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Indirect Regulation: A Remedy to Cure the Defects of European Environmental Policy? – The EMAS-Regulation

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Abstract

The Eco-Management and Audit Scheme (EMAS) belongs to new forms of reflexive or indirect regulation in European environmental policy. The development of European environmental policy is outlined in respect to indirect regulation. By the example of EMAS the paper analyses the impacts of indirect regulation. At the first level the analysis focuses on the EMAS-participation within the European Union emphasising that EMAS turns out to be more a German rather than a European project. At the second level the analysis concentrates on the effects of EMAS-participation in respect to in-company processes of ecological modernisation as well as to external, mainly market-based impacts. The results are ambivalent: Positive effects are an improved level of in-company environmental protection and enhanced legal compliance. However, innovative potentials to organisational environmental learning are only partly exhausted. Market effects and improved relationships to external stakeholders seldom occur. To attribute these outcomes to specific instruments of environmental regulation would negate the multi-level and multi-centred institutional setting of European environmental policy. Therefore, starting points for a more effective European environmental policy are discussed, which combine aspects and instruments of direct and indirect regulation. Moreover, options to increase the participation of firms in EMAS are outlined.

1. Introduction

In times of enhanced international competition environmental as well as social standards are threatened to be reduced or undermined by processes of 'ecological or social dumping'. This challenge to environmental regulation also affects the European Union and its environmental policy, which had emerged as a 'by-product' of European economic growth policy and developed to a fully established field of European policy ensuring a comparatively high level of environmental protection. However, the creation of the Common European Market as well as the extension of the European Union to central and eastern European countries will walk along with an increased level of economic exchange and activities within the community, which is combined with more or less not-intended ecological side-effects. For example, such negative ecological side-effects are linked with an extension of transport related to economic activities, an increased usage of soil for extended infrastructures of transportation and a more extensive utilisation of natural resources as a prerequisite for an increased level of production and services within the European economy. The EC faces more severe ecological problems in respect to the entry of eastern European states because most of these new member states are marked by a relatively low level of environmental standards and a comparatively poor record on monitoring and national law enforcement (McCormick 2001: 66).

Moreover, public and political debates on the limits to the prevailing regulatory approach in European environmental policy, above all in respect to policy implementation and legal enforcement, fostered a change in European environmental policy. The regulatory approach was supplemented by a market-based approach of indirect regulation in the 1990ies which underscores voluntary action, creates environmentally oriented information flows in order to direct consumers' attention to environmental friendly firms and products or to economic incentives to environmental action. In this new concerto the EMAS regulation on self-regulated but simultaneously publicly supervised environmental management systems played a key role. The combination of different environmental policy approaches was to foster the flexibility and adaptability of European environmental policy in an economic environment of enhanced global competition, ensuring a high level of environmental protection.

Many a political actor or regulator at the European level considered indirect regulation as a central starting point to innovate European environmental policy in order to meet new demands of enhanced economic competition. In this paper[1], the impacts of indirect regulation on European environmental policy will be analysed by the example of the regulation on Eco-Management-and-Audit-Scheme (EMAS). This paper embraces eight chapters: After this short introduction the modernisation of European environmental policy by the new policy approach of indirect regulation is highlighted in chapter 2. In this approach indirect regulation is linked with the concept of ecological modernisation at the European level. Chapter 3 provides an overview on the political and institutional development of European environmental policy in which EMAS was adopted. In the forth chapter the political genesis of the EMAS regulation is dealt with. It focuses on the social construction of the 'implementation gap' related to the regulatory approach of European environmental policy and explains EMAS as a process of political competition on regulation. The key traits of the EMAS regulation are described in chapter 5. In the sixth section of this paper the distribution of EMAS-participation in member states of the European Union is analysed. Chapter 7 examines the impacts of EMAS at the establishment level covering internal as well as external effects of EMAS. The paper finishes with some concluding remarks.

