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The Impacts of Corporate Environmental Management Systems - A Comparison between EMAS and ISO 14.001

Abstract:

The authors present and discuss the results of empirical research on the implementation of standardized environmental management systems in companies. As there are basically two competing standards – the European EMAS and the worldwide ISO 14.001 – the focus of the paper is on potential different and common features of the corporate implementations, experiences and impacts.

Although the methodical approaches of the empirical research projects differ to a great extent, their results are quite similar: The experiences of the companies with environmental management systems do not really differ with respect to the formal standards underlying but to the corporate culture and the strategic importance environmental orientation has for the company. There are some more or less important differences in the formal demands of the two standards (for example the duty to publish an environmental report within EMAS but not ISO 14.001), but these differences do not really lead to different corporate practices. The widespread opinion- especially in Austria and Germany - that EMAS leads to a 'star performance' in environmental management cannot be confirmed by empirical findings.

In addition to these results this paper points out the occurring problems of empirical research in the field of environmental management. Many of the given statements by the corporate actors cannot be verified by the researchers and therefore have to be handled carefully. This leads to the proposition that companies have to evaluate their grade of sustainability themselves and should publish the results to make it possible for the stakeholders to compare them. The main task for the scientific community then would be to develop the necessary indicators, benchmarks, standards etc. to help the companies.

Keywords: corporate environmental management, environmental management systems, EMAS, ISO 14.001, environmental performance measurement, environmental reporting, corporate sustainability evaluation

1 Two competing EMS-standards

Within the last years many companies all over the world installed standardized environmental management systems (EMS) in order to systematically manage the environmental effects of the companies' activities. There are basically two relevant systems, EMAS (Eco-management and Audit Scheme, the EU's standard, a state run system) and ISO 14.001 (the worldwide EMS-standard, privately run by the International Organization for Standardization). Several empirical studies tried to find out how the implementation of one of those systems influences environmental performance, costs and benefits of companies.

Since most of this research took place in German speaking countries, their results have not yet been published in English. In this paper the authors try to give a short overview on the results and a comparison between the EMAS and ISO 14.001 experiences. Both, EMAS and ISO 14.001, are formalised environmental management system standards that compete to gain favour of companies and organisations– at least in the European Union. Since EMAS was established by the EU and is furthermore provided with the force of law it is considered to be more significant. ISO 14.001 is just an industrial standard but as part of the 'ISO management standard family' it is very well known by potential users.

Participation is voluntary and both systems do not substitute national environmental law. The development especially of EMAS was motivated by the idea, that the pressure of competition would encourage a large number of companies to participate, even if their previous voluntary environmental care was rather small.

Both standards represent a new approach to corporate environmental care. They do not focus on results of actions in form of material objectives and limits, but on setting up organisational structures and managerial processes and subject these to continual control. To comply with these requirements corporate actors are no longer allowed to just obey the rules. They rather have to develop and make use of different abilities like formulating environmental objectives and implementing organisational structures and processes as well as measurement of achievements.

This engagement is rewarded with a certificate that shows the corporate environmental commitment to the public. In the case of EMAS the certificate is combined with the right to use the EMAS-logo in corporate advertising (but not in product advertising).

In the core of the EMS, the structure of the management system, ISO 14.001 and EMAS were quite similar at the time the studies were carried out. Both systems include specific organisational measures to avoid pollution and damages of the environment and intend to improve the environmental performance of a company. They force participating companies not only to implement particular measures (like environmental policy, aims and program) but also to carry out periodical internal checks and external audits by independent auditors.

Looking at both standards in detail there are some differences[1]. EMAS is above all a supranational instrument of environmental policy, which aims to stimulate the rather deadlocked and Europe-wide differently developed environmental legislation by turning away from the

former 'command and control'-concept with its limited effects in comprehensive environmental measures.

While ISO 14.001 is primarily an internal management tool used by companies to improve their systematics, legal security and innovative ability, EMAS sets a second focus on the external stakeholders. Companies participating in EMAS have to publish an environmental statement to inform the public. ISO 14.001 does not include this duty.

The recent amendment of EMAS (EMAS II) defuses the rivalry between the two standards. ISO 14.001 is now the management system required by EMAS. A company, which has already installed an EMS based on ISO 14.001, has to accomplish some additional duties only (for example the proof of complete legal compliance (with national environmental laws) and the publication of the environmental statement) to get validated as an EMAS-participant as well.

Corporate self-control and the supervision by public and experts required by EMAS regulations are often considered to be a substitute for state control. Therefore, EMAS has frequently been misinterpreted as an instrument of deregulation of environmental laws. This is the main reason why several companies expected state support in return. In the case of ISO 14.001 as a private norm these wishes could not emerge, and consequently participation in this system does not require any public statement.

Though, both standards are open in content. The users themselves and not the standards set the goals they aim to achieve with the aid of the established EMS. Especially in Germany it has been argued, that EMAS is overall of a higher valence than the ISO 14.001 standard. However, this proposition can only be evaluated through the empirical study of practical experiences and not from the wording of the standards themselves.

