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Research Paper
2000-B-5

Implementation of EMAS in the Netherlands
A case study on national implementation, environmental effectiveness, allocative efficiency, productive efficiency and administrative costs

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European Project IMPOL -
The Implementation of EU Environmental Policies: Efficiency Issues

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Foreword

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

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

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

IMPOL research reports are available at <http://www.cerna.ensmp.fr/Progeuropeens/IMPOL>. For further information, please contact:

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Introduction

This case-study report was prepared as a part of the IMPOL-project¹. It provides a characterization of the implementation of Council Regulation (EEC) no 1836/93 on the Community eco-management and audit scheme (EMAS) in the Netherlands. It also includes an inventory of the environmental and efficiency outcomes of the implementation process.

This report is structured as follows. Chapter 2 provides information on the policy context of EMAS in the Netherlands. Environmental management and certification were important issues since the early 90s. Chapter 3 describes the competent bodies that were appointed in the Netherlands for implementing EMAS. Also the established accreditation system and registration system are clarified. The process of accreditation of verifiers is clarified in section 4. Due to the history of environmental management in the Netherlands the co-ordination of EMAS and ISO14001 was of importance, this issue is clarified in chapter 5. Section 6 provides empirical information on the motives of the companies that participated in EMAS.

Bültman and Wätzold of the UFZ in Leipzig-Halle coordinated the case studies on EMAS in the four IMPOL countries. They provided the indicators applied in this report (Bültman and Wätzold, 1999). Chapter 7 applies the indicators for assessing the environmental effectiveness. The chapters 8, 9 and 10 apply the indicators for efficiency. Chapter 8 assesses allocative efficiency, chapter 9 administrative costs and chapter 10 productive efficiency. In chapter 11 some preliminary conclusions are drawn.

¹ In full: The Implementation of EU Environmental Policies: Efficiency Issues, funded by the European Commission DGXII, Fourth Framework Programme: Environment and Climate / ENV4-CT97-0569.

2. The policy-context of EMAS in the Netherlands

In the Netherlands environmental management systems were no new issue. Since 1989 there is a policy programme that stimulates environmental management systems in private and public companies.

Early history of environmental management in the Netherlands

In order to understand the attitudes towards EMAS and the rather disappointing outcomes of EMAS if it comes to the number of participants, we have to go deeper into the history of environmental management in the Netherlands. It was the large employers' association NVO/NCV that took care of the kick off. But not for reasons of environmental awareness. NVO/NCV published in 1986 a brochure that contained the outlines of what became known as the methodology of environmental management systems. It was only in 1989 that the governmental memorandum on environmental management was issued. The position of the large employers' association VNO/NCW in the joined learning and negotiation process in between 1986 and 1989 was strongly determined by positions of large-scale industry, by developments in the United States of America and by pilot experiences within Dutch industry.

The years 1980 - 1985 were dominated by the quest for deregulation in the Netherlands. The country was not doing well in economic performances. Within Dutch government, over-regulation was believed to be a huge problem. Economic growth was small, it was believed that over-regulation was part of the problem. The ministry of Domestic Affairs published an enormous memorandum on deregulation. It included environmental regulation. Industry perceived environmental regulation as fast changing, detailed and as a potential threat. Industry preferred of course stability in order to be able to invest without large risks on account of increasing and fast developing regulation from government. Industry perceived self-regulation, environmental management and environmental management systems as the perfect strategies to cash in deregulation. So the quest for de-regulation was the key driver for industry.

Very often in the Netherlands 1989 is perceived as the starting point of environmental management in companies. Often it is believed to be linked to the growing awareness of environmental problems in the Netherlands in the years 1987-1989, resulting in the ambitious 1989 first National Environmental Policy Plan. This is not true. It is linked in the sense that this *self-regulation* was believed to be a basic implementation strategy for the

implementation of the NEPP towards industry. Environmental management as an issue started earlier. Of course the policy memorandum accelerated things and was a key driver for the smaller companies. The *co-regulation* system that leads to binding negotiated covenants is another basic NEPP-implementation strategy towards industry that in its consequences is linked to environmental management standards in the Schemes of the SCCM.

However, the perceived gains from deregulation were already in 1986 the core argument for the employers' organization to promote environmental management. The memorandum on environmental management in 1989 was written in close co-operation between government and industry. For instance an extensive and comprehensive environmental analysis as an element of environmental management systems was present in early drafts but removed in more final drafts. Industry was not against internal environmental auditing but was afraid of an inefficient obligation to assess everything concerning material and energy-flows. In the 1989 policy document issues like standardization, normalization and certification and a different regulatory approach were already addressed. It is important to note that a renewed, modernized regulatory system and deregulation were important drivers for the employers' association to strive for. For government, environmental management systems were an interesting focus. However not a sufficient condition for a different regulatory system or deregulation as such.

Government needed unified trustworthy environmental management systems and the proof of the pudding for every company individually. One way of judging the quality of environmental management systems was believed to be standardization, normalization and certification. From this moment on, it was clear for involved parties that some governmental involvement in standardization, normalization and certification was inevitable for cashing in the gains of a different regulatory system/deregulation.

The 1989 Memorandum on Environmental Management

The central policy document was discussed in parliament. It was at the cutting edge of a shift in the implementation strategy of national policy. Self-regulation was believed to be an important strategy in addition to regulation and incentives. Negotiations with groups of actors in society leading to covenants were part of this strategy as well as "learning" oriented programs like the one that aimed at environmental management in firms. The "learning" oriented program aiming at the stimulation of environmental management and environmental management systems in organisations was a programme of about 60 millions Dutch guilders governmental money. The implementation of the programme was predominantly organised for every sector of industry separately. One of the conditions was that the projects aimed for deliverables like checklists, handbook and courses on how to

implement environmental management systems in companies. Another condition for the funding was that it contributed directly to the dissemination of environmental management and environmental management systems. There were also regional projects and some projects about "special issues". There were three "special issues most important". *First category* was about the integration of other systems like quality management, safety management and health management with environmental management systems. The *second category* was about adopting alternative approaches for permitting authorities in their treatment of companies that implement serious and good environmental management systems.

The *third category* was about normalisation and certification of environmental management systems. This means normalisation and certification has been an on the agenda since 1989, starting of with BS 7750 and succeeded by ISO 14001 and EMAS.

By all of this, EMAS was launched in a context with a rather extensive history.

On changing interaction between governments and companies on environmental matters

On the agenda of Dutch environmental policy was the modernisation of permits that take into account if a company is pro-active and has an environmental management system. Without decreasing the level of demands, the role of governments as permitting authority can take into account the efforts of pro-active companies. Competent permitting authorities can make use of EMAS (and ISO) while granting permits and controlling and enforcement of regulation. In most cases these competent authorities are provinces and municipalities. The aim is a new sort of, more global, permit in which the self-regulation of the involved company is a key-element.

Consequences for national implementation of ISO 14001 and EMAS

For that governments and business partners should be able to trust that certifying ISO 14000 and the registration and verification of EMAS is done on a high and stable level of quality. For that, the implementation of the Council Regulation 1836/93 should be and is harmonised with ISO 14001. In the Netherlands the choice was made to heavily co-ordinate the interpretation of the Council Regulation and as well to co-ordinate it with the interpretation of ISO 14001. This led to a rather progressive interpretation of ISO 14001, more on this in chapter 5. Due to the co-ordinating efforts, the additional requirements of EMAS on top of ISO certification are restricted to the environmental statement and the verification of this statement. The Dutch NEN ISO 14001 comprehends in its interpretation more than ISO 14001.

Situation on environmental management systems when EMAS started

Extensive research under several hundreds of companies in four branches of industry indicated the "state of the art" on environmental management systems in 1994 in the Netherlands. Only 7.5% of the companies were totally passive, 38.3% were exploring the issue, 54.2% of the companies already started building environmental management systems and taking environmental measures by itself. The group of 54.2% was divided into two categories. Only 4.2% of the companies were in the top category being "advanced" (De Bruijn en Lulofs, 1996).

The history of environmental management in the context of environmental policy in the Netherlands explain at least two aspects that are going to be discussed in the next chapters:

The wishes for a strong co-ordination with ISO 14001 had some impacts on the institutional arrangements for implementing EMAS. A *private* organisation was aimed at for the competent bodies, the accreditation system and registration, still *not* profit oriented and that still was embedded in the other institutional arrangements for implementing environmental policy. The consequence is a private organisation at one hand and rather a large influence of the government in both EMAS and ISO 14000 on the other hand, being the influence on ISO 14001 the most surprising.

3. Competent bodies, accreditation system and registration

For the time being the EMAS is only open for industrial activities and services that support industrial activities like research and laboratories.

3.1. SCCM as central body for both EMAS and ISO 14000

In the Netherlands a foundation “Co-ordination Certification Environmental management Systems” is established (in Dutch: Stichting Coördinatie Certificatie Milieuzorgsystemen, in short: SCCM). This foundation can be interpreted as a joint action of government and industry. The foundation SCCM is nominated and designated by the Dutch national government as the proper authority to implement the Council Regulation 1836/93 (EMAS). The SCCM registers EMAS-verified companies. The SCCM aims to (1) promote environmental management systems and (2) promote the incorporation of EMS in permitting, monitoring and reinforcement by governments. In the quality of designated authority the SCCM performs the registration of companies that take part in EMAS. In the *board of supervision* of the SCCM the government and industry are present. In case of substantial policy related issues the board of supervision has to approve of the issue. There is an *advisory board* in which five representatives of relevant governments, five representatives of relevant businesses and five relevant "third parties" like environmentalists and labour unions are participating (15 members). The advisory board of SCCM act as Central Council of Experts to the accredited institutions (in Dutch: Centraal College van Deskundigen) and is as such accepted by the Dutch Accreditation Office (In Dutch: Raad voor de Acreditatie). In this capacity, the SCCM and the Central Council of Experts frame the “rules of the game” for accredited institutions:

SCCM as outcome of the game

SCCM was created because national government had to appoint a ‘notified body’ for registration of EMAS participants. So the SCCM is the result of building the necessary institutional structure for implementing EMAS in the Netherlands. The SCCM was no player, the SCCM was the outcome of the game. Government was prepared to grant a start subsidy towards SCCM.

