

Systematic Environmental Management

EMAS in Germany



Report on Experience
1995 to 1998

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Federal Environmental Agency

EMAS in Germany



Report on Experience
1995 to 1998

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About this Report

In order to permit a better assessment of the situation and prospects of EMAS, the Federal Environmental Agency conducted, during the period from 15 June 1998 to 30 April 1999, a survey of all the German sites registered up to the end of 1998 (1,806 participants). The aspects in the questionnaire included the following:

- ☐ Reasons for taking part
- ☐ Cost-benefit ratio (Was it worth taking part?)
- ☐ Environmental statement (response and presentation)
- ☐ Experience with environmental verifiers
- ☐ Further non-financial support
- ☐ EMAS system (What should be improved?)
- ☐ EMAS and/or ISO 14001?

In view of the relatively high response rate of nearly 70 percent, the gratifying representation of the various industries and regions in the sample, and the results of a follow-up survey of non-participants, it may be assumed that the survey results permit a good measure of general application to the survey universe as a whole.

The central finding of the survey is as follows: The EMAS system can continue to be a successful instrument of European environmental policy if

- ☐ on the one hand it offers sufficient incentive for voluntary participation (e.g. through greater efforts by the EU Commission and the German government to permanently implant in the public awareness, by means of effective advertising and information campaigns, the Eco Audit idea and the “Eco Audit Logo” that distinguishes the participating companies), and
- ☐ on the other hand, the environment related requirements for companies and administrative authorities are not set so low as to impair the ecological effectiveness of the regulation system.

FOR READERS IN A HURRY: THE KEY POINTS AT A GLANCE

Taking responsibility: Systematic Environmental Management

In mid 1995 the European Union adopted the “Council Regulation (EEC) No. 1836/93 allowing voluntary participation by companies in the industrial sector in a Community Eco-Management and Audit Scheme”, usually known for short as the “EMAS Regulation”. This seeks to induce companies, on a voluntary basis, to develop environmental programmes and environmental management systems, undertake audits and prepare environmental statements.

EMAS in Europe: Germany tops the list

From the entry into force of the EMAS Regulation in autumn 1995 until 30 June 1999, some 2750 industrial sites were registered in the EU member states. Germany, with 2,085 sites, accounts for about 76 percent of all participants in the EMAS system. It is followed by Austria in second place with 6.9 percent, Sweden in third place with 5.6 percent and Denmark in fourth place with 3.7 percent.

A comparison of EMAS and ISO 14001:

German preference for EMAS

By the end of June 1999, about 11,000 companies worldwide had obtained certification in accordance with the global environmental management standard ISO 14001. To date this instrument has been well received in Japan, Germany, the United Kingdom, Sweden and Taiwan in particular. Whereas in Germany there are about one and a half EMAS sites to every ISO 14001 certified company, the situation in the other EU member states is very different: here there are more “ISO 14001 companies” than “EMAS companies”.

EMAS in Germany:

steady rise in number of registered sites

In Germany the number of registered sites has displayed more or less linear growth since the EMAS Regulation came into force. While only about 40 sites were registered at the end of 1995, the figure rose to nearly 500 by the end of 1996 and around 1000 by the end of 1997. In April 1999 the number of registered sites finally topped the 2000 mark.

New *Länder* not out of line

At the end of December 1998 there were 288 sites registered in the new *Länder* (former Eastern Germany). They thus account for about 16 percent of the national total. In terms of the total population of Germany, the new *Länder* are slightly under-represented. In relation to economic power, however, the new *Länder* are strongly over-represented. And another comparison: at EU level, the new *Länder* still come out ahead of all other countries.

Workforce: nearly 1.2 million employees

In 1995 there were fewer than 60,000 employees working at EMAS sites in Germany. By the end of December 1998 the figure had already reached more than a million. At the end of June 1999 an

estimated 1.2 million people were working in German “EMAS companies”. This is about 3.5 percent of the entire gainfully employed population of Germany.

Contribution to turnover around DM 125 billion

It is possible to make a rough estimate of the annual contribution to turnover made by registered German sites. This indicates that in 1995 the contribution to turnover made by the 60,000 employees at the time was in the region of nearly DM 6 billion. By the end of June 1999 the figure had risen to around DM 125 billion.

Widely varying reasons for participation

The most important reason given by the companies surveyed for their participation in EMAS was “continuous improvement of environmental performance”. About three out of four companies see this as an important reason, while only two percent regard it as unimportant. Other important reasons given were: identifying weak spots and potential in the use of energy and resources; motivating employees; greater legal certainty; improvements in organisation; improving corporate image; detecting and minimising environmental and liability risks; and reducing company-specific environmental impacts. Only about half the respondents took part in the EMAS system with the aim of reducing costs. Indeed, for twelve percent this is an unimportant reason.

Time factors: “environmental management manual”, “data acquisition” and “environmental statement”

In the context of work made necessary by the establishment and development of the EMAS system, the companies surveyed see the following as time consuming or very time consuming (figures in brackets show percentage in agreement): preparing an environmental management manual (78 percent), acquiring data (73 percent), preparing the environmental statement (62 percent), training and informing employees (44 percent), compiling the relevant legal provisions (37 percent), assessing environmental impacts (36 percent).

Personnel expenses: at least DM 167 million during start-up phase

The sites surveyed estimate that personnel expenses for participation in EMAS average about twelve man months. On the basis of an environmental officer’s average gross annual earnings of around DM 80,000, this means the lowest limit for personnel expenses for the 2085 industrial sites registered by the end of June 1999 was at least DM 167 million.

Financial cost: at least DM 242 million in the start-up phase

The sites surveyed estimate that the financial cost of participation in the EMAS system averages about DM 116,000. Some 40 percent of respondents said that the cost was very difficult to quantify – so the information on costs can be no more than a very rough estimate. The total financial cost incurred by German companies as a result of their voluntary participation in the EMAS system from its entry into force until the end of June 1999 is thus estimated to be in the region of DM 242 million. This figure does not include the minimum personnel expenses of around DM 167 million (see above).

What benefits has participation brought?

At the top of the list of benefits was “improved organisation and documentation”. Over 80 percent of the companies surveyed stated that this was (fully) applicable. Well over half the registered sites

succeeded in achieving improvements in legal certainty, corporate image and employee motivation. Further down the list (“partly applicable”) came responsible resource management, site safety, setting an example to suppliers, optimising process workflows, improved cooperation with authorities, positive marketing effects, cost savings and competitive advantages/safeguarding the future of the site. At the tail end of the list (“scarcely applicable”) came “cheaper insurance/loans” and “use of public development funds”.

Have cost savings been achieved?

Around half the companies surveyed stated (“(fully) applicable”) that they had been able to achieve cost savings in the waste sector through their participation in the EMAS system. For nearly 40 percent of the companies this also applied to the “energy” and “water/wastewater” sectors. However, three out of four companies said it was difficult to quote an exact figure for the costs saved. Those companies that did quantify their savings put them at around DM 140,000, or DM 330 per employee.

Positive or negative cost-benefit ratio?

The future success of EMAS is closely linked to the question of whether participation – which is after all entirely voluntary – ultimately pays off for the company. Twenty-nine percent of the companies surveyed were unable as yet to assess the cost-benefit ratio of participation in the EMAS system. The remaining 71 percent see the cost-benefit ratio as follows: 25 percent positive, 17 percent neutral and 29 percent negative.

Environmental statement: response and presentation

The interest in the environmental statement displayed by local residents, customers, authorities, media and the general public fell well short of the companies’ expectations. Equally disappointing from the respondents’ point of view was the interest displayed by industrial customers, banks and insurance companies, suppliers and employees. A contrasting response is found among scientific institutions, students and business consultants. Here the response was in fact much greater than the companies’ interest. The quality of the environmental statements varies greatly: on the one hand, as the companies surveyed themselves admitted, there are at least 40 environmental statements that contain no information whatever on relevant environmental effects. On the other hand, there are well over 100 sites today that document environmental indicators which are related to an ecological evaluation procedure. The majority of environmental statements contain a systematic comparison in the form of a substance and energy balance. About 70 percent of the companies surveyed stated that this was (fully) applicable.

EMAS: requests for improvements

When it comes to the prospects for the future of EMAS, the question of the improvements that the companies surveyed would like to see is a central issue. Among ten suggestions that were put to the companies, better information of the public with regard to the significance and relevance of the EMAS system was clearly given top priority. Second on the list was “a more constructive attitude and improved recognition by the authorities, including the exercise of discretion”. About 87 percent of the companies surveyed stated that this was (fully) applicable. The larger the industrial site (in terms of employee numbers), the greater the desire for improvement. The aspect of “less administrative work by reducing legal measuring and reporting requirements” took third place. About 83 percent of the

companies surveyed stated that this was (fully) applicable. Here too it is noticeable that the bigger the site, the more marked is the desire for improvement.

EMAS: relatively large percentage intend to continue

In response to the key question “Will your company continue participating in EMAS?”, the answers were as follows: “Yes, preparations already in progress” (59 percent), “Yes, very probably” (29 percent). Here it is particularly noticeable that a much larger proportion of the bigger industrial sites were already tackling the preparatory work for “revalidation” than the smaller sites.

Trump card of EMAS:

“Continuous improvement of environmental performance”

What then are the reasons why German companies want to continue participating in the EMAS system? In the first instance it is the continuous improvement of environmental performance. Nearly 90 percent of the companies surveyed said that this criterion (fully) applied to them. In addition, the following features were given particular emphasis by the companies as reasons for continued participation in EMAS: high environmental performance targets, increased legal certainty, strong emphasis on employee participation, preparation of an environmental statement, independent verification.

EMAS and ISO 14001: many are taking a dual approach

The question of whether the companies were also planning certification under ISO 14001 was answered as follows: a good 30 percent already have this additional certification. Nearly 15 percent are planning this additional certification. One in every five companies said that internal discussions were still in progress and they had not yet reached a decision. The rest, in other words about one company in three, have no plans for additional certification. In response to the question concerning reasons for this additional certification under ISO 14001, the criterion of “worldwide validity” proved to be of overriding importance. There was also widespread agreement with the argument that positive effects can be achieved by combining ISO 14001 and EMAS.

Systematic Environmental Management

EMAS Regulation

In mid 1995 the European Union adopted the “Council Regulation (EEC) No. 1836/93 allowing voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme”, usually known for short as the “EU Eco Audit Regulation”. The core element of this modern piece of environmental legislation is the establishment and development of an industrial environmental management system.

Verified environmental management on own responsibility

The aim is to induce companies, on a voluntary basis, to develop environmental programmes and environmental management systems, undertake audits and prepare environmental statements. As a reward for their successful participation, sites audited by accredited environmental verifiers and having a valid environmental statement receive (after registration with the competent Chamber of Industry and Commerce) this twelve-star emblem (referred to in the Regulation as “statement of participation”):



This site has an environmental management scheme and its environmental performance is reported on to the public in accordance with the Community eco management and audit scheme.
(Registration No. ...)

Enlargement Ordinance

In the past the EMAS system was only open to companies in the manufacturing, energy generation, waste management, mining and quarrying industries. However, on 10 February 1998 the “Enlargement Ordinance” to the EMAS Act (UAG-ErwV of 9.2.1998) entered into force. This now makes it possible to apply the scheme to companies in commerce, service companies and local authorities.

Town halls discover EMAS too

A number of model projects concerning local authority EMASs were initiated prior to the Enlargement Ordinance to the EMAS Act, and their results confirm that it is possible to apply the EMAS Regulation to the public local authority administration. Examples include the model project “Communal Eco Audit Baden-Württemberg” and the model project “Environmental Management of the Municipal Administration of Wuppertal”. To provide practical help and guidance for interested authorities, copies of the instructions for these model projects are available:

- Leitfaden “Umweltmanagement für kommunale Verwaltungen”, (*Guide to Environmental Management for Local Authorities*), Landesanstalt für Umweltschutz Baden-Württemberg, 1998.
- Praxisratgeber zur Entwicklung kommunaler Umweltmanagementsysteme (*Practical Guide to the Development of Local Authority Environmental Management Systems*), Wuppertal 1998.

Reviews of the projects for introducing an environmental management system in public administration show that in Germany this is done almost without exception in close connection with the EMAS Regulation. Of over 30 projects completed, in progress or planned for integrating environmental protection in public authorities, two thirds are at the local authority level. The local authorities are thus playing a pioneering role in environmental activities in Germany. At the beginning of July 1998 the towns of Isny and Leutkirch were the first towns in Germany to be validated as local authority sites in accordance with the Enlargement Ordinance to the EMAS Act. EMAS itself, as an important step, revealed some extremely interesting findings. Potential for ecological and economic savings became clearly visible. The establishment of an environmental management system has succeeded in organising “environmental work” and integrating it as a firm component in daily administrative workflows.

Revision of the EMAS Regulation (EMAS* -II) in preparation

The EU Commission is currently proposing to extend the existing scheme under the regulation beyond the present list of industries to take in all areas of business and administration, and to incorporate the international standard ISO 14001 in the Regulation. With numerous changes (integration of ISO 14001, enlargement of circle of participants, frequency of environmental statements, inclusion of indirect environmental impacts, more flexible communication, EMAS logo, deregulation, benchmarking), the Commission aims to improve acceptance of the Regulation among potential users and to improve the ecological profile of the Regulation itself. From the German point of view two central objectives for EMAS-II can be identified from experience with the EMAS Regulation to date:

- Safeguard and strengthen the ecological effectiveness of EMAS
- Raise its economic effectiveness by incentives to participate.

* EMAS: the “Environmental Management and Audit Scheme”

EMAS in Europe

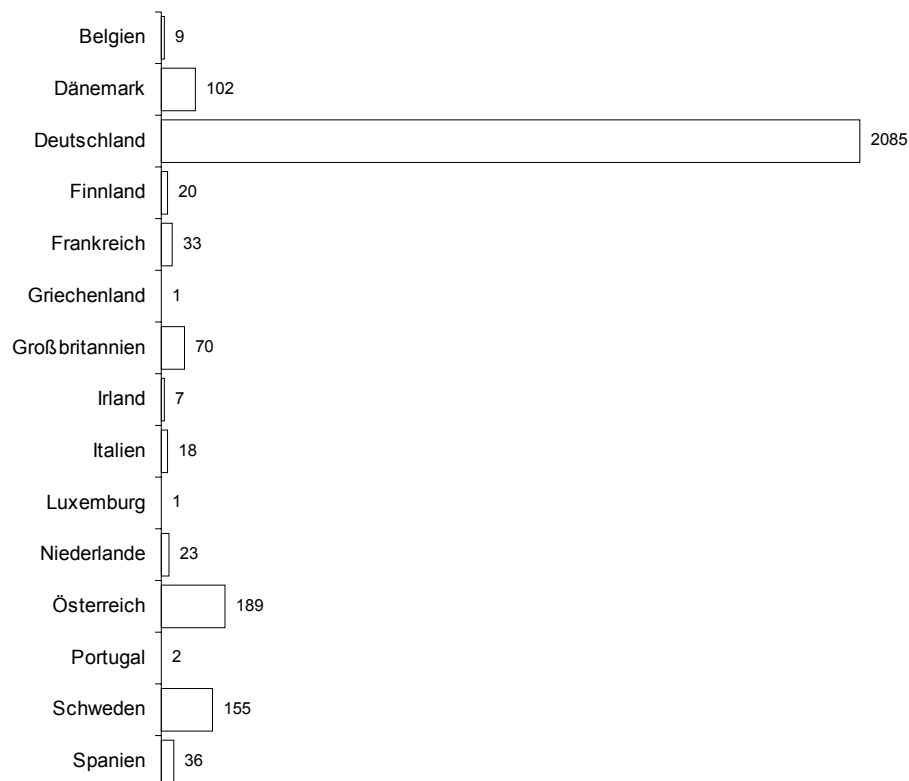
Germany tops the list

Between the entry into force of the EMAS Regulation in autumn 1995 and 30 June 1999, some 2,751 industrial sites were registered in the EU member states (Fig. 1). Germany, with 2,085 sites, accounts for about 76 percent of all participants in the EMAS system. It is followed by Austria in second place with 6.9 percent, Sweden in third place with 5.6 percent and Denmark in fourth place with 3.7 percent.

Fig. 1:

EMAS: How many sites are registered in the member states?

Number of registered sites (as at 30 June 1999)



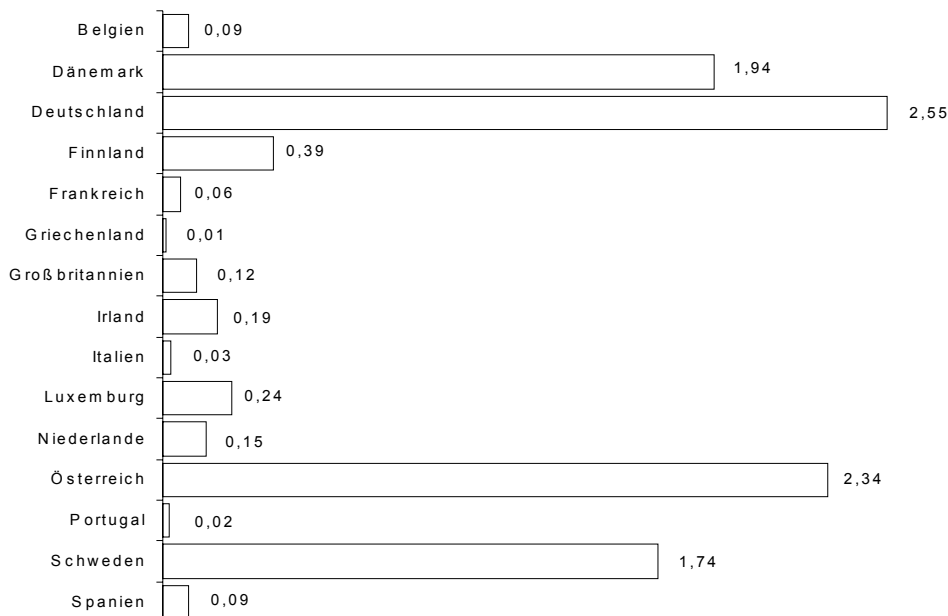
Source: European Commission 1999.

Putting it in perspective

This picture can be put in perspective by comparing the number of sites in each country with the population or the economic strength of the

individual EU member state. Using these yardsticks reduces the gaps between Germany and the other EU states, in some cases considerably. In terms of population (Fig. 2) Germany, with 2.55 sites per 100,000 inhabitants is ahead of Austria (2.34 sites), Denmark (1.94 sites) and Sweden (1.74 sites). Well behind are Finland (0.39 sites), Luxembourg (0.24 sites), Ireland (0.19 sites), the Netherlands (0.15 sites) and the United Kingdom (0.12 sites). At the bottom of the list are Belgium (0.09 sites), Spain (0.09 sites), France (0.06 sites), Italy (0.03 sites), Portugal (0.02 sites) and finally Greece (0.01 sites).

Fig. 2:

EMAS:**How does the number of sites registered in the member states relate to their population?****Number of registered EU sites per 100,000 inhabitants (as at 30 June 1999)**

Source: Own calculations, figures from European Commission 1999.

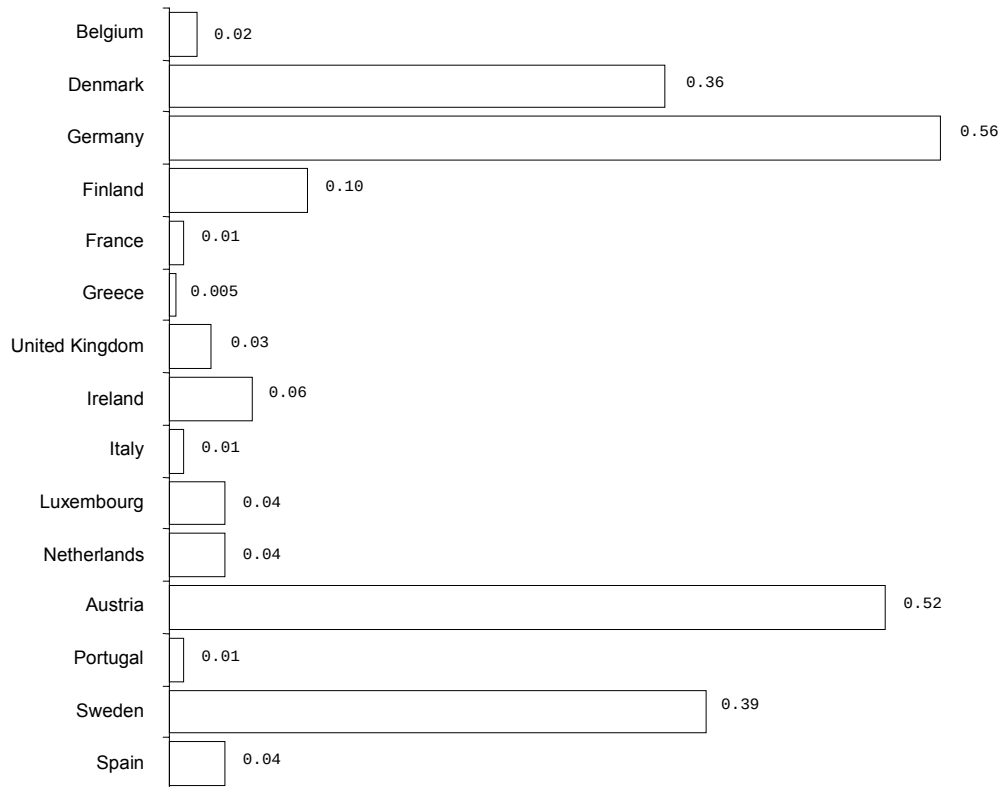
In terms of economic strength (Fig. 3) Germany, with 0.56 sites per billion DM gross national product, lies only just ahead of Austria (0.52 sites), Sweden (0.39 sites) and Denmark (0.36 sites). These are followed by Finland (0.10 sites), Ireland (0.06 sites), and the Netherlands, Luxembourg and Spain (0.04 sites each). At the back of the field are the United Kingdom (0.03 sites), Belgium (0.02 sites), and France, Italy and Portugal with 0.01 sites each. Greece has only 0.005 sites per billion DM gross national product.