Meanwhile numerous empirical studies have been published on EMS. The majority refers to the EU as well as – more often - to German or other national practices. They are mainly based on the implementation of the first version of EMAS, sometimes in combination with ISO 14.001. The results presented in this article are essentially based on our own studies[2]. We compared our results to a wide range of other empirical studies based on questionnaires and case studies.[3] The results of these studies are to a great extent consistent.

Switzerland is the only country in Western Europe, where, as a non-member of the EU, companies can only implement environmental management systems according to ISO 14.001.

With most of the German studies concentrating on EMAS and the additional problem that a lot of eco-orientated companies in Germany participate in both systems, Switzerland is the country where we can gain pure experiences with ISO 14.001. A recently published study by Thomas Dyllick and Jost Hamschmidt[4] from St. Gallen/ Switzerland offers the opportunity to compare results and to clarify questions of the value of both standards. Another look at ISO 14.001 in practice in the form of collected worldwide case studies provides Ruth Hillary.[5]

2 The Spread of the Systems

It is not surprising that the ISO 14.001 standard attracted more participants, even though it came into force a year later than EMAS. After all it is valid worldwide. More significant than

the absolute numbers are the relative changes. In the last two years the number of ISO 14.001-participants rose from 13.440 (December 1999) to 31.793 (October 2001), a growth ratio of about 135%. In the same time EMAS-participation increased only by 25%, from 3.155 to 3.995 with even some falling numbers within this time span (in the first half of 2000 participation dropped by 4%).[6]

Although these numbers show nearly eight times more ISO 14.001-participants than EMAS-participants a valid statement about the attractiveness of each standard is not possible, because of the different validity of the standards (world-wide vs. EU-only). Such a comparison is only feasible in the EU, where companies can choose between the two standards.

Analysing the data on participation in the EU the preference for ISO 14001 becomes evident. In every EU-country, except for Germany and Austria, ISO 14.001 is preferred to EMAS. More than ?, about 2.650 sites, of the EMAS-participants are located in Germany (either sites of German companies or international companies situated in Germany). It is difficult to explain why so many German sites take part in EMAS. One reason can certainly be seen in the government-financed programs for participating companies that were offered especially in the early stages of the European EMAS-implementation-process. On the other hand, German companies are confronted with very strict environmental laws and therefore have to do significantly more in order to get validated than companies in other European countries. This is the same for Austria.

In relation to the different sizes of the EU member states we find the largest share of EMAS sites in Austria followed by Germany and the Scandinavian countries. Apart from Germany and Austria the ratio of ISO 14.001-participants compared to EMAS is 5/1 or even higher.

The Dyllick/ Hamschmidt study offers another interesting detail: They investigated the highly concentrated market for ISO 14.001-certifications in Switzerland. The three major certification-companies have an accumulated market share of 94%.[7] To our knowledge, comparable data of the corresponding market structures in Germany are not available, at least not publicly. It would be interesting to have more information on these conditions, because they are likely to influence the further development of validations and certifications respectively as well as the costs.

Another insight into instructive background information on the global spread of EMS-standards is provided by the BMU/UBA study. It deals with the acceptance of EMS in different countries and cultures and shows the great influence of different national eco-political constellations. Moreover, the importance of the varying cultural conditions of companies, law and economy becomes evident in this study.[8] Besides all superficial similarities of economic reality in different countries, which can mainly be put down to globalisation, the globalised economy and accordingly the environmental management remains rooted in national cultures. This explains at least partially the great differences in the propagation of EMS-standards.

In prospect the competition between EMAS und ISO 14.001 seems to be decided: the world-wide spread industrial standard has prevailed. It is questionable, whether the EMAS II amendment will be successful in winning back lost ground. Especially since EMAS II even converged closer to ISO 14.001 instead of increasing the demands and to position itself as the star-performance it already claims to be.

There is a wide range of possible explanations for this actual situation that this paper does not aim to discuss. Instead the focus lies on the impacts of each system. Only if EMAS really is the 'star performance' compared to ISO 14.001, the prevailing of ISO 14.001 is problematic from an ecological perspective. This question seems less relevant considering that the total number of eligible companies who implemented any EMS is less than 1%. On the other hand it can be stated for Germany that EMS affect over 50% of all employees, because the bigger companies participate to a greater extent than the small or medium sized companies.

3 Experiences and impacts

To begin with the punch line: The available studies do not prove that there are any significant differences in the effects of EMS depending on the different underlying standards.

Apart from details the observed differences of impacts between companies are not to be put down to the applied formal EMS-standard. They rather result from corporate political intentions which led to the implementation of the standard as well as from corporate cultural conditions the standards are confronted with and more or less fit in. This stringently results from the substantial findings of the surveys on hand.

3.1 Ecological Impacts

Environmental management systems get implemented to improve the corporate environmental care by detecting and removing ecological weak spots, either as a self-imposed aim or influenced by stakeholders. According to surveys on the motivation of companies this is stated to be the main reason for establishing EMS.[9] Therefore, the ecological impact is central to the question whether there might be a difference in valence of various EMS standards.

