicates that net benefits for society ($B_{SN}=B_S-C_{SS}$) exist. Participation in EMAS is able to increase a company's environmental performance and subsidies are only granted to some EMAS registered companies. By contrast, the costs of running the EMAS accreditation, supervision and registration system which are borne by governments (C_{SR}) are low. This suggests that the overall net benefits of EMAS are significantly higher than governments' expenditure used to run the EMAS system. In other words, EMAS can be considered a successful policy instrument.

6 The future of EMAS

The EMAS Regulation states in Article 20 that the Scheme shall be reviewed in five years after coming into force, and, if necessary, appropriately amended. The EU Commission published a draft proposal for a revised Scheme (EMAS II) on 30 October 1998. The proposal has been modified several times. The most recent version (February 2000) is a common position adopted by the Council which still needs to be approved by the European Parliament.

Against the background of the low number of EMAS participants, one central aim of the revision is to make participation in EMAS more attractive. With respect to ISO14001, the revision seeks convergence in organizational aspects such as the description of the EMS on the one hand, and tries to position EMAS as the more demanding standard by strengthening the additional requirements of EMAS such as the provision of credible information to the public on the other. In the following we describe selected³⁷ features of the revision and discuss their influence on the number of EMAS registrations. The discussion will be based on our analysis of the implementation of EMAS in the four case-study countries and centred around the question of how the revision will change the relative advantages companies' gain by participating in EMAS or ISO14001.

The proposal for EMAS II (common position of the Council) provides *inter alia* for:

- Measures to increase EMAS participants' gains from external communication, for instance the introduction of a well recognizable EMAS logo (Art. 8), the possibility for

³⁷ We selected only those features where our analysis of the implementation processes in the four countries allows us to assess their effects on participation in EMAS. Other aspects, such as the active involvement of employees (Art. 1) or the opening of EMAS to the participation of all kinds of organizations (Art. 3,1), are neglected.

companies to use selected information from the environmental statement in stakeholder-specific publications (annex III 3.5), and a more concrete obligation for Member States to inform the public about EMAS (suggestion of certain instruments to distribute the information, Art. 12, 1);

- Inviting Member States to “consider how registration under EMAS may be taken into account in the implementation and enforcement of environmental legislation in order to avoid unnecessary duplication of effort by both organizations and competent enforcement authorities” (Art. 10, 2);
- The obligation of Member States to promote participation in EMAS, especially among SMEs (Art. 11, 1);
- Asking Member States to “consider (...) how registration under EMAS may be taken into account when setting criteria for their procurement policies” (Art. 11, 2);
- The adoption of the EMS requirements of ISO14001 (annex I A);
- Measures to expand requirements that go beyond ISO14001, e.g. yearly update and validation of the environmental statement (Art. 3, 3b).

The changes in the relative advantages of EMAS and ISO participation the above amendments to EMAS I are likely to cause are summarised in Table 4.

Table 4: Advantages of EMAS and ISO14001 from a company perspective - EMAS II

	France	Germany	Netherlands	UK
Participation costs	ISO14001 –	ISO14001 –	ISO14001 –	ISO14001 –
International recognition	ISO14001	ISO14001	ISO14001	ISO14001
Clarity of EMS	Equivalent +	Equivalent +	Equivalent +	Equivalent +
Similarity to ISO9000	Equivalent +	Equivalent +	Equivalent +	Equivalent +
Regulatory Relief	Equivalent	EMAS (+)	Equivalent	Equivalent
Involvement of business organizations	ISO14001/ Equivalent ³⁸	Equivalent	Equivalent	Equivalent
Promotion (information)	Equivalent	Equivalent	Equivalent	Equivalent
Promotion (funding)	Equivalent	EMAS	Equivalent	Equivalent
External communication	$EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$ +	EMAS +	EMAS +	$EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$ +
Public procurement	Equivalent	EMAS (+)	Equivalent	Equivalent
<p>ISO14001: Advantages from ISO14001 participation are higher than from EMAS participation</p> <p>EMAS: Advantages from EMAS participation are higher than from ISO14001 participation</p> <p>Equivalent: Advantages resulting from participation are the same for both standards</p> <p>$EMAS \begin{matrix} \leq \\ > \end{matrix} ISO14001$: Whether advantages from EMAS or ISO14001 participation are higher differs from one firm to the next</p> <p>+ : EMAS II can be expected to result in higher advantages for EMAS participants (compared to EMAS I)</p> <p>– : EMAS II can be expected to reduce advantages for EMAS participants (higher costs) (comp. to EMAS I)</p>				

The measures that aim at increasing EMAS participants' gains from external communication are unlikely to provide a sufficient incentive to significantly increase the number of EMAS participants, because the external stakeholder can only appreciate a company's participation in EMAS if they have enough knowledge about the scheme. So far, EMAS is only little-known, especially among the general public (consumers and neighbours). It is doubtful

³⁸ As described in 3.1.3, the French accreditation, supervision and registration system is currently undergoing a reform that partly transfers responsibility from authorities to business organizations. However, this reform was not influenced by EMAS II.

whether the information instruments proposed in EMAS II will be applied by the Member States to an extent sufficient to change this situation.

Moreover, the encouragement of Member States to provide a lighter regulatory touch to EMAS participants cannot be counted on to give an impulse to EMAS participation in France, the Netherlands or the UK. As enforcement authorities in these countries largely treat EMAS and ISO14001 as equivalent, deregulation measures that might be stimulated by EMAS II will most likely be applied to both EMAS registered and ISO14001-certified companies, and thus will not create a comparative advantage of EMAS over the ISO standard. In Germany, there is a trend towards more regulatory relief in a number of German states and so far it has been exclusively granted to EMAS participants. However, if the recent considerations of some German States to offer regulatory relief to ISO14001-certified companies as well are put into practice, EMAS will lose this important advantage it has over ISO14001.