The coordinating role of the SCCM

The arguments for the SCCM Scheme for establishing and up-dating a *Scheme for Verifying EMAS* and a *Scheme for Certifying ISO 14001* are already given above: coordination, unification, trustworthiness of certificates. Industry wanted a different regulatory system and had to work out thing with government. Their case is not supported by multiple standards that are badly monitored and by that are not decisive for changing the regulatory culture. Besides this argument the employers' association always stressed the need for coordination. The thought of several standards without co-ordination and guarantees was a bugbear for the employers' association.

About the SCCM scheme:

In order to be accredited by the Council for Accreditation the Certifying body had to comply to the requirements from EN 45012/EAC Guide 5. EN 45012 comprehends the general standards, for certifying environmental management systems. The EAC Guide 5 was additional drafted. ISO Guide 62 is the successor of EN 45012. ISO Guide 62 is accompanied by an interpretation document IAF EMS Guide. One of the requirements is that Certifying/ Verifying Bodies have at their disposal a Scheme for Certification (BS 7750 and ISO 14001) and a Scheme for Verification (EMAS). These Schemes `blueprints' have to be approved of by the Council of Experts. Generally speaking every organization that wishes to be accredited has to create their own Council of Expert and their own Schemes. The Council for Accreditation has to check whether the requirements are met. The Schemes are evaluated and up-dated by the Central Council of Experts. Suggestions towards such updates can be made by anyone.

Government, employers' associations and non-governmental organizations agreed upon a Central Council of Experts and one Scheme for ISO and one Scheme for EMAS to meet the requirements, to achieve co-ordination, unification, unambiguous quality and efficiency. So not every Certifying or/and Verifying Body has to create their own Council of Experts and draw their own Schemes.

In order to become accredited, the Council for Accreditation requires also that candidates enter into an agreement to use the developed schemes and accept the Central Council of Experts acting for them. So accredited organizations have to use the Schemes and to pay a fee to contribute towards the costs being made for efforts they otherwise had to perform on an individual basis.

The SCCM deliberate with the accredited organizations on the unambiguous use of the Schemes.

The Scheme for Verifying EMAS comprehends three substantial sections:

- 1 Interpretation of EMAS
- 2 The internal organization of the Verifying Body (including competence)
- 3 Operating procedures for Verifying Bodies

By these procedures a *Scheme for Certifying ISO 14000* and a *Scheme for Verifying EMAS* are developed. If necessary the advisory body updates these schemes.

3.2. The institutional embedding and funding of SCCM

The SCCM has no autonomous staff. The directorate/management is out-contracted to “Stuyt Projecten bv.” The secretariat is accommodated at the “Facilitaire Organisatie Industrie” in The Hague. The body “Facilitaire Organisatie Industrie” supports the “Target group policy” of the Dutch Ministry of Housing, Physical Planning and Environment. The “Target group policy” of the Dutch Ministry of Housing, Physical Planning and Environment is a policy approach to implement national environmental policy on lower regional and sector levels. Basically national environmental goals and, deduced from environmental quality goals or standards, national emission ceilings are split up over the relevant activities in society. The relevant activities are framed by the activities of the so-called “target groups”: agriculture, consumers, traffic, energy sector, households, waste management sector and *industry*. These are all groups that have to contribute to the implementation of the national environmental policy. This is a difficult and comprehensive approach. For the target group *industry* over forty sectors or branches are relevant. So with an agenda for the target group *industry* as a whole there is no operational system. This agenda has to be split up over the branches. In this process the “Facilitaire Organisatie Industrie” offers support, exchange of thoughts, splitting up over sectors, study and also dealing. Also issues for technology research programs can be derived from this setting. The ultimate goal for all this is to prepare the floor for Environmental covenants between (sectors of) industry and the governments.

The *SCCM* is embedded in these structures for several reasons. One of them is practical and has to do with accessibility and secretarial support. However, “Facilitaire Organisatie Industrie” is an institutional setting for industry and governments to communicate and prepare covenants without the hierarchical position of supervision the state has in the normal political and regulatory process. Although sometimes the threat of regulation is used to smoothing up things.

In this institutional setting voluntary systems like EMAS and ISO 14001 can be discussed in the right institutional frame. The idea of promoting environmental management systems, including EMAS and ISO 14001, is part of the discussions and efforts to agree upon in covenants.

For this, the idea to locate SCCM at the “Facilitaire Organisatie Industrie” has been a balanced decision. In the context of tradition in environmental policy implementation since 1989, it would have been a revolution if EMAS would have been embedded into strict public implementation bodies. It is important to note that BS7750 and ISO 14001 were on their way when EMAS was issued. There was a strong political demand to co-ordinate ISO 14000 and EMAS. The need for co-ordination and bridging made other choices unlikely. Still the result is that EMAS, like ISO 14001 is embedded in the broader context of implementing the national environmental policy. It is important to note that the minimal requirements that have to be met to be EMAS registered also include the voluntary environmental agreements between the sector and governments, not only the regulatory obligations (this is stated in the *Scheme for Certifying ISO 14000* and the *Scheme for Verifying EMAS*). On the other hand the voluntary environmental agreements are not only agreed upon by the national governments, consent of other relevant governments like provinces, municipalities and the water authorities, is also a condition sine qua none. And indeed it are these other governments in their quality of permitting authorities that are asked to incorporate the whole idea of environmental management systems in their practice of permitting, monitoring and enforcement. So also for the political aim of reaching for a new kind of permit, the institutional embedding of EMAS was already pre-cooked.

This is in a nutshell the quite complex reasoning that has made the Dutch government decide on the national institutional implementation of EMAS the way it did. It is placed in the middle of the new implementation strategy and still not without strong ties with the broader agenda of implementing the national environmental policy in a target group approach.

Contracts between accredited organisations and SCCM

Accredited institutions can sign an agreement with the SCCM in order to use the schemes. There are ten accredited organisations that have an agreement with SCCM to use *the Scheme for Certifying ISO 14000* of which five also have an agreement with SCCM to use *the Scheme for Verifying EMAS*. The advantage for the accredited institutions is that they don't have to develop their own "Scheme for verification" themselves and don't need their own Council of Experts. There is, since 1998, a possibility for a pre-agreement with SCCM for those organisations that are in the process of being accredited by the Council for

Accreditation (see chapter 4). There are five pre-agreements by the end of 1998 (EMAS and ISO).

Funding of SCCM

Accredited organisations have to pay 6000 guilders/year for using the SCCM-schemes, be it for EMAS or for ISO 14001. For both schemes it is 9000 guilders/year. On top of that a yearly compensation have to be paid by the accredited organisations for every certificate issued. This contribution is 375 Dutch guilders.

There are about 360 organisations ISO 14000 certified in the Netherlands, the number of EMAS registrations is relatively low, being 23 sites or 20 companies registered. In 1996 the number was 13, in 1997 20. In 1998 there was a small profit made. The number of ISO-certificates grew faster in 1997 than expected.

Amount of work spend on EMAS at the SCCM

For registration, follow-up of registration, some support to the ministry on EMAS issues and work for the Central Council of Experts about 22 days of work are spend every year.

4. Accreditation by the Dutch Council for Accreditation

The SCCM does not certify or verify itself. This is done by independent institutions that have to be accredited for the job by the Council for Accreditation. The Dutch Council for Accreditation is a non-profit foundation and was established in September 1995. At that moment the Dutch Council for Certification merged with the Dutch Accreditation Board for Calibration Laboratories, Test Laboratories and Inspection Bodies. There is no official basis in public law. However the central position of the Council in its field is recognised in a decision of the Dutch cabinet. The Council collaborates with associated organisations in Europe (EA/EAL and EAC) and at the global scale (ILAC/IAF)

The Dutch Council for Accreditation supervises organisations engaged in assessing the quality of products, working procedures and measuring systems. This is done for the benefit of government, business and consumer organisations. The Council for Accreditation is entitled to officially accredit such organisation if it has been found competent. The Council is also entitled to audit accredited organisations for compliance with accepted criteria.

In the Netherlands organisations are accredited and not individuals. This is not a formal rule, it is possible that individuals are accredited, but it is discouraged. If it is possible in the new EMAS-II, the possibility for individuals to be accredited will be skipped completely in the future.

The scope definition is primary the responsibility of the organisation: The organisation that makes an application defines the scope for which it thinks it meets the criteria for accreditation. The organisation that request accreditation has to prove that they have at their disposal procedures to judge whether a specific plant that wants to be verified is or is not within the scope. For individuals that are accredited the scope will be limited beforehand. Scopes are not harmonised yet, the recommendation is to use the so called NACE-arrangement.

Initial accreditation

The Council for Accreditation will evaluate all accredited organisations during the first couple of years. This will be part of the initial accreditation process. The accredited organisation has to pay 2500 Dutch guilders registration fee. Besides that they have to pay

the Council for Accreditation for the days involved. This will be about 10 days, depending on the scope, assuming that everything is found acceptable at once. Before the official accreditation process starts the submitted application is scanned quickly in a preliminary inquiry to assess whether an application is sensible. For that reason all the official applications have been accredited finally. There were however applications that did not lead to a full-fledged accreditation process. Besides checking skills, documentation and visiting the office, a strong emphasis is laid on observation of the verification process in practice. About five days of the auditor of the Council of Accreditation is spent on this.

The full-fledged accreditation will cost the applicant about 19500 Dutch guilders. If the outcomes of the assessment are not satisfying, additional efforts/assessments are necessary. One should keep in mind that the accreditation of the EMAS verifiers in the Netherlands in practice was cheaper because the involved work and thus costs decrease when the applicant already has other relevant accreditation's like for ISO 14000.

The choice to invest heavily during initial accreditation in observations/eye-witness the work of the candidate-verifier is well considered. The confidence in just testing theoretical knowledge is limited, working-procedures and skills are believed to be as important.

Supervision of verifiers

The Council of Accreditation does the supervision of verifiers. Once a year every accredited verifier is checked. This is done by minimal a visit and checking produced reports. In a number of cases, observation/eye witness of the accredited organisation doing their work expands this. If something is found not correct an announcement of non-conformity is made. Depending on the issue reaching from detail to important the accredited organisation has a few weeks to a year to correct things. If things are found not correct after this period, suspensions is possible and of course draw back of the accreditation given. For the supervision process the accredited organisations have to pay 6000 Dutch guilders a year and 1 to 1.5 % of the turnover on account of the accreditation. One should keep in mind that all EMAS accredited organisations are also ISO 14000 accredited and often also accredited for other norms like ISO 9000 etc. The amount of 6000 Dutch guilders is for supervision of all accreditation's.