At first it is expected that the self-set eco-political aims in the context of EMS should significantly improve the ecological performance of companies with formalised EMS compared to those without. If EMAS really is of a higher value due to sanctions owing to the state-controlled validation, explicit orientation towards the public and the demand for documented ecological activities beyond compliance, EMAS companies should furthermore effect noticeable better results than companies certified only according to ISO 14001.

However, this conclusion cannot be drawn from any of the results of the empirical studies. Neither is it provable that companies with an implemented formalised standard show an ecological performance that is superior to those without any formalised EMS, nor do the studies point out that enterprises following EMAS aim for higher goals than those following ISO 14.001 or another EMS-standard.[10]

Early studies gave evidence that the established structures like formal responsibilities, working and procedural instructions, periodical audits and detailed environmental manuals - resulted in strict formalism and clear documentation rather than in adaptable and innovative organisational structures and processes.[11] This general statement was not only gained from empirical studies, but was also characterised as an inevitable symptom of EMAS.[12]

Conclusions drawn from subsequent empirical studies tend to confirm these early judgements. Environmental management systems are primarily expert systems. Participation of the employees is considered to be very important by most of the respondents but in practise

this seems to be an exception. Participation of the works council is only realised in a small minority of companies. The established structures predominantly show only small differences to those requested by the legal regulations. In consequence EMAS does not improve the corporate environmental care to a higher extent than obligatory liabilities already did.

It is the formal structure of EMAS itself and not only the special German method of implementation that enforces this phenomenon.[13] EMAS implementation requires systematic checks of all relevant corporate activities and a complete documentation of all formal measures installed. Compliance to these requirements is to be proved to the accredited verifier and - by being forced to publish an environmental statement - even partly to the public. At the same time a process of continuous improvement of corporate environmental care is to be established. According to the findings of modern organisational theory this is only possible by loosening strict regulations and structures and enforcing organisational learning and development.

EMS in general as well as EMAS compared to ISO 14.001 have not yet proven their capability to lead companies to a better ecological performance, let alone to sustainability. With the use of new and therefore often cleaner technology, even companies with no or only small ecological ambitions realise cost savings by reducing the input of resources and the output of waste. Accordingly, cynics predicted that neither the ecological pioneers nor other well-managed companies, but those with the biggest (ecological) backlog would gain the most from participating.

In fact the Swiss study on ISO 14.001 confirms that the majority of participating companies (73%) had no experiences on environmental management before entering this standard.[14] Contrary to the popular self-assessment of participating companies as eco-pioneers, the standards seem to attract primarily those that are not above average on this field. [15]

Taking a close look at the environmental goals companies have to set by themselves according to both standards and the corresponding level of achievement one gets a first impression on the ecological impact of EMS. Here it becomes evident, that - at least in the beginning of the work with EMS- operational goals dominate, namely those that seem shortly accessible with a sufficient certainty.

The corporate environmental policy of companies participating in EMAS is dominated by technical measures. The focus is still on additive technologies (end of pipe). A change to technologies that avoid environmental pollution instead of treating it afterwards has yet to happen. At the moment investments in integrated environmental technologies are not common.

Nevertheless, the Swiss study confirms a trend that already emerged in the earlier German studies: organisational activities as well as the introduction of product-orientated ecology gain ground in the companies' programmes. Perspectively we can expect the step into a comprehensive ecological modernisation, especially in companies that already have more experiences in EMS by now.

These empirical findings contradict the criticism on EMAS, that it had a weak point in the field of products because EMAS I – in contrast to ISO 14.001 – did not require dealing with product-ecology. [16] The finding that the implementation of an EMS increases the sensibility of

companies for ecological problems in regard to the use and disposal of their products applies to EMAS and ISO 14.001 accordingly. [17]

A main difference between the two systems is the request to evaluate the impact of all measures in terms of ecological effects in order to achieve effectiveness and not only efficiency. This is included in the EMAS-standard but not in ISO 14.001. [18] In practice companies lack the competence to do so and regional or national environmental goals are often missing. Therefore a valuation of the relevance of corporate ecological goals and measures does scarcely take place. [19]

Altogether the answer to the question on the ecological impact of standardized environmental management systems has apparently to be adjourned. It cannot be answered until there are long-term experiences with EMS as well as generally accepted indicators.

3.2 Economic Impacts

The economic impacts can be determined from the comparison of implementation costs and financial benefits.

EMAS participation (as well as ISO 14001) is connected with considerable costs. Thereby we do not mean costs for technical measures of environmental care such as water treatment or waste gas cleaning. These costs should rather be called EMS consequential expenses. EMS-costs are costs that are directly connected with the implementation of the management system from the decision to participate up to the validation/ certification.