Fig. 3:

EMAS:

How does the number of sites registered in the member states relate to their economic strength?

Number of registered EU sites per billion DM gross national product (as at 30 June 1999)



Source: Own calculations, figures from European Commission 1999.

EMAS and ISO 14001 Compared

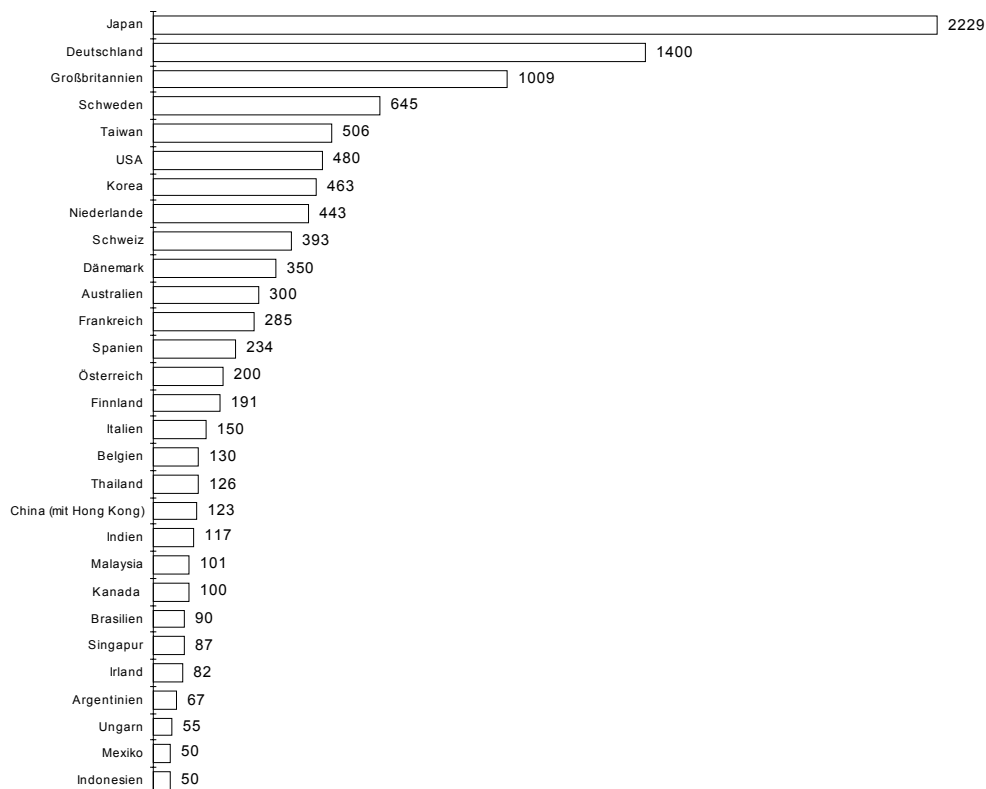
ISO 14001: Japan ahead of Germany and United Kingdom

In order to help businesses to establish and develop environmental management systems, the International Standardization Organization (ISO) has drawn up the worldwide standard ISO 14001. Since October 1996, DIN EN ISO 14001 “Environmental Management Systems – Specification with Instructions for Use” has had the status of a German standard. By the end of June 1999 some 11,000 businesses worldwide had obtained certification under ISO 14001 (Fig. 4).

Fig. 4:

Environmental management worldwide: businesses certified under ISO 14001

Number of businesses certified worldwide under ISO 14001 (as at 30 June 1999)



Source: Estimate by Federal Environmental Agency 1999.

To date this instrument has been well received in Japan, Germany and the United Kingdom. In these three countries alone, over 4,600

businesses have obtained certification under ISO 14001 in the past three years. A very positive response can also be seen in the following countries, some with well over 300 ISO 14001 companies: Sweden, Taiwan, USA, Korea, Netherlands, Switzerland, Denmark and Australia.

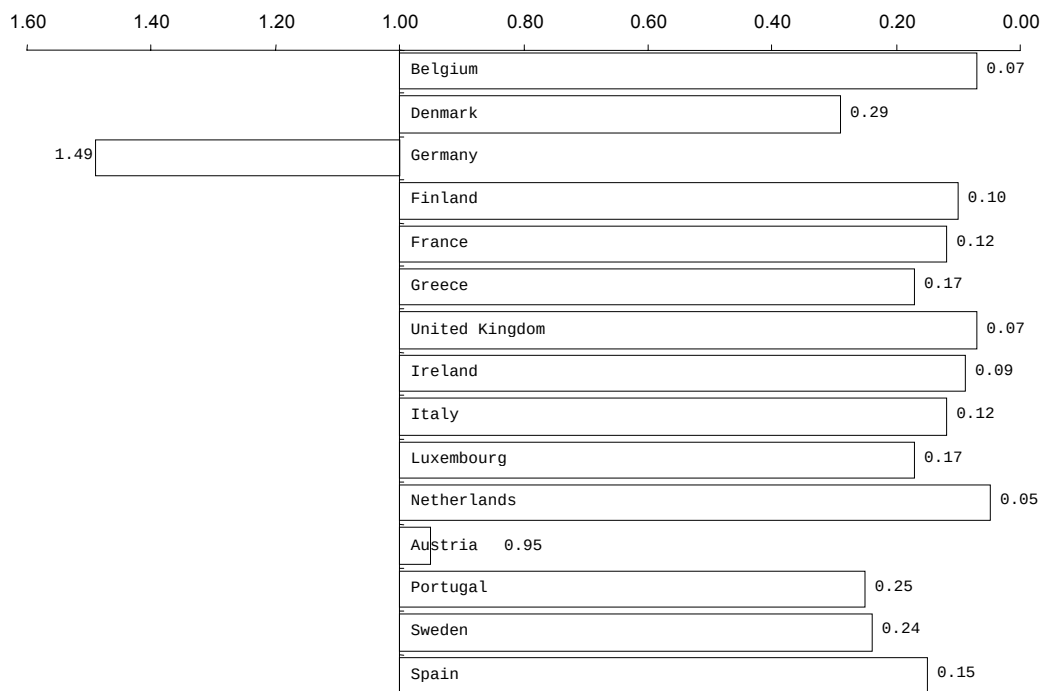
German preference for EMAS

It is interesting to compare the EMAS statistics with the ISO 14001 statistics within the European Union. Whereas in Germany there are about one and a half EMAS sites to every ISO 14001 certified company (Fig. 5), the situation in the other EU member states is very different. Example: in the United Kingdom the EMAS system is only of secondary importance compared with the ISO 14001 standard: here there is only one EMAS site to fourteen ISO 14001 companies.

Fig. 5:

EMAS / ISO – relative proportions within the European Union

Number of EMAS sites per certified ISO 14001 company in the individual countries
(as at 30 June 1999)



Source: Estimate by Federal Environmental Agency 1999.

EMAS in Germany

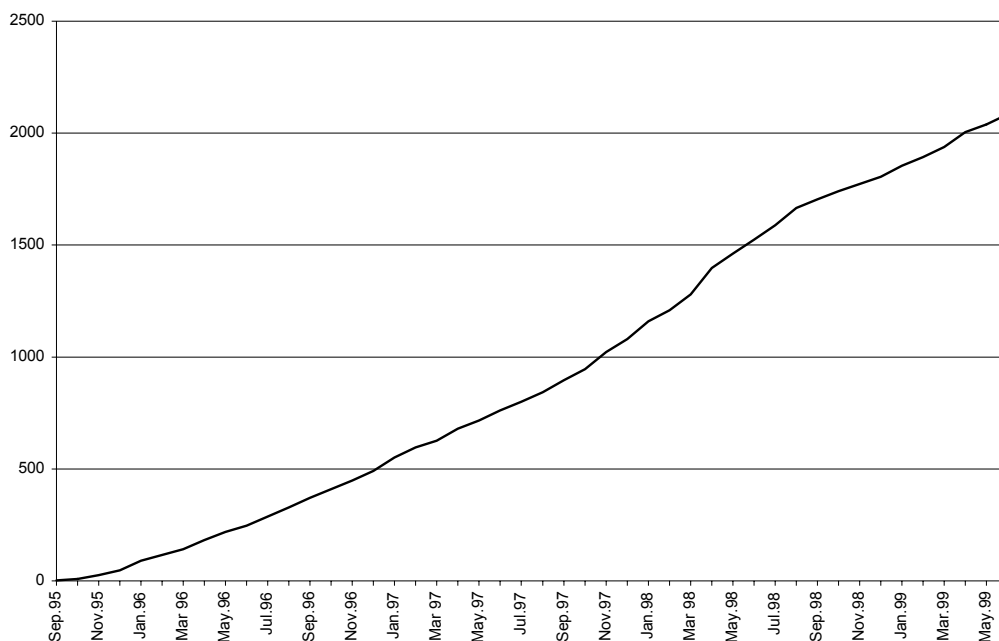
Steady rise in number of sites registered to date

In Germany the number of registered sites has displayed more or less linear growth since the EMAS Regulation came into force (Fig. 6). While only about 40 sites were registered at the end of 1995, the figure rose to nearly 500 by the end of 1996 and around 1000 by the end of 1997. In April 1999 the number of registered sites finally topped the 2000 mark. By the end of June 1999 there were 2,085 “Eco Audit companies” registered in Germany.

Fig. 6:

EMAS: How many sites are registered in Germany?

Number of registered sites (as at 30 June 1999)



Source: Own compilation based on figures from DIHT (German Industrial and Trade Association), 1999.

An average of around 40 registrations per month

During the years 1995/1998, an average of about 40 sites a month were registered with the competent chambers of industry and commerce (Fig. 7). The unusually rapid growth in the spring and summer of 1998

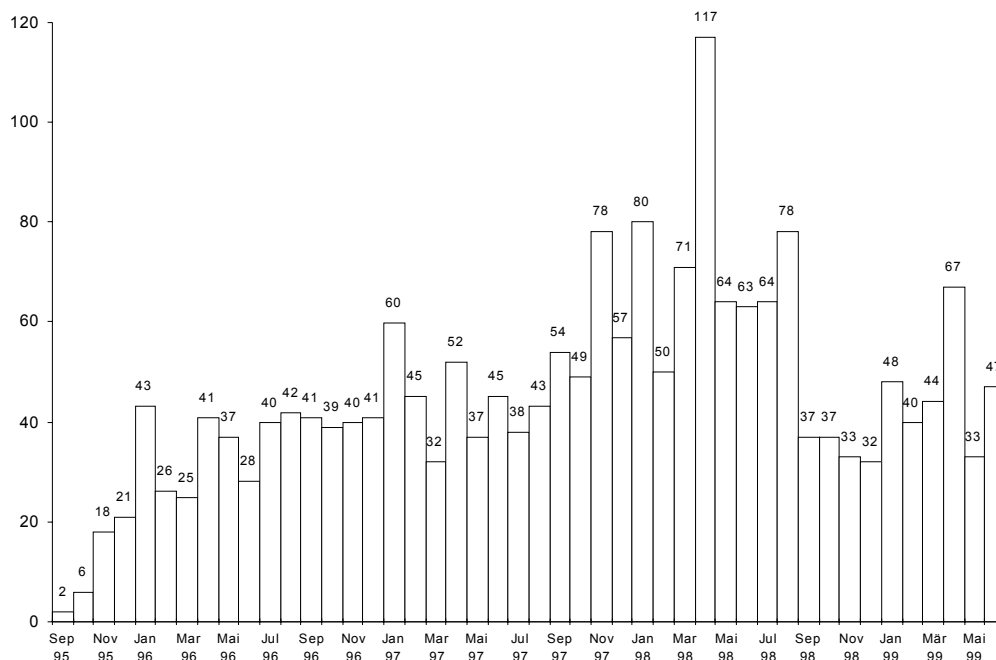
was probably due to the entry into force in February 1998 of the Enlargement Ordinance to the EMAS Act. For the period up to the end of 1998 the following effect can be observed (figures in brackets are the number of registered sites):

- Commerce (58),
- Energy supply (14),
- Hospitals (13),
- Transport (13),
- Hotel and restaurant trade (10),
- Public administration (8),
- Wastewater management including other waste management (6),
- Sports facilities (4),
- Banking industry (3),
- Libraries (1),
- Laundries (1),
- Test laboratories (1).

Fig. 7:

EMAS: How many sites are registered in Germany every month?

Number of sites registered per month (as at 30 June 1999)



Source: Own compilation based on figures from DIHT (German Industrial and Trade Association), 1999.

Chemical industry, steel and light-metal construction and food industry in the lead

The industry statistics for the period to end of December 1998 reveal the following picture (figures in brackets indicate the percentage of the total number of sites registered in Germany):

- ☐ Chemical industry (11.1 percent),
- ☐ Steel and light-metal construction (10.5 percent),
- ☐ Food industry (10.1 percent),
- ☐ Mechanical engineering (7.8 percent),
- ☐ Rubber and plastics (7.1 percent),
- ☐ Motor vehicle manufacture (5.4 percent),
- ☐ Manufacture of furniture/jewellery (5.1 percent),
- ☐ Waste management 7 recycling (5.1 percent),
- ☐ Manufacture of electrical appliances (4.5 percent),
- ☐ Publishing/printing (4.3 percent),
- ☐ Miscellaneous (29.0 percent).

About 60 percent of the sites are in North-Rhine/ Westphalia, Bavaria and Baden-Württemberg

Broken down by *Länder*, the figures for the period to the end of December 1998 reveal the following picture (figures in brackets indicate the percentage of the total number of sites registered in Germany):

- ☐ North-Rhine7Westphalia (21.8 percent),
- ☐ Bavaria (21.1 percent),
- ☐ Baden-Württemberg (16.9 percent),
- ☐ Hesse (8 percent),
- ☐ Lower Saxony (5.3 percent),
- ☐ Rhineland-Palatinate (4.7 percent),
- ☐ Saxony (4.4 percent),
- ☐ Saxony-Anhalt (3 percent),
- ☐ Schleswig-Holstein (3 percent),
- ☐ Thuringia (2.9 percent),
- ☐ Berlin (2.6 percent),
- ☐ Brandenburg (1.9 percent),
- ☐ Saarland (1.7 percent),
- ☐ Mecklenburg-Western Pomerania (1.3 percent),
- ☐ Hamburg (0.9 percent),
- ☐ Bremen (0.5 percent).

New *Länder* not out of line

At the end of December 1998 there were 288 sites registered in the new *Länder* (former Eastern Germany). They thus account for about 16 percent of the national total. In terms of the total population of Germany, the new *Länder* are slightly under-represented. In relation to economic strength, however, the new *Länder* are strongly over-represented. And another comparison: at EU level, the new *Länder* still come out ahead of all other countries.

Purpose, Design and Representative Nature of Survey

Purpose and design of survey

In order to permit a better assessment of the situation and prospects of EMAS, the Federal Environmental Agency conducted, during the period from 15 June 1998 to 30 April 1999, a survey of all the German sites registered up to the end of 1998 (1,806 participants):

- ☐ The companies were asked to supply two environmental statements (one copy for building up a database and another for the library).
- ☐ They were also sent an eight-page questionnaire which was developed in close connection with the research findings of the "Evaluation Study".

"Evaluation Study"

- ☐ In order to assist the German environmental authorities with the review of EMAS planned for 1998, a 25-strong research group lead-managed by the Institute for Ecology and Business Management (Oestrich-Winkel) was commissioned by the Federal Environment Ministry and the Federal Environmental Agency to carry out what is probably the most comprehensive analysis to date of German environmental management practice. In the context of the UFOPLAN project "Evaluation of Environmental Management Systems in Preparation for the 1998 Review of the Community Eco Audit Scheme" ("Evaluation Study" for short), six different "spotlights" were used to throw light on the "Eco Audit stage" from various different angles. Analysis of some 1,600 literary references
- ☐ Investigation of nearly 100 model projects
- ☐ Evaluation of over 200 environmental statements
- ☐ Examination of the legal dimension
- ☐ Empirical investigation of the experience of participating companies
- ☐ Analysis of the experience and expectations of person involved in the procedures and of social pressure groups.

The key message of the project is: without a clear and easily explained differentiation of the quality standard between the worldwide environmental management standard ISO 14001 and the EMAS system, there is a risk that the EMAS system will be used less and less compared with ISO 14001. EMAS should therefore be positioned as "Ecological Star Performance".

Note

Important individual results have already been published by the Federal Environmental Agency in the series TEXTE 20/98 and TEXTE 52/98. The results of the provisional final report are to be published in a book which will probably appear towards the end of 1999.

The aspects in the questionnaire included the following:

- ☐ Reasons for taking part
- ☐ Cost-benefit ratio Was it worth taking part?
- ☐ Environmental statement: Response and presentation
- ☐ Experience with environmental verifiers
- ☐ Further non-financial support

- ☐ EMAS system: What should be improved?
- ☐ EMAS and/or ISO 14001?

Return rate nearly 70 percent

By the end of April 1999 replies had been received from exactly 1,228 of the 1806 sites written to (45 addresses were unusable). Is a return rate of nearly 70 percent a lot or a little? This result is

- ☐ very gratifying considering that numerous questionnaires had been sent to the registered sites in the past years and months and that the questionnaire was fairly extensive (time and cost factor);
- ☐ rather disappointing considering that all "Eco Audit companies" have more or less committed themselves to an open dialogue with the public by participating in the Community scheme.

Hardly any distortion in sectors and *Länder*

A look at the industry statistics (Table 1) shows only slight discrepancies between the sample and the universe. Take the chemical industry, for example: here the figure for the universe is 11.1 percent and for the sample 11.9 percent. In other words: the chemical industry is only minimally over-represented (0.8 percentage points) in the survey.

Table 1

EMAS:

How are the various industries represented in the survey?

Industry	Universe (percent)	Sample (percent)	Deviation
Chemical industry	11.1	11.9	+ 0.8
Steel/light-metal construction	10.5	10.4	- 0.1
Food industry	10.1	10.7	+ 0.6
Mechanical engineering	7.8	8.6	+ 0.8
Manufacture of rubber/plastic products	7.1	7.3	+ 0.2
Manufacture of motor vehicles / parts	5.4	5.6	+ 0.2
Manufacture of furniture/jewellery/music instruments	5.1	3.7	- 1.4
Waste management/recycling	5.1	4.1	- 1.0
Manufacture of electrical appliances	4.5	4.2	- 0.3
Publishing/printing	4.3	4.7	+ 0.4
Miscellaneous	29.0	28.8	- 0.2

* Attribute percentage in sample minus attribute percentage in universe: plus (minus) means that the percentage of the attribute in the survey was too high (low) by the percentage points stated.

Source: Federal Environmental Agency 1999.

A similarly favourable picture emerges from the statistics broken down by *Länder* (Table 2). The biggest deviation here is found in North-

Rhine/Westphalia, which is slightly over-represented by 1.3 percentage points.

Table 2

EMAS: How are the various <i>Länder</i> represented in the survey?			
Land	Universe (percent)	Sample (percent)	Deviation *
North-Rhine/Westphalia	21.8	23.1	+ 1.3
Bavaria	21.1	21.0	- 0.1
Baden-Württemberg	16.9	17.2	+ 0.3
Hesse	8.0	7.7	- 0.3
Lower Saxony	5.3	5.2	- 0.1
Rhineland-Palatinate	4.7	4.5	- 0.2
Saxony	4.4	4.2	- 0.2
Saxony-Anhalt	3.0	3.3	+ 0.3
Schleswig-Holstein	3.0	3.2	+ 0.2
Thuringia	2.9	2.4	- 0.5
Berlin	2.6	2.3	- 0.3
Brandenburg	1.9	1.6	- 0.3
Saarland	1.7	1.6	- 0.1
Mecklenburg-Western Pomerania	1.3	1.4	+ 0.1
Hamburg	0.9	0.8	- 0.1
Bremen	0.5	0.5	0.0
* Attribute percentage in sample minus attribute percentage in universe: plus (minus) means that the percentage of the attribute in the survey was too high (low) by the percentage points stated.			
Source: Federal Environmental Agency 1999.			

Follow-up survey of non-participants

Do the findings of this report tend to apply also to those companies that did not take part in the Federal Environmental Agency's survey? In order to clarify this question, a follow-up telephone survey was conducted among the non-participants in the survey. Interviews were held with 60 companies chosen at random. The following reasons for non-participation in the survey were found:

- ☐ One company in two did not answer for time reasons alone.
- ☐ In one case in four the questionnaire did not reach the competent officer in time. This deficit, which was observed at large sites in particular, was usually attributed to a transfer of responsibilities.
- ☐ Only in about twelve percent of cases was it clearly stated that the company had expected participation in the EMAS system to bring considerably greater benefits and would therefore no longer be taking part in future.

**Conclusion: the findings of the report are
capable of generalisation**

In view of the relatively high response rate of nearly 70 percent, the gratifying representation of the various industries and regions in the sample, and the results of the follow-up survey of non-participants, we assume that the survey results permit a good measure of general application to the survey universe as a whole.

Number of Employees and Contribution to Turnover

Average of around 590 employees in a German "Eco Audit company"

During the period studied (1995/1998) the average EMAS site in Germany had about 590 employees. The range is considerable:

- ☐ The smallest registered site that took part in the survey by the Federal Environmental Agency was a carpenter's business with three employees. The small business specialises in artisanal furniture production. It is particularly concerned to inform its customers about environmental aspects relating to the handling, use and disposal of the products supplied.
- ☐ The largest registered site that took part in the survey by the Federal Environmental Agency was a car factory with 35,000 employees. In line with the principle "We act in an environmentally aware fashion", the company's environmental policy is binding on all employees at the site and is publicised in notices and circulars.