The fact that the promotion of companies' participation in EMAS is made obligatory is unlikely to raise the number of EMAS registrations in the four case-study countries. In Germany, promotional activities are already widespread and not likely to be increased further. France, the Netherlands and the UK have equally promoted EMAS and ISO14001 participation, and this will not change if promotional activities are increased.

We cannot provide a clear answer to the question of whether the invitation of Member States to take registration under EMAS into account in their procurement policy will increase participation in EMAS. Even if Member States follow this invitation, the practice of the Dutch, French and UK authorities to treat ISO14001 and EMAS as equivalent with respect to regulatory relief suggests that not only EMAS registered but also ISO14001-certified companies will be given preferential treatment. The position of German authorities is less predictable. Whether they will give preferential treatment only to EMAS registered or also to ISO14001 certified companies may depend on the outcome of the recent discussions to treat EMAS and ISO14001 equally with respect to regulatory relief.

That the EMS requirements of EMAS will be identical to those of ISO14001 improves the clarity of the EMS and makes it easier for companies that have already experience with ISO9000 to implement EMAS. In general, it improves the compatibility of the two standards and thus makes it less expensive for companies to switch from one to the other or to participate in both. This implies that it is easier for ISO certified companies to additionally become registered under EMAS. However, the Dutch experience suggests that not many companies are interested in this option.

The measures that aim at strengthening those requirements of EMAS that go beyond ISO14001, for example the obligation to have the environmental statement validated annually instead of every three years, might enhance the credibility of EMAS, but will definitely incur higher costs. As it is currently rather high costs than a lack of credibility that prevents companies from participation, these measures can be expected to have a negative effect on the number of EMAS registrations.

To sum up, we can say that the revision of the EMAS Regulation will remove some of the aspects where EMAS has been at a disadvantage to ISO14001, i.e. the clarity of the EMS and similarity to ISO9000. Moreover, it is likely to provide some (rather small) additional benefits to EMAS participants in the fields of external communication. and public procurement. On the other hand, EMAS II will lead to higher costs for EMAS participants and probably will not have any effects on the relative advantages of EMAS and ISO14001 participation with respect to regulatory relief and promotional activities. Finally, it should be mentioned that one of the most important advantages of ISO14001 over EMAS, worldwide recognition, will remain under EMAS II. Therefore, we conclude that the measures of EMAS II discussed above won't significantly increase participation in EMAS in the four case-study countries.

However, as we have shown in 2.3.3, high participation in EMAS is not necessarily desirable, but requires EMAS to produce higher net benefits for participating companies and society than ISO. The first empirical studies to address these questions suggest that overall EMAS has neither led to higher benefits for participating firms nor to more environmental improvements and thus benefits for society.³⁹ This means that from an economic point of view there would be no reason to prefer a company's registration under EMAS to its certification with ISO14001. However, before such a conclusion can be drawn, more empirical research into the costs and benefits of the two standards is needed.

7 Summary of results

Environmental management system standards are now well established in Europe. However, whether companies chose EMAS or ISO14001 varies significantly between the four EU Member States we analysed. The central explanation for these differences is that the way the EMAS Regulation was implemented in the various countries generated greatly differing net benefits of EMAS registration and ISO14001 certification for companies.

³⁹ Cf. FEU 1998, p.7.

In France, the Netherlands and the UK authorities did not provide preferential treatment to EMAS participants and business organisations do not support EMAS more than ISO 14001. Therefore, the only advantage EMAS has over ISO14001 is that it is better suited for external communication. However, not much weight is attached to this advantage by the vast majority of companies and is even considered a disadvantage by some firms in France and the UK. By contrast, companies in all three countries appreciate that ISO14001 certification is less demanding than EMAS registration as it does not demand a validated environmental statement. Additionally, companies value the fact that ISO14001 is a worldwide standard, whereas EMAS is restricted to Europe. Against this background it is no surprise that in France, the Netherlands and the UK, participation in EMAS is low and well behind ISO14001.

In Germany, the relative attractiveness of EMAS compared to ISO14001 was increased by granting regulatory relief exclusively to EMAS registered companies and by providing EMAS with more and higher subsidies than companies certified with ISO14001. Furthermore, the involvement of business organizations in the accreditation and supervision system for verifiers and registration system for companies led companies to trust the system and business organizations to promote EMAS. Consequently, Germany is the only country where more companies decided in favour of EMAS and not ISO14001. Recently, however, this situation has changed and ISO14001 has caught up quickly. This is mainly due to the facts that the level of companies' information about ISO14001 has risen, companies are more aware of ISO's advantages such as worldwide recognition, and are partly disappointed about the benefits from external communication generated by EMAS.

Despite low participation rates in France, the Netherlands and the UK, EMAS can be considered a successful policy instrument, because the benefits generated by EMAS outweigh its costs. Companies only participate in the voluntary scheme when their benefits exceed their costs, thus participation provides positive net benefits for them. In addition, there exist net benefits for society due to EMAS registered companies' improved environmental performance. By contrast, costs borne by government (and thus society) for running the accreditation, supervision and registration system are low.

The revision of the EMAS Regulation is not likely to significantly improve EMAS' position in the competition with ISO14001 and to increase the number of EMAS participants. Although it will remove some of the disadvantages EMAS has compared to ISO14001 and create some (rather small) additional benefits to EMAS participants, it will also make EMAS

registration more costly. Moreover, the decisive advantage of the ISO standard, its worldwide recognition, will also remain under EMAS II.

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