Regarding the costs we find that in spite of printing and publishing the environmental statements, the validation by the state-accredited verifier and the registration participating in EMAS seems to lead to lower costs than participating in ISO 14.001. The Dyllick/ Hamschmidt study reports average costs of 287.000 Sfr (between 100.000 in the case of small and 535.000 Sfr for bigger companies), while the German EMAS-sites spend an average of 80.000 € (between 35.000 € and 130.000 €).[20] That is about half of the amount that Swiss companies spend on an EMS. This difference is much too high to explain it with the higher price-level in Switzerland. The allegedly simpler and less demanding system costs significantly more than the 'noble' EMAS?

On the side of monetary benefits findings are quite similar. The Swiss study displays average monetary benefits (mostly cost savings) of 167.000 Sfr per year, the German study of about 50.000 €. The better part of these differences can therefore be explained by the different sizes of companies involved in the studies.

The payback period based on Dyllick/ Hamschmidt is 2.2 years; according to the UNI/ASU study it is 1.5 years. Many other German studies mainly report payback periods between 1.5 and 2.5 years. The available data regarding the different sizes of sites reveals a gap between smaller and medium/bigger sized companies. Especially for smaller companies the payback periods are much longer (up to 10 years).

At a closer look, the findings have to be put into perspective again. The empirical knowledge regarding EMS costs in that sense of the word is based on the statements of corporate managers in different questionnaires. Usually these statements are based on more-or-less precise data of corporate costing systems. These sources are of limited reliability. Most of the

costing systems do not provide the possibility for exact cost allocation of environmentally relevant types of costs, especially of internal costs that do not directly lead to expenditures. The consulted corporate actors admitted that the statements on costs were mainly estimates. Additionally many managers who were asked in questionnaires do not exactly distinguish between EMS project costs and consequential expenses for environmental technical measures. This leads to considerable variations in the cost data given in empirical studies.

Furthermore, many companies have received financial aid from the government. Consequently, their statements about the level of costs do not remain under the planned costs quoted to the official sponsor. Besides these political circumstances there are micro-political interests to be considered.[21] The asked corporate actors combine their own internal goals with their statements. The environmental experts for example have to internally communicate their work as something that saves expenses rather than increases costs. These effects vary with the individual position and influence of the actors. It is not possible to take all these circumstances into account and translate them into financial parameters.

In ISO 14.001-companies as well as in EMAS-companies the internal costs amount to more than half of the total costs. Especially these costs are subject to problems in terms of accounting and consequentially to the validity. Therefore the findings of the ISO 14.001 study have to be carefully interpreted as well.

Taking a look only at the external validation/ certification, the environmental statement as demanded by EMAS and the registration, which are costs directly connected with expenses, the cost-findings get adjusted. EMAS-costs average out at about 18.000 €, while ISO 14.001 costs only 12.000 €. As expected, EMAS is significantly higher priced than ISO 14.001 on this field.

Even less valid than the estimated costs are the ascertained valuations of monetary benefits. Firstly, the accounting problem as mentioned above is even more precarious relating to the benefits. To impute cost savings by means of resource reduction directly to the implementation of an EMS is only possible in exceptional cases. Secondly, the above-mentioned problems of answers influenced by micro-politics occur here as well and even stronger, as economic benefits are the main internal argument to continue working with an EMS.

Concerning the effects on costs and benefits it has to be stated that the larger amount of intended benefits occur where monetary valuations are impossible to do. The implementation of an EMS has to be regarded as an investment. The costs have to be incurred immediately; the benefits accumulate over time and are often difficult to associate directly with the EMS. Finally, questionaires are the least suited method to attain valid findings on this field. Therefore the quantitative data has to be interpreted with greatest care.[22]

Considering that the external benefits of validated/certificated EMS – although extremely difficult to evaluate - should be higher in the case of EMAS compared to ISO 14.001, because of the duty to publish an environmental statement, the necessary higher expenditure seems justified. To prefer ISO 14.001 only to save expenses is not advisable.

3.3 Corporate benefits

It is not surprising that the stated corporate benefits too are nearly the same for EMAS and ISO 14.001 according to the different studies. Amazingly this counts even for the external

corporate-political impacts. Due to the different constructions of the systems differences in this regard could have been expected.

In this field the impacts are much smaller than expected. Irrespective of the standard the EMS attract very little interest by the companies' stakeholders. Especially positive market effects were only slightly noticed by the surveyed managers. In contrast, they report on better contact and cooperation with authorities for environmental law, in the German EMAS-studies as well as in the Swiss ISO 14001-study. Managers predominantly mentioned overall image improvements as positive effects of EMS.

How can this be explained, considering the fact, that ISO 14.001 demands external information much less than EMAS, which sets an important focus on the public? Of course, even though it is not demanded, ISO 14.001 does not bar any user from the active communication about his environmental management and its ecological benefits. That is exactly what most of them do: 57% of the surveyed Swiss companies publish environmental statements or at least plan to do so. Inversely a noticeable part of the EMAS-companies do not perceive the chances of external communication, but regard it only as a bothering liability. Some companies even demand payments for their environmental statements. Public seems to be only slightly interested anyway. The authorities positively recognise the voluntary efforts for environmental care no matter whether based on the state-controlled EMAS or not.