2. Indirect Regulation in European Environmental Policy

The 1990ies can be characterised at least in two ways as a turning point in European environmental policy: During this decade European environmental policy was fully established as an autonomous policy field of the European Union. Simultaneously, considerable political pressure was brought on centralised regulatory mechanisms of environmental European law as being inefficient and inflexible neglecting the specific institutional settings and environmental states in different European countries. Therefore, critics argued in favour of the principle of subsidiarity. Political pressure was also directed towards the prevailing character of European environmental law and policy which rested on protective norms. Criticism against European environmental policy was raised by business associations and some governments of

[1] An earlier draft of this paper was presented in the seminar on 'European Sociology' at the University of Florence in March 2004 during my stay as a visiting lecturer. I would like to thank Paolo Giovannini very much for the opportunity to discuss my paper in his seminar as well as for his great hospitality.

member states of the European Union. In their view the protective orientation of environmental policy and law was regarded as a 'burden on business' and inappropriate to cope with economic demands on flexibility and deregulation in times of enhanced global competition. Moreover, the criticism of juridification referred to the implementation gap of European environmental law and policy. This point of criticism was also shared by environmentally oriented non-governmental organisations.

Critics of the protection-oriented pattern of legal environmental regulation opted for a different approach focussing on the concept of 'reflexive law' (cf. Teubner/Willke 1984; Isaksson 1997; Müller 2002): Reflexive law takes account of the enhanced complexity of societies and supranational social and economic spaces and their processes of differentiation into a diversity of sub-systems. In this perspective centralised mechanisms of regulation and approaches of direct intervention fail to attain political goals because they neglect the self-dynamics and the 'autopoietic' character of societal subsystems (cf. Luhmann 1988). Therefore, external political processes are regarded to be insufficient in order to create solutions for environmental problems. The rationality behind reflexive law "consists in the ability of regulation to take the needs of subsystems into account and to integrate and co-ordinate the interactions between semi-autonomous subsystems" (Isaksson 1997: 306). In this view self-organisation of social subsystems is combined with the regulation of interaction processes between different subsystems. The main function of reflexive law resides in generating norms for the regulation of interaction processes, such as co-operation, negotiation, agreement and conflict resolution, and to reorganise the legal premises and prerequisites of interaction-structures. Reflexive law intends to create 'discursive structures' (Teubner/Willke 1984) for the interaction of subsystems, i.e. opportunities for participation, negotiation and agreement which enable subsystems to develop appropriate solutions to problems they face. Therefore, the approach of reflexive law rejects direct intervention or regulation strategies in favour of indirect regulation. At the level of the European Union indirect regulation contains forms of 'management by objectives' which rests on negotiating political goals and opening or enlarging spaces to member states in goal-attainment.

However, a combination of different environmental policy instruments emerged as a new prevailing pattern of environmental European regulation: Regulatory instruments were supplemented on the one hand by economic instruments and on the other hand by information-based instruments of indirect regulation, as e.g. the European eco-label and the European regulation on the Eco-Management and Audit-Scheme (EMAS). This 'instrumental mix' is a result of political negotiation processes between different political actors in the field of European environmental policy (cf. Héritier 1997), above all the European Council, the European Commission, the European Court of Justice, interest groups and the European Parliament which successfully extended its rights in environmental legislation.

Indirect regulation is expected to foster processes of ecological modernisation at the level of the European Union in times of enhanced economic globalisation. Especially since the beginning of the 1990ies a further expansion of economic internationalisation can be observed which is linked with an extension of global trade on information, services and goods, an increase of financial and capital transactions and the emergence of new multinational companies by fusions or take-overs (cf. Gouldson/Murphy 1997; Martin/Schumann 1996). These tendencies of economic globalisation walk along with an enhanced competition on productivity, costs and prices exerting a strong pressure on social as well as environmental standards. The

range of action related to European environmental policy is threatened to be reduced according to the primacy of enhanced economic competition (Lutz/Roth 1999). Therefore, the question is raised, how the European Union can meet the ecological challenge in face of an increased economic challenge. The concept of ecological modernisation provides a partial answer to this challenge. It has been taken up by the European Union in some respect as a strategy in environmental policy. Ecological modernisation can be defined as follows (Gouldson/Murphy 1997: 74): It “proposes that policies for economic development and environmental protection can be combined to synergistic effect. Rather than seeing environmental protection as a brake on growth, ecological modernisation promotes the application of stringent environmental policy as a positive influence on economic efficiency and technological innovation. Similarly, rather than perceiving economic development to be the source of environmental decline, ecological modernisation seeks to harness the forces of entrepreneurship for environmental gain.”