Amount of work spend on EMAS at the Council for Accreditation

At the Council for Accreditation only a small number of days are spend on the assessment for EMAS. Sometimes somebody is contracted for this job, but there is a regular auditor at the council. Especially for EMAS the number of days for supervision is limited to some, maybe 10. Of course the numbers of days spend on the initial accreditation's depend on the

number of applicants. In the Dutch practice this number is small, maybe 10-20 days a year.

Preference to accredit organisations

In previous cases of policymaking the individual environmental expert has been perceived as a too limited approach. In 1989 policy aimed at starting up regional Environmental Business Agencies. Initial thoughts were about individual environmental consultants. It was assessed that individuals do not have the capabilities to cope with all necessary disciplines on an individual basis. The choice was made to opt for Environmental Business Agencies working in teams of staff with different disciplinary backgrounds. When EMAS, BS 7750 and ISO 14001 are at stake, the experiences with ISO 9000 are also very relevant. A manageable system was believed to comprehend a limited number of players. Only then accreditation could also be done on the job and by desk research in the offices of the candidates. Also supervision was believed to be better and better manageable.

Only in exceptional cases it is thinkable that an audit is done by one person, usually it is done by a team, managed by a lead verifier, complying to the written decision-making rules. In the Scheme for Verification and the Scheme for Certification of the SCCM the personal requirements are included. It is the responsibility of the accredited organization to draw up adequate audit teams. The Council for Accreditation controls and supervises this aspect.

If an accredited organization lacks some knowledge they can hire specific competence for auditing some -technical- processes. The Council for Accreditation controls and supervises this aspect.

The Council for Accreditation controls and supervises this aspect. Of course the accredited organizations have to justify their audit-teams. The Council for Accreditation also assesses the theoretical knowledge and practical skills of individual auditors in "on the job" situations.

5. Co-ordinating EMAS and ISO-14001

If companies already have at their disposal an ISO-14001 certificate, a shortened EMAS-verification procedure applies: The company has to hand over an Environmental Statement that has to be approved of by an Accredited Environmental Verifier. In short: the registration and verification of EMAS is in the working procedures very similar to those of ISO 14000.). This choice is made in the Netherlands while working on the obligation to make EMAS operational. Although the European Commission has acknowledge the similarity between the requirements of ISO 14001 and EMAS (April 16th, 1997), some requirements in EMAS are not in ISO 14001 (Heida a.o.1997: 27-28) like:

- Specific points of attention for environmental policy and environmental program, the so-called Good Management Practices that have to be incorporated into environmental policy (EMAS Annex I, parts C and D);
- Detailed requirements for internal environmental audits (EMAS Annex III); initial environmental assessment (obligatory in EMAS, recommended in ISO 14000 Annex A);
- Some details in regard with the environmental policy and the environmental impact assessment.

In general, the EMAS verifier should assess, by means of secondary analysis, whether an organisation that has an ISO 14001 certificate, also meets the extra requirements as mentioned. In the Netherlands this is *not necessary* because of the fact that the accredited institutions for the ISO 14001 certification work under the conditions set by the SCCM in their system. The interpretation of ISO 14001 that is used includes the mentioned elements. This means that the additional effort is limited to the environmental statement and the verification of it. For Dutch companies that have used a foreign accredited institution for ISO 14001, and the SCCM interpretation is therefor not used, the extra criteria have to be met. The European Normalisation Organisation CEN has developed a bridging document with additional requirements to fulfil the gap (1997).

The close co-ordination has led to an institutional setting in which ISO 14001 is interpreted in a rather progressive, environmental oriented way in the *Scheme for certifying ISO 14001*. The influence of the government on ISO 14001 practices is rather large compared to other countries. EMAS and ISO 14000 are implemented by private, non-profit oriented

bodies. The co-ordination of EMAS and ISO 14000 has led to a situation in which ISO 14001 certified companies (certified according the scheme of the SCCM) can be EMAS verified and registered with limited effort.

Position of industry

The EMAS and the ISO requirements were unified while drafting the Schemes. This had some implications on for instance the internal environmental audit is only recommended in ISO but obligatory in the Dutch interpretation, etc. The only real difference is the Environmental Statement and the verification of it.

Industry doesn't mind it, the gains are believed to be larger. The influence of Dutch government is present in the system but should not be exaggerated. It is the Central Council of Experts that evaluated the Schemes and updates them. Five members of the Central Council of Experts are civil servants. One of them is from the Ministry, the others are employed by de-central governments. Five members are from industry. One member is from an environmental organization and one member is employed by a labor union. The strong participation from de-central governments once again indicates the importance of the joint goal of a new kind of regulatory approach. It should also be taken into account that there was an informal previous national standard introduced by the National Memorandum on Environmental Management in 1989. To get rid of this national standard by adopting the international standards was of course also an argument not to oppose.

6. Motives of Dutch companies to participate in EMAS

The aim of this chapter is to analyse the reasons why companies decided to participate or not to participate in EMAS. This decision is believed to be influenced by the advantages that companies hope to gain from the participation itself (general motives of companies in chapter 6.1), promotional activities to support the participation of companies in EMAS by state authorities and other organisations (information, advice, subsidies in chapter 6.2) and the advantages for EMAS-participants with respect to deregulation (e.g. reduction of information duties and public authorities' controls in chapter 6.3).

6.1 Motives of Dutch companies

Dutch companies that participate in EMAS were asked to judge some advantages that are supposed to be connected to EMAS participation. The next figure gives an overview of the evaluation of companies, assigning a number on a scale from 1 (very important) to 6 (totally unimportant). Ordered by declining importance:

Figure 1: Reasons for participation in EMAS (average scores)

Reason	Average score on scale
Improve company's image	2.0
Improve environmental performance	2.3
Improve co-operation with public authorities	2.4
Gain competitive advantages	2.7
Expectation of simplified administrative procedures (e.g. license requirements)	2.8
Gain preferential treatment from clients (e.g. get more orders)	2.8
Assure legal compliance	3.1
Motivation of employees	3.6
Cost reduction	3.7
Gain preferential treatment from insurance companies and banks	3.9
Anticipation that the company will be compelled to participate in the future	4.1

Dutch companies perceived the reasons with a low average score as most important factors that influenced them to their positive decision on EMAS participation. Score above 3.5 indicate reasons of which the companies thought of as of little importance or relevance. For that reason, the compared to other IMPOL relatively high score on of the motive 'Assure legal compliance' has to be explained: ISO 14001 states in 4.2.c: '...includes a

commitment to comply with relevant environmental legislation and regulations, and with other requirements to which the organization subscribes'. So the standard already opens the possibility for 'legal compliance + '. The 'only informative annex A' explains a bit more. The annex A is declared obligatory in the Dutch version NEN EN ISO 14001. In the SCCM scheme it becomes clear that 'legal compliance + ' has to be interpreted as including the negotiated agreements. These agreements go beyond regulation and indicate future regulation for laggards who do not implement themselves. The verifiers have to check on that whether the companies are at least preparing the right measures and subsequently implement them. So the level of ambition is beyond regulation. That is one explaining argument.

The second explaining argument is that only very pro-active companies participate in EMAS. The number is very small, even compared to ISO participation. For those companies legal compliance cannot be a serious ambition level. They are beyond that. This empirical argument might very well be strong. It is even strengthened by the fact that almost all EMAS participants were already BS 7750 or ISO 14001 certified. They opt for EMAS because of the environmental statement, changing the relations with government, publicity and image. Assuring legal compliance is a passed station.

There was one company that explained that customers/clients required EMAS participation. Another company expressed that the need for management information was a driver to participate in EMAS.

A considerable number of companies are not satisfied with the impact of EMAS participation. One third of the companies were disappointed in their expectations. Arguments mentioned are:

- The number of participants in the Netherlands is still too small to have good returns on EMAS participation;
- There are no gains in terms of marketing, ISO 14001 is more international oriented and is negative for EMAS;
- EMAS hardly has any additional value on top of ISO 14001;
- The ISO 14001 certificate is sufficient for improving co-operation with governments;
- The governments react neutral and not enthusiastic.

Important is to note that almost all companies were already BS 7750 or ISO 14001 certified when they took the decision to participate in EMAS.

6.2. Promotional activities

In the Netherlands measures to promote the participation in EMAS are mainly undertaken by the Stichting Coördinatie Certificering Milieuzorgsystemen as described in chapter 3.

When the organisational measures in order to implement EMAS became operational in 1995, the minister of Housing, Physical Planning and the Environment, admitted that promotional activities were of great importance (letter of April 1995 to Parliament). Not only for EMAS but also for BS7750 and ISO 14001. She proclaimed that the organisational framing of the Stichting Coördinatie Certificering Milieuzorgsystemen (SCCM) should be done in a way that the foundation could adjust their expenditures to their incomes. No staff was hired on a permanent basis. For the outside world the foundation has an autonomous profile. The minister admitted that for the start-off of the Stichting Coördinatie Certificering Milieuzorgsystemen financial support was necessary. An onetime subsidy therefor was given.

The Dutch government has partly financed the costs of SCCM over the years 1995, 1996 and 1997 (also in the broader context of implementing the national environmental policy). As from 1998 the SCCM has to earn their own revenues.

The Council of Supervision and the Advisory Board of SCCM secures involvement of industry and governments. The minister of Housing, Spatial Planning and Environmental Affairs has proclaimed that two representatives from industry and two representatives of permitting governments shall be in the Board of Supervision. One of the members of the supervising council is put forward by the ministry of Housing, Spatial Planning and Environmental affairs, one is put forward by VNO/VCW (the largest organisation of private companies) and one is put forward by Natuur en Milieu (a large environmental organisation).

The SCCM developed a number of promoting activities.

The SCCM has developed *a Scheme for Certifying ISO 14000* and *a Scheme for Verifying EMAS*. If necessary the advisory body updates these schemes.

The EMAS-schemes consists of:

1. An interpretation of EMAS
2. Requirements that Accredited Environmental Verifiers have to meet
3. Requirements on the operating procedures of the Accredited Environmental

Verifiers

Promotional activities for EMAS particularly *towards companies* in the Netherlands are *not* that widespread. First of all it is a task of the SCCM. The SCCM developed material that is used for promotional activities. The SCCM has published a *Scheme for Certifying ISO 14000* and a *Scheme for Verifying EMAS*. Next to these rather technical documents the SCCM has published a brochure "Certificatie van milieuzorgsystemen" that is used for promotional purposes. An application form and conditions for registration is also available at SCCM.