Larger companies/sites predominate

According to the survey, the majority of the companies taking part in EMAS have more than 500 employees. A statistical analysis of the number of employees in *the entire company* reveals the following picture:

- ☐ 1 to 99 employees: 29 percent,
- ☐ 100 to 499 employees: 29 percent,
- ☐ over 500 employees: 42 percent.

The number of employees at the *registered site* during the entire observation period 1995/1998 breaks down as follows:

- ☐ 1 to 10 employees: 5 percent,
- ☐ 11 to 50 employees: 14 percent,
- ☐ 51 to 100 employees: 11 percent,
- ☐ 101 to 200 employees: 12 percent,
- ☐ 201 to 500 employees: 20 percent,
- ☐ 501 to 1,000 employees: 13 percent,
- ☐ 1,001 to 5,000 employees: 13 percent,
- ☐ over 5,000 employees: 12 percent.

Reduction in average size of site

In 1995 the average number of employees at the registered sites came to 1,248 persons. The picture for the subsequent years was as follows:

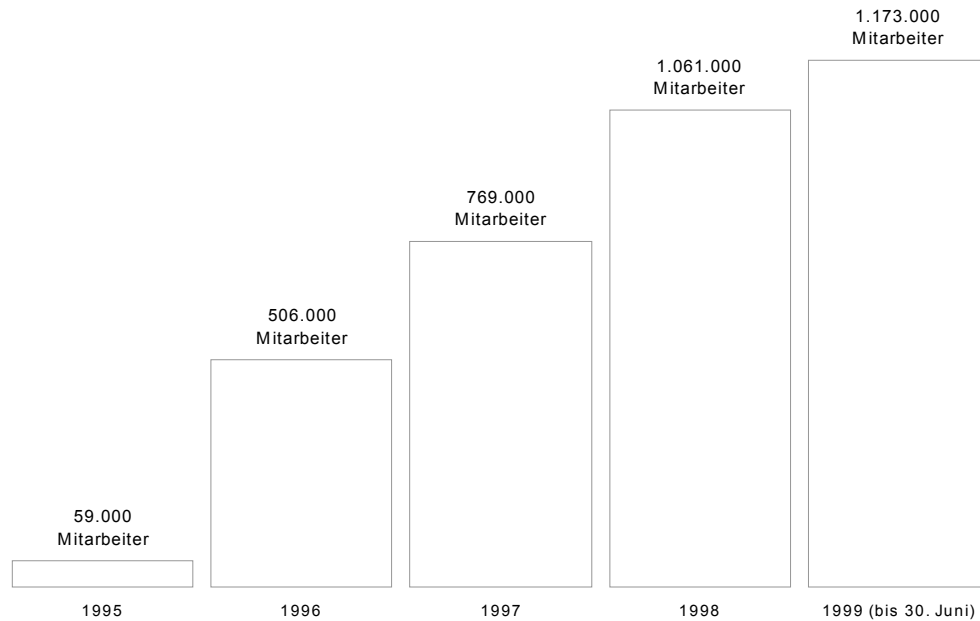
- 1996: around 1,009 employees,
- 1997: around 447 employees, and
- 1998: around 402 employees.

Site size and company size developed “hand in hand” with this trend: Whereas in 1995 the share of larger companies participating (500 or more employees) was still around 75 percent, the corresponding figures for the subsequent years were 52 percent in 1996, 41 percent in 1997 and only 33 percent in 1998.

Extrapolation: Nearly 1.2 million people are currently employed at the registered sites in Germany

In 1995 fewer than 60,000 employees were working at EMAS sites in Germany (Fig. 8). By the end of December 1998 the figure had already reached more than a million. On the basis of 2,085 registered sites for the period to end of June 1999 and the cautious assumption of an average of 400 employees per registered site for the period January to June 1999, it seems likely that nearly 1.2 million people were employed in German “Eco Audit companies” at the end of June 1999. This is about 3.5 percent of the 34 million gainfully employed persons in Germany.

Fig. 8:

EMAS:**How have employee numbers developed at registered sites in Germany since autumn 1995?**

Note on extrapolation: The number of employees was determined on the basis of the following estimate: 1995: 47 registered sites x 1,248 employees (average for 1995); 1996: result for 1995 plus 443 registered sites x 1,009 employees (average for 1996); 1997: result for 1996 plus 590 registered sites x 447 employees (average for 1997); 1998: result for 1997 plus 726 registered sites x 402 employees (average for 1998); 1999: result for 1998 plus 279 registered sites x 400 employees (rough estimate for period January to end of June 1999).

Source: Federal Environmental Agency 1999.

Extrapolation:

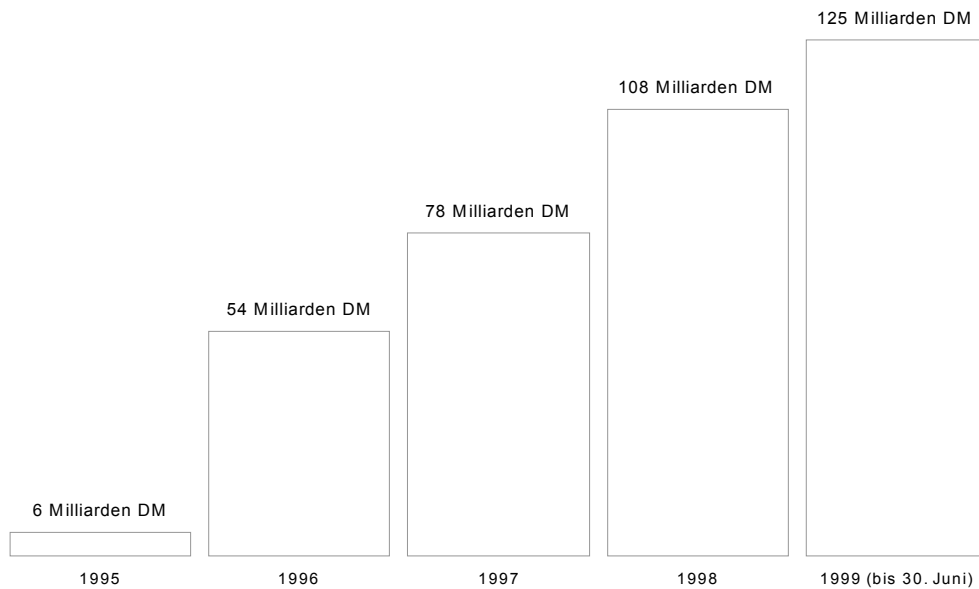
The contribution to turnover made by the registered sites in Germany is currently around DM 125 billion

The annual contribution to turnover made by the registered sites in Germany can be roughly determined on the basis of the average sales per employee in the relevant industries (average value added) (Fig. 9).

This indicates that in 1995 the contribution to turnover made by the 60,000 employees at the time was in the region of nearly DM 6 billion.

By the end of June 1999 the figure had risen to around DM 125 billion.

Fig. 9:

EMAS:**What contribution to turnover is made by the registered sites in Germany?**

Note on extrapolation: The contribution to turnover was roughly estimated on the basis of the average number of employees at the registered site (see Fig. 8) and the average contribution to turnover of an employee in the industries represented in the universe. The relevant turnover figures (gross value added) are taken from the Statistical Yearbook 1998 (base year 1996).

Source: Federal Environmental Agency 1999.

Reasons for Taking Part

Widely varying reasons for participation

The most important reason the companies surveyed gave for their participation in EMAS was “continuous improvement of environmental performance” (Fig. 10). About three out of four companies see this as an important reason, while only two percent regard it as unimportant.

Fig. 10:

EMAS: Why do German companies participate in EMAS?



Source: Federal Environmental Agency 1999.

Other important reasons are:

- ☐ Identifying weaknesses and potentials in the use of energy and resources,
- ☐ Motivating employees,
- ☐ Increasing legal certainty,
- ☐ Improving company organisation,
- ☐ Improving corporate image,
- ☐ Detecting and minimising environmental and liability risks,
- ☐ Reducing company-specific environmental impacts.

Cost savings tend to be a secondary reason for participation

Only 47 percent of the companies surveyed take part in EMAS in order to save costs. Indeed, for twelve percent this is an unimportant reason. Even less important from the respondents' point of view are the aspects "increased demands by customers and other demand groups" and "discovering ecological product and process innovations".

Motives are largely independent of employee numbers

Hardly any major differences can be found between the reasons for participation and the number of employees at the site. The biggest differences are found for the aspect of "image improvement": some 68 percent of the "smaller" sites (with up to 99 employees) regard this aspect as important, but only 57 percent of the "larger" sites (with 100 or more employees).

Clearer differences between industries

There are sometimes appreciable differences in the reasons for participation by the various industries. For example, there are in some cases considerable differences between the chemical industry and the food industry (Table 3): especially with regard to the aspect "identifying weaknesses and potentials in the use of energy and resources" the difference of 30 percentage points is very large.

Table 3

EMAS: Reasons for participation by selected industries		
Reason for participation	Chemical industry (answer “important” in percent)	Food industry (answer “important” in percent)
Continuous improvement of environmental performance	68	80
Identifying weaknesses and potentials in the use of energy and resources	55	85
Motivating employees	58	70
Improving corporate image	59	58
Increasing legal certainty	57	63
Improving company organisation	54	62
Detecting and minimising environmental and liability risks	51	61
Reducing company-specific environmental impacts	41	58
Cost savings	35	53
Increased demands by customers or other demand groups	23	16
Discovering ecological product or process innovations	15	18
Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample. Source: Federal Environmental Agency 1999.		

Cost in Terms of Time

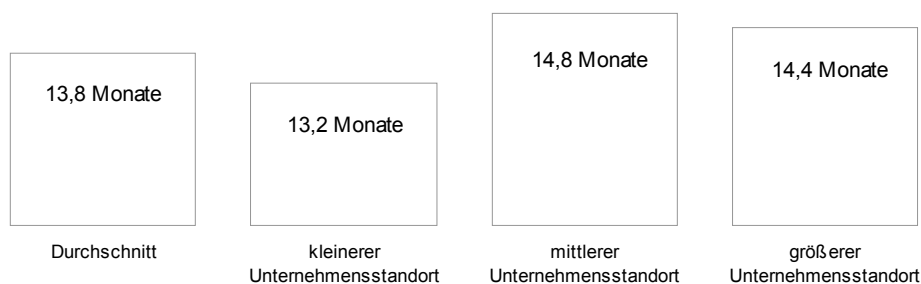
Average of nearly 14 months

The sites surveyed needed an average of about 13.8 months from the decision to take part to registration (Fig. 11). Large and medium sites need considerably more time than smaller sites.

Fig. 11:

EMAS:

How long do sites need from the decision to participate until registration?



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees).

Source: Federal Environmental Agency 1999.

Maximum: four years lead time

The time from decision to registration differs considerably, according to the respondents: it lies between two and 48 months. The four sites that needed only two months were a carpenter's firm, a bakery, a recycling company and a dairy. The two sites that needed 48 months were a newspaper printing works and a manufacturer of plastic products.

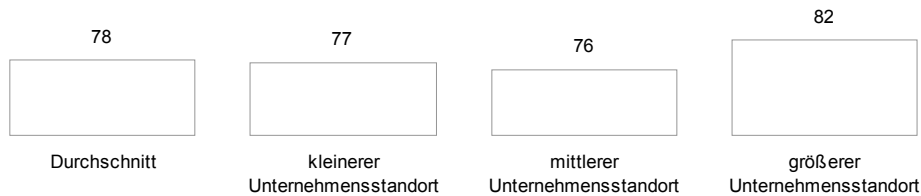
Preparation of environmental management manual very time-consuming

The environmental management manual serves as an "environmental protection guide book for employees". It explains the building blocks of the company's environmental policy, presents the environmental management system, and contains relevant rules and regulations. Nearly 80 percent of the companies surveyed said that it was time-consuming or very time-consuming to prepare (Fig. 12). Large sites in particular attach special importance to this time factor.

Fig. 12:

EMAS: Time factor “Environmental Management Manual”

The preparation of the Environmental Management Manual was time-consuming or very time-consuming (agreement in percent)



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees).

Source: Federal Environmental Agency 1999.

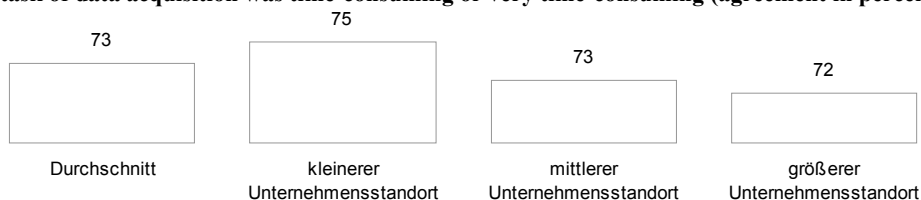
Time-consuming data acquisition

Acquisition of the environment relevant data is also regarded as particularly time-consuming. Nearly three quarters of the companies surveyed said that this was time-consuming or very time-consuming (Fig. 13). Small sites in particular regard data acquisition as disproportionately time-consuming.

Fig. 13:

EMAS: Time factor “Data Acquisition”

The task of data acquisition was time-consuming or very time-consuming (agreement in percent)



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees).

Source: Federal Environmental Agency 1999.

Other time factors

In the context of work made necessary by the establishment and development of EMAS, the companies surveyed also see the following as time consuming or very time consuming (figures in brackets show percentage in agreement):

- ☐ Preparing the environmental statement (62 percent),
- ☐ Training and informing employees (44 percent),
- ☐ Compiling the relevant legal regulations (37 percent),
- ☐ Assessing environmental impacts (36 percent).

Cost in Terms of Manpower

Average of one man year

The sites surveyed estimate that personnel costs for participation in EMAS average about twelve man months. The spectrum is vast: It ranges from one to 250 man months. The correlation between the size of the site and the human resources necessary for participation in EMAS is clear: whereas a small site with fewer than 100 employees estimates an average of seven man months, the information from the companies surveyed indicates that a site with 500 or more employees needs an average of nearly 20 man months.

Additional employees taken on?

In reply to the question "Did you take on additional employees?" about one in four respondents replied "Yes". The size of the site is virtually immaterial for this question.

Extrapolation: Human resources needed for the start-up phase at least DM 167 million

The open-ended question "In what functions/departments was the cost highest?" received the following answers:

- ☐ Environmental protection/environmental officer (28 percent),
- ☐ Production/manufacture/engineering (26 percent),
- ☐ Company management/management (10 percent),
- ☐ Quality management/quality & environmental protection (9 percent),
- ☐ Environmental protection and safety (5 percent),
- ☐ Environmental management officer (4 percent),
- ☐ Safety/safety & environmental protection (2 percent),
- ☐ Miscellaneous (16 percent).

On the basis of an environmental officer's average gross annual earnings of around DM 80,000, the lowest limit for personnel expenses for the 2085 industrial sites registered by the end of June 1999 is estimated to be at least DM 167 million.

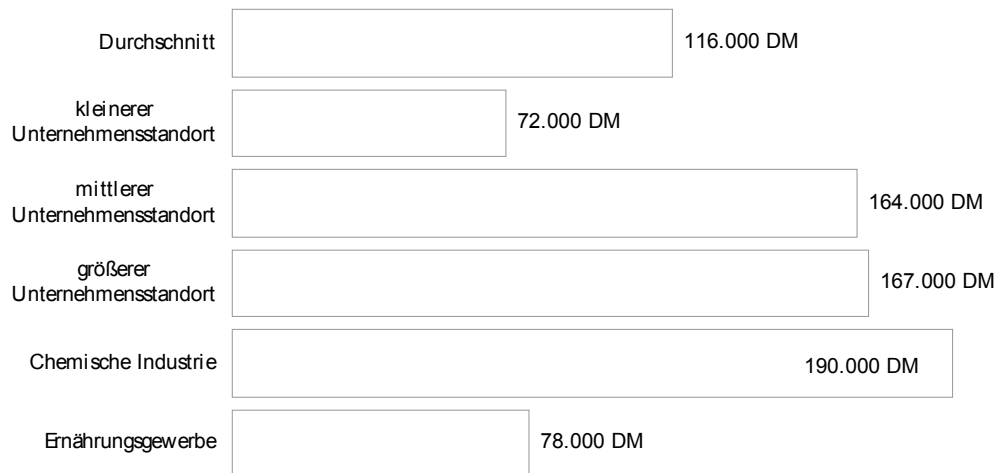
Financial Cost

Average of DM 116,000

The sites surveyed estimate that the financial cost of participation in EMAS averages about DM 116,000 (Fig. 14). The spectrum is considerable: It runs from DM 5,000 to DM 1,350,000. As expected, there is a clear correlation between size of site and financial cost: Expenditure also increases with the number of employees.

Fig. 14:

EMAS: How high is the estimated financial cost?



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

Extrapolation: Financial cost at least DM 242 million in the start-up phase

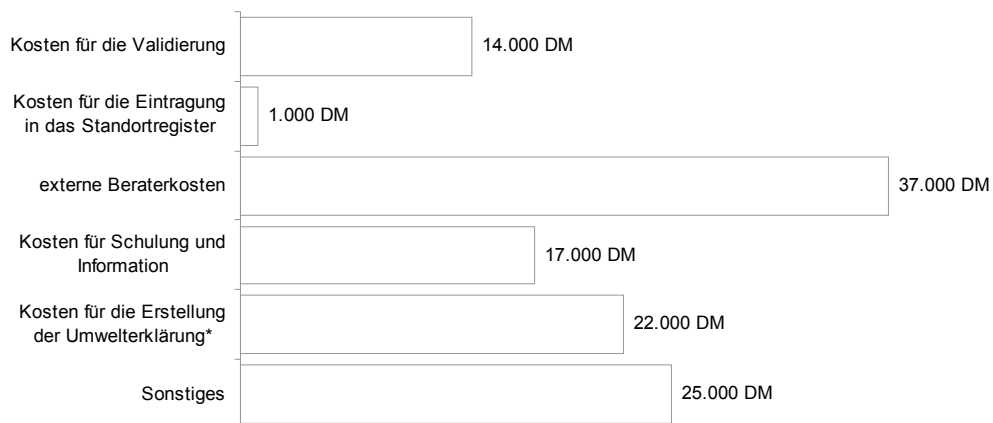
This extrapolation is subject to the following reservation: some 40 percent of respondents said that the cost was very difficult to quantify – so the information on costs can be no more than a very rough estimate. The average financial cost per employee is DM 240 per year. The total financial cost incurred by German companies as a result of their voluntary participation in EMAS from its entry into force until the end of June 1999 is thus estimated to be in the region of DM 242 million. This figure does not include the minimum personnel expenses of around DM 167 million (see above).

External consultancy costs are around DM 37,000

According to the respondents, the cost of external consultants is the most important item under the heading of financial cost (Fig. 15). It amounts to nearly DM 80 per employee. This is followed by the cost of preparing the environmental statement (DM 45), the cost of training and informing employees (DM 37), the cost of validation (DM 30) and the cost of entry in the register of sites (DM 2).

Fig. 15:

EMAS: What cost items make up the estimated financial cost?



* Rough estimate on the basis of information for 52 sites.
Source: Federal Environmental Agency 1999.

Cost of maintaining system difficult to forecast

Some 55 percent of the companies surveyed say that they are scarcely able to forecast the average annual cost of continued participation in EMAS. Those who attempted to quantify the costs put them at an average of DM 31,000 per annum, or over DM 60 per employee.

Cost-Benefit Ratio

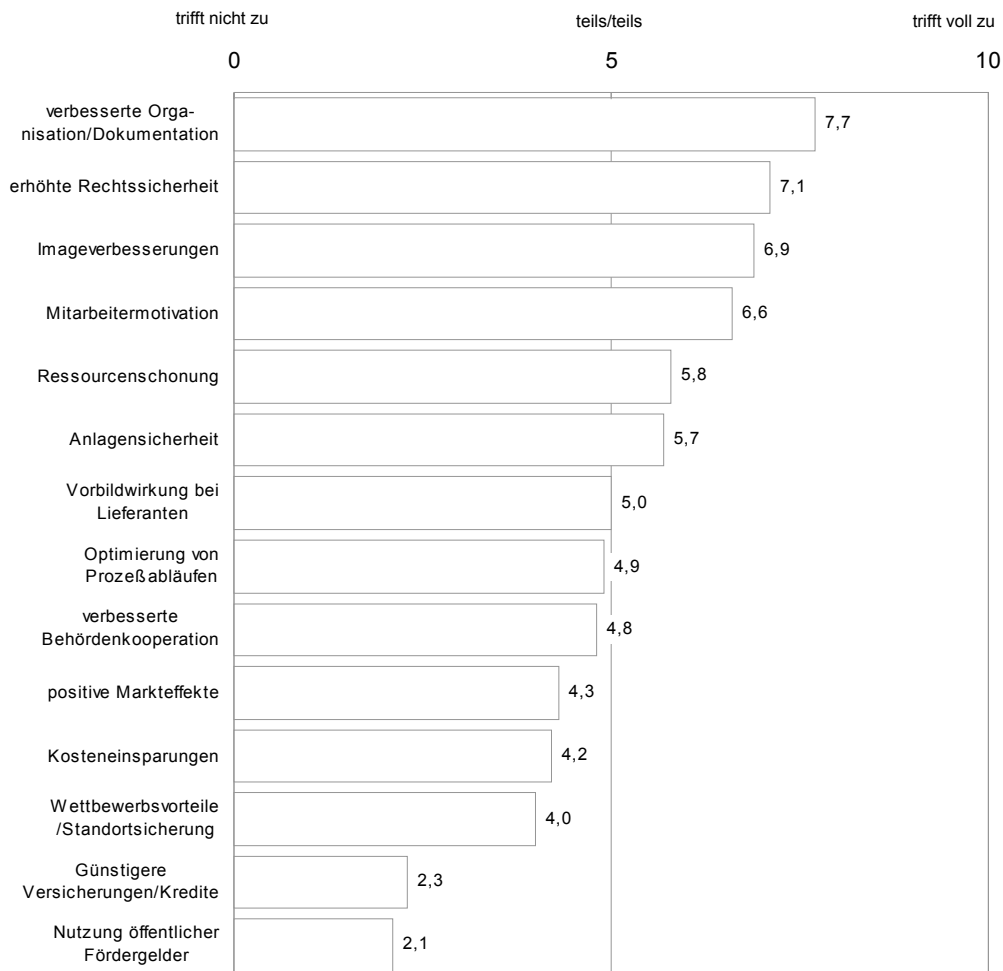
Broad spectrum of benefits

At the top of the list of benefits was “improved organisation and documentation” (Fig. 16). Over 80 percent of the companies surveyed stated that this was (fully) applicable. Well over half the registered sites succeeded in achieving improvements in legal certainty, corporate image and employee motivation.