The concept of ecological modernisation requires a change of environmental policy from reactive to preventive strategies (Jänicke et. al. 1999: 120 pp.). A reactive environmental policy is focussed on the compensation of ecological damages as well as on waste disposal or an additive utilisation of environmental technologies, whilst preventive policy strategies are marked by ecological modernisation related to an application of innovative, i.e. integrative environmental technologies saving natural resources. Environmental modernisation proposes win-win-situations of mutual ecological and economical goal attainment. For instance, recycling strategies and a usage of eco-efficient technologies on the one hand contribute to save natural resources and integrate environmental aspects into the in-company agenda setting, as e.g. by taking account of environmental aspects in decision-making processes on technological investments. On the other hand strategies of environmental modernisation advocate the reduction of costs, as e.g. in the procurement of raw materials and waste disposal. In this perspective ecological modernisation paves the way for an improved competitiveness of firms and economies: First of all, it enhances the development, production and implementation of environmentally safe technologies as a competitive edge. Secondly, it provides firms with an advantage in cost competition by an increased eco-efficiency of production compared with competitors neglecting the ecological side of cost reduction. Furthermore, ecological modernisation is a starting point to a more ambitious structural change of branches and industrial sectors integrating ecological demands into structures of transport and production as well as into patterns of consumption (cf. Jänicke et al.1999: 121 p.)

Such win-win-strategies of ecological modernisation require a change of regulation patterns in environmental policy from the regulatory approach to more flexible patterns of regulation which combine regulatory strategies with market-based and information instruments and shift the focus on environmental policy from direct to indirect forms of regulation. Such indirect forms of regulation are to stimulate processes of ecological modernisation within the EC-member states at sectoral and company level by the utilisation of economic incentives (cf. Becke 1999). The European Community adopted such policy strategies of indirect regulation to foster a high level of environmental protection among its member states (Kraemer 1995: 28 pp.). These strategies are to create market-based incentives for companies to introduce environmentally safe technologies or to continuously improve their products, organisation and processes of production (cf. Fichter 1995: 1; Kraemer 1995: 28). The mixture of policy instruments related to indirect environmental regulation still contains commands and orders and prohibitions, but enlarges the

spectre of policy instruments by environmentally oriented economical instruments, such as environmental taxes on fuel and energy, rates or duties and charges as well as market-based incentives. Different political actors in the field of European environmental policy opted for strategies of indirect regulation because they expected market-based mechanisms to foster advantages of the environmental situation within the European Union. In this perspective a crucial role plays the creation of new flows of information within companies and in their socio-economic environment composed of different stakeholders, such as banking and insurance companies, customers and residents or non-governmental organisations and other interest groups. The core idea behind this perspective rests on the assumption that public access to and the public distribution or reporting of environmentally relevant information on environmentally friendly products and production processes are to give environmentally oriented companies a competitive edge over conventional competitors because of advantages of reputation among customers and other stakeholders. In this view a good environmental performance of companies pays off because public information flows create an awareness of customers about good company eco-performance whereby the demand of goods or services is increased. Moreover, environmentally engaged companies may open up new market opportunities. Therefore, a control of public information flows on the ecological performance of companies is intended to enhance the competitiveness of environmentally oriented firms as well as to reduce environmental pollution and prevent further environmental damages.

The European council regulation on “Eco-Management and Audit Scheme” (EMAS) of 29th June 1993 epitomises the market-based and information instruments related to the new policy strategy of indirect regulation. As regulation the character of EMAS differs from other legal instruments of European policy, such as directives and decisions. According to Article 189 of the EEC Treaty regulations are generally applied and “binding in its entirety and directly applicable in all Member States” (Hildebrand 2002: 14). EMAS serves two significant purposes: Firstly, it aims at the integration of environmental aspects into the management and production processes and the organisational structures of companies with the assistance of an environmental management system. Secondly, it is to provide external stakeholders with credible and valid information about the environmental impacts and performance of companies (ibid: 142). EMAS does not stand alone as a market-based instrument of the European environmental policy. The European Commission and especially the General Directorate for Environment intended a double strategy, in which company-related and product-oriented market-based instruments were to complement one another. The European Regulation No. 880/92 formed the foundation of a product eco-label for environmentally safe products. Companies can voluntarily participate in a procedure whereby their products will be subjected to a product life cycle analysis. Thereby products are examined and compared with each other in respect to different product categories. The best ten to 15 products in environmental respect are rewarded with the European eco-label, the so-called Euro-flower-label. The eco-label can be utilised by companies for advertising and customer information. This European regulation intends to foster the development, production, sale and usage of environmentally friendly products with resource-saving production processes (Kraemer 1995: 27). Contrary to this product-oriented regulation, the EMAS-regulation aims at a continuous environmental performance of companies or establishments.