The ministry of Housing, Physical Planning and Environmental Affairs also published a brochure "Certificatie van milieuzorg-systemen". Besides this the government tries to integrate the issue of EMAS registration and ISO 14000 certification into the implementation of the target group policy. In the target group policy covenants are prepared and signed for different trades of industry. These covenants set the agenda for environmental relevant change in sectors of industry. Pro-active companies comply with the covenant voluntary. Laggards are forced to do by the permitting authorities. Since a letter to the parliament February 9th, 1998, improving quality of environmental management systems in companies up to the level of ISO 14001/EMAS is on the agenda for every covenant. Still the small and medium sized enterprises without serious environmental burden are not supposed to get certified/verified.

Furthermore the ministry strives for a different kind of permitting and monitoring of companies that have advanced environmental management systems. This is done to stimulate companies and to relief the workload of permitting governments. There is a course/training developed for permitting civil servants "Maatwerk in milieu". This modern approach includes are more global and sets targets instead of detailed regulation. For this the ministry has published a document about the changing relations between governments and pro-active companies to "guide" permitting authorities. The SCCM is involved in policy making on the interrelatedness between the new type of permit and the consequences for verification (EMAS) and certification (ISO 14001). The SCCM delivers information and instruction sessions on this issue and also published a brochure on this issue.

There are also some tasks for promotional activities for trade-organisations and chambers of commerce. They are not paid for this but it is just part of their work, sometimes they pick-up press releases from the SCCM. This way the SCCM publishes promotional articles in specialist magazines and journals. Sometimes they advertise in these magazines. These activities and press releases led for instance in 1998 to 1400 inquiries by telephone, mostly by companies. On request the SCCM organises information and instructive sessions for groups of companies. By indirect means industry is reached by accredited institutions that

support themselves and by environmental consultancy agencies in general.

Financial support for individual companies that want to participate in EMAS was very limited not to say that there was no financial support. Almost all companies in our survey did not receive any financial aid for their efforts relating to EMAS. There were no national subsidy schemes. There were two companies that received money from the European Commission, 10% and 20% of the costs involved..

To summarise, promotional activities with respect to *information and advice* have been available in the Netherlands. It has to be recognised that information and advice on EMAS has not been pushed in an aggressive manner. It should be kept in mind that already a lot was done at forehand that aimed at environmental management, environmental management systems and the certification of environmental management systems in companies (compare chapter 2).

Financial support from national sources has not been available for companies that wanted to participate in EMAS-participants. Those two companies that have received a financial contribution explained that this contribution was not very important for them. That might also be caused by the fact that it covered only 10-20% of the estimated costs. The low participation in EMAS can more easily and more convincingly be explained by the fact that ISO 14001 is more popular and is believed to have more advantages for Dutch companies.

6.3. Deregulation in the context of EMAS

Deregulation in the strict context of EMAS is no issue in the Netherlands. Talks about deregulation for pro-active companies started as soon as the program to stimulate companies towards environmental management started in 1989 (compare chapter 2). Deregulation at the level of the central government is not that much at stake. Under the threat of regulation covenants are agreed upon. These covenants set the agenda for change. If the companies do not act in line with the covenant regulation will be issued. This is a kind of self-regulation instead of regulation, the fact whether companies participate in EMAS or do not participate in EMAS is not important.

As described earlier, at the level of the de-central governments the issue of deregulation is relevant. The general idea is that companies that internalised environmental values into their organisations and perform well should be treated different from laggards as far as permitting, monitoring and reinforcement is at stake. Using goals instead of detailed rules could decrease the level of details in the permit. The flexibility of the company could increase. The so-called "main lines permit" is controversial. There are some legal objections regarding the legal security for people that have interest in the environmental burden of the

company, for instance local residents and neighbours. This is rather a technical discussion. However the Administrative Justice System already expressed that some arrangements are not legal. Nevertheless the "main lines permit" is implemented quite often and the central governments is determined to continue this renewal. It is perceived as a reward for a company that we should be able to trust. Participation in EMAS or ISO 14001 helps to proof that the environmental management systems and the environmental management is sound.

As far as self-control mechanisms as substitute for public measurements and controls are at stake the situation is not that different. The law makes it possible for permitting authorities to require information on prescribed self-controls and measurements. These reports have however to be checked by themselves. The company cannot do reinforcement itself, as has been determined by the Administrative Justice System. Officially there are strict limits to the variance of behaviour as far as monitoring and enforcement is at stake. In practice however there always were large differences made by civil servants involved in monitoring and controls between "good" companies and "bad" companies.

So the trend is not deregulation but *a different* relationship and *different interaction* between authorities and companies that are pro-active. Pro-active companies can take over some of the regulation duties of permitting governments by "self-regulation" and perform measurement duties, self-control and reporting. Being EMAS verified or ISO certified can play an important role. The temporary constraints are found in the environmental law and administrative law. The Ministry of Housing, Physical Planning and Environmental Affairs is determined to change the law if it necessary to alter the traditional relationships between governments and pro-cactive companies.

7. Assessment of the outcomes of the implementation process

7.1. Introduction

The purpose of this and the next chapters is to assess the outcomes of the implementation of EMAS in terms of environmental effectiveness.

7.2. Environmental effectiveness

EMAS tries to promote continuous improvements in the environmental performance of industrial activities by (EMAS-Regulation Art.1 (2)):

- (a) the establishment and implementation of environmental policies, programmes and management systems by companies in relation to their sites;
- (b) the systematic, objective and periodic evaluation of the performance of such elements;
- (c) the provision of information on environmental performance to the public.

In the Guidelines for the case study on EMAS and the German case study report, the possibilities to assess environmental effectiveness have been evaluated. Bültman and Wätzold concluded that the overall environmental improvement brought about by EMAS depends on both the number of participating companies and the environmental improvement that is achieved on the company level by participation in EMAS. Looking at the environmental improvements on the company level, we can differentiate between:

- a. the goal of EMAS (continuous improvement of the environmental performance of an industrial activity);
- b. the means to achieve this goal (installation of environmental policies, programmes and management system, periodic evaluation of the systems performance and provision of public information).

The sequence will be that we will first deal with the participation in EMAS in section 7.2.1, then we will evaluate the overall contribution of EMAS to the environmental performance

of a company in section 7.2.2 and finally, we will look in detail at the contribution of the different elements of EMAS in section 7.2.3.

7.2.1. Participation

Participation in EMAS in the Netherlands is easy to assess as all the participating companies are registered by the SCCM. Figure 2 relates the number of participating companies to the number of companies that possibly could participate in EMAS and for which data is available for all the four countries under review. These are the companies from the manufacturing sector with more than 20 employees².

Figure 2: EMAS registered sites in relation to the number of sites from the manufacturing sector

	number of companies with more than 20 employees in the manufacturing sector (1995)	number of sites registered with EMAS (no. must be actualised acc. to date of CERNA's figures)	percentage of companies that participated in EMAS
France	24.671	?	?
Germany	37.413	1,482	3,96%
Netherlands	6.404	23	0.36%
UK	29.608	?	?

Source: Eurostat – New Cronos Datenbank 12/98 and Dutch SCCM publications

There are about 360 organisations ISO 14000 certified in the Netherlands, the number of EMAS registrations is relatively low, being 23 sites or 20 companies registered. In 1996 the number was 13, in 1997 20.

In the Netherlands it is only possible for industrial companies and for companies that deliver industrial services to be registered in EMAS. The possibility for other service companies will be opened in the future. An important driver for this came from the government that expressed that as examples governmental companies also should become EMAS registered. Still this possibility is not opened yet.

ISO and EMAS

Approximately 360 companies were registered with ISO 14001 in 1998 in the Netherlands. A small percentage of these companies were also registered with EMAS. In the Netherlands, ISO 14001 dominates strongly over ISO 14001. One of the reasons was that there was already some experience with BS 7750. Since 1989 a policy was implemented that aimed at

² The number of possible participants might be higher as smaller companies can also participate. However, so far participation was largely restricted to companies with more than 20 employees.

the diffusion of environmental management and environmental management systems among companies. It was pushed heavily both by governments as by business organisations and trade associations, chambers of commerce and centres for innovation. One of the key points of interest was the question of normalisation and certification (compare chapter 2). For that reason soon BS 7750 was introduced with the intention to have the ISO standard as its successor. So the introduction of environmental management systems and certification was already done years before EMAS came into practice.

Because the SCCM has strongly co-ordinated EMAS and ISO in its certification and verification schemes, the additional effort to become EMAS registered once ISO 14001 certified is rather small. It is just about drawing up an environmental statement and having that verified. One of the reasons why the effort is rather limited is because the initial environmental assessment that is recommended in ISO 14001 is in fact prescribed in the Dutch interpretation of ISO 14001. Also on the issue of continuous improvement the Dutch interpretation of ISO 14001 is rather progressive. It has not only to do with the management system but also with the level of ambition of the environmental goals within the company's environmental policy. This is directly linked to the environmental performance because the management system has to guarantee this. For these reasons taking the step from ISO 14001 to EMAS is a limited one.

Out of 15 companies 14 reported that they already had implemented an environmental management system before they opted to become EMAS registered. From those companies 13 were already ISO 14001 certified. Only one company mentioned that although they were not ISO certified, that they implemented ISO 14001 and EMAS, became certified and verified an registered, all in order to choose later on the system of preference. ISO 14001 is, like in a lot of other countries, perceived as really international while EMAS is surrounded by a provincial image. Industry does not want a provincial image. EMAS in its first draft, aiming at a governmental dominated and obligatory system did not fit in into the voluntary Dutch tradition with regard to environmental management systems. So BS 7750 and its successor ISO 14000 became the leaders. BS 7750 was already the leader when EMAS was introduced.

7.2.2. Improvement of the environmental performance of a company

It is difficult to assess the overall impact of EMAS on the environmental performance of a company because it is impossible to disentangle between the impact that EMAS has on its environmental performance and other causes. Bültman and Wätzold mentioned some other causes like environmental legislation, technological change and pressure from stakeholders. They thought that the most fruitful way is to rely on companies' opinion on whether

EMAS can help to improve their environmental performance. As an indicator they proposed the results of a company survey which asked for the amount of measures that have been introduced in the context of EMAS and their relevance with respect to environmental improvement.