Fig. 16:

EMAS:

What beneficial effects did German companies gain from participation in the European eco management scheme?



Source: Federal Environmental Agency 1999.

In mid field among the beneficial effects (“more or less”) are

- ☐ Sparing utilisation of resources,
- ☐ Plant safety,
- ☐ Setting an example to suppliers,
- ☐ Optimising process flows,
- ☐ Improved cooperation with authorities,
- ☐ Positive market effects,
- ☐ Cost savings,
- ☐ Competitive advantages/safeguarding site future.

At the tail end of the list (“scarcely applicable”) came “cheaper insurance/loans” and “use of public development funds”.

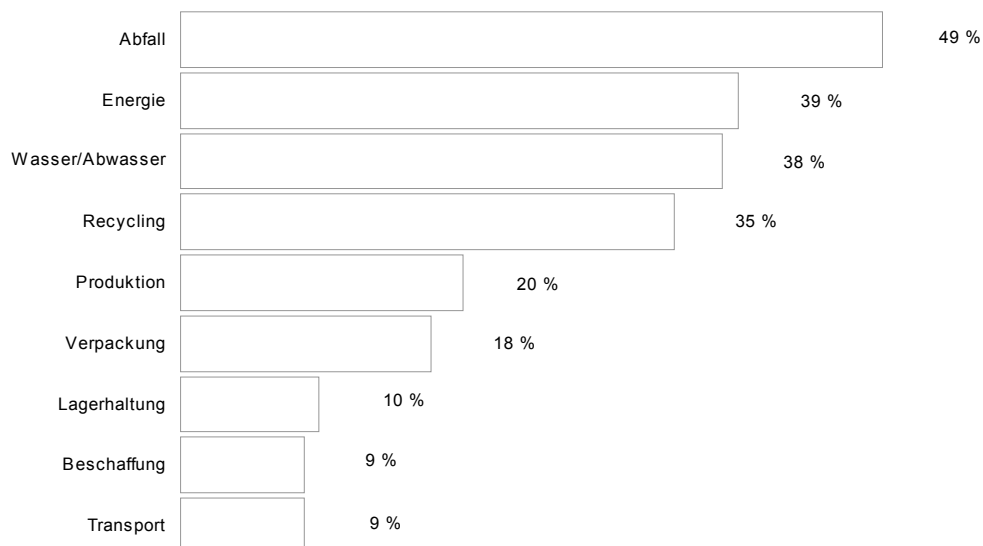
Cost savings especially in waste sector

Around half the companies surveyed say (“(fully) applicable”) that they were able to achieve cost savings in the waste sector through their participation in EMAS (Fig. 17). For nearly 40 percent of the companies this also applied to the “energy” and “water/wastewater” sectors.

Fig. 17:

EMAS:

In what areas did German companies make cost savings as a result of participating (“(fully) applicable”)?



Source: Federal Environmental Agency 1999.

Cost savings achieved

About 75 percent of the companies surveyed said it was difficult to quote an exact figure for the costs saved. Those companies that did quantify their savings put them at an average of DM 140,000, or DM 330 per employee. The total quantifiable savings – noted in the context of the survey – are in the region of DM 27 million.

Assessment of cost-benefit ratio

The future success of EMAS is closely linked to the question of whether participation – which is after all entirely voluntary – ultimately pays off for the company. Twenty-nine percent of the companies surveyed were unable as yet to assess the cost-benefit ratio of participation in the EC environmental scheme. The remaining 71 percent see the cost-benefit ratio as follows:

- ☐ 25 percent positive,
- ☐ 17 percent neutral, and
- ☐ 29 percent negative.

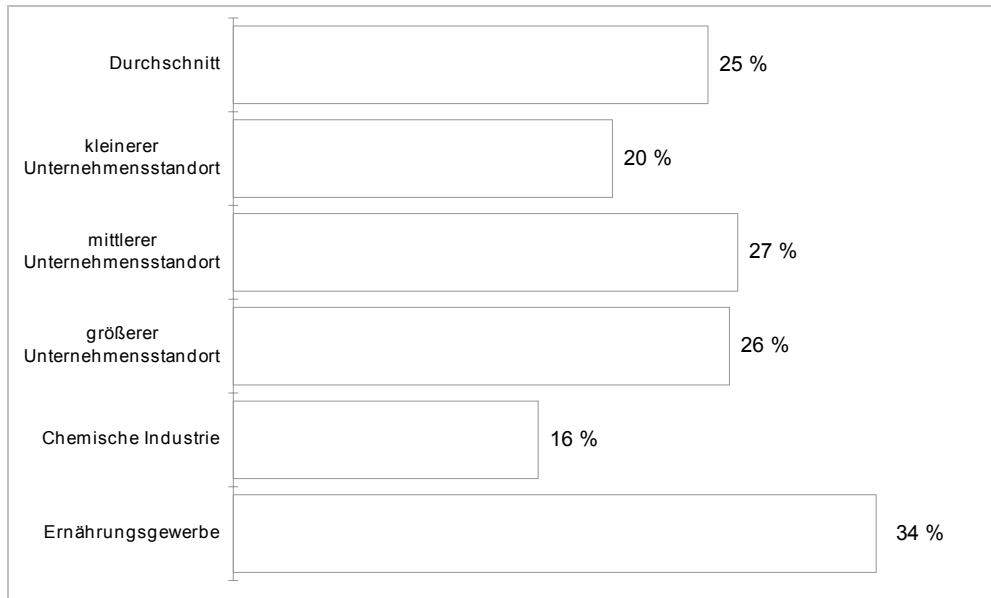
The respondents at small sites gave the cost-benefit ratio not only disproportionately low positive ratings, but also disproportionately low negative ratings (Fig. 18). Marked industry-specific differences can also be observed: of the companies surveyed in the chemical industry, only about 16 percent saw a “positive cost-benefit ratio”. Among the respondents in the food industry, by contrast, the figure was as high as 34 percent.

In reply to the question “Do you believe the cost-benefit ratio will improve in the second audit procedure?”, 27 answered “Yes”, 35 percent “No” and 38 percent “Difficult to say”. The companies in the food industry in particular are more pessimistic than most about this aspect.

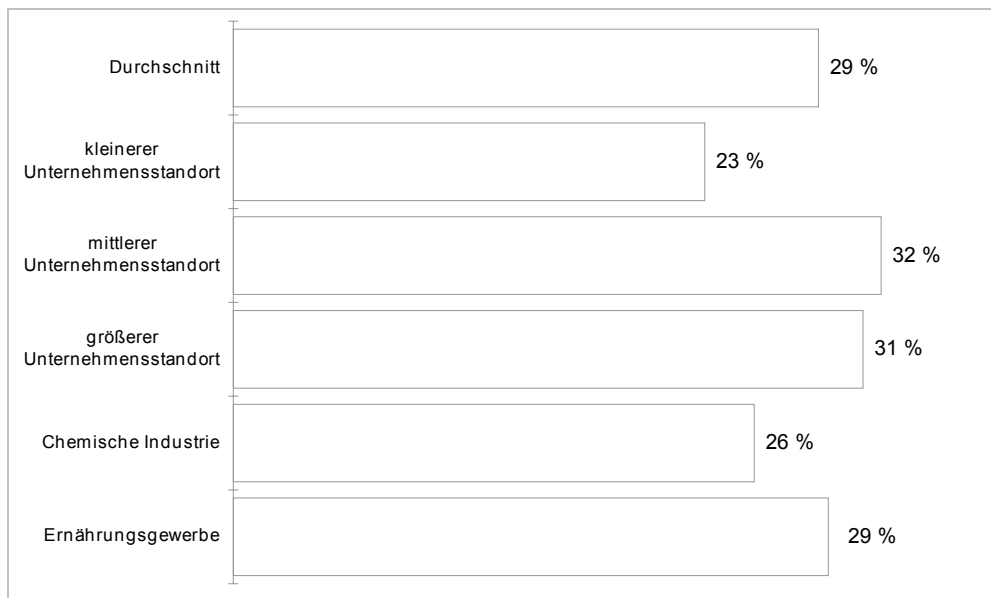
Fig. 18:

EMAS: How do participants rate the cost-benefit ratio?

“Positive”



“Negative”



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

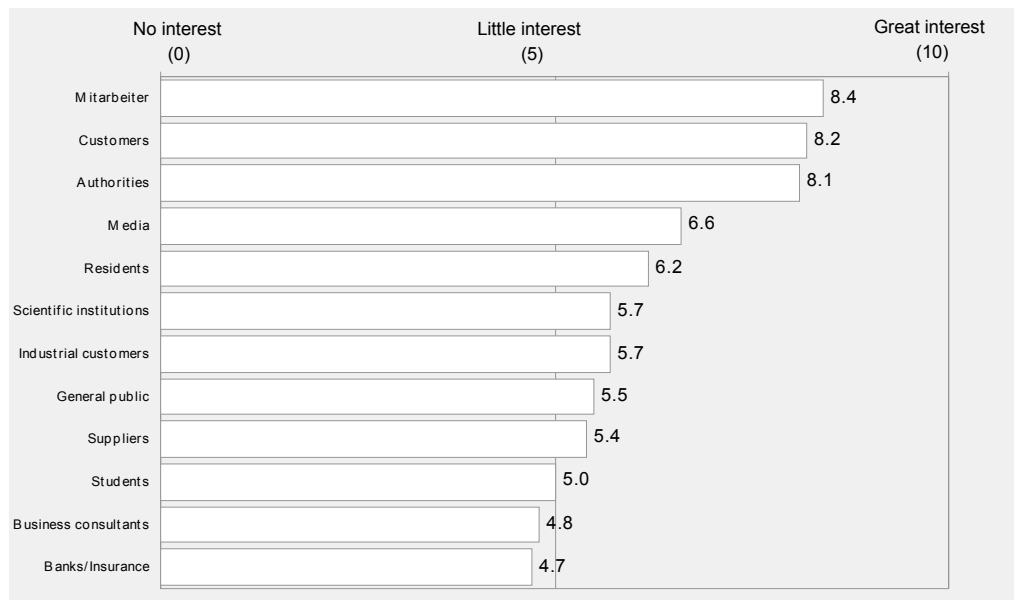
Environmental Statement: Response and Presentation

Hoped-for interest

The environmental statement to be drawn up for the site is a hallmark of EMAS. The idea – pursued with the publication of an environmental statement – is the notion that only an open dialogue with the public about the “whether” and “how” of company environmental protection can ensure the necessary acceptance and the necessary trust in the company. In which pressure groups did the participants hope to encounter great interest in their environmental statements? In particular, they would like to have reached their own employees and customers, and the public authorities (Fig. 19). They have little interest in target groups such as the general public, suppliers and students. At the bottom of their list of preferences come business consultants and banks and insurance companies.

Fig. 19:

EMAS: What target groups would the companies most like to have reached with their environmental statement?

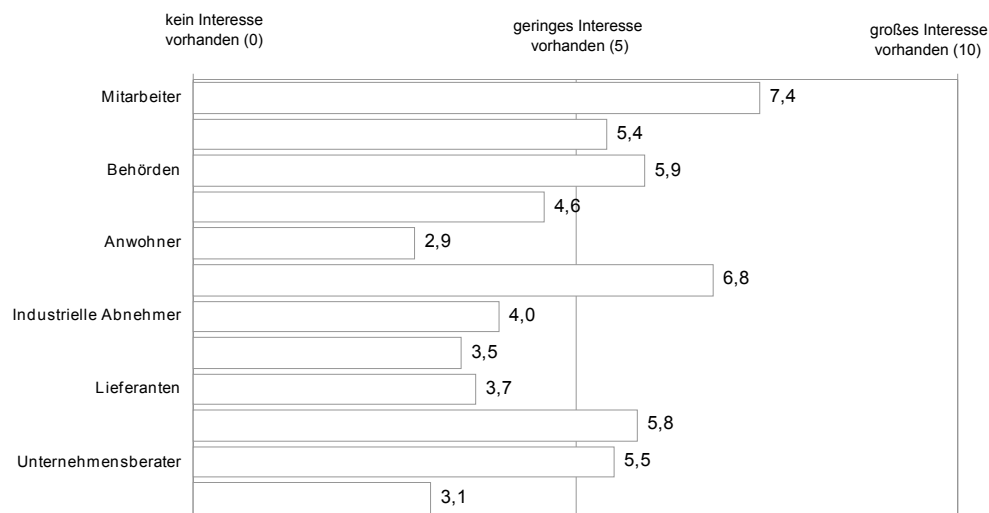


Source: Federal Environmental Agency 1999.

Actual interest

And what does the actual response to environmental statements look like (Fig. 20)? According to the companies surveyed, the groups displaying the most interest in the environmental statements are their own employees, scientific institutions and – to a lesser extent – authorities and students. Virtually no interest is displayed in particular by local residents, by banks and insurance companies, the general public and suppliers.

Fig. 20:

EMAS:**How do the companies rate the actual response to their environmental statements?**

Source: Federal Environmental Agency 1999.

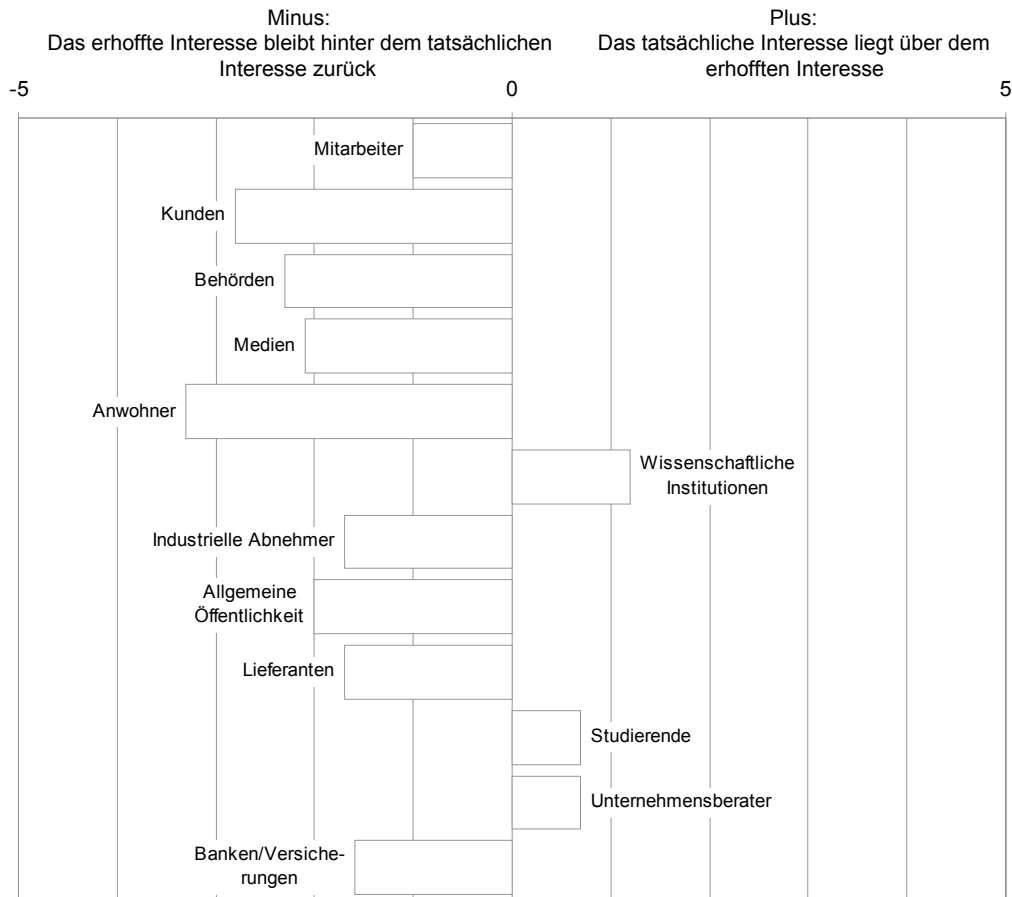
Expectations rarely satisfied

What then does the “wish-reality balance” for environmental statements look like (Fig. 21)? The interest of local residents, customers, authorities, media and the general public falls well short of the companies’ expectations. Equally disappointing from the respondents’ point of view was the interest displayed by industrial customers, banks and insurance companies, suppliers and employees. A contrasting response is found among scientific institutions, students and business consultants. Here the response was in fact much stronger than the companies expected.

Fig. 21:

EMAS:

How big are the differences between hoped-for and actual interest in the environmental statements?



Source: Federal Environmental Agency 1999.

Readiness for dialogue particularly high in the chemical industry

Nearly two out of three environmental statements include an explicit request to the pressure groups to get to grips with the contents. They also name contacts for feedback. In the chemical industry the figure is particularly high at 72 percent. In the food industry, by contrast, it is relatively low at 53 percent.

Environmental statements are often lavish productions

Nearly 17 percent of the companies who took part in the Federal Environmental Agency's survey did not provide the Agency with an environmental statement despite its explicit request to do so. The remainder sent the Agency one or more copies. The majority of the environmental statements, which average around 22 pages, are (sometimes very) lavish productions.

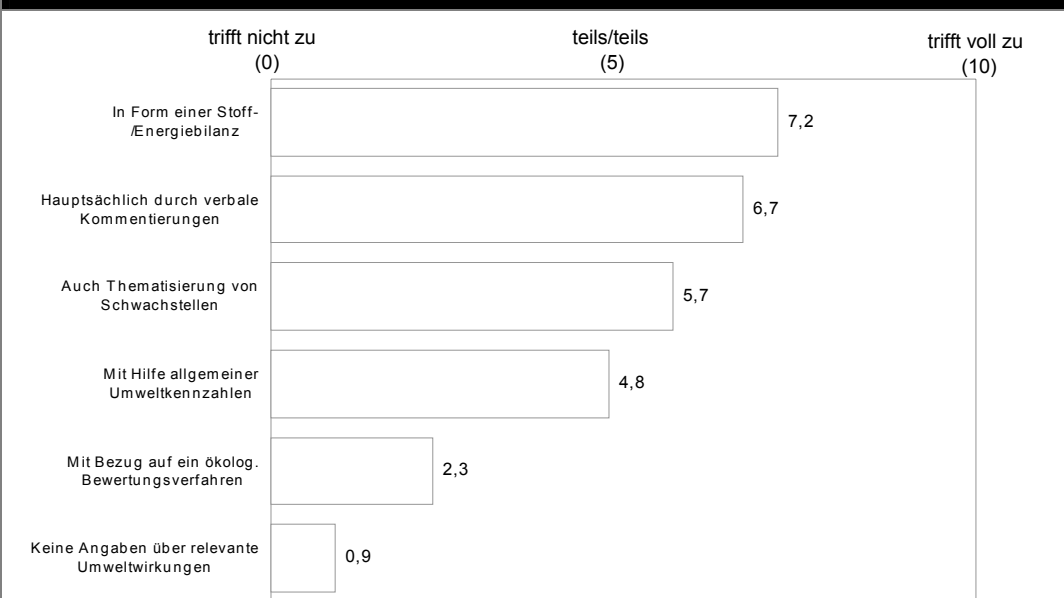
Corporate environmental indicators still not standard

The quality of the environmental statements varies greatly (Fig. 22): on the one hand, as the companies surveyed themselves admitted, there are at least 40 environmental statements that contain no information whatever on relevant environmental effects. On the other hand, there are well over 100 sites today that actually document environmental indicators which are related to an ecological evaluation procedure. The majority of environmental statements contain a systematic comparison in the form of a substance and energy balance. About 70 percent of the companies surveyed stated that this was (fully) applicable.

Fig. 22:

EMAS:

How are important environmental issues presented in the environmental statement?



Source: Federal Environmental Agency 1999.

Assessment of our Guidance Publications

Publications by Federal Environment Ministry and Federal Environmental Agency

To provide assistance with questions relating to environmentally oriented business management, the Federal Environment Ministry and the Federal Environmental Agency have in recent years issued a number of publications, including two manuals and a guide:

- ☐ Handbuch Umweltcontrolling (*Environmental Controlling Manual*) (Munich 1995),
- ☐ Handbuch Umweltkostenrechnung (*Environmental Cost Accounting Manual*) (Munich 1996),
- ☐ Leitfaden Betriebliche Umweltkennzahlen (*Guide to Corporate Environmental Indicators*) (Berlin 1997).

Potential for practically oriented guides by no means exhausted

The Guide to Corporate Environmental Indicators, at 50 pages a very concise and very practically oriented publication, is obtainable free of charge from the reply service of the Federal Environmental Agency, and is available in an English version as well. It is only to be found at one out of three sites. The users questioned rated it as follows:

- ☐ very useful (29 percent),
- ☐ helpful (64 percent),
- ☐ useless (7 percent).

The 700-page Environmental Controlling Manual (Textbook of the Year 1995 in the field of Environmental Management), which is obtainable through booksellers, is only to be found at one out of four sites. The users questioned rated it as follows:

- ☐ very useful (24 percent),
- ☐ helpful (67 percent),
- ☐ useless (9 percent).

Environmental cost accounting evidently not very widespread

The 250-page Environmental Cost Accounting Manual, which is obtainable through booksellers, takes third place in the “presence

ratings”: It is to be found at only 15 percent of the sites that took part in the survey. However, as many as 90 percent of the users questioned rate it very useful (15 percent) or helpful (85 percent).