3. The Development of European Environmental Policy: From Incidental Measures to Institutionalisation

European environmental policy is a 'latecomer' among the spectre of European policies. It reflects both processes of policy and institutional learning and embraces a broad variety of regulations and provisions which lack a coherent pattern of regulation. This diversity is attributed to different 'philosophies', levels and approaches to environmental regulation which can be attributed to different periods in which European environmental policy developed. It can also be explained by diverse national initiatives influencing political processes of agenda-setting and legislation at the European level (cf. Eichener 1996: 261). Therefore, a co-existence of different approaches and instruments in European environmental policy prevails today. During the 1990ies a new pattern of indirect and procedural regulation developed in European environmental policy which thrust the dominant pattern of direct regulation into the background giving since then priority to an 'instrumental mix' of European environmental policy. EMAS is an important instrument of European environmental policy reflecting this new approach of indirect and procedural regulation. The emergence of this new pattern is closely linked with specific historical trajectories of European environmental policy. Therefore, I would like to sketch the historical development of European environmental policy.

The historical and political development of European Environmental policy consists of four different periods[2]. According to Philip M. Hildebrand three stages can be distinguished in which a genuine European environmental policy had proceeded until the early 1990ies. The first period lasted from 1957 until 1972. Hildebrand characterises it as a stage of 'incidental' measures (2002: 16). At this stage the political and legal foundations of the European Community were institutionalised by the Treaty of Rome on 25th March 1957, which above all aimed at the creation of a common market in order to enable an economic exchange of goods, capital and services without barriers. The Treaty of Rome focussed on the attainment of four goals: a closer co-operation among member states, an improvement of welfare, enhanced stability of member states and an improvement of quality of life and working conditions for citizens of the European Community. During this stage a genuine institutionalised European environmental policy did not come into existence. Environmental policy remained a 'by-product' of other European policies which was mainly addressed in terms of danger protection (Hillenbrand 1994: 50). Only a few articles of the Rome Treaty were interpreted to become starting points to address environmental matters[3]. All political measures had to refer directly to the primary goal, i.e. the establishment of a European common market. Therefore, only a few incidental and isolated initiatives with regard to environmental matters were taken. They referred e.g. to the protection of employees and the public against radioactive

[2] The short overview on the evolution of European environmental policy will mainly refer to publications of Philip M. Hildebrand (2002) and John McCormick (2001) unless noted otherwise.

[3] For instance, Article 2 referred to a harmonious development of economic activities as well as a continuous and balanced economic expansion and an intended rise of the standard of living. The latter was interpreted to foster an improvement of the quality of life becoming an indirect goal of the European community and opening up linkages to environmental issues. Article 36 at least indirectly referred to environmental protection justifying the restriction of imports or exports in case of endangering e.g. public security, the protection of health and life of human beings, fauna and flora and the protection of national treasures.

radiation and to a unitary classification and labelling of hazardous substances. A coherent program or concept of environmental policy incorporating political goals was not conceived during this period. Environmental measures were often initiated behind time. If legislation with regard to environmental matters was passed, often low standard norms prevailed (ibid). Policy measures in respect to environmental matters aimed at removing or avoiding barriers of trade attributed to different national standards in environmental protection (cf. Barnes/Barnes 1999: 25).