In fact, positive corporate benefits through EMS evolve mainly inside the company organisation. The work with EMS leads to systematisation and documentation of competences and processes of operative environmental care. They affect sureness on the compliance with environmental laws. They help to get the idea of corporate environmental care – and with it the responsible persons – accepted by including corresponding rules into the company's basic principles and the therewith-documented support by the management. This happens firstly internally with the option to communicate it externally. Regarding the strategic dimension of corporate policy it has already been attested that EMS show little impact.[23]

4 Methodical problems and perspectives

The insights in corporate environmental management and its substantial results as well as the experiences of companies with standardized EMS presented in this paper mainly come from empirical academic research projects and not from continuous internal or external evaluation of companies. This fact implicates some benefits but also several problems.

The most important benefit is that empirical academic research can afford to define specific goals and an adapted design for each study. It usually does not have to look after the costs unless at least one financier has declared his willingness to pay for the project. Those projects use to clearly define the goals and criteria, which shall be applied. Although they mainly focussed on corporate environmental care, they tried to evaluate the economic and social outcomes as well. Therefore one can say that the respective actual status of corporate sustainability was evaluated by the above-mentioned projects (see endnote 3).

But the project-status of the evaluation leads to the fact that the produced results are valid only for the moment. All research projects that this paper informs about present snapshot-results of the social field they are dealing with.

On the other hand the surveys suffer from the problems as aforementioned: Most of the empirical research is based on oral or written interviews with corporate experts. The statements they give must be seen as subjective and often superficial judgements of more or less well informed persons, who mostly don't make much effort to answer the questionnaires. Even if they talk for example about costs or environment-technical figures such as quantities and qualities of waste, we do not know if they took a look into their technical or cost accounting documents before writing down the figures or if they just estimate. Even if we pay regard to all the sophisticated rules of empirical research we therefore cannot be sure that the results we present are valid and reliable.

Secondly no company can be forced to take part in questionings. They will take part only if they have any closer connection to the theme the questioning deals with. That is why usually only environmentally active or at least interested companies participate in projects about corporate environmental management topics. The results of them do not really inform about the status in the general economy but only within its environmentally conscious sector.

Another disturbing factor is that the respondents are used to answer not only academic questionnaires but also questions of other public-agents such as journalists or environmental activists. They are professionals of corporate public relations, who are used to paint a positive picture of what they are asked for. Additionally they have to communicate their own social role within the company as a positive one, so that they will not give any information that could harm the company or themselves as environmental experts. This might lead to biases that cannot be eliminated from the results of empirical questionnaire-research.

But even if the respondents are willing to tell nothing but the truth and have the necessary knowledge, there remain some other problems. The usual financial and technical documentations of companies are not sophisticated enough that they show all those figures needed for comprehensive evaluation of corporate sustainability efforts. The normal cost accounting for example cannot exactly show the costs and benefits of special environmental measures, not only because some of the effects cannot be exactly evaluated in financial figures but also because the exact cost figures disappear in the general overhead costs of the company. A sophisticated environmental cost-and-benefit-accounting usually does not exist in 'normal' companies.

At least in EMAS-companies exists an environmental statement, which has to be published after the external validation-process by the accredited verifier. Most of the ISO-14.001-companies voluntarily publish environmental or sustainability reports as well. These documents could be used as more valid sources for the evaluation of corporate sustainability than questionings.

They really are subjects of empirical evaluation and rating at least in German speaking countries.[24] And, besides general information about the company, special information about its environmental policy, organisation, goals and measures, they give some 'hard' figures about the ecological and social impacts of the firm's activities and products. But the general guidelines for environmental reporting and the special directions within the EMAS regulation are so weak that most of the information given cannot be compared between different companies or branches. That is why most of the report-ratings do not evaluate the sustainability-status of

the company but the features of the reports themselves such as completeness, intelligibility and credibility. Unless there are exact and binding rules for corporate environmental reporting, the existing reports do not present a valid base for corporate sustainability evaluation as well.[25]

To sum it up one can say that probably even most of the companies themselves do not know their own sustainability status, let alone what that could be. Any academic who tries to evaluate this status and compare it with other companies or with the average status of all companies in a branch or the whole economy, therefore is in a very difficult position. Even if he could clearly explain what corporate sustainability means, he up to now does not have the appropriate empirical instruments to evaluate it in a valid and reliable way.

There are three major steps to go towards evaluation of sustainability:

- First of all the scientific community has to define as exactly as possible the figures and indicators which are appropriate to measure the phenomenon of corporate sustainability.
- Secondly as many companies as possible should voluntarily or forced by law build up a corporate sustainability information system which validly delivers the figures needed for evaluation.
- And thirdly those figures have to be published in order to create the possibility to compare different companies and branches with respect to their sustainability performance without being dependent on the oral or written statements of corporate experts given in questionings.