Below-average penetration of small sites

The guidance publications from the Federal Environment Ministry and the Federal Environmental Agency are intended to address small and medium enterprises in particular. The survey shows, however, that penetration of this particular target group is below average (Table 4).

Table 4												
Whom do the guides reach and how are they rated?												
Size of site	Guide to Operational Environmental Indicators (percent)				Environmental Controlling Manual (percent)				Environmental Cost Accounting Manual (percent)			
	present	very useful	helpful	useless	present	very useful	helpful	useless	present	very useful	helpful	useless
Average	33	29	64	7	24	24	67	9	15	15	85	0
Up to 99 employees	25	28	71	1	13	33	60	7	8	15	85	0
100 to 499 employees	46	30	62	8	35	25	67	8	23	14	86	0
500 + employees	49	27	65	8	38	23	69	8	26	14	86	0

Source: Federal Environmental Agency 1999.

Experience with Environmental Verifiers

Good marks

The success of EMAS is closely connected with the quality of the work of the environmental verifiers. In Germany alone there are today some 200 individual environmental verifiers or environmental verification organisations whose distinguishing features are, under the EMAS Act, supposed to be “independence”, “neutrality” and “reliability”. For these three criteria the environmental verifiers received good to excellent ratings from the companies surveyed: around 68 percent of the respondents rated them “very good” and about 27 percent “good”. For the following criteria the environmental verifiers received lower – but still relatively good – marks:

- ☐ Ecological knowledge (“very good/good”: 94 percent),
- ☐ Depth of audit (“very good/good”: 94 percent),
- ☐ Density of audit (“very good/good”: 91 percent),
- ☐ Legal knowledge (“very good/good”: 90 percent),
- ☐ Organisational knowledge (“very good/good”: 89 percent),
- ☐ Technical knowledge (“very good/good”: 87 percent),
- ☐ Knowledge of relevant industry (“very good/good”: 77 percent).

“Standards set very high”

The standards required by the environmental verifiers are described by the majority of companies surveyed as “very high”. This category was selected by

- ☐ 59 percent for the criterion “verification of compliance with statutory environmental provisions”,
- ☐ 52 percent for the criterion “verification of origin, details and reliability of the relevant data”,
- ☐ 38 percent for the criterion “assessment of environmental impacts”, and
- ☐ 33 percent for the criterion “examination of the data acquisition assessment procedure”.

Non-financial Support

At national and regional level alone there are numerous forms of assistance of a financial and non-financial nature that are intended to make it easier to enter EMAS. The target groups are mostly small and medium enterprises. However, chambers of commerce and industrial associations also provide their members with a very broad spectrum of consulting facilities that are designed specifically for “new entrants”.

Do the companies that are already participating successfully in the European Community scheme want further support in this field? And if so, what specific form should the intangible assistance from chambers and associations take?

Great interest in information about current environmental legislation

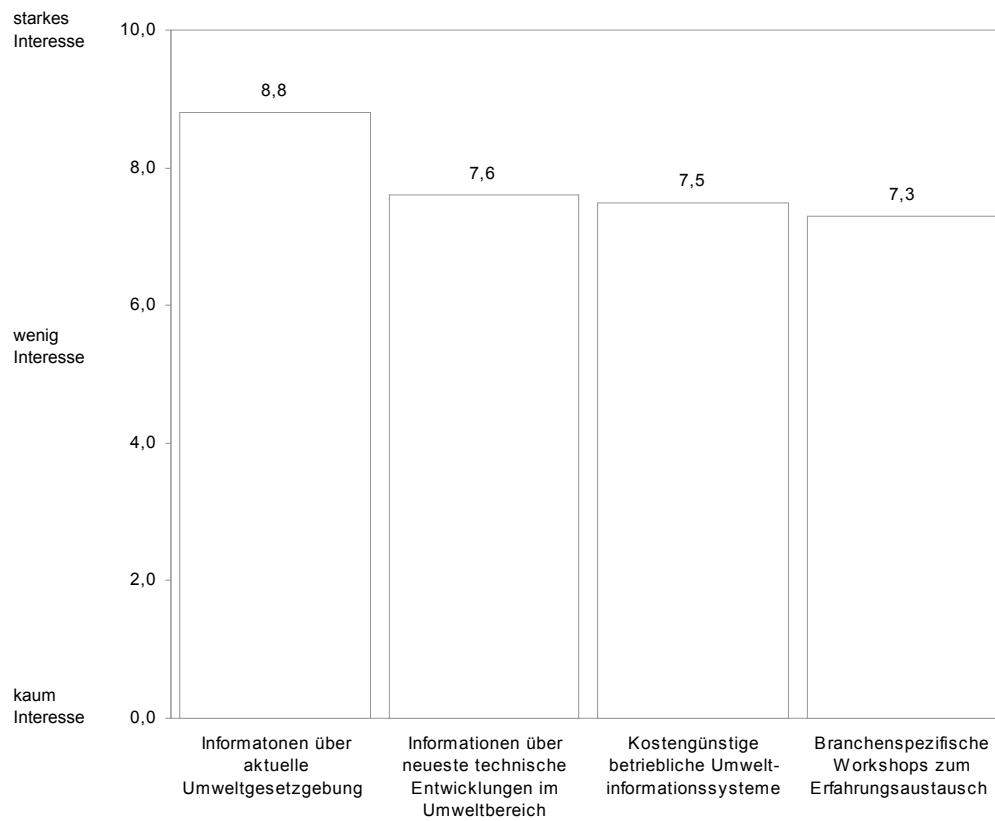
Even after the first validation of their sites, the companies surveyed say they still have a considerable interest in non-financial support from their chambers and associations (Fig. 23). Their greatest wish is for information about current environmental legislation: some 76 percent of the respondents indicated great interest here. Well over half are also interested in information about the latest technological developments in the environmental sector and in the provision of low-cost operational environmental information systems. About half the companies surveyed would very much like to have industry-specific workshops for sharing experience.

Other wishes

More than 70 respondents expressed their wishes in writing. The following is a condensed list of the results:

- ☐ Benchmarking as orientation guide,
- ☐ Assistance with public relations work,
- ☐ Assistance with auditing process,
- ☐ Advice on training employees,
- ☐ Aids to compliance with legislation,
- ☐ Support for cooperation with authorities,
- ☐ Computer programs and advice on eco balances.

Fig. 23:

EMAS:**How great is interest in further non-financial support from chambers and associations?**

Source: Federal Environmental Agency 1999.

EMAS: Requests for Improvements

In first place: More/better information for the public

When it comes to the prospects for the future of EMAS, the question of improvements that the companies surveyed would like to see is a central issue. Among ten suggestions that were put to the companies, better information of the public with regard to the significance and relevance of the EMAS system was clearly given top priority (Fig. 24). Particularly in the field of steel and light-metal construction, this aspect is considered especially important.

Fig. 24:

EMAS:

Suggested improvement: "Better information for public concerning the importance and relevance of EMAS"

Percentage of respondents who (fully) agree with the statement



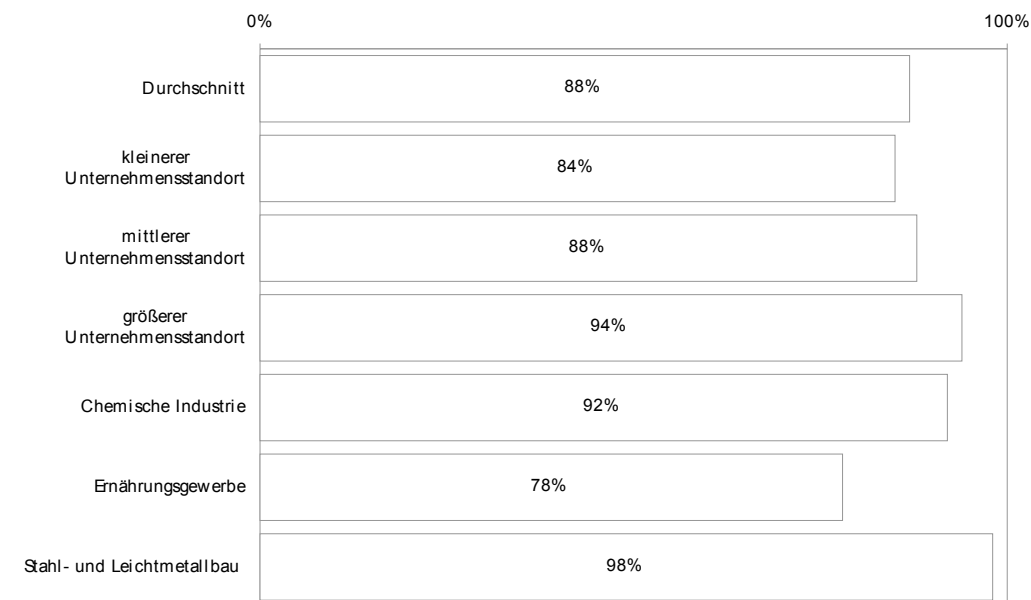
Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

In second place: More constructive attitude by authorities

Second on the list of suggested improvements was “a more constructive attitude and improved recognition by the authorities, including the exercise of discretion” (Fig. 25). About 88 percent of the companies surveyed stated that this was (fully) applicable. The bigger the site, the more marked is the desire for improvement.

Fig. 25:

EMAS:**Suggested improvement: “More constructive attitude and better recognition by the authorities including exercise of discretion”****Percentage of respondents who (fully) agree with the statement**

Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

In third place: Reduction of administrative burden

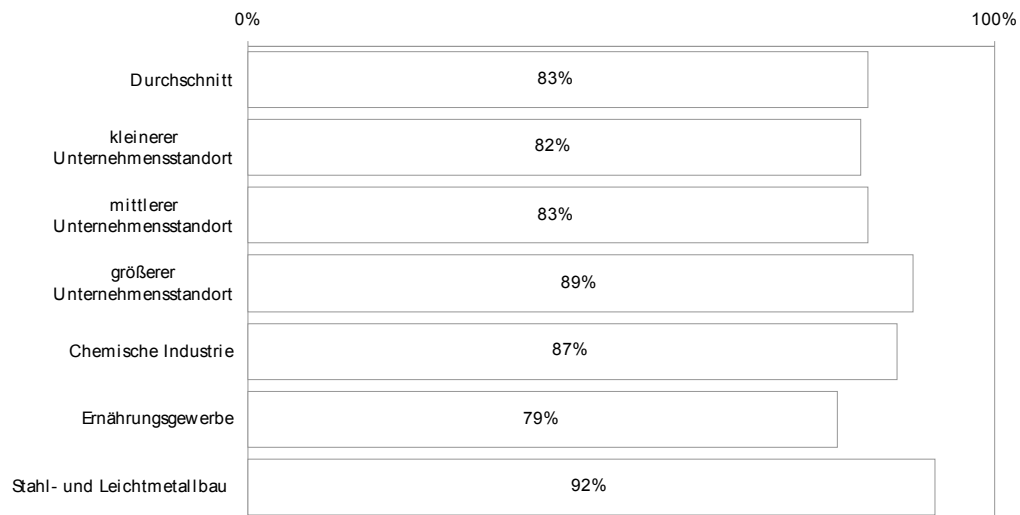
The aspect of “less administrative work by reducing legal measuring and reporting requirements” took third place (Fig. 26). About 83 percent of the companies surveyed stated that this was (fully) applicable. Here too it is noticeable that the bigger the site, the more marked is the desire for improvement.

Fig. 26:

EMAS:

Suggested improvement: “Less administrative work by reducing legal measuring and reporting requirements”

Percentage of respondents who (fully) agree with the statement



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

Further suggestions for improvements

The following suggested improvements took 4th to 10th place in the rankings:

- ☐ Improving the structure and clarity of the Regulation (“I (fully) agree”: 77 percent),
- ☐ Preferential treatment for public contracts (“I (fully) agree”: 67 percent),
- ☐ More practical instructions and standards for assessing environmental impact (“I (fully) agree”: 57 percent),
- ☐ Regular information on state environmental protection objectives and priorities as orientation guide (“I (fully) agree”: 47 percent),
- ☐ Development of generally recognised principles for the preparation of environmental statements (“I (fully) agree”: 37 percent),
- ☐ More attractive design of “statement of participation” (“I (fully) agree”: 37 percent),
- ☐ Link between validation and substantial requirements (“I (fully) agree”: 37 percent).

Open-ended question

The respondents were also given the opportunity to give completely free answers. More than 80 of the companies surveyed replied to the open-ended question: "What other aspects ought to be improved in EMAS ?" The following is a condensed selection of their ideas:

- ☐ *Information of public authority staff*
- ☐ *Improvements in opportunities for publicity*
- ☐ *Tax benefits for validated companies*
- ☐ *Lower costs (especially for verifier and chamber)*
- ☐ *Special requirements for small and medium enterprises*
- ☐ *Inclusion of additional target groups*
- ☐ *Modification of required standards depending on industry and size of operation*
- ☐ *Environmental protection should be taught in schools as (possibly optional) subject (one possible form would be inclusion in "normal" lessons with embodiment in outline plans)*
- ☐ *Relativation of the continuous improvement approach*
- ☐ *Clear definitions (e.g. "Umweltbetriebsprüfung" means the same as "audit")*
- ☐ *Companies that voluntarily implement EMAS must not be burdened with the penalty of an ICC registration fee*
- ☐ *Eco Audit and ISO 14001 must be brought together ("We cannot afford to have two systems in industry")*
- ☐ *Companies cannot afford to have more than one management system (PRACTICAL ASPECT!)*
- ☐ *Less bureaucracy in validation; verifier should be less afraid of giving the impression of producing unduly favourable reports*
- ☐ *Abolition of "simplified environmental statement"*
- ☐ *More pressure to make products more ecological*
- ☐ *Parallelisation of environmental/quality management, at least for companies with up to 50 employees*
- ☐ *Bring definition of "site" into line with ISO 14001*
- ☐ *Integration of occupational safety/health is essential*
- ☐ *Much less bureaucracy and red tape*
- ☐ *Improved training specifically for small and medium enterprises*
- ☐ *Simpler documentation "Combination QSE" (Quality – Safety – Environment)*

EMAS and/or ISO 14001?

"Revalidation" every three years required

The "eco audit cycle" is repeated every three years: within this period the registered sites must have a "revalidation" carried out by an independent environmental verifier of their choice. Otherwise the sites will be deleted from the register kept by the competent chamber of industry and commerce.

Relatively large percentage intend to continue

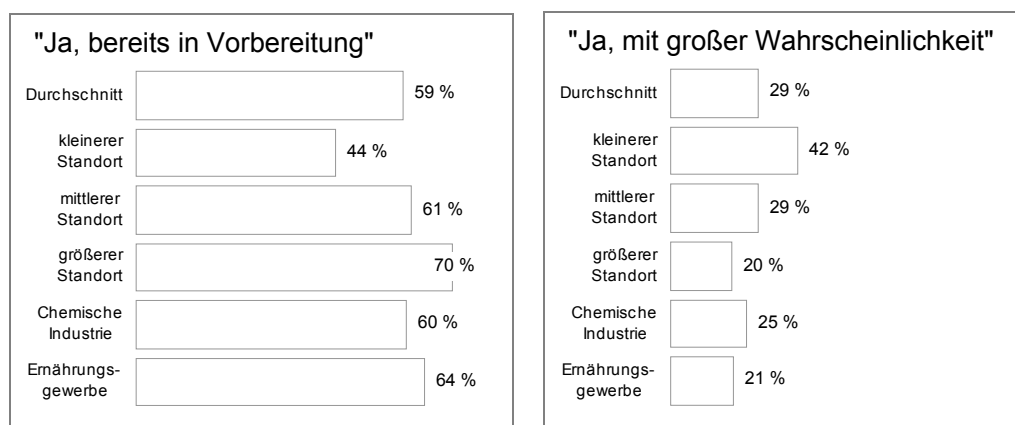
In response to the key question "Does your company intend to continue participating in EMAS?", the answers were as follows (Fig. 27):

- ☐ "Yes, already in progress" (59 percent),
- ☐ "Yes, very probably" (29 percent).

Here it is particularly noticeable that a much larger proportion of the bigger industrial sites were already tackling the preparatory work for "revalidation" than the smaller sites.

Fig. 27:

EMAS: Will the German companies remain faithful to EMAS?



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

Hardly any "drop-outs"

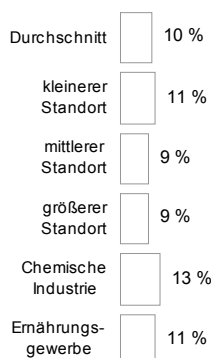
It appears that only a relatively small number of German "Emas companies" intend to turn their back on the system. In about ten percent

of the companies surveyed the process of internal consultation is not yet finished, and only about two percent of the respondents answered with a categorical “No” (Fig. 28):

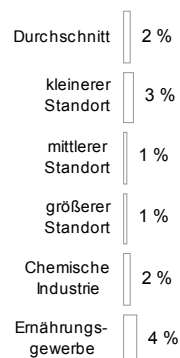
Fig. 28:

EMAS: Will the German companies remain faithful to Emas?

"Eventuell, interne Abstimmung noch nicht abgeschlossen"



"Nein"



Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

EMAS trump card: "Continuous improvement of environmental performance"

What then are the reasons why German companies want to continue participating in EMAS? In the first instance it is the continuous improvement of environmental performance (Fig. 29). Nearly 90 percent of the companies surveyed say that this criterion (fully) applies to them. In addition, the following features were given particular emphasis by the companies as reasons for continued participation in EMAS.

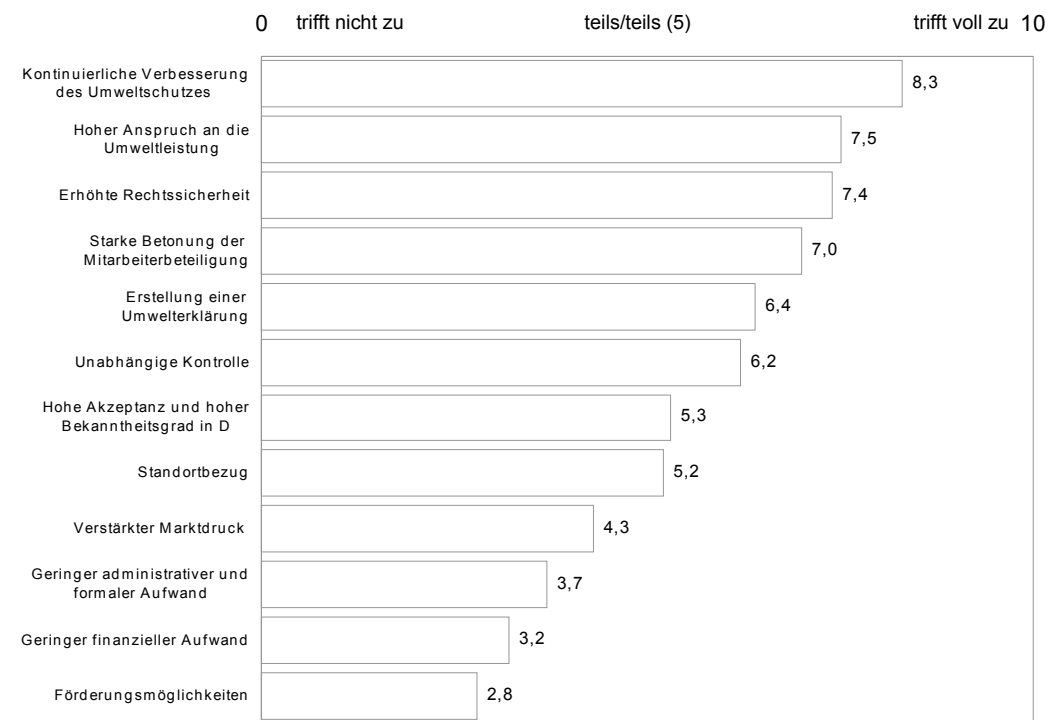
- ☐ High standard of environmental performance,
- ☐ increased legal certainty,
- ☐ strong emphasis on employee participation,

- ☐ preparation of an environmental statement,
- ☐ independent control.

Fig. 29:

EMAS:

What are the reasons for continued participation?



Source: Federal Environmental Agency 1999.

EMAS and ISO 14001: many are taking a dual approach

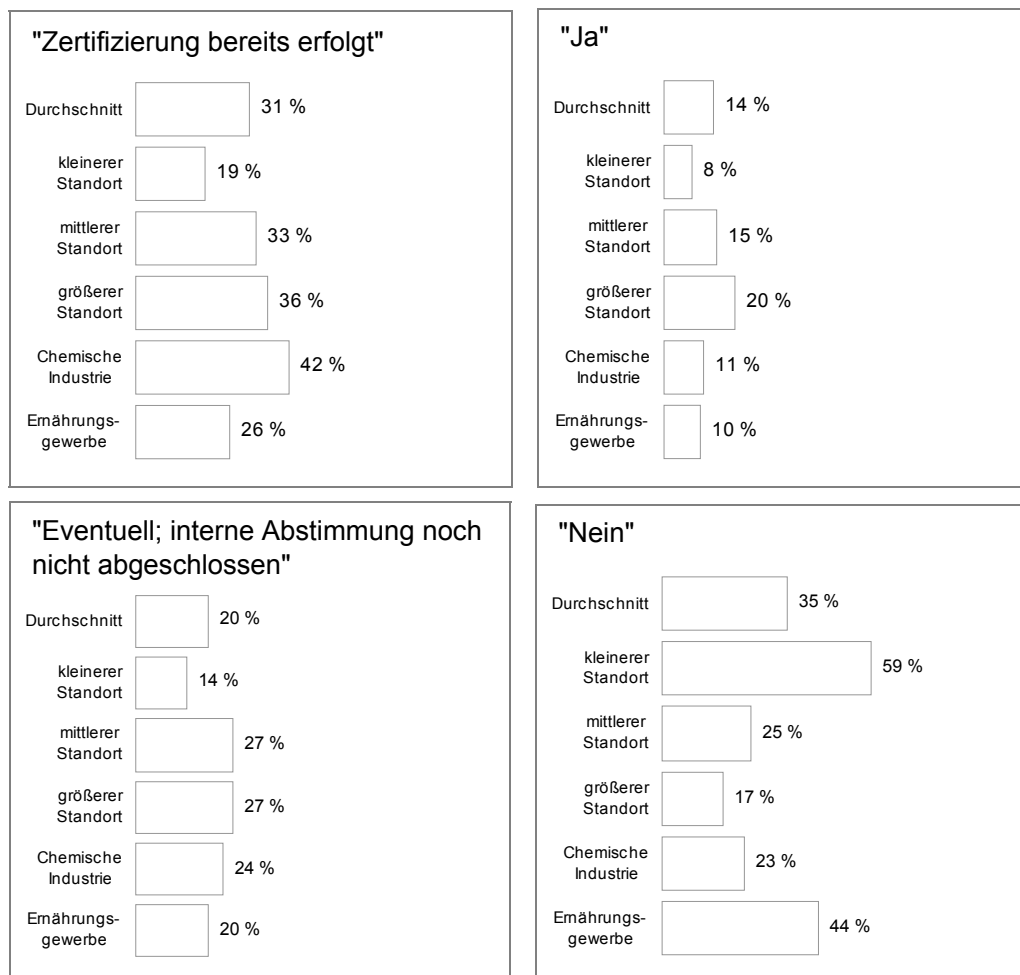
The question of whether the companies were also planning certification under ISO 14001 was answered as follows (Fig. 30):

- ☐ Nearly 31 percent already have this additional certification.
- ☐ About 14 percent are planning this additional certification.
- ☐ About 20 percent have not yet decided, because the internal consultation process is not yet completed.
- ☐ About 35 percent have no plans for additional certification.