Figure 3: Measures to improve the environmental performance companies have undertaken or intend to undertake in the context of EMAS-participation (percentage of companies)

Technical improvement of existing plant	83%
Optimisation of production process	42%
Optimisation of products	33%
Replacement of problematic material	33%
Optimisation of transports	17%

Figure 3 gives the results of a survey on measures companies have undertaken or intend to undertake to improve their environmental performance in connection with their EMAS-participation. Still interpretation of these figures only can be done with some additional information. The percentage is taken from the twelve companies that did answer this question. Three companies did not answer this question. Two explained this. One company did not think of environmental oriented measures as being induced from participating in EMAS. Their continuous attention for the environment induced the measures. One company was explicit that environmental oriented measures were induced from the "BMP" and the "Milieujaarplan". The "BMP" relates to the Dutch system of implementation of the environmental policy in the target group approach. For heterogeneous branches of industry this implies plans for 4 to 8 years in which passed on goals have to be translated in environmental oriented measures. For homogeneous branches of industry the "BMP" does not only hand the goals but also the measures that have to be taken by the individual companies. Often the "BMP" is presented as a voluntary agreement between governments and companies. Nevertheless there is always the threat of regulation during negotiations. On top of that the environmental management systems were introduced to the Dutch companies already in the early nineties. A lot of EMAS registered companies were already ISO 14001 certified. So especially in the Netherlands it is impossible to disentangle between the impact that EMAS had on environmental performance and other causes.

The assessment of the environmental effects of these measures is given in

Figure 4.

Figure 4: Environmental effects resulting from measures undertaken in the context of EMAS-participation (average scores on a six point scale; 6 = no effects 1= huge effects)

Waste reduction	2.80
Reduction of energy consumption	3.20
Reduction of gaseous emissions	3.26
Reduction of water pollution	3.53
Reduction of water consumption	3.60
Reduction of resource use	3.79
Reduction of soil pollution	3.87
Reduction of noise	3.93
Localisation of dangerous waste from the paste	4.29

The scores on the indicators in figure 3 and 4 suggest that EMAS can significantly initiate measures to improve the environmental performance of a company, whereas these measures only have medium environmental effects. Bültman and Wätzold wrote in the German case study on EMAS that it remained unclear which percentage of measures mentioned in the German survey would have been undertaken also without the companies participating in EMAS. In the Dutch situation, like mentioned above, the history of voluntary environmental management and environmental management systems, started much earlier than EMAS was issued. Environmental management is about "how it can be done". Besides this, the target group approach has been implemented since 1989. For a number of sectors of industry this gives the agenda for change or with other words "what should be achieved". Still regulation or the threat of regulation is still to be assessed as an important cause. So, the kind of activities undertaken and the environmental measures being taken are *at least partly but probably for a large part* initiated by other causes than EMAS as such. Several companies in our research population made such a statement. The drive to get ISO 14001 certified or EMAS verified than can be interpreted as an expression to be willing to justify the behaviour of the company and to be transparent on the efforts being made for improving the environmental performance. Nevertheless there is also *no logical reason* why the systematic auditing, reporting and feed-back would not stimulate the environmental performance and thus the number and quality of environmental oriented measures being taken. When the Dutch companies were asked for their motives, quit a number of companies stressed that after the as most important mentioned *company's image* the second most important motive was improving the environmental performance of the company.

Additional environmental effects of EMAS (on top of ISO)

It has to be low. Only one company participating in EMAS did not act on top of another standard for environmental management. It is my true believe that the people answering in

the questionnaires find it hard to disentangle the environmental measures and the related environmental impacts. Some made remarks on this. It is the old story. What was first: the chicken or the egg? In this case there are two chickens EMAS and ISO. We know for sure that the ISO chicken was there before the EMAS chicken moved in. Even the conclusion that it is the combined effect of both standards is not in line with my experience in the field. Several research projects indicates that companies start taking environmental measures and somewhere on the road pick up the environmental management thing. So they collect eggs and then get aware that it might be a good idea to have chickens too. In a more widely time-horizon it becomes messy to disentangle. Even the fact that measures are written down in environmental programs and the effects are integrated into environmental policy of the firm does not have to indicate that the system is deductive, it could as well be inductive. On top of that EMAS participants are particularly keen on proving good, systematically managed, environmental performances. So there is an element of social desirable answering in these data also.

7.2.3. Means to improve the environmental performance of an industrial activity

After this general assessment we will discuss the contributions of the different elements of EMAS to the improvement of the environmental performance of sites. We will differentiate according to Art. 1 (2a-c) of the Regulation between (1) the establishment and implementation of environmental policies, programmes and management systems (chapter 7.2.3.1), (2) the provision of information of environmental performance to the public (chapter 7.2.3.2), and (3) the systematic, objective and periodic evaluation of the performance of such elements (chapter 7.2.3.3).

7.2.3.1 Establishment and implementation of environmental policies, programmes and management systems

This part refers to the internal activities that a company has to undertake in order to *improve its environmental performance*. It is about "how it is done". Bültman and Wätzold differentiate between environmental policy, environmental review, environmental programme, environmental objectives and environmental management systems. To assess the relevance of these elements as indicators the opinion of companies on their importance is used. Figure 5 gives an overview over these indicators.

Figure 5: Importance of different elements of EMAS(average scores on a six point scale; 6 = superfluous 1= very useful)

	Netherlands	Germany
Environmental statement	1.9	2.4
Validation	2.5	2.6
Registration	2.5	3.2
Environmental effects evaluation	2.9	2.1
Environmental policy	3.0	2.2
Environmental objectives	3.0	1.8
Environmental audit	3.1	2.1
Environmental programme	3.1	1.7
Documentation	3.4	2.2
Legal compliance audit	3.6	2.1
Operational control	3.7	2.2

Remarkable outcome is that the Environmental statement, Validation and Registration are found to be the most useful elements of EMAS for Dutch companies. In Germany these elements were judged as the least useful. This once again emphasises the influence of developments in the Netherlands prior to EMAS. A number of companies explicitly mentioned the fact that the other elements were already there because of their Environmental Management System, be it BS 7750 or ISO 14001 certified. The additional elements Environmental statement, Validation and Registration are highly valued while the other elements are assessed as being useful but not new or adding things to the company. The external justification and the elements connected to that are the additional value of EMAS for the company. This once again indicates the earlier remarks that the number of additional measures/environmental performance because of EMAS is to be *assessed as rather limited*. Once again it should be kept in mind that almost all companies did have an environmental management system, often certified, before taking the additional effort of participating in EMAS. Because of the co-ordinated certification schemes, the real additional effort is in the Environmental statement, the Validation of it and the Registration. The research outcomes in figure 5 are therefor beyond all doubts. For the Dutch companies the external activities are the most useful and not the internal activities. This indicates that EMAS has not been very successful in helping companies to improve their internal activities towards environmental improvement.

The research outcomes in Germany are completely opposite Bültman and Wätzold concluded:

“The most striking aspect is that all internal activities that a company has to undertake to

comply with EMAS have been given a relatively high value (ranging from 1.7 to 2.4 on a scale from 1 (very useful) to 6 (superfluous)). This suggests that EMAS has been successful in helping companies to improve their internal activities targeted towards environmental improvement.” (1999)

7.2.3.2. Provision of information of environmental performance to the public

The EMAS-Regulation requires companies to publish an environmental statement (EMAS-Regulation Art. 5) which has to be validated by the verifier. This is a public document that has to be validated. In the Netherlands, because of the established co-ordination between EMAS and ISO, the environmental statement is in the Dutch context the key difference between EMAS and ISO 14000. ISO 14000 does not require an environmental statement in the Dutch version NEN-ISO 14001. So the assessment of the environmental statement is important.

Figure 6 gives data on the assessment of the environmental statement by the EMAS registered companies on a 6-points scale:

Figure 6: Assessment of the environmental statement (mean score on a six-point scale from 1= completely true to 6 = completely untrue)

Reflects the environmental engagement of the company	1.7
Enables a critical dialogue about the environmental performances of the company	2.1
Useful PR-instrument	2.2
Information of employees and neighbourhood	2.3
Provides information for public authorities	2.7
Serves only to comply with EMAS regulation	4.3

Figure 6 indicates that the EMAS registered companies do appreciate this core difference between EMAS and NEN ISO 14001 and admit that the theoretical advantages that come with the environmental statement are also to be appreciated in practice.

7.2.3.3. External validation of companies

This part deals with the quality of the external control of the activities that a company has to undertake in order to comply with EMAS and the sanctions provided in case of non-compliance. The quality of the external control depends on various aspects: (1) the competence of the verifiers, (2) the quality and strictness of the validation, (3) the strictness of the supervision of the verifiers, (4) the supervision of the supervising body, (5) the registration procedures and the level of public authorities' involvement in the system (Bültman and Wätzold, 1999):

7.2.3.3.1 Competence of the verifier

In the Netherlands organisations are accredited and not individuals. This is not a formal rule, it is possible that individuals are accredited, but it is discouraged. The scope definition is primarily the responsibility of the organisation. The organisation that makes an application defines the scope for which it thinks it meets the criteria for accreditation. Of course the defined scope has to be defined. The organisation that request accreditation has to prove that they have at their disposal procedures to judge whether a specific plant that wants to be verified is or is not within the scope. For individuals that are accredited the scope will be limited beforehand. Scopes are not harmonised yet, the recommendation is to use the so called NACE-arrangement.

On competence and constitution of verifying teams a lot is proclaimed in the *Scheme for Verifying EMAS*. Point of reference is ISO 14012.2. The required level of education and work-experience is at least high vocational training. This is in the Dutch educational system the level just below university level. A verifier has carried out at least four EMAS-verification processes or environmental audits coached by a registered verifier and must have at least four years of work experience in several of the following fields:

- Environmental principals of environmental compartments like air, water, surface and have knowledge of technologies that can be applied.
- Technical and environmental knowledge of production processes.
- Best available technology for the abatement of environmental burden including the use of the technologies in practice.
- Executing assessments on environmental pollution and environmental effects.
- Environmental law, environmental rules and related instruments.
- Principals of management systems in practice.
- Principals of environmental management systems and normalisation practices.
- The introduction of environmental management systems in practice.
- Audit procedures, audit processes, audit techniques and related norms.

This does not mean that a verifier has to be expert on all these fields. Still his competence has to include the capabilities to work with specialists on the fields that our not part of his personal specialisation.