There exist at least some academic projects, which try to make progress in step one. We mention again the efforts to standardize corporate sustainability reporting of the Global Reporting Initiative as well as other projects in this field.[26] Additionally there have to be mentioned the attempts to use the new strategic management tool 'balanced scorecard', a multidimensional strategic information and management system, to implement corporate sustainability management by defining figures and indicators of sustainability as corporate strategic goals.[27] But even if one considers this step as relatively easy to go, future must show if there is a realistic chance for the next ones. The second step could be prepared by a national or European panel-research project in cooperation between EMS companies and academic research in order to develop and implement corporate sustainability information systems on a trial basis.

5 Outlook

The message is clear: EMS are considered economically profitable investments by managers of the participating companies. Despite all the indicated problems of empirical research in this

field, the scientists dealing with EMS are also in nearly complete agreement on the profitableness. The systems furthermore lead to numerous additional valuable, but difficult to be financially rated, corporate benefits and they seem - even though it is still too early for definite statements - to support their main purpose: the improvement of corporate environmental care.

All empirical findings suggest, that the different normative fundaments of the EMS, especially the state-run character of EMAS compared to the private norm ISO 14.001, have no significant influence on practical effects. The impacts and benefits of EMS are primary rather conditioned by the general strategic orientations that lead to the implementation of one of the systems.

Considering the different expenses for the implementation of the systems, participating in ISO 14.001 seems to be the better alternative. Higher costs for an EMAS implementation can only become justified, if stakeholders realise the significance of EMS in general and thereby notice the importance of a stronger public commitment as it is integrated in EMAS. As a state-run system the European Union and the national governments are asked for support in matters of publicity. In Germany a marketing programme for EMAS has already been started.[28]

Which strategies predominate in practice and which means are to be employed in order to persuade the corporate actors of their chances offered by environmental management systems, is still too little known. However, there is reason to be confident: In the context of the research-support programme 'Betriebliche Instrumente für nachhaltiges Wirtschaften'[29] by the German BMBF[30] a good many projects have started that may generate answers and solutions.

Moreover, in the future EMS research has to turn its attention more to the – theoretically well-founded – analysis of the internal corporate conditions in which the EMS have to fit in. The findings indicate that especially internally a lot of opportunities have been wasted so far. To utilise these, it is necessary that the structures put into practice harmonise with the organisational culture of the company. Culture contains various informal structures next to the formal ones.[31] This directs the attention to all employees instead of the common expert-orientated handling of EMS. Corporate environmental care has to "live". This means that the protection of the natural environment has to be realised beyond formal structures, with the involvement of every member of the company. Environmental care is a multifunctional task for everyone, managers as well as employees. The success of environmental management systems depends to a large extent on the motivation and participation of the personnel.

Some studies have been carried out on this topic. They are often based on new (sociological and economical) organisational theories like the concept of micro-politics.[32] Another very suitable approach is the modern system theory. The qualitative studies offer more insight into the internal processes, conditions and problems of implementation and the working with EMS. On the other hand they suffer from less generalisable results, as the micro-political and cultural conditions of companies vary considerably. The greater profoundness of the studies is only possible in exchange for the breadth of the studies. In order to offer solutions rather than pointing out problems and wasted opportunities we need to know more about these in-

ternal aspects. Further qualitative research is necessary to find patterns that are applicable to most of the companies.[33]

Besides the necessary theoretical analysis of corporate behavior in general and corporate sustainability management in particular, the methodical and informational basis for sustainability evaluation has to be improved. This must be the main purpose of corporate sustainability evaluation research in the near future.

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1 For a detailed comparison of all important aspects of both systems see BMU/UBA 2000, p. 28-34
2 esp. UNI/ ASU 1997 and FBU 1995
3 Mainly the following articles and reports: Schnauber/ Kiesgen/ Mangelmann 1994, Gerling Consulting-Gruppe 1995, Umweltakademie Fresenius/ IHK Dortmund 1996, Baum et al. 1996, Klemisch 1997, Wietschel/ Rentz 1997, Isaak/ Keck 1997, FEU 1998a/ b/ c, Hartmann 1998, Hoeppner et al. 1998, Jaeger et al. 1998, Seidel/ Weber 1998, BMU/UBA 2000.
4 see Dyllick/ Hamschmidt 2000, for a short overview in English see Hamschmidt 2000
5 see Hillary 2000
6 For up to date figures see www.ecology.or.jp/isoworld/english/ analy14k.htm
7 Dyllick/ Hamschmidt 2000 p. 30
8 see BMU/UBA 2000, p. 103-109
9 see e.g. UNI/ ASU 1997, p. 48 and Seidel/ Weber 1998, p. 24
10 see BMU/UBA 2000 p. 34-36
11 see e.g. Freimann/ Schwaderlapp 1996
12 see Freimann 1997
13 see esp. Issak/ Keck 1997, Hartmann 1998 and FEU 1998a
14 see Dyllick/ Hamschmidt 2000 p. 29f.
15 Findings from German studies addressing this issue are not available to our knowledge.
16 see e.g. Dyllick 1995 and Glatzner 1997
17 see BMU/UBA 2000, p. 58-60
18 see Stahlmann/ Clausen 2000
19 see BMU/UBA 2000
20 see UNI/ASU 1997
21 see Freimann 1999b
22 see Dyllick/ Hamschmidt 2000 p. 80
23 esp. Dyllick/ Hummel 1995, Dyllick 1999 und Freimann 1999a
24 see e.g. Steven/ Schwarz/ Letmathe 1997, Loew/ Fichter 1998, Lange/ Ahsen/ Daldrup 2001
25 see e.g. the first international guidelines for sustainability reporting by the Global Reporting Initiative (GRI) (www.globalreporting.org)
26 see IOEW/IMUG (ed.) 2001
27 see Dyllick/ Schaltegger 2001 and Arnold/ Freimann/ Kurz 2001
28 see www.emas-logo.de
29 „Corporate instruments for a sustainable economy“
30 Bundesministerium für Bildung und Forschung, the German Ministry of Education and Research
31 see e.g. Smircich 1983, Czarniawska-Joerges 1992
32 see e.g. Birke/ Schwarz 1994, Burschel 1996, Dückert/ Groth/ König 1999
33 A research project on the effects of employees participation on the cultural fit of EMS is carried out at the moment by our research group.