Here too there are clear correlations with the size of the site: certification has already been obtained by only about 19 percent of small companies. The corresponding figure for the large companies is almost twice as high, at around 36 percent. Even more marked is the correlation in the answer category "No". This answer is about four times as frequent from respondents with small sites as from companies with large sites.

Fig. 30:

EMAS and/or ISO 14001: Are German companies planning additional certification under ISO 14001?



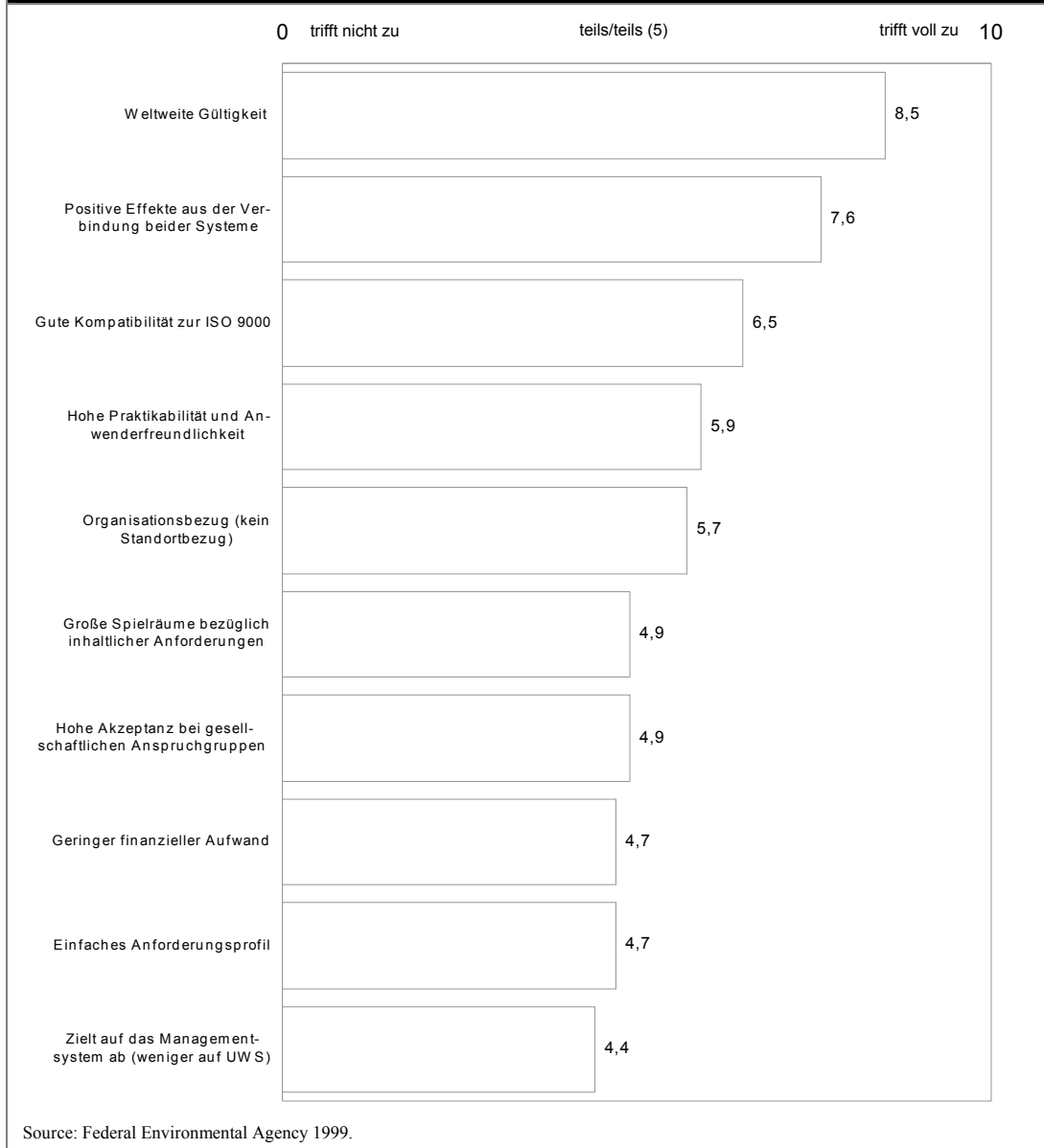
Note: small site (1 to 99 employees), medium site (100 to 499 employees), large site (500 or more employees). Note on choice of industries: The chemical industry and the food industry are, apart from the steel and light-metal construction industry with a share of ten percent, by far the most strongly represented industries in the universe/sample.

Source: Federal Environmental Agency 1999.

ISO 14001 trump card: Valid worldwide

In response to the question concerning reasons for this additional certification under ISO 14001, the criterion of “worldwide validity” proved to be of overriding importance (Fig. 31). There was also widespread agreement with the argument that positive effects can be achieved by combining ISO 14001 and EMAS.

Fig. 31:

ISO 14001:**What are the reasons for additional certification?**

Reasons for rejecting additional participation in the ISO 14001 system

About 100 respondents answered the open-ended question about reasons for deciding not to take part in the ISO 14001 system as well. The following is a condensed selection of their ideas:

- ☐ *Collecting certificates doesn't get you anywhere. EMAS has more PR impact than ISO 14001. Environmental statement is more important.*
- ☐ *ISO 14001 should be integrated in EMAS.*
- ☐ *No involvement of public; no environmental statement; verifiers come from outside the industry; ISO 14001 not high enough calibre; merely a standard, not a law!*
- ☐ *ISO 9001 is quite adequate for us.*
- ☐ *Requirements of the EMAS Regulation with regard to reducing environmental impacts are stricter, and this is a good thing.*
- ☐ *EMAS through environmental statement and binding objectives = greater internal pressure to carry on and greater opportunities for public relations work.*
- ☐ *Why spend money on audits with the same content?*
- ☐ *Await developments, wait for amalgamation of EM-QM, link between ISO 14001 and EMAS.*
- ☐ *We meet the requirements, but the market simply doesn't demand it. What counts is the functioning system and not the certificate.*
- ☐ *EMAS enjoys the highest international recognition – so no need for ISO.*
- ☐ *The aim is continuous improvement of environmental performance. The aim is not receiving a certificate. An environmental management system under EMAS is much more demanding and offers more constructive design scope than ISO 14001. EMAS also focuses more on the idea of the continuous improvement process. Relationship to site is established in EMAS. Why two certificates? That won't make the environment (????) any better.*

- ☐ *Additional cost: revision of manual, annual audits by technical inspection authorities etc.*
- ☐ *For completeness sake; EMAS preferred because of environmental statement (public).*
- ☐ *You can't do everything ...*
- ☐ *Of no interest to the business at its present size.*
- ☐ *Aims at management systems and less at voluntary environmental protection; lack of site focus.*
- ☐ *EMAS is better known in Germany; simpler audit procedure because less demanding requirements concerning management documentation.*
- ☐ *ISO = "Eco Light" with over-rigid rules.*
- ☐ *A combined QM/EM system that contains the elements of ISO 14001 already exists, but no benefits expected from additional certification.*
- ☐ *Cost too high; too much work; not enough interest on the part of public and customers.*
- ☐ *Annual certification costs.*
- ☐ *Too much emphasis on system and not on continuous improvement of environmental performance; EMAS Regulation clearer in this respect.*
- ☐ *No need at present; have built up ISO 9000 in parallel; EMAS and certificate "Specialist Waste Management Centre and Shredder Facility under End-of-life Vehicles Regulation" in place and adequate!*
- ☐ *First goal: national orientation in sales; second goal: ongoing process of improvement.*

Voices from Industry

Anonymised selection

More than 100 of the companies surveyed took the opportunity to give the Federal Environmental Agency additional information for the Eco Audit survey and on practical aspects of operational environmental protection. As the following selection shows, in reproducing the opinions here we have merely made them anonymous, but have not “censored” them in any way. We are interested in every “voice”, every “for or against”:

Confidentiality and notes on cost information

“... Thank you for your interest in our company’s environmental statement. We enclose two copies for your use. ... In view of the confidentiality aspects discussed with you on the telephone, we have not enclosed the environmental verifier’s validation statement with the environmental statement. We would also mention that the information on costs to some extent includes expenditure on quality management, because we built up the two systems at the same time and it was therefore not always possible to separate them clearly. We hope our participation has been of assistance to you. If you have any questions, please do not hesitate to contact our Mr. P.”

Readiness for dialogue

“... Thank you for your interest in our environmental statement. We were delighted with the good response to our validation under the Eco Audit Regulation 1836/93. This prompted us to undertake a graphic revision of our environmental statement, which had previously existed in a very plain and simple form. Do you like it – our ... environmental statement? Does it leave open any questions concerning the integrated ... management system for quality and environment? Please feel free to let us know your opinions. We will be glad to hear them. With refreshing greetings from, Yours sincerely ...”

Too time-consuming

“... We are pleased to send you two copies of our environmental statement to help build up your database and library. We do not intend to answer the questionnaire, as such an extensive form cannot be completed in “a few minutes”. ...”

Company environmental protection as strategic competition factor

“... We are glad of the opportunity to show you our efforts in the field of environmental protection with the enclosed environmental statement and your questionnaire. ... For us, endeavours to improve company environmental performance are a key corporate task and a strategic competition factor that must be constantly developed and improved. This is the only way to overcome the much discussed conflict of objectives between economics and ecology. If you would like any further information on environmental protection at O., please feel free to contact us. ...”

First environmental statement as part of an ecological learning process

"... Many thanks for your interest in our environmental activities. We are glad to send you the enclosed brochure containing our validated environmental statement. ... The lively interest in the media shows us the need to communicate our ecological awareness and activities to the general public as well. We see our first environmental statement as part of an ecological learning process. We therefore welcome any feedback in the form of questions, suggested improvements or constructive criticism. ..."

Large number of inquiries reduces readiness to engage in dialogue

"... With reference to your above-mentioned letter we enclose our environmental statement for your information. We trust you will appreciate that in view of the large number of inquiries we have, in agreement with our quality management advisers at our head office, adopted a policy of not answering any more questionnaires. ..."

Close contact sought with public authorities

"... Many thanks for your interest in our environmental statement, which we are pleased to enclose herewith. By participating in EMAS we hope to make a positive contribution to environmental protection both in the company and its surroundings. We will endeavour to achieve the targets we have set ourselves and pursue a continuous process of improvement. This includes appraisal of our suppliers and close contact with authorities and institutions. We would be very pleased to hear any reactions you may have. ..."

Red tape spoils participation

"... You will see from the enclosed material that it is only the bureaucracy and red tape of the authorities that has completely discouraged us from further participation in the environmental scheme we embarked on with such enthusiasm. This is our only reason for answering your inquiry. ..."

Where do the environmental statements go?

"... First of all, many thanks for your letter of June 1998. As requested, we have completed your questionnaire to the best of our ability. The two environmental statements are also enclosed. We have sent some 1500 environmental statements to the following institutions:

- ☐ Federal Environment Ministry, Bonn
- ☐ Ministry of Environment and Transport, Baden-Württemberg
- ☐ Regional Commissioners, Baden-Württemberg
- ☐ District Commissioners, Baden-Württemberg
- ☐ Factory and Trades Inspectorates, Baden-Württemberg
- ☐ Local authorities in the rural administrative district of Ortenau
- ☐ Port authority, Kehl am Rhein
- ☐ Cooperative bodies in Germany, especially in Baden-Württemberg
- ☐ Business consultants
- ☐ Environmental verifiers
- ☐ Laboratory institutes
- ☐ Enterprises in industry and commerce
- ☐ Customers and suppliers."

Environmental statements in English as well

"... Please find enclosed the completed questionnaire as requested. We are also enclosing four copies of our environmental statement 1997 (2x German, 2x English). We hope we have helped you by answering the questionnaire and sending the environmental statements. If you have any questions, please contact the undersigned. ..."

"Money-grabbing"

"... Please find enclosed the questionnaire about the Eco Audit scheme. P.S.: I fail to understand why, in spite of auditing and certification of the environmental management system, a company is nevertheless required, as a specialist facility under Section 19 of the Water Resources Management Act, to have every little oil pan inspected by an independent expert under the Land Water Act. What is the point of introducing an environmental management scheme if the system is not trusted to ensure this minimum of control? I regard this as pure money-grabbing – it is time this practice was stopped! ..."

Savings are independent of the Eco Audit

"... We are pleased to note your interest in our company. In Item 3.2 of your questionnaire you refer to benefits and cost savings arising from the introduction of EMAS. As an audited and validated company we would make the following comments on this point: the savings you ask about are results produced by innovations and operational considerations. In our opinion, which is shared by other audited companies, these savings must be regarded as completely independent of voluntary participation in EMAS. On this point, therefore, the question as formulated by you will not yield objective results. Please find enclosed two copies each of our validated environmental statement and our environmental reports of recent years. ..."

Cover charge for environmental statements

"... Please find enclosed the completed questionnaire. Thank you for sending us the brochure "Environmental Protection and Employment". Many thanks for your interest in our environmental statement, which was prepared and validated in accordance with Regulation (EEC) No. 1863/93. We will be glad to send you our environmental statement on payment of a cover charge of DM 15.00 including postage. A copy will be sent to you C.O.D. on receipt of your confirmation that you agree to pay this charge. Thanking you in advance for your understanding, ..."

Strengthening individual entrepreneurial responsibility

"... We are returning enclosed the completed questionnaire on EMAS and the environmental statement for our site ... As well as modern technologies, environmental protection needs an effective management system. ... Our company has voluntarily ventured to embark on a new system and has made a commitment to continuous improvement of its performance in this field above and beyond existing legal requirements. We see this as a contribution to preventive environmental protection and hope it will result in a strengthening of individual entrepreneurial responsibility. If you have any questions, suggestions or comments on our environmental statement, we should be very glad to hear from you briefly. ..."

Eco Audit as driving force for innovation

"... Our efforts over many years in the fields of company environmental protection and occupational safety have been documented in our enclosed first environmental statement. Following the successful Eco Audit our production and publishing site was entered in the site register of the Chamber of Industry and Commerce ... under the registration number However, the environmental statement should be seen not merely as a documentation, but also as an example of what can be achieved from a printing point of view with the modern facilities at our site. In this way we have sought to achieve a multiple use for this product, and thereby implemented an environmental protection objective. The possibilities and limitations of the paper qualities used are easily recognised. With graphic elements and colour gradients we have equalised the page transitions between the various paper shades and surfaces. We hope that you too will be able to put our environmental statement to multiple uses from this point of view. We will be glad to answer any questions you may have. Your suggestions will help us with the further optimisation of our continuous improvement process. ..."

"Blocked" working time is the biggest cost item

"... Many thanks for your letter sending us your questionnaire and the brochure "Environmental Protection and Employment". At the end of 1996 our company underwent not only validation in the Eco Audit scheme, but also certification under DIN EN ISO 9001 and 14001. The introduction of the systems as a complex has proved its worth, although we have not established an integrated system, i.e. quality and environment are separate. This is connected with the purely practical need to give the two persons responsible a sufficient degree of independence. On the other hand one cannot establish and maintain both systems alone and there are not more than two persons available for part of their working time. In your questionnaire you raised a number of interesting questions, which we have answered to the best of our ability. Following the validation, we made a detailed investigation of our costs, and I would point out that the expenditure of DM 234,000 was the actual expenditure (excluding any specific investments). To this extent it is misleading to suggest to SMEs that the cost is in the region of DM 60,000 to DM 100,000. The most expensive item is not the fees and the verifiers, but the "blocked" working time of the company's own personnel. And here the preparation of the documentation heads the list. We would be glad if you could send us the results of your survey. Incidentally we have noticed that a large number of institutions, especially universities, are theoretically investigating the question of how EMAS could be improved. Should this not preferably be a research topic for people who are themselves involved in EMAS? We would be interested in taking part in such work at SME level. ..."

"Revalidation" can result in extensive changes to the environmental statement

"... We are pleased to send you the new environmental statement of ... GmbH as requested. Unfortunately delays occurred during the revalidation because of the need for extensive changes to the environmental declaration. We apologise for the resulting delay in sending you the statement. We are returning the completed questionnaire for your further use. ..."

Opinions from seven sites summarised in one questionnaire

"... We are enclosing with this letter the completed questionnaire "Your expert opinion on EMAS". As discussed with you in advance on the telephone, we have summarised the opinions of our seven site officers in one questionnaire. We hope this will contribute to further optimisation of the system in the spirit of a continuous improvement process. ..."

Environmental statement in the Internet

"... Many thanks for your interest in our environmental statement. Please note that the environmental statement of ... is obtainable in the Internet under [http://www ...](http://www...) ..."

UBA brochure "Environmental Protection and Employment" as aid to argumentation

"... First of all many thanks for the brochure "Environmental Protection and Employment". I find the treatment of this issue very successful, since in my opinion it takes the dialectic approach that needs to be (but is frequently not) used for environmental matters. The brochure also provides a very good background of data and argumentation for everyone working in this field. The completed questionnaire is enclosed. I shall be glad to answer any further questions you may have. I look forward with interest to the results of your analysis and remain, etc. ..."

Passing on positive experience

"... We enclose the completed questionnaire mentioned above. As a company closely linked with environmental protection we are interested in passing on our positive experience with EMAS and thereby maybe providing companies that are not yet certified with an aid to decision making. In response to your request we are also enclosing our environmental statement 1996. We should be grateful if you would inform us about your findings when the survey is complete. ..."

Problems with presentation of site and product ecology

"... Many thanks for your letter of June 1998 and the brochure "Environmental Protection and Employment". I was glad to take part in your questionnaire. There are however a few points that I have to throw further light on. Our environmental statement is currently at the printers, and I will send you two copies as soon as they are available. You should not be surprised at the long time we needed (Item 3.1.1). In fact we started work immediately after the EMAS Act was published by Bonn, knowing full well that at that time there was no chance of validation/certification. And it was only thanks to this early start that we were able to play our pioneer role as the first certified ... organiser. We deliberately gave the validation of our product ... equal status alongside the validation of the site, because otherwise the environmental statement of a ... organiser would not have been credible; after all, significant impacts are caused at the destination areas and by transport to them. As a result of this extension/modification we were unable to publish an input-output analysis (as the manufacturing industry can), but have concentrated on ... indicators (relates to Item 4.3). I will of course be glad to help you with any further information or questions. Please call ..."

Suggested improvements

"... Thank you for your interest and for sending us the brochure "Environmental Protection and Employment". We are glad to comply with your request for feedback about our experience on the basis of the prepared questionnaire. To support our answers, we would like to make two fundamental observations: we see a possibility that the legislature can make a contribution to harmonising the requirements arising from the EMAS Regulation 1836/93 and DIN ISO 14001. Here we attach particular importance to less pronounced regulation of the individual elements on the lines of DIN ISO 14001. It also seems to us that there is a need for including the service sector and abandoning the site focus. We look forward with interest to the results of this survey and remain, etc. ..."

Call for an effective eco tax, so that resource-efficient technology pays

"... As requested, we are enclosing the completed questionnaire and two environmental statements. We regard participation in the Eco Audit as very positive and in 1997 we successfully introduced an environmental cost management system under a pilot project run by the ... Ministry of Trade and Industry. Both projects have resulted in organisational and technical changes and produced substantial cost savings without costing a single job. Unfortunately, in view of the low energy prices, we cannot invest in a heat and power cogeneration system to exploit further energy saving potential. We need an effective eco tax so that it can at last become possible in this country to invest in urgently needed resource-efficient technology. We will stay on the ball and seek to achieve continuous improvements in environmental performance in all sectors of the company. ..."

Broad opinion forming process

"... With reference to your letter of June 1998, I have attempted to answer your questionnaire. The answers are the outcome of our experience of the Eco Audit. The answers have been discussed in a body within the company (... Committee). I hope you will find them useful. I am of course at your disposal if you have any further questions. Our company is very interested in the possibility of a summary of your findings. ..."

"Newcomer"

"... Many thanks for your congratulations on our validation under the EMAS Regulation. We would also like to thank you for the brochure "Environmental Protection and Employment", which may help us decide where we stand. Although it was only last week that we received confirmation from the ICC of our registration in the list of validated sites and were then able to issue the environmental statement to the public, which means that we have had little response as yet, we have made every effort to answer the enclosed questionnaire in the light of our experience to date. We are pleased to comply with your request for a number of copies of our first environmental statement. ..."