The second stage which covered the time span between 1972 and 1986 can be characterised as 'the responsive period' (Hildebrand 2002: 18). At this stage the negative ecological side-effects of a more or less continuous and rapid economic growth within the EC and its member states – fostered by the reconstruction of European economies after World War II - became obvious. Environmental problems of severe air, soil and water pollution in Europe were publicly debated. The first report commissioned by the Club of Rome and publications addressing environmental concerns, such as Rachel Carson's 'The Silent Spring', nourished this public debate (Barnes/Barnes 1999: 26). In several European countries, especially in Germany, a new social movement of environmental activists evolved which succeeded in addressing public attention and canalising concerns on environmental problems related to economic growth (cf. Stamm 1988; Castells 2001). Moreover, some member states emerged as 'frontrunners' in environmental protection within the European Community advocating an environmental policy at European level. For instance, Germany set up the first nationwide environmental action program or France established the first ministry of environmental affairs among European member states. Last but not least, the first World Conference of the United Nations on the Human Environment in Stockholm emphasised the relevance of environmental policy. The starting point for a coherent approach in European environmental policy was the Paris Summit Conference in 1972 where the head of states or governments requested the European Commission to develop a blueprint for a European action program in environmental policy. The 'First Community Action Program on the Environment' (1973-1976) was approved of the Council of heads of governments or states in 1973. This environmental action programme is a landmark in the development of European environmental policy: It introduced environmental protection as a matter of joint political action at the European level. For the very first time guiding principles of an environmental policy were agreed on, objectives were set and priorities for environmental action were fixed. The action program contained some far-reaching principles to be still valid today in European environmental policy, as e.g. the idea of preventive environmental policy or the principle of internalising external costs triggered by environmental polluters (cf. Wepler 1999; Hildebrand 2002).

This action program also reflected the principle of subsidiarity in European environmental policy: Germany and France objected to a larger extension of legal competencies at the European level. Therefore, the action program was not approved of by a formal council decision, but rather on basis of a joint declaration of the European Council. This compromise took account of French and German interests. It established a shared responsibility between the European Union and member states defining environmental actions to be implemented at the European level and at the level of member states. This shared responsibility also implied that environmental action programs are not legally binding, but rather serve as guidelines of European governance. Notwithstanding, environmental action programs constitute

at least a normative basis for environmental policy at the European level (cf. Wepler 1999: 144 p.).

Since then six European environmental action programmes were adopted creating a framework for joint environmental action on the European level[4]. The central functions of environmental action programs consist of creating consensus on guiding principles and objectives among European member states and initiating new steps of a European environmental policy (cf. Vittinghoff 1992; Baumast 1998). During the responsive period of European environmental policy three different environmental action programmes were agreed on by member states. Both of the first and the second environmental action programs shared a common feature: The measures of environmental policy were mainly directed to the environmental policy principles of compensation or repair (cf. Bongaerts 1990; Taschner 1994; Baumast 1998). Contrary to these action programs the third environmental action program (1982 – 1986) underscored an environmental policy of prevention and is characterised by an integrative approach on environmental policy instruments. An example of this shift is the European directive on environmental impact assessment which is compulsory for companies or projects which might create severe damages to the environment (cf. Kaupe 1998: 202; Spindler 1990: 48). Moreover, the third environmental action programme was quite successful in stimulating legislation because between 1983 and 1985 more than 40 directives, eight decisions and ten regulations were adopted (Hildebrand 2002: 20).

Nevertheless, the most significant driving forces to the establishment of a common environmental policy at the European level were economic interests. The different national laws and provisions to environmental protection were regarded as potential barriers to economic competition within the EC. Member states with a higher level of environmental protection promoted successfully a harmonisation of European environmental policy, setting more ambitious objectives in order to escape higher costs of adoption compared to member states with a lower level of environmental protection. For example, The Netherlands and Germany promoted a generalisation of higher environmental standards at the European level because in both of the countries high standards of environmental protection linked with regulatory approaches prevailed. Still lacking a legal fundament European environmental policy remained in a subordinate position to the dominant economic objectives of the European Community.

The responsive environmental policy during the 1970ies fostered the introduction of environmental law in European member states which before lacked a set of environmental legislation. Moreover, it established a platform for further joint action in European environmental policy. Joint environmental action rested mainly on the adoption of commands and prohibitions in respect to environmental matters fostering a regulation pattern of ‘command and control’. A variety of environmental directives were passed which had to be adopted by European member states in a specified time span. Nevertheless, the implementation of these directives was often delayed, partly adopted or not adopted at all by single member states, if the directives contradicted to national environmental legislation or confronted member states with high expenditures (cf. Hillenbrand 1994: 52).

[4] A more detailed overview on the six European action programs on the environment is provided by Norbert Gorißen (2002).