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References

Arnold, Wolfgang/ Freimann, Juergen/ Kurz, Rudi 2001: Vorueberlegungen zur Entwicklung einer Sustainble Balanced Scorecard für KMU, in: UmweltWirtschaftForum vol. 4, p. 74-79

Baum, Heinz-Georg/ Sturm, Anke/ Wittmann, Robert 1996: Pioniererfahrungen mit dem Oeko-Audit, in: Umwelt Wirtschafts Forum vol.4, p.72-77

Birke, Martin/Schwarz, Michael 1994: Umweltschutz im Betriebsalltag. Praxis und Perspektiven ökologischer Arbeitspolitik, Opladen

Bundesumweltministerium (BMU)/ Umweltbundesamt (UBA)(Hg.) 2000: Umweltmanagementsysteme. Fortschritt oder heiße Luft? Frankfurt

Burschel, Carlo 1996: Umweltschutz als sozialer Prozeß. Die Organisation des Umweltschutzes und die Implementierung von Umwelttechnik im Betrieb, Opladen

Czarniawska-Joerges, Barbara 1992: Exploring Complex Organisations: A Cultural Perspective, Newsbury Park/Ca., London, New Dehli

Dückert, Thea/ Groth, Thorsten/ König, Susanne 1999: Betrieblicher Umweltschutz und Partizipation, Köln

Dyllick, Thomas 1995: Die EU-Verordnung zum Umweltmanagement (EMAS-Verordnung) im Vergleich mit der geplanten ISO-Norm 14.001, in: Zeitschrift für Umweltpolitik und Umweltrecht, 16.Jg. p. 299-339

Dyllick, Thomas 1999: Wirkungen und Weiterentwicklungen von Umweltmanagementsystemen, in: Seidel, Eberhard (Hg.): Betriebliches Umweltmanagement im 21. Jahrhundert, Berlin/ Heidelberg, p. 117-130

Dyllick, Thomas/ Hamschmidt, Jost 2000: Wirksamkeit und Leistung von Umweltmanagementsystemen. Eine Untersuchung von ISO-14.001-zertifizierten Unternehmen in der Schweiz, Zürich

Dyllick, Thomas/ Hummel, Johannes 1995: EMAS und/oder ISO 14.001? Wider das strategische Defizit in den Umweltmanagementsystemnormen, in Umwelt Wirtschafts Forum Heft 3 p. 24-28

Dyllick, Thomas/ Schaltegger, Stefan 2001: Nachhaltigkeitsmanagement mit einer Sustainability Balanced Scorecard, in: UmweltWirtschaftsForum, vol. 4, p. 68-73

Forschungsgruppe Betriebliche Umwseltpolitik (FBU) 1995: Pilot-Oeko-Audits in Hessen - Erfahrungen und Ergebnisse. Ein Forschungsbericht, in: Hess. Ministerium für Wirtschaft (Hg.) Schriftenreihe Technologie in Hessen, Wiesbaden

Forschungsgruppe Evaluierung Umweltaudit (FEU) 1998a: Vorlaeufige Untersuchungsergebnisse und Handlungsempfehlungen zum Forschungsprojekt "Evaluierung von Umweltmanagementsystemen..", Oestrich-Winkel/ Frankfurt(Main)

Forschungsgruppe Evaluierung Umweltaudit (FEU) 1998b: Umweltmanagement in der Praxis - Teilergebnisse eines Forschungsvorhabens zur Vorbereitung der 1998 vorgesehenen Ueberpruefung des gemeinschaftlichen Oeko-Audit-Systems, Teile I - III, in: Umweltbundesamt (Hg.) Texte 20/98 Berlin