No problems filling in the questionnaire

"... We are returning to you enclosed the completed questionnaire "EMAS: Situation and Prospects in Germany". Unfortunately we are three days over the deadline. Filling it in did not cause us any great problems. We wish you every success in your analysis. ..."

2,000 environmental statements printed

"... A number of points occurred to us when answering your list of questions: the environmental statement for 1995 was distributed during the period 1995 to 1998. In this time some 1,600 copies were distributed, 1,100 in response to requests. The new environmental statement 1998 has a print run of 2,000 copies. The answers to your question 6 apply to both environmental verifiers. We aim to achieve certification under DIN EN ISO 14001 because of its worldwide acceptance (August 1998). In view of the detailed environmental statement we regard the EMAS validation as considerably more valuable. We should like to order the two manuals "Environmental Controlling" and "Environmental Cost Accounting". Many thanks for sending us the brochure "Environmental Protection and Employment". ..."

Readiness to engage in dialogue overtaxed

"... Thank you for your interest in our environmental management system. We enclose herewith the questionnaire and two copies of our environmental statement. We have read with great interest your "First Provisional Evaluation": regarding the point that the outcome is rather disappointing, we would make the following comments: your inquiry was sent out in the middle of the holiday season. In this period one has to expect delays when it comes to matters that are not immediately relevant to production. The fact that your questionnaire is very extensive and thus fails to facilitate the dialogue undoubtedly does nothing to speed things up. Of course the companies taking part in EMAS have committed themselves to a dialogue with the public. However, when this dialogue increasingly takes the form of very extensive questionnaires that frequently take up to two hours or more to answer, we do not find the hesitant response to your request very surprising. The time taken for this task is by no means inconsiderable, especially for a company of our size (40 employees). We believe that questions about the content of the environmental statement can be dispensed with when the statement itself is also requested. This will help to make the questionnaires shorter. ..."

"Rejected"

"... We have received your questionnaire concerning the survey "Situation and Prospects in Germany" of EMAS. We trust you will appreciate that we have decided as a matter of policy not to take part in any questionnaire surveys, because we receive so many requests that we would have to take on additional staff if we were to deal with all the requests. We feel sure that you will receive enough answers in your survey to make representative statements about EMAS in Germany. ..."

Annual publication of environmental statements

"... Following its successful validation and certification under the EMAS Regulation and DIN EN ISO 14001, I am pleased to send you two copies of the first full environmental statement for the ... site. I am sorry that I have not been able to return the completed questionnaire earlier, but your letter found its way into the mail of a colleague who was on holiday for a considerable time. By publishing environmental statements at yearly intervals we aim to maintain our contact and dialogue with the public and describe the on-going process of improving our company's environmental performance. As a result of the restructuring of the entire ... group, the former production and ancillary operations of ... AG at the ... site have been transformed into the legally independent subsidiary company If you have any further questions or suggestions regarding the content or design of our environmental statements or if you need extra copies of the environmental statement, please do not hesitate to call us on the telephone number shown. Under Item 5 of your questionnaire there is mention of the guidance works "Guide to Company Environmental Indicators", "Environmental Controlling Manual" and "Environmental Cost Accounting Manual". As a member of the Environmental Protection Department I am very interested in the works mentioned. I should therefore be grateful if you could send them to my address, complete with invoice. ..."

Emas as an effective means of keeping track during restructuring

"... In answer to your questionnaire I would like to say a few preliminary words of explanation that may help you with your analysis. The implementation of the Eco Audit Regulation in our company came at a time of radical restructuring of ... AG. ... This meant that in parallel with the situation inventory proper, we needed a restructuring of environmental protection and environmental management. Against this background, you will no doubt understand that the questions about the cost of implementing EMAS are difficult or impossible to assess and that we therefore have to leave some of the questions unanswered. At any rate we found that the implementation of the Eco Audit Regulation was an effective aid to keeping track of the situation during the restructuring process. We will be glad to answer any further questions you may have. ..."

Simpler design of and greater recognition for EMAS

"... Please find enclosed your returned questionnaire and two copies of our environmental statement for the ... site. We are very glad that you are making a comparative survey of the EMAS system, because we believe that a simpler design and greater social recognition could give the scheme even more prestige. We would very much welcome the promotion measures you mention: "workshops for sharing experience" and "provision of low-cost company environmental information systems". If you have any suggestions or want further information I am at your disposal.. ..."

Tired of questionnaires

"... First of all I would like to apologise for the late return of your list of questions. I hope you can still use the answers in your study. The real reason for the delay is that I have had very poor experience of "eco questionnaires" in recent months. Today there are so many inquiries from scientific and semi-scientific institutions with pages and pages of questions about the sense or lack of sense of audits, not to mention the numerous inquiries from consultants, that I have decided for ... only to take part in selected questionnaires. There is no time to answer such inquiries during normal working hours, which is why I am doing it at the weekend. We have even had visits and surveys in the form of interviews in our firm with universities. To this day we have not received the promised findings. Time is far too valuable to waste on such things. In my view many of your prepared answers hit the nail on the head. I believe that at the present time EMAS is getting further and further from its original purpose, and when I think of the new scale of fees I am increasingly convinced that it is better not to continue supporting this trend. It is possible that we may get out of EMAS next year (after three years). From my point of view validation has only been worthwhile in that today we have to put a good deal of dedicated and meticulous work into pursuing the "publicly known" objectives. If you have any further questions, criticisms or suggestions I should be grateful if you would contact me direct. ..."

Important not to lose sight of SME orientation

"... Unfortunately, owing to a staff error, the questionnaire you sent us in June was not returned until we received your reminder. Since time was very short, we were unable to draw special attention to certain points. Also, in the urgency of the moment, we forgot to send you the two environmental statements. These are now enclosed with this letter. We were the first German company to be certified and validated in a management system in accordance with the criteria of DIN EN ISO 9001, DIN ISO 14001 and the EMAS Regulation 1836/1993. In this year's maintenance audit we also integrated the requirements of VDA 6, and we are working on implementing the requirements of QS 9000 in the existing management system by next year's maintenance audit. We are a company that operates as a supplier It is therefore necessary for us to adapt to the demands of all our customers. The environment is also an important aspect here. This management system was established here in our company without any external assistance to meet our own needs. We are therefore fully justified in claiming that it is absolutely tailored to practical needs and not only preached, but practised. Last year we again joined the "Environmental Pact Bavaria", but have not received any kind of feedback at all. Since we are now faced with the task of preparing a new environmental statement for 1999 and we would like to make a start on it, we unfortunately find that, as so often, bureaucracy is lagging behind the practical world and the authors themselves are frequently not clear as to what is actually required. After brief inquiries in the relevant places I found that unfortunately there is as yet no concrete information about what shape the environmental statement that has to be prepared at three-yearly intervals must take. Our first verifier tied us very, very closely to the literal interpretation of the EMAS Regulation. Unfortunately there is no concrete information about the relationship between DIN ISO 14001 and the planned revision of the EMAS Regulation and whether they will come closer or overlap. We cannot throw things in the right wastepaper bin under DIN ISO 14001 and into the left wastepaper bin under EMAS. We would therefore ask you in all your efforts to ensure that priority is given to bringing the requirements into line with practical reality. It is difficult enough for a medium-sized family business such as ... to satisfy all the requirements of customers, authorities and associations and bear the relevant financial burdens. Public opinion today tends to confuse a company with a state institution that has to perform numerous social tasks and has to work "tax effectively" into the bargain. We take a positive attitude to environmental legislation – but this should be seen solely from the point of view of feasibility "by practitioners – for practitioners". In my opinion the media could make a considerable positive contribution here – if the general public were better informed about such matters. We would be very pleased if it proved possible for you to include these ideas in your findings. ..."

EMAS Survey: Selection of Participants

A selection of sites that participated in the EMAS survey by August 1998

- 3M Innovation
- ABB CEAG Stromversorgungstechnik GmbH, sites: Senator-Schwartz-Ring and Lange Wende
- ABB Daimler-Benz Transportation (Deutschland) GmbH
- ABB Daimler-Benz Transportation (Deutschland) GmbH, Werk Kassel
- ABB Kraftwerke Service GmbH
- ABB Kraftwerksleittechnik GmbH
- ABB Leistungszentrum Elektronik GmbH
- ABB Turbinen Nürnberg GmbH
- Abfallwirtschaftsgesellschaft mbH Wuppertal
- ABL-Technic Wagenseil GmbH
- accu -industrie-bedarf Kunstmann GmbH
- Acore Gießereitechnik GmbH
- Adam Opel AG
- Adelholzer Alpenquellen GmbH
- Adlerbrauerei Herbert Zötler GmbH
- Adolf FÖHL GmbH & Co
- Adtranz Siegen ABB Daimler-Benz Transportation (Deutschland) GmbH
- AE GOETZE GmbH
- AEG Hausgeräte GmbH
- AEG Sachsenwerk GmbH
- Aeroquip, ZN der Aeroquip-Vickers International GmbH
- AESCULAP AG
- AGRAR FRISCH GmbH Wendelstorf
- Akzo Nobel Chemicals GmbH; Akros Chemicals GmbH & Co. KG; Akzo-PQ Silica GmbH & Co.
- Albert Ackermann GmbH & Co. KG
- Alcan Deutschland GmbH
- Alcoa Automotive Structures GmbH, Werk Soest
- Alfred Clouth, Lackfabrik
- Allgäu Recycling GmbH
- ALLIGATOR Farbenwerke Rolf Mießner GmbH & Co KG
- ALNO AG Pfullendorf
- Aluminium Norf GmbH
- Aluminium Rheinfelden GmbH
- Andechser Molkerei Scheitz GmbH
- ANDERSEN Apparatebau und Umformtechnik GmbH
- AOL Verlag
- APU GmbH, Gesellschaft für Analytik und Planung von Umwelttechnologie
- AQUATEC, Peter Schmidt GmbH
- Arcobräu
- Armstrong Insulation Products
- AssiDomän Innocat GmbH
- Atotech Deutschland GmbH Werk Feucht
- Audi AG
- AuerBräu AG
- August Faller KG
- August Hildebrandt Kabeltrommeln
- Aumüller Druck KG
- Ausimont G.m.b.H.
- Autoliv GmbH
- Axel Springer Verlag AG
- Braun Melsungen AG
- Babcock Industrierohrleitungsbau GmbH
- Bäckerei Brede
- Bäckerei Dietmar Kaiser
- Bad Dürheimer Mineralbrunnen GmbH+Co
- Badische Stahlwerke GmbH
- bar GmbH
- BAUER Betriebsges. mbH
- Bauer Spezialtiefbau GmbH
- Baumann GmbH Federnfabrik
- Baustoffaufbereitung K&S GmbH
- BAV Verwaltungs- und Beteiligungs GmbH
- Bayer AG und Bayer Faser GmbH
- Behr GmbH & Co.
- Behrendt Rohstoffverwertung GmbH
- Benecke-Kaliko AG
- Benteler-AWE-Umformtechnik GmbH
- Bergchemie J.C. Bröcking + Co. GmbH
- Bergische Löwen-Brauerei GmbH&Co. KG
- Berning + Söhne GmbH & Co
- berolina Schriftbild GmbH&Co.KG
- Bertand Faure Sitztechnik GmbH&Co. KG
- Bilfinger + Berger BauAG Bodensanierung Roth
- Bischof + Klein GmbH & Co.
- Bitzer Kühlmaschinenbau GmbH
- Bizerba GmbH & Co. KG
- BLANCO GmbH & Co. KG
- BLAUE QUELLEN Mineral- und Heilbrunnen AG
- Blum Recycling GmbH
- bock büroorganisation GmbH
- Bodet & Horst GmbH&Co. KG
- Boehringer Mannheim GmbH
- Bosch-Siemens Hausgeräte GmbH
- BPW Bergische Achsen KG
- Brandenburger Bauelemente GmbH
- Brauerei Bruckmüller Amberg
- Brauerei G.A. Bruch
- Brauerei Iserlohn Öko-Audit GbR
- Brauhaus Faust OHG
- Bremerhavener Entsorgungsgesellschaft mbH
- Brinkmann&Fahlenbreder Innenausbau GmbH
- Brötje Schaumtechnik GmbH
- brühl druck + pressehaus giessen
- BSU GmbH
- BTR Sealing Systems Group
- Bühler GmbH
- Burda Druck GmbH
- Burger Knäcke GmbH
- Byk Gulden Lomberg Chemische Fabrik GmbH
- BYK-Chemie GmbH
- Canon Gießen GmbH
- Carl Kühne KG (GmbH&Co.)
- Carl Leipold Metallwarenfabrik GmbH
- CARL SCHENCK AG
- Carolinen Brunnen Getränke Wüllner GmbH&Co. KG
- CB Chemie und Biotechnologie GmbH
- CC-Dr. Schutz GmbH
- Celanese GmbH
- Chemische Fabrik Budenheim Rudolf A. Oetker
- Cherry Mikroschalter GmbH
- CIBA-GEIGY GmbH
- Confidessa Confiserie-Spezialitäten Produktions- und Vertriebs GmbH
- Continental AG Radsystem GmbH
- CREATON AG
- CWS Lackfabrik GmbH & Co. KG
- Daimler Benz AG
- Damm+Co. Qualitätsguß KG
- Danone GmbH
- Degussa AG, Site: Wolfgang
- Destellerie Dr. Gerald Rauch GmbH; AVG Aluminiumverschluß GmbH & Co. KG
- Deutsche Bahn AG
- Deutsche ICI GmbH, Betriebsstätte Deggendorf
- Deutsche Star GmbH (Mannesmann Rexroth AG)
- Diamant-Zucker KG
- Dierkes Möbelfabrik GmbH & Co. KG

- DORMIRA Magdeburger Möbelwerke in Schönebeck
Zweigniederlassung der Steinhoff Trend Design GmbH Uplengens-Remels
- Dörrenberg Edelstahl GmbH
- Dow Deutschland Inc.
- Dr. August Oetker Nahrungsmittel-Werk Wittenburg-GmbH
- Dr. August Wolff GmbH & Co. Arzneimittel
- Dr. Gerhard Mann Chem.-pharm. Fabrik GmbH
- Dr. H. Schittmann GmbH Chemische Fabrik
- Dr. Ing.h.c. F. Porsche AG
- Dr. Johannes Hedenhain GmbH
- Drangmeister Schreinerwerkstatt
- Druckerei Rudolph
- Dynamit Nobel GmbH Explosivstoff- und Systemtechnik, Geschäftsbereich Wehrtechnik-Werk Würgendorf
- H. Kluge GmbH
- Rosenbach Fertigungs- und Vertriebsges. mbH
- EBK Entsorgungsbetriebe Stadt Konstanz
- eibe Produktion + Vertrieb GmbH & Co.
- Einbecker Brauhaus AG
- Eisenmann Druckguss GmbH
- ELAC Phonosysteme GmbH
- Elektromanufaktur Hanauer GmbH & Co.
- Elf Atochem Deutschland GmbH
- ELIOG-kelvitherm Industrieofenbau GmbH
- Elopak GmbH
- elox Gerhard Gotta GmbH & Co. KG
- Elring Klinger GmbH
- Ensinger Mineral- Heilquellen GmbH
- Erfurt & Sohn
- Erhardt + Leimer GmbH
- Erich Heidrich GmbH
- ERZ Entsorgung und Recycling Zwickau GmbH
- ESN Elastomer GmbH
- etifix Etiketten GmbH
- ETRAS GmbH
- EUROPIPE Deutschland GmbH
- Euroteam GmbH
- EvoBus GmbH
- EW HOF Antriebe und Systeme GmbH
- Funktionelle Metallveredelung Deersheim GmbH
- Fa. Gebr. Klems GmbH
- FAG Kugelfischer Georg Schäfer AG; Unternehmen FAG OEM und Handel AG, FAG Komponenten AG, FAG Automobiltechnik AG, FAG Aircraft/Super Precision Bearings GmbH, FAG OEM und Handel AG(Elfershausen), FAG Komponenten (Eltmann), FAG OEM und Handel AG(Wuppertal)
- Falke Feinstrumpfwerke
- Familia Fleischzentrale Neumünster
- Fels-Werke GmbH
- Fels-Werke GmbH
- Felten & Guillaume Energietechnik AG
- Femira GmbH
- Festo KG
- FiberMark Gessner GmbH & Co.
- Fichtel & Sachs AG, Unternehmen der Mannesmann AG
- Fine Foods International GmbH&Co. Deutsche KG
- Firma Winfried Feller Holzgestaltung
- fischerwerke Artur Fischer GmbH & Co. KG
- Fläming Quellen GmbH&Co.
- Fleischwaren Wulff GmbH
- Flensburger Brauerei
- Flexipack-Werk Wunderlich GmbH&Co.
- Ford-Werke AG
- Frank Druck GmbH&Co. KG
- Franz Schneider Brakel GmbH&Co
- FreiLacke
- Fresenius Medical Care Deutschland GmbH
- Freudenberg Bausysteme KG
- Freudenberg Mektac GmbH & Co. KG
- Freyburger Buchdruckwerkstätte GmbH
- Friedrich W. Renke GmbH
- Fritsch Elektronik GmbH
- Fritz Niessen GmbH&Co. KG
- Fulda Verpackung Stabernach Jr. GmbH
- Funk Fertigungstechnik GmbH
- Fürstlich Fürstenbergische Brauerei KG
- G&K-Recycling UTSCHE Remda
- Gesellschaft für Abfall-Aufbereitung mbH
- GAF-Hüls Chemie GmbH
- Gamma-Service Produktbestrahlung GmbH
- GARANT Fenster Neumeier GmbH
- Gardinia Plastik-Werk, Wälder & Co. GmbH & Co. KG
- Gas-, Elektrizitäts- und Wasserwerk Köln AG
- GEALAN WERK Fickenscher GmbH
- Geberit Produktions GmbH, Site: Pfullendorf
- Gebr. Kock Spinnerei GmbH & Co.
- Gebrüder Schaette KG
- Gehr
- Gelenkwellenwerk Stadtilm GmbH
- GEMES GmbH
- Georg Fischer GmbH, Leipzig
- Georg Kohl GmbH + Co
- GEORGII KOBOLD AUGUST HEINE GmbH & Co, Leinfelden-Echterdingen and Horb
- Gepade Polstermöbel Pamme GmbH & Co.
- Geräte- und Pumpenbau GmbH Dr. Eugen Schmidt
- Gerhard Collardin GmbH
- Gesellschaft für Abfallwirtschaft mbH
- Glaxo Wellcome GmbH & Co.
- GMA Gustav Meyer Stanztechnik GmbH & Co.
- goldreif Möbelfabrik GmbH+Co.
- Göttinger Brauhaus AG
- GRAMMER AG
- Grünau Illertissen GmbH
- Grundfos Pumpenfabrik GmbH
- Gustav Stabernack GmbH Lauterbach
- GWAB mbH Recycling-Zentrum Herborn-Seelbach
- Brinkhaus GmbH&Co KG
- &E. Reinert KG
- Hager Electro GmbH
- HAKAWERK W. Schlotz GmbH
- HALKO GmbH
- Hans Oetiker Metallwaren- & Apparatefabrik GmbH
- Hartmann & Braun GmbH & Co.KG Geschäftsbereich Gerätetechnik, Site: SENSYCON, Geschäftsgebiet Temperaturmeßtechnik
- Hartmetall-Werkzeugfabrik Paul HORN GmbH
- Hassia & Luise Mineralquellen Bad Vilbel GmbH&Co.
- Hawle Armaturen GmbH
- Hebel Alzenau GmbH & Co.
- Heidelberger Schlossquell-Brauerei GmbH
- Heinz Essmann GmbH
- Heistener Tiefbau Gesellschaft mbH
- Hekel KGaA
- HELIO FOLIEN GmbH
- HELIOS-Lacke Bollig & Kemper GmbH 6 Co. KG.
- Henkel Fragrance Center GmbH
- Henkel Teroson GmbH
- Heraeus Electro-Nite GmbH
- Herbaria Kräuterparadies GmbH
- Hermes Schleifmittel GmbH&Co.
- Hettich Umformtechnik GmbH&Co. KG
- Hewing GmbH
- HIPPE Werk Georg Hipp GmbH&Co. KG
- Hochland Reich, Summer & Co.
- Hoechst AG und Hostalen Polyethylen GmbH
- Hoechst Marion Roussel Deutschland
- Hoechst Trevira GmbH & Co KG
- Holz König GmbH
- Holz und Baustoffrecycling GmbH & Co. KG Otto-Rüdiger Schulze
- Holzbau Augustin GmbH
- Horbart GmbH
- Horstmann-Steinberg GmbH
- Hostalen Polyethylen GmbH
- Howmedica GmbH Pfitzer Medical Technology Group
- Hüls AG
- Hüls AG
- Hüls Silicone GmbH, DIMA Silicone GmbH
- Hund Büromöbel GmbH
- HyCom GmbH & Co. KG
- ic Kälte- und Klimatechnik GmbH
- IG Sprühtechnik GmbH
- IKON AG Präzisionstechnik
- imobau Hütner GmbH
- IMPARAT Farbwerk Iversen & Mähl GmbH & Co.
- INA Wälzlager Schaeffler OHG
- Indramat GmbH
- InfraServ GmbH und Co. Höchst KG
- interstuhl Büromöbel GmbH&Co. KG
- ISO ELEKTRA Elektrochemische Fabrik GmbH
- ITW Oberflächentechnik GmbH
- IWITUT Industriewärme & Umwelttechnik GmbH & Co.
- Schmalz GmbH Förder- und Handhabungstechnik
- Ziegler Zweigniederlassung der Paul Hartmann AG
- Voith AG
- Ostendorf GmbH & Co.
- Jellinghaus GmbH Co.
- John Deere Werke