For a leader of verifying teams there are some additional requirements. He has to have the knowledge and experience to lead verifying team. Because there are hardly persons that can meet these requirements a transitional arrangement is in use. Minimal requirements to be a lead-auditor are:

- To be qualified and registered for ISO 9000 management systems and fulfil the requirements of ISO 10.011-2 with regard to training, practical experience and auditing.
- Being qualified for the scope-sector of the company that wants to be verified.
- Minimal four verification processes executed as verifier, environmental auditor or observer.
- Participation in a course/training on EMAS or applicable norm.
- By either education or experience having expertise on environmental law en rules.

Leaders of verifying teams that are part of the transitional arrangement are not allowed to verify without involvement of another verifier.

There are also demands on the decision-making in the verifying-team. The person/verifier that takes the final decision has to meet the following additional requirements:

- Having participated in a course on assessment and evaluation of quality-systems, finished off by an exam with positive result.
- Having participated in a course on the principals of environmental management systems.
- Having at least four years of full time work experience, at least two years experience as an expert in quality and environmental management systems in companies and institutions.
- Having professional experience on all parts of environmental BS 7750/ISO 14000 and/or ISO 9000 quality audits. Experience should be at least four audits in the last two years with a joint length of at least 20 days.

For the time being the EMAS is only open for industrial activities and services that support industrial activities like research and laboratories.

7.2.3.3.2 *Quality and strictness of the validation*

Bültman and Wätzold wrote about the quality and strictness of the validation “...is difficult to assess as neither the verifier nor the verified company have an incentive to say that the controls of the verifier are too lax. Therefore, we use as an indirect indicator for the quality and strictness of the validation the time the verifier spends for doing his (or her) job, especially the time spent for the inspection of the site. Additionally, we search for evidence that the quality and strictness of the validation is particularly high or low. In order to assess the time the verifier spends for the validation we ask verifiers in all the four countries under review how much time they need to validate one particular company. This company is from the metal industry and medium sized” (1999). The company description is in Annex 1.

For the assessment in the Netherlands we used a number of sources. This led to a range in estimates, but the general picture is clear:

Table 7: Average time a verifier spends inside the company (in man days)

	France	Germany	Netherlands	UK
Preparation		4.5	2/1	
Inspection of site		2.5	4/7	
after inspection		2.5	1/1	
Overall		9.5	7/9	

The UFZ model company was used, compare annex 1. Three experts were asked to assess the time verifiers spend inside a company, an expert working as auditor for the Council for Accreditation, and two (lead-) auditors working EMAS accredited organizations.

The experts assessed of course that smaller or larger size of companies do account for a difference in the time a verifier spends in a firm. However also a lot of different characteristics of companies make a difference. They did not think it was a sensible thing to score small, medium and large companies. The estimates were quite comparable. When I asked them about that, they explained that there is competition however price is only of limited importance. Earlier contacts are more influential. It is not hard to understand. A lot of companies are already ISO 9000, BS 7750 and/or ISO 14001 certified as they start up EMAS. There is of course a large overlap between ISO 14001 and EMAS, especially in the Netherlands where the Schemes are heavily coordinated. Secondly, the involved efforts are smaller if the verifying company already is familiar with the firm whose environmental statement has to be verified.

In the Netherlands verifiers take the controls seriously and certainly not lax. A large effort is put in the inspection of the site. It certainly is not possible to “buy” a registration. Of course there is competition between the verifiers. Still the price of verification is not very different between the different verifiers. It is important to note that competition is not as much a matter of price. And even if the price is relevant, often the company uses the same organisation they had experiences with in regard to other issues like ISO 14000 or ISO 9000. It also makes a difference in the costs involved when a verifier knows the company very well.

7.2.3.3 Strictness of the supervision of the verifiers

Supervision of verifiers

The way verifiers work is determined by the *Scheme for Verifying EMAS*. Bodies around the SCCM like the Council of Supervision and the Central Council of Expert evaluate the working procedures and –if necessary- take the initiative to adjust the *Scheme*.

The Council of Accreditation does the supervision of verifiers. Once a year every accredited verifier is checked. This is done by minimal a visit and checking produced reports. In a number of cases, observation/eye witness of the accredited organisation doing their work expands this. If something is found not correct an announcement of non-conformity is made. Depending on the issue reaching from detail to important the accredited organisation has a few weeks to a year to correct things. If things are found not correct after this period, suspension is possible and of course draw back of the accreditation given. Besides this, the SCCM will ask the Council for Accreditation to evaluate those verifiers that seem give reason to doubt about their qualifications.

As a part of the accreditation process, the verifiers are observed/eye-witnessed doing their job. The evaluation of all verifiers and leaders of verifying teams will be linked to accredited organisations.

For the reasons mentioned above, about 40% of the actual EMAS validations have been observed/eye-witnessed by the Council for Accreditation. The supervision has not led to suspensions or drawback of the EMAS accreditation's. This fact is according to the council of accreditation not to be interpreted as lax-supervision. An accreditation procedure that aims at experienced organisations is an important factor. Those kinds of organisations take an announcement of non-conformity serious.

Level of control from registration body and enforcement agencies

Bültman and Wätzold, wrote about his theme: “*Before a site is registered, the registration body examines the application form and documents, inter alia the environmental*

statement, and the relevant enforcement agencies check whether the site complies with the relevant environmental regulations. The registration body can delete or temporarily suspend the site from the register at any time, if it concludes that the site no longer complies with the EMAS-Regulation or if it is informed by the relevant enforcement agencies that the site violates environmental regulations. To assess the level of control we use as indicators:

- number of sites where the environmental regulatory body has raised objections against registration, reasons of these objections, consequences for the companies (removal of objections, refusal of registration, ...)
- number of sites where the registration body has raised objections against a registration (excluding the objections by the environmental regulatory body), reasons of these objections and consequences for the companies
- number of sites that have been deleted or temporarily suspended from the register”(1999).

The Dutch situation compared with the German situation

Figure 8: Percentage of sites where objections have been raised against registration

	Germany	Netherlands
sites where the environmental regulatory body has raised objections against registration (in % of total registered sites)	5,9 %	8%
sites where the registration body has raised objections against registration of sites (in % of total registered sites)	5.1 %	13%
sites that have been deleted or temporarily suspended from the register (in % of total registered sites)	0.3 %	0%

In the cases in which the environmental regulatory bodies raised objections because the company did not comply with all relevant environmental laws the procedure started with consulting both parties about the issue. In both cases agreements on the issues were reached and implemented to reach compliance with the law within a certain period. If this happened the registration was granted.

The SCCM postponed some registrations until the right documents were submitted to fulfil the requirements for registration.

To summarise our impression concerning the environmental effectiveness of EMAS: the number of companies registered is small. The registered companies state that the most usefull elements were the external oriented ones and not the internal oriented elements of EMAS . Still companies report a considerable number of environmental measures in the context of EMAS. The causal direction of the relation is however not very clear. The fact

that a lot of activities were already taken in the Netherlands on the field of environmental management and environmental management systems in the years 1989 to 1995 is an important rival explanation as is the fact that a lot of EMAS registered companies were already ISO 14001 certified. Nevertheless because of the introduction of EMAS the Dutch government was able to influence the interpretation of ISO 14000 considerable. ISO 14000 is interpreted rather progressive, demanding environmental analysis/audit, continuous improving environmental performances as well as a continuous improving management system. The implementation of ISO 14000 is also a balance system between private and public interests. In which public interests certainly include environmental interests. EMAS might as well indirectly have been promoting ISO 14000 in the Netherlands. The prospects on EMAS are that little companies will finish their participation in EMAS and the number of large companies being EMAS registered probably will grow to some tens. An important factor is a recent Dutch law that requires yearly environmental statements/reports from 300 large companies

8. Allocative efficiency

8.1. Introduction

Bültman and Wätzold wrote about allocative efficiency in relation to EMAS: *“Allocative efficiency of abatement activities means in general that a given goal (e.g. reduction of an emission by 50%) is achieved with minimum costs. This implies that the abatement activities follow the pattern that polluters with the lowest marginal abatement costs abate first. In the context of EMAS, the policy maker does not set a specific environmental goal in the traditional sense such as an emission limit. As analysed in chapter 0 the objective of EMAS is the promotion of continuous improvements in the environmental performance of industrial activities, and, the extent to which this aim can be achieved depends on the number of participating companies as well as the environmental improvement that is achieved on the company level. In order to assess the allocative efficiency of the EMAS implementation process the analysis has to concentrate on the means to achieve these aims, and allocative efficiency has to be defined with respect to these means. Furthermore, there can be another source of inefficiency in the EMAS implementation process which is related to the determination of prices by regulatory bodies”* (1999).

In chapter 8.2 we will go into the measures to increase participation in EMAS and the issue of allocative efficiency. In chapter 8.3 we will go into the issue of means to improve the environmental performance of an industrial activity and allocative efficiency. In chapter 8.4 we will go into the issue of determined prices and costs.

8.2. Measures to increase participation in EMAS

In the Netherlands there are only two EMAS registered companies that admit that they have received a subsidy in order to participate in EMAS. This companies explained that it covered about 10% - 20% of the costs and that it was not unimportant to receive a contribution but still not essential. It was paid by the European Union. Because of the fact that there were no national subsidies granted, the allocative efficiency cannot be at stake.

In the Netherlands there were no promotional schemes targeted towards particular group of companies or regions. The SCCM performs the prescribed promotional functions for all companies in the Netherlands alike. There were also no subsidies. So promotional schemes

cannot be a source of inefficiency.

There is however in the publications of the ministry and the SCCM some tendency to advice some categories of companies not to get EMAS registered or ISO 140001 certified. The SCCM states that environmental management systems are of advantage for every organisation in general. Still they state that for some companies validation (EMAS) or certification (NEN-ISO 14001) is a too demanding instrument. This is especially the case for small companies with a small environmental burden. The “advice” is given by stating that in practice companies want to be EMAS registered or ISO certified for which the environment is an important issue (because of their environmental burden) and/or have customers that require certain environmental goals achieved and/or companies that want to be a font runner and/ or companies that are part of a holding and by this factor have to act (SCCM Certificatie Milieuzorgsystemen, p:14).

This could be relevant for the allocative efficiency. Still it does not have to be inefficient if the more polluting companies are the first that participate in EMAS. The revenues are potentially larger. Neither has it to be inefficient if companies that have to meet demands of their customers participate because of that as front runners in EMAS. In the last case the net-costs to participate can be lower.