Forschungsgruppe Evaluierung Umweltaudit (FEU) 1998c: Umweltmanagement in der Praxis - Teilergebnisse eines Forschungsvorhabens zur Vorbereitung der 1998 vorgesehenen Ueberpruefung des gemeinschaftlichen Oeko-Audit-Systems, Teile V und VI, in: Umweltbundesamt (Hg.) Texte 52/ 98 Berlin

Freimann, Jürgen 1999a: Jenseits von EMAS. Umweltmanagementsysteme – Erfahrungen und Perspektiven, in: Seidel, Eberhard (Hg.): Betriebliches Umweltmanagement im 21. Jahrhundert, Berlin/ Heidelberg u.a.O., p. 131-145

Freimann, Jürgen 1999b: Akteursperspektiven im betrieblichen Umweltmanagement. Eine empirische Annäherung, in: Zeitschrift für angewandte Umweltforschung, 12.Jg. p.492-506

Freimann, Juergen/ Schwaderlapp, Rolf 1996: Implementation of the EU's EMAS Regulation in German Companies, in: Eco-Management and Auditing, vol. 3, p.109-112

Gerling Consulting-Gruppe 1995: Oeko-Audits in nordrhein-westfaelischen Unternehmen, in: Ministerium fuer Wirtschaft, Mittelstand und Technologie NRW (ed.) Duesseldorf

Glatzner, Ludwig 1997: Öko-Audit: Was ist dran am Zertifikat? in: Globus Heft 1 p. 56-60

Hamschmidt, Jost 2001: Economic and Ecological Impacts of Environmental Management Systems in Companies: Experiences from Switzerland, EURO Environment Conference, Aalborg, 18.-20. October 2000, CD-ROM

Hartmann, Wolf D. 1998: Oeko-Audit: Ein Dutzend Erfahrungen aus der Unternehmenspraxis, in: Umwelt Wirtschafts Forum vol. 6, p. 32-36

Hillary, Ruth (ed.) 2000: ISO 14.001: Case Studies and Practical Experiences, Greenleaf Publishing, Sheffield

Hoeppner, Nils-Oliver/ Sietz, Manfred/ Seuring, Stefan/ Czaja, Frank 1998: Oeko-Audit-Verordnung - Ergebnisse einer Befragung validierter Unternehmen, in: Umwelt Wirtschafts Forum vol. 6, p.73 - 76

IOEW/ IMUG (ed.) 2001: Nachhaltigkeitsberichterstattung – die Praxis glaubwürdiger Kommunikation zukunftsfaehiger Unternehmen, Berlin

Issak, Robert/ Keck, Alexander 1997: Die Grenzen von EMAS, in: Umwelt Wirtschafts Forum vol. 5, p.76-85

Jaeger, Thomas/ Wellhausen, Anja/ Birke, Martin/ Schwarz, Michael 1998: Umweltschutz, Umweltmanagement und Umweltberatung - Ergebnisse einer Befragung in kleinen und mittleren Unternehmen, Koeln

Klemisch, Herbert 1997: Ergebnisse des Forschungsprojektes 'Oeko-Audit und Beschaeftigtenbeteiligung in KMU', in: Klemisch, Herbert (ed.) Oeko-Audit und Partizipation - Die betriebliche Umsetzung von Umweltinformationssystemen in kleinen und mittelstaendischen Unternehmen Koeln, p.5-22

Lange, C./ Ahsen, A.v./ Daldrup, H. 2001: Umweltschutz-Reporting, München

Loew, T./ Fichter, K. 1998: Umweltberichterstattung in Deutschland und Europa, Berlin

Schnauber/ Kiesgen/ Mangelmann 1994: Analyse des betrieblichen Umweltschutzes unter besonderer Beruecksichtigung des Umwelt-Audit-Konzeptes, in: Ruhr-Universitaet Bochum/ INNOSYS - Gesellschaft fuer Innovative Arbeitssysteme (ed.) Bochum

Seidel, Eberhard/ Weber, Frank M. 1998: Die EMAS-Praxis in Deutschland, in: Umwelt Wirtschafts Forum vol. 6, 1998, p.22-27

Smircich, Linda 1983: Concepts of Culture and Organizational Analysis, in: Administrative Science Quarterly 1983, p. 339-358

Stahlmann, Volker/ Clausen, Jens 2000: Umweltleistung von Unternehmen. Von der Öko-Effizienz zur Öko-Effektivität, Wiesbaden

Steven, M./ Schwarz, E.J./ Letmathe, P. 1997: Umweltberichterstattung und Umwelterklärung nach der EG-Oeko-Audit-Verordnung, Berlin

Umweltakademie Fresenius/ IHK Dortmund 1996: Kopplung von Qualitaets- und Umweltmanagement - Auswertung einer Befragung von 3000 Unternehmen in Nordrhein-Westfalen, Dortmund

Unternehmerinstitut/ Arbeitsgemeinschaft Selbständiger Unternehmer (UNI/ASU) 1997: Öko-Audit in der mittelständischen Praxis, Bonn