- Josef Haunstetter Sägenfabrik
- Julius Lorenz GmbH&Co.
- Hölzer & Wulf O.H.G.
- KABE Labortechnik GmbH
- Kährs-Schlotterer
- Kaiser's Kaffee-Geschäft AG Fleischwerk Viersen
- Karl Ebert Betonsteinwerke GmbH
- Karl Holder GmbH Metallveredelungswerk
- Karl Leibinger Medizintechnik GmbH & Co. KG
- KATHI Rainer Thiele GmbH
- Kaufmann-Kunststoff
- Kautex Werke Reinhold Hagen AG
- Kemmlit-Bauelemente GmbH
- Kemper System GmbH&Co. KG
- Kendall Medizinische Erzeugnisse GmbH
- KEPEC Chemische Fabrik GmbH
- KERACHEMIE GmbH
- Kitzmann Bräu KG
- Klaus Steilmann GmbH&Co. KG
- Klöber GmbH Bürositzmöbel
- Kludi-Armaturen Scheffer Vertriebs- und Verwaltungs-IHG
- Kneissler Brünertechnik GmbH
- Knick Elektronische Meßgeräte GmbH & Co.
- Knoll AG
- Kobusch Folien GmbH
- Kolbe-Druck GmbH & Co. KG
- Kolben-Seeger GmbH & Co. KG
- Konica Business Machines Europe GmbH
- König+Neurath AG
- Koralle-Sanitärprodukte GmbH
- Kornmühlebäcker
- Korsnäs Wilhemstal GmbH
- Krupp VDM GmbH
- Kruse Kalk KG
- KS-Recycling GmbH&Co.KG
- Kummer GmbH & Co. KG
- & C. Steinmüller GmbH
- Landwirtschaftliches Verarbeitungszentrum Markranstädt GmbH
- Lauffenmühle GmbH
- LEG Schölecketal GmbH & Co Landfleischerei Ribbenstedt KG
- Leiner GmbH Sonnenschutz
- Leipfinger-Bader KG
- Leonische Drahtwerke AG, Unternehmensbereich Drähte, Kabel, Konfektion
- Licher Privatbrauerei Ihring-Melchior GmbH & Co. KG
- Life Food GmbH
- Lincoln GmbH
- Linke-Hofmann-Busch GmbH
- Lodewick GmbH
- Löwenbräu Meckatz Benedikt Weiß KG
- Löwenbrauerei Hall fr. Erhard GmbH & Co., Wildbadquelle Mineralbrunnen GmbH & Co. KG
- Ludwig Auer GmbH
- Lufthansa Technik AG, sites: Hamburg and Frankfurt am Main
- MANN+HUMMEL KUNSTSTOFFTECHNIK GmbH+CO. KG
- Mannesmann BOGE GmbH
- Mannesmann Rexroth GmbH
- MAR Montage-Abbruch-Recycling GmbH Erfurt, site: Recyclingplatz Stotternheimer Straße
- Margon Brunnen GmbH
- März Fashion Group GmbH
- Mauden GmbH&Co.
- maul-belser Medienverbund
- Max Helmer GmbH
- MC-Bauchemie Müller GmbH&Co.
- Meguin GmbH Mineralölwerke
- MEKRA Lang GmbH&Co.KG
- MEKU Metallverarbeitungs-GmbH
- Memminger Bürger- und Engelbräu AG
- Menzi GmbH Dr. Fuest & Lange
- Mercedes-Benz AG
- MERZIGER FRUCHTGETRÄNKE GmbH & Co. KG
- Messer Griesheim GmbH
- Metallbau Schubert GmbH
- Metallverarbeitung Buttstädt GmbH
- Metallwerke Harzgerode GmbH
- Mettler-Toledo (Albstadt) GmbH
- Michael Huber München GmbH
- Michael Schmid GmbH, Feinkostmetzgerei
- Michehls Atelier GmbH
- Miele & Cie. GmbH & Co.
- Milchwerke am Burgwald eG
- Mitsubishi Semiconductor Europe GmbH
- Mitteldeutsches Druck- und Verlagshaus GmbH
- Möbelwerk Moser GmbH & Co. KG
- Mobil Schmierstoff GmbH
- Mohndruck Graphische Betriebe GmbH
- MORALT Fertigelemente GmbH & Co.
- Muckenhaupt & Nusselt GmbH & Co. KG - Kabelwerk
- Müksch Recycling GmbH
- Muldenhütten Recycling und Umwelttechnik GmbH
- Münnerstädter Glaswarenfabrik GmbH
- Munsjö Paper Decor GmbH & Co. KG
- Neff GmbH
- Nestlé Deutschland AG
- Neue Arbeit Nord GmbH
- Neumarkter Lammsbräu
- Neuselters Mineralquelle
- NOVAPAX KUNSTSTOFFTECHNIK, Steiner GmbH & Co. KG
- Novartis Nutrition GmbH
- NSM AG
- Nutzfahrzeuge Ludwigsfelde GmbH Entwicklungsgesellschaft für Kraftfahrzeugtechnik Ludwigsfelde mbH, Unternehmen der Mercedes-Benz AG
- OBE - GmbH & Co. KG
- Oderland-Brauerei GmbH Frakfurt (Oder)
- OPTIFIT Jaka-Möbel GmbH
- Oranienburger Pharmawerk GmbH
- Orbis Naturana GmbH Möbelbau
- Oscorna-Dünger GmbH
- OSRAM GmbH
- OTTO Kunststoffverarbeitung GmbH&Co.KG
- OWL-Entsorgungs GmbH & Co. KG
- Palmberg GmbH Büroeinrichtungen + Service
- Parentin GmbH
- Paul Hartmann AG
- Paul Hettich GmbH & Co., Hettich Management Service GmbH, Hettich Maschinentechnik GmbH & Co. KG
- Peguform GmbH
- Perga-Chem GmbH
- Peters-plastic GmbH
- Pfeleiderer AG
- Phenolchemie GmbH&Co. KG
- Pigrol Farben GmbH
- Pinsker-Verlag GmbH
- PLEUCO GmbH
- Pneumant Reifen GmbH
- POB Polyolefine Burghausen GmbH
- Poggenpohl Möbelwerke GmbH
- Poppe & Potthoff GmbH&Co.
- Privatbrauerei Moritz Fiege
- Private Weißbierbrauerei G. Schneider & Sohn KG
- pro-beam
- PROFIL Verbindungstechnik GmbH & Co. KG
- Progress-Werk Oberkirch AG
- Promacon Dr. Schirm GmbH
- pronorm Gieschwa Möbel GmbH & Co KG
- PTS Compound - Produktions GmbH
- Quack + Fischer GmbH
- QUERMANN GmbH
- Woeste & Co. "Yorkshire" GmbH
- Radium Lampenwerk
- recycle it GmbH
- Recycling und Entsorgung Darmstadt GmbH
- Regionalservice Breisgau der Badenwerk AG, site: Rheinhausen
- Regionalservice Hochrhein der EnBW Badenwerk AG
- REINZ-Dichtungs-GmbH
- REKOVA Plast- und Metallverarbeitung GmbH
- remex Verwertungsgesellschaft mbH Parkentin
- Remmers Bauchemie GmbH
- Remmers Baustofftechnik Produktions GmbH
- Reudnitzer Brauerei
- Rheinisch-Bergische Druckerei- und Verlagsgesellschaft mbH
- Rheinische Baustoffwerke GmbH & Co. KG
- Rietenauer Mineralquellen
- Rittal-Werk Rudolf Loh GmbH & Co. KG
- Röhm GmbH, Hüls-Gruppe
- Rolf & Gösling GmbH
- Rommelsbacher ElektroHausgeräte GmbH
- RST Stahlbau GmbH & Co KG
- RUDOLF WILD WERKE
- Siedle & SöhneTelefon- und TelegrafentechnikStiftung & Co
- Saarbrücker Druckhaus
- Sachsen Papier Eilenburg GmbH
- Sächsisch Recycling GmbH
- Sanbloc GmbH
- SANIPA Badeinrichtungen GmbH
- Sanyo Industries Deutschland GmbH

- SCA HYGIENE PAPER GmbH
- SCA Packaging AG & Co KG
- Schempp & Decker Präzisionsteile und Oberflächentechnik GmbH
- Schertler Verpackungen GmbH
- Schiwa GmbH
- Schleswig-Holsteinischer Zeitungsverlag GmbH
- Schlott Tiefdruck GmbH
- Schmidt & Klaunig Druckerei und Verlag
- Schreiner Müller
- Schülke & Mayr
- Schultheiss-Brauerei-Verbund
- Schulze & Co. KG
- Schwermetall Halbzeugwerk GmbH & Co. KG
- Seda Kleiderfabrik GmbH & Co. KG
- Sedus Stoll AG
- Seifenfabrik BUDICH GmbH
- Seile Beschichtungen GmbH
- Sengewald Verpackungen GmbH
- SGDA Sanierungsgesellschaft für Deponien und Altlasten mbH
- SHG Umformtechnik GmbH
- Siemens AG
- Siemens AG Medizinische Technik Siemens Röntgenwerk Rudolstadt
- Siemens Aktiengesellschaft Bereich Automobiltechnik Geschäftsgebiet Steuer-, Regel- und Informationssysteme
- Siemens Nixdorf Informationssysteme AG
- Siempelkamp Giesserei GmbH & Co.
- SIG Combibloc GmbH
- Sinziger Mineralbrunnen GmbH
- Sirona Dental Systems GmbH, vormals Siemens AG, Medizinische Technik und Dentalsysteme
- SKW Stickstoffwerke Piesteritz GmbH
- SKW Trostberg AG
- Smurfit C.D. Haupt Papier- und Pappenfabrik GmbH & Co. KG
- Solvay-Werk Bernburg
- Sonopress GmbH
- SP Reifenwerke GmbH
- Spezialschweißungen Andreas Hackl
- Stabilus GmbH
- Städtereinigung Rudolf Ernst & Co. GmbH
- Stadtwerke Coesfeld GmbH
- Stadtwerke Karlsruhe
- Stadtwerke Münster GmbH
- Stadtwerke Rosenheim
- Stadtwerke Unna GmbH
- Steierl-Pharma GmbH
- Stelter Zahnradfabrik GmbH
- Sternquell-Brauerei GmbH
- STEULER Industriewerke GmbH
- Stiebel Eltron GmbH & Co. KG, Werk Eschwege
- Stocker's Backstube GmbH
- Stockhausen GmbH & Co. KG
- Stora Kabel GmbH
- Stora Spezialpapiere GmbH
- Strepp GmbH & Co. KG, Papierfabrik Hochkoppelmühle
- Strombergkellerei Bönnigheim eG
- Süddeutsche Schraubenfabrik Pilgram-Rupprecht GmbH
- SSF-Verbindungssteile Pilgram-Rupprecht GmbH
- Süddeutscher Zeitungsdienst Druckerei- und Verlags GmbH
- Süd-Eloxal GmbH und Galvano-Mayer GmbH & Co. KG
- Sulzer Escher Wyss GmbH
- SUSPA Compact AG
- System Kosmetik Produktionsgesellschaft für kosmetische Erzeugnisse mbH
- Tally GmbH
- Technical Ceramics GmbH & Co. KG
- TECHNO FINISH GmbH Seebach
- TERMA-GmbH
- Teutoburger Mineralbrunnen GmbH & Co.
- Thesys Gesellschaft für Mikroelektronik mbH
- THOR Chemie GmbH
- Thorey Gera Textilveredelung GmbH
- Thyssengas GmbH, sites: head office (Duisburg), Hünxe, Nievenheim, Epe and Xanten South and Xanten North
- Tiolox Implants GmbH, Dentaureum J.P. Winkelstroeter KG, Esprident GmbH
- Tischlerei Tilman Shastri
- Toshiba Europe GmbH (TRO)
- TRV Thermische Rückstandsverwertung GmbH & Co. KG
- TRW Airbag Systems GmbH
- Turbinenwerk Görlitz
- UCM URSA Chemie GmbH
- Umweltschutz Elsertal GmbH Thüringen
- Unichema Chemie GmbH, Emmerich
- UNION-ZUCKER Südhannover GmbH
- Universal Kraftfutterwerk Franz Ehrle GmbH
- Urenco Deutschland GmbH
- Urenco Deutschland GmbH Betrieb Gronau
- USB Umweltservice Bochum GmbH, site: Zentraldeponie Kornharpen
- VACC BRAND GMBH+ CO
- van Laack GmbH
- VAW alucast GmbH
- VAW aluminium AG
- VDO Adolf Schindling AG
- VEBA Kraftwerke Ruhr AG, Kraftwerk Knepper
- Vereinigung Rheinischer Molkereien GmbH & Co. KG (VRM)
- Verlag M. DuMont Schauberg, Expedition der Kölnischen Zeitung GmbH & Co. KG
- VESTOLIT GmbH, Hüls-Gruppe
- Viana Naturkost GmbH
- Viessmann GmbH & Co.
- VILSA-BRUNNEN O. Rodekohl GmbH & Co.
- Vinnolit Kunststoff GmbH, sites: Knapsack, Köln, Gendorf, Burghausen
- VIVO GmbH
- VOKO Franz Vogt & Co. KG
- Volkswagen AG
- Vollkornbäckerei Das Freibackhaus
- Kugel GmbH & Co. KG
- Wackenhut GmbH & Co.
- Wandel & Goltermann GmbH & Co.
- Wanfried-Druck Kalden GmbH
- Wärmerversorgung Berlin GmbH
- Warsteiner Brauerei
- Weleda AG
- Wensauer Automobile GmbH, NL ADC Furth im Wald
- Werkmeister GmbH
- Werkzeugfabrik GmbH Königsee
- Westdeutsche Quarzwerke Dr. Müller GmbH
- Wesumat Fahrzeugwaschanlagen GmbH
- WETZEL GmbH & Co. KG
- WIESBY GmbH & Co. KG, sites: Gotteskoogstraße und Schmiedestraße
- Wilhelm Bötzel GmbH & Co. KG
- Wilhelm Schimmel Pianofortefabrik GmbH
- Wilhelmi Werke AG
- Willi Glück KG
- Wipoton
- WKW Feuerverzinkerei GmbH
- Wolf & Kiermeier GmbH Elektrounternehmen
- Wuppertaler Stadtwerke AG
- Yankee Polish Lüth GmbH + Co
- YMOS AG
- Zambelli Fertigungs GmbH & Co. for the sites: Haus im Wald and Aiterhofen
- Zambelli Kircheninstandsetzung GmbH for the site: Haus im Wald
- Zeschky Galvanik GmbH & Co. KG
- Zettelmeyer GmbH
- ZF Hurth Bahntechnik GmbH
- Zippe Industrieanlagen GmbH
- Zippendorfer Bäcker
- ZME Elektronik Recycling GmbH
- Zucker Verbund Nord AG
- Zucker-Aktiengesellschaft Uelzen-Braunschweig
- Zuckerverbund Magdeburg GmbH

Übersetzungsauftrag 99AP/00

Texte für Grafiken

((Bei allen Zahlen in den Grafiken ist ein Dezimalkomma immer durch einen Punkt zu ersetzen! In einigen Grafiken kommen Zahlen mit einem Punkt als Tausender-Trenner vor; hier muss im Englischen ein Komma hin!))

Text für Symbol auf 1. Umschlagseite, Titelseite und Seite 11:

EC ECO MANAGEMENT AND AUDIT SCHEME

Seite 13, Abb. 1:

Belgium
Denmark
Germany
Finland
France
Greece
United Kingdom
Ireland
Italy
Luxembourg
Netherlands
Austria
Portugal
Sweden
Spain

Seite 14, Abb. 2:

Belgium
Denmark
Germany
Finland
France
Greece
United Kingdom
Ireland
Italy
Luxembourg
Netherlands
Austria
Portugal
Sweden
Spain

Seite 15, Abb. 3:

Belgium
Denmark
Germany
Finland
France
Greece
United Kingdom
Ireland
Italy
Luxembourg
Netherlands
Austria
Portugal
Sweden
Spain

Seite 16, Abb. 4:

Japan
Germany
United Kingdom
Sweden
Taiwan
USA
Korea
Netherlands
Switzerland
Denmark
Australia
France
Spain
Austria
Finland
Italy
Belgium
Thailand
China (incl. Hong Kong)
India
Malaysia
Canada
Brazil
Singapore
Ireland
Argentina
Hungary
Mexico
Indonesia

Seite 17, Abb. 5:

Belgium
Denmark
Germany
Finland
France
Greece
United Kingdom
Ireland
Italy
Luxembourg
Netherlands
Austria
Portugal
Sweden
Spain

Seite 18, Abb. 6:

Monatszahlen (mit Windows-Regionaleinstellung England/USA aktualisieren – die abgekürzten Monatsnamen erscheinen dann auf Englisch).

Seite 19, Abb. 7:

- wie Abb. 6 -

Seite 27, Abb. 8:

59,000 employees
506,000 employees
769,000 employees
1,061,000 employees
1,173,000 employees

1999 (to 30 June)

Seite 28, Abb. 9:

DM 6 billion
DM 54 billion
DM 78 billion
DM 108 billion
DM 125 billion

1999 (to 30 June)

Seite 29, Abb. 10:

Unimportant reason (0)	Partly (5)	Important reason (10)
------------------------	------------	-----------------------

Continuous improvement in environmental performance		
Identifying weaknesses and potentials in use of energy/resources		
Motivating employees		
Improving image		
Increasing legal certainty		
Improving internal organisation		
Detecting and minimising environmental and liability risks		
Reducing company-specific environmental impacts		
Cost savings		
Increased demands by customers or other pressure groups		
Discovering ecological product and process innovations		

Seite 32, Abb. 11:

13.8 months
Average

13.2 months
Small site

14.8 months
Medium site

14.4 months
Large site

Seite 33, Abb. 12:

78	77	76	82
Average	Small site	Medium site	Large site

Seite 33, Abb. 13:

73	75	73	72
Average	Small site	Medium site	Large site

Seite 35, Abb. 14:

Average	DM 116,000
Small site	DM 72,000
Medium site	DM 164,000
Large site	DM 167,000
Chemical industry	DM 190,000
Food industry	DM 78,000

Seite 36, Abb. 15:

Cost of validation	DM 14,000
Cost of entry in register of sites	DM 1,000
External consulting costs	DM 37,000
Cost of training and information	DM 17,000
Cost of preparing environmental statement	DM 22,000
Miscellaneous	DM 25,000

Seite 37, Abb. 16:

	Not applicable	Partly applicable	Fully applicable
Improved organisation/documentation			
Increased legal certainty			
Improved image			
Employee motivation			
Sparing use of resources			
Plant safety			
Setting example to suppliers			
Optimising process flows			
Improved cooperation with authorities			
Positive market effects			
Cost savings			
Competitive advantages/safeguard site future			
More favourable insurance/loans			
Using public development funds			

Seite 38, Abb. 17:

Waste

Energy

Water/wastewater

Recycling

Production

Packaging

Storage

Procurement

Transport

Seite 40, Abb. 18:

“Positive”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

“Negative”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Seite 41, Abb. 19:

	No interest (0)	Little interest (5)	Great interest (10)
Employees			
Customers			
Authorities			
Media			
Local residents			
Scientific institutions			
Industrial customers			
General public			
Suppliers			
Students			
Business consultants			
Banks/insurance			

Seite 42, Abb. 20:

	No interest (0)	Little interest (5)	Great interest (10)
Employees			
Customers			
Authorities			
Media			
Local residents			
Scientific institutions			
Industrial customers			
General public			
Suppliers			
Students			
Business consultants			
Banks/insurance			

Seite 43, Abb. 21:

Minus:

Actual interest fell short of hoped-for interest

Plus:

Actual interest exceeded hoped-for interest

Employees

Customers

Authorities

Media

Local residents

Scientific institutions

Industrial customers

General public

Suppliers

Students

Business consultants

Banks/insurance

Seite 44, Abb. 22:

	Not applicable (0)	Partly applicable (5)	Fully applicable (10)
In form of a substance-energy balance sheet			
Mainly through verbal comments			
Also discussion of weaknesses			
With aid of general environmental indicators			
With reference to an ecological evaluation procedure			
No information about relevant environmental impacts			

Seite 49, Abb. 23:

Great interest

Little interest

No interest

((untere Reihe, von links nach rechts))

Information about current environmental legislation

Information about latest technical developments in environmental sector

Low-cost environmental information systems

Industry-specific workshops for sharing experience

Seite 50, Abb. 24:

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Steel and light-metal construction

Seite 51, Abb. 25:

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Steel and light-metal construction

Seite 52, Abb. 26:

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Steel and light-metal construction

Seite 54, Abb. 27:

“Yes, already in preparation”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

“Yes, in all probability”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Seite 55, Abb. 28:

“Possibly, internal discussions
still in progress”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

“No”

Average

Small site

Medium site

Large site

Chemical industry

Food industry

Seite 56, Abb. 29:

	Not applicable (0)	Partly applicable (5)	Fully applicable (10)
Continuous improvement in environmental performance			
High standards of environmental performance			
Increased legal certainty			
Strong emphasis on employee participation			
Preparation of environmental statement			
Independent inspection			
High acceptance and well known in Germany			
Site focus			
Increased market pressure			
Low administrative and formal input			
Low financial input			
Opportunities for public assistance			

Seite 57, Abb. 30:

“Already certified”

Average
Small site
Medium site
Large site
Chemical industry
Food industry

“Yes”

Average
Small site
Medium site
Large site
Chemical industry
Food industry

“Possibly; internal discussions
still in progress”

Average
Small site
Medium site
Large site
Chemical industry
Food industry

“No”

Average
Small site
Medium site
Large site
Chemical industry
Food industry

Seite 58, Abb. 31:

	Not applicable (0)	Partly applicable (5)	Fully applicable (10)
Worldwide validity			
Positive effects from combination of two systems			
Good compatibility with ISO 9000			
Very practicable and user friendly			
Organisational focus (not site focus)			
Great freedom regarding substantive requirements			
Great acceptance among social groups			
Low financial cost			
Simple profile of requirements			
Aims at management system (rather than environmental system)			