In the Netherlands there were no promotional schemes targeted towards particular group of companies or regions. The SCCM performs the prescribed promotional functions for all companies in the Netherlands alike. There were also no subsidies. So promotional schemes cannot be a source of inefficiency.

8.3. Means to improve the environmental performance of an industrial activity

In the guidelines for the performed case-study Bültman and Wätzold wrote.

“...we will divide the means to improve the environmental performance of an industrial activity into three parts and discuss for each part what allocative efficiency means in this context. For all means we will follow the general line that we assume that as long as the firms respectively the external verifiers have the freedom to act as they wish the efficient solution, i.e. the cheapest solution to achieve a certain goal (e.g. establishing a management system), is implemente” (1999).

8.3.1 Establishment and implementation of environmental policies, programmes and management systems

In the Scheme for Verifying EMAS there are norms for how to assess the activities of the firm (environmental policy, environmental review, environmental programme, environmental objectives and environmental management systems). Nevertheless these are not demands from the government, and also these requirements are formulated as goals and do not imply that the nature of the company should not be taken into account. So there are no reasons to assume that efficiency is at stake. How to reach for the goals and standards set, depend on the company's features.

8.3.2 Provision of information of environmental performance to the public

Inefficiencies may arise when rules concerning the content and the extent of the environmental statement are prescribed. In the Scheme for Verifying EMAS there is a description of the functions of the environmental statement and also some indication of the information that could be included in the statement. There are no rule involved, it concerns guidelines both for the company and for the verifier. The word "must" is not used, the word "could" dominates. Very concrete, binding information is not there, so there is no reason to believe that efficiency is at stake.

8.3.3 Systematic, objective and periodic evaluation of the performance of such elements

Indicators for inefficiency could be found in guidelines that oblige verifiers to follow certain validation procedures. Bültman and Wätzold claimed that *“in general they cause inefficiency if a validation procedure is prescribed which needs more input as an alternative validation procedure which generates the same output, i.e. the quality and the strictness of the validation process is adequate. One should bear in mind that prescriptions do not cause inefficiency if they only prescribe a certain strictness or quality of the validation. An example for inefficiency could be a standardised evaluation procedure for all companies which does not take into account differences that arise from e.g. the size of a company or the seriousness of possible offences”* (1999).

In the Netherlands a lot of guidelines in are given in the *“Scheme for Verifying EMAS”*. However they are all about working procedures and quality standards that should be complied with. Nevertheless the descriptions are in words that imply guideline that can be applied but still leave enough room to take into account the features of the firm. The guidelines do not make it impossible to take into account differences that arise from the

size of a company or the seriousness of environmental burden caused.

8.4. The determination of prices by regulatory bodies

Bültman and Wätzold stated that “*Some of the prices for services which companies need that participate in EMAS are not determined by market forces but by state, private or mixed regulatory bodies (e.g. registration fees). The prices of these services are efficient when they reflect the actual cost of the service; they are inefficient if they do not. This means also that charging no fees for a service could be inefficient as well. We differentiate between examination and supervision fees for the verifiers, validation costs and registration costs. Indicators for efficiency are therefore prescriptions for fees and prices. However, it has to be examined in each case whether they lead to inefficiencies*”, (1999).

8.4.1 Accreditation and supervision fees

The accredited organisation have to pay 2500 Dutch guilders registration fee. Besides that they have to pay the Council for Accreditation for the days involved. This will be about 10 days, depending on the scope, assuming that everything is found acceptable at once. Before the official accreditation process starts the submitted application is scanned quickly in a preliminary inquiry to assess whether an application is sensible. For that reason all the official applications have been accredited finally. There were however applications that did not lead to a full-fledged accreditation process. The cost involved for a full-fledged accreditation will be about 19500 Dutch guilders, if it takes 10 days of work from the Council of Accreditation. If the outcomes of the assessment are not satisfying, additional efforts/assessments are necessary. In total the amount of money involved will be in about 22000 Dutch guilders.

One should keep in mind that the accreditation of the EMAS verifiers in the Netherlands in practice was cheaper because the involved work and thus costs decrease when the applicant already has other relevant accreditation's like for ISO 14000. So costs reflect actual work on a day-price basis. The price of a day input from the Council for Accreditation is a “regular” consultancy fee that can be justified. The amount of 2500 Dutch guilders is a fee charged that does not take into account the actual amount of work involved.

Fee for supervision of verifiers

The Council of Accreditation does the supervision of verifiers. Once a year every accredited verifier is checked. This is done by minimal a visit and checking produced reports. In a number of cases, observation/eye witness of the accredited organisation doing their work

expands this. For the supervision process the accredited organisations have to pay 6000 Dutch guilders a year and 1 to 1.5 % of the turnover on account of the accreditation. One should keep in mind that all EMAS accredited organisations are also ISO 14000 accredited and often also accredited for other norms like ISO 9000 etc. The amount of 6000 Dutch guilders is for supervision of all accreditation's.

The efficiency of all this can be analysed in different perspectives. Efficient can be interpreted in the sense that the fees should equal the actual costs involved. A fixed fee might represent actual costs when we assume that the supervision efforts do not vary. In general this might be the case, nevertheless findings can initiate additional supervision efforts. In that case the fee doesn't rise but the supervision costs do. In total the revenues of the Council of Accreditation (and the SCCM) should equal the actual costs, both organisations are not profit oriented. The % of the turnover has of course no relation to the actual costs caused by that verifier. Bültman and Wätzold analyzed that "*... there is also an efficiency argument to structure prices according to the amount of validations. In case there is only a basic fee, the fee represents a fixed cost for the verifier. This implies that with an increasing amount of validations the costs per validation decrease. Therefore, those verifiers that validate many sites can offer better prices with the consequence of a tendency towards an oligopolistic structure and the corresponding inefficiencies*" (1999).

Accredited organisations also have to pay 6000 guilders/year for using the SCCM-schemes to the SCCM, be it for EMAS or for ISO 14001. For both schemes it is 9000 guilders/year. On top of that a yearly compensation have to be paid by the accredited organisations for every certificate issued. This contribution is 375 Dutch guilders.

8.4.2 Validation Costs

It is left to the verifier and the company to negotiate the price in the Netherlands. This can be perceived as an efficient system as it reflects the actual costs of validation. Nevertheless the price for validation depends on aspects as whether or not the company is already ISO 14001 certified and how well the verifier knows the company from previous work. This is of course not to be perceived as inefficiency, the costs reflects the amount of work to be done by the verifier. The savings for an ISO 14001 certified company can be in the range between 50-80% (the last number only if the same organisation is used to verify).

8.4.3 Registration Costs

The companies do not pay for registration costs in the Netherlands. A fee for registration is however subject of deliberations at SCCM. Still the verifiers have to pay yearly for every

certificate an amount of 375 Dutch guilders to SCCM (SCCM, 1999, p.7). This can be considered as registration fee. If one accept that, the fee is not differentiated according to administrative effort which is an indicator for inefficiency.

9. Administrative costs

Bültman and Wätzold proposed the following approach on administrative costs: *“In order to assess the administrative efficiency of the EMAS-implementation process we will calculate the amount of administrative work connected with EMAS which is being done by the different actors. The administrative costs are structured with respect to different actors and different parts of the EMAS participation process (costs for promotional schemes, costs for companies, validation costs, registration costs, costs for the accreditation and supervision of environmental verifiers, costs for the supervision...). This will enable a detailed comparison of each part of the implementation process between the four countries under review.”*

Not all kinds of administrative costs occurring in the context of EMAS are relevant for our project. Therefore, we make the following delimitation: Only those costs are recorded that occur in the form of human labour. We also consider only those costs that directly result from running the EMAS-system in the last twelve months. This means that costs occurred in the past e.g. for establishing the accreditation and registration bodies and developing guidelines for verifiers are not considered. However, we make an exception with those administrative cost that are directly related to the participation of a company and the examination of the verifiers (costs for companies, validation costs, registration costs, examination cost). Here, we multiply the costs for one single company with the number of EMAS-participants respectively the examination cost for one candidate with the number of candidates. The costs are measured in man months per year. In order to take into account that the number of participating companies varies between the four countries under review we divide the overall amount of administrative costs by the number of EMAS-participants in the respective country. If we have hints on variations over time, these hints will be given. (1999)

Figure 9 give the corresponding estimates in man-months for the Netherlands in line with the guidelines from Bültman and Wätzold (1999).

Figure 9: Overall amount of administrative work (measured in man months, mm = 20 days)

	Germany	Netherlands
Costs for promotional schemes	586 mm	-
Costs for companies	185 mm	6.4 mm
Validation costs	704 mm ³	9.2 mm
Costs for the accreditation and supervision of environmental verifiers	139 mm	1 mm
Costs for the supervision of the DAU and UGA	42 mm	-
Registration costs	139 mm+x	0.85 mm*
Overall administrative cost	1,795 + x	17.45
Overall administrative cost divided by number of EMAS-participants	1,21 + y	0.76

*includes some promotional activities

10. Productive efficiency

Bültman and Wätzold proposed the following approach on administrative costs (1999):

“In general, productive efficiency means that companies or sites install cost-efficient abatement technologies, i.e. they are able to choose the abatement cost curve that represents minimum costs. With respect to EMAS we prefer to use the term „compliance costs“ instead of „abatement costs“, i.e. the costs that result on the company level from fulfilling the requirements of EMAS. Whether or not companies manage to achieve productive efficiency highly depends on the information they have about existing techniques (methods to install environmental management systems, how to write a report etc.). Therefore, the indicator for productive efficiency would be the provision of information about how to participate in EMAS and the related costs and benefits”.

As has been mentioned earlier, from 1989 companies have been intensely provided with information about environmental management, environmental management systems, normalisation and certification. This has been done with considerable result. In chapter 2 was mentioned that quite a number of companies were building environmental management systems in those years. The informational events on EMAS have not been as intensive as in Germany. Nevertheless a number of informational events were caused by the ministry and the SCCM. Both promotional and by explaining EMAS in the *Scheme for verifying EMAS*. The informational events towards EMAS have not been very intensive. It can however be doubted that the companies needed intensive informational events given all the activities that were undertaken in the previous years. Maybe in some countries EMAS was introduced on order to get things moving, in the Netherlands it was new only as far as the environmental statement and its verification is at stake.

Overall, there is no reason to conclude that productive efficiency was low. Whether we can conclude if productive efficiency was high is questionable. For a large number of aspects like environmental management, environmental management systems and thus like EMAS, this certainly was the case. To what extend the informative events were intensive enough to conclude that productive efficiency was high on the environmental statement and its verification remains uncertain. It was certainly not low. So the qualitative judgement on productive efficiency has to be that it was medium to high in the Netherlands.

11. Summary and conclusions

EMAS was launched in a Dutch context with a rather extensive history. In the Netherlands environmental management systems were no new issue. Since 1989 there was a policy programme that stimulates environmental management systems in private and public companies. It was a "learning" oriented program of about 60 millions Dutch guilders from the government. The implementation of the programme was predominantly organised for every sector of industry separately. Most projects were funded for 50 % of the proposed budget. Important issues like adopting alternative approaches for permitting authorities in their treatment of companies that implement serious and good environmental management systems and normalisation and certification of environmental management systems were in the program. Normalisation and certification has been an on the agenda since 1989. Starting of with BS 7750 and succeeded by ISO 14001 and EMAS.

In the Netherlands the choice was made to heavily co-ordinate the interpretation of the Council Regulation and as well to co-ordinate it with the interpretation of ISO 14001. This led to a rather progressive interpretation of ISO 14001. Due to the co-ordinating efforts, the additional requirements of EMAS on top of ISO are restricted to the environmental statement and the verification of this statement.

The wishes for a strong co-ordination with ISO 14000 had some impacts on the institutional arrangements for implementing EMAS. A *private* organisation was aimed at for the competent bodies, the accreditation system and registration, still *not* profit oriented and that still was embedded in the other institutional arrangements for implementing environmental policy. The consequence is a private organisation at one hand and rather a large influence of the government in both EMAS and ISO 14000 on the other hand, being the influence on ISO 14000 the most surprising.

The leading roles are for the Council for Accreditation as far as accreditation and supervising the verifiers is at stake and the SCCM as promotion, registration and guidelines for verifiers are at stake. Accredited institutions can sign an agreement with the SCCM in order to use the schemes.

In the Netherlands only organisations are EMAS accredited, not individuals. The accreditation-procedures and the fees involved, both for the Council for Accreditation and the SCCM discourage individuals to apply for accreditation. This is an explicit policy-strategy.

A considerable number of the 23 EMAS registered companies are not satisfied with the impact of EMAS participation. One third of the companies were disappointed in their expectations. Arguments mentioned are:

- The number of participants in the Netherlands is still too small to have good returns on EMAS participation;
- There are no gains in terms of marketing, ISO 14001 is more international oriented and is negative for EMAS;
- EMAS hardly has any additional value on top of ISO 14001;
- The ISO 14001 certificate is sufficient for improving co-operation with governments;
- The governments react neutral and not enthusiastic.

Almost all companies in our survey did not receive any financial aid for their efforts relating to EMAS. There were two companies that received money from the European Commission, 10% and 20 % of the costs involved. There was no national financial support for individual companies that want to participate in EMAS.

To summarise, promotional activities with respect to information and advice have been available in the Netherlands. It has to be recognised that information and advice on EMAS has not been pushed in an aggressive manner. It should be kept in mind that already a lot was done at forehand that aimed at environmental management, environmental management systems and the certification of environmental management systems in companies.

National financial schemes for support were not available in the Netherlands.

Environmental effectiveness

About 90% of the companies reported that they already had implemented an environmental management system before they opted to become EMAS registered. From those companies 13 were already ISO 14001 certified. Only 23 companies are EMAS registered in the Netherlands.

The environmental measures being taken and reported by companies are *at least partly but probably for a large part* initiated by other causes than EMAS as such. Several companies in our research population made such a statement. The drive to get ISO 14001 certified or EMAS verified than can be interpreted as an expression to be willing to justify the behaviour of the company and to be transparent on the efforts being made for improving

the environmental performance. Nevertheless there is also no reason why the systematic auditing, reporting and feed-back would not stimulate the environmental performance and thus the number and quality of environmental oriented measures being taken. When the Dutch companies were asked for their motives, quite a number of companies stressed that after the as most important mentioned *company's image* the second most important motive was improving the environmental performance of the company.

Remarkable outcome is that the Environmental statement, Validation and Registration are found to be the most useful elements of EMAS for Dutch companies. In Germany these elements were judged as the least useful. For the Dutch companies the *external* activities are the most useful and not the internal activities. This once again emphasises the influence of developments in the Netherlands prior to EMAS. This indicates that EMAS has not been very successful in helping companies to improve their internal activities towards environmental improvement.

During initial accreditations, the Council for Accreditations invest heavily in observations/eye-witness the work of the candidate-verifier is well considered. The confidence in just testing theoretical knowledge is limited, working-procedures and skills are believed to be as important. Because of initial accreditations and regular controls of verifiers, about 40 % of the EMAS procedures have been eye-witnessed by the Council for Accreditation.

To summarise our impression concerning the environmental effectiveness of EMAS: the number of companies registered is small. The registered companies state that the most useful elements were the external oriented ones and not the internal oriented elements of EMAS. Still companies report a considerable number of environmental measures in the context of EMAS. The causal direction of the relation is however not very clear. The fact that a lot of activities were already taken in the Netherlands on the field of environmental management and environmental management systems in the years 1989 to 1995 is an important rival explanation as is the fact that a lot of EMAS registered companies were already ISO 14001 certified. Nevertheless because of the introduction of EMAS the Dutch government was able to influence the interpretation of ISO 14000 considerable. ISO 14000 is interpreted rather progressive, demanding environmental analysis/audit, continuous improving environmental performances as well as a continuous improving management system. The prospects on EMAS are that little companies will probably finish their participation in EMAS and the number of large companies being EMAS registered probably will grow to some tens. An important factor is a recent Dutch law that requires yearly environmental statements/reports from 300 large companies

Allocative efficiency

In the Netherlands there were no promotional schemes targeted towards particular group of companies or regions. The SCCM performs the prescribed promotional functions for all companies in the Netherlands alike. There were also no subsidies. So promotional schemes cannot be a source of inefficiency.

Because of the fact that there were no national subsidies granted, the allocative efficiency cannot be at stake.

In the analysis of the means for improving the environmental performances of an industrial activity were found no arguments to assume that inefficiency occurs.

In general the fees for accreditation and supervision are efficient. In general the revenues gained are no larger than the costs made. The distribution of costs over the relevant organisations is probably not totally efficient. For the process of an initial accreditation (that is successful without additional work), about 11 % of the costs is fixed and 89% depends on the labour of the Council of Accreditation that is necessary. A large portion therefor is directly linked to costs and a small portion is fixed, it is questionable to what extend this part is directly linked to costs.

It is left to the verifier and the company to negotiate the price in the Netherlands. This can be perceived as an efficient system as it reflects the actual costs of validation. Nevertheless the price for validation depends on aspects as whether or not the company is already ISO 14001 certified and how well the verifier knows the company from previous work. This is of course not to be perceived as inefficiency, the costs reflect savings in the amount of work to be done by the verifier. The savings for an ISO 14001 certified company can be in the range between 50-80% (the last number only if the same organisation is used to verify).

The companies do not pay for registration costs in the Netherlands. A fee for registration is however subject of deliberations at SCCM. Still the verifiers have to pay for every certificate an amount of 375 Dutch guilders to SCCM (SCCM, 1999, p.7). This can be considered as registration fee. If one accept that, the fee is not differentiated according to administrative effort, which could be an indicator for inefficiency.

Allocative efficiency is quite high, it is likely that those companies with the highest net-returns participated first, costs are distributed for large part to the organisations that caused them, no large subsidies or profits are present. With regard to some minor amounts of money there are some doubts whether they decrease allocative efficiency.

Administrative costs

In line with the small number of companies participating in EMAS, the administrative costs are low. Compared to Germany the administrative costs for each company registered is smaller.

Productive efficiency

Overall, there is no reason to conclude that productive efficiency was low. Whether we can conclude if productive efficiency was high is questionable. For a large number of aspects like environmental management, environmental management systems and thus like EMAS, this certainly was the case. To what extent the informative events were intensive enough to conclude that productive efficiency was high on the environmental statement and its verification remains uncertain. It was certainly not low. So the qualitative judgement on productive efficiency has to be that it was medium to high in the Netherlands.

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Annex 1

Description of the site to be validated

Branch:

The company produces standard profiles and special profiles made of strip steel. Computerised roll-forming machines produce profiles from coils by the cold rolling process. The company possesses 20 of such machines. The material is not further treated in the company. If additional treatment (spraying, galvanisation) is needed, this is done by other companies.

The company possesses a design office and a tool room for producing the sector/profile forming tools as well as the tools necessary for the subsequent processing. There also exist 8 motorised (metal-turning) lathe, 3 eroding machines and several milling and grinding machines as well as drills.

The company has no plants which require official authorisation by German law.

Fleet of vehicles:

3 lorries

Size of the company:

Medium sized company with 150 employees. 100 employees work in the production and 50 employees in the administration.

History of the company:

The company was founded in 1978. It started with 10 employees but has grown steadily since then. Some of the first machines are still working whereas others have been replaced by new ones. Altogether the machines are between 2 and 20 years old.

Environmental impact:

The produced strip steel and the products themselves are not harmful to the environment. No relevant emissions exist. Cleansing agent, degreasing agent, cooling agent and lubricants

used in the production process are potentially harmful. Cleansing and degreasing agent are only used in small amounts and the cooling agent is recycled. The lubricants are put on the profiles during the production process and remain there. They are therefore problematic.

The production is relatively energy intense.

Waste exists mainly as scrap metal which is partly mixed with lubricants. The waste is disposed by another company and recycled.

Activities to improve the company's environmental performance before EMAS participation

So far, there have been no particular activities to improve the company's environmental performance other than those required by legal obligations.

The company is required by law to have a waste management. Therefore, data exists with respect to waste for the last few years. There is no other information available with respect to the environmental impact of the company. The company has also not undertaken any waste reduction measures.

EMAS has led the company to invest only in small improvements. E.g. a collecting device for metal shavings was built.

Management:

The company is still run by its founder.

The company has been certified according to ISO 9001 in 1995.

Size of the area:

The size of the company's area is approximately 25,000m². Buildings cover 15,000m².

Environment:

The company is situated in an industrial area in the countryside.