The third stage of European environmental policy development can be described as the 'period of initiative' (1985 – 1992). Above all, initiative relates to the formal institutionalization of European environmental policy on grounds of the so-called Single European Act (SEA) as a further development of the Treaty of Rome. The SEA entered into force on 1st July 1987. This legal institutionalisation of environmental policy can be attributed to the planned enlargement of the European Union from six to 12 member states in 1992 and to the primary goal to complete the creation of a common European market. The European Commission founded a task force on the environment and the internal market to assess potential ecological impacts of the enlargement of the common market. The task force draw the conclusion that a disintegration of economic growth and environmental destruction can only be achieved by an institutionalised European environmental policy (cf. Barnes/Barnes 1999: 38 p.; Hildebrand 2002: 26).

Therefore, the SEA created the first legal, formally approved foundation of environmental policy at the European level by the introduction of a specific title on the environment whereby institutional changes within the European policy framework were initiated (cf. ibid; Hillenbrand 1994). Environmental protection became an equal-ranking field of European policy. In Article 130r the goals, principles and guidelines of the European environmental policy were formulated. Moreover, the competencies of member states and the European Union were divided. The SEA also permitted single member states to advance as environmental frontrunners by setting higher environmental standards than agreed on at the European level. The SEA established the option of a qualified majority voting of the council of ministers with regard to environmental policy. This new procedure provided a framework for the extension of environmental legislation at the EC-level and was reinforced by the European Court of Justice. The procedure contradicted to the principle of unanimity, which had prevailed until then as a prerequisite for taking environmental action at the European level. The new procedure raised the barriers to single member states to reject environmental initiatives for legislation making use of a veto. The procedure of majority voting also played an important role in the decision-making process on EMAS at the council of ministers' meeting in 1993. Institutional change by the SEA resided also in the introduction of the 'co-operation procedure' enhancing the political influence of the European parliament in the legislative process on environmental legislation.

The SEA contained a new principle of European environmental policy emphasising that environmental demands should be integrated into other European policies, i.e. environmental policy became a cross-over-policy of the European Union (Hildebrand 2002: 29). The environmental goals fixed in the SEA were broadly formulated in order to extend the range of competencies of the European Union in respect to nearly all environmental aspects. Moreover, it included principles of environmental policy which went beyond of a policy of repair and compensation, as e.g. the SEA also underscored the principle of prevention in respect to environmental damages crossing national and European borders. Among other principles it also emphasised the principle of taking account of the interests of developing countries and fixed the principle of a concerted co-operation between member states with regard to the development and the implementation of environmental measures.

The legal institutionalisation of the European environmental policy was also mirrored by the establishment of the General Directorate on Environment within the European Commission. The period of initiative was characterised by a qualitative change in

European environmental policy altering the focus from danger protection to risk management and prevention of environmental damages, as e.g. in environmental impact assessment. During the period of initiative the European Commission entered into force the fourth European action programme on the environment. Contrary to the other action programmes it introduced a perspective of environmentally focussed product policy to the European environmental action agenda laying the foundations for the European product eco-label (cf. Bongaerts 1990; Weizsäcker 1990). Compared to previous periods the range of environmental policy instruments was enlarged as well as the number of directives or regulations on the environment increased (Hillenbrand 1994).

According to McCormick (2001: 61) the fourth period of the development of European environmental policy started in 1993 and still has been continuing today. It can be characterised as a period of ongoing but consolidated institutional change. First of all several tendencies can be observed as consolidation of European environmental policy. The Maastricht Treaty on European Union (1993) enhanced the relevance of environmental policy by the integration of the environment as policy goal into the opening articles of the treaty. In Article 130r the qualified majority voting is stated as the rule on most environmental issues. Consolidation also characterises the legislative process on environmental matters because between 1993 and 1999 the number of new laws on the environment stagnated or declined in relation to an increase of legal amendments (ibid.: 63-64; Schwarz 2002: 28): 72 per cent of the pieces of environmental legislation between 1995 and 1999 consisted of legal amendments. Whilst between 80 and 90 per cent of environmental laws adopted by the Council of Ministers at the end of the 1970ies were new pieces of legislation, this share fell to 20 per cent in 1995 and 1997. This tendency to consolidation can be explained by a variety of causes: For instance, the Santer Commission (1995 – 1999) preferred a consolidation of existing environmental laws and activities rather than acting as a promoter in environmental policy. The reinforcement of the principle of subsidiarity within the framework of the Maastricht Treaty led to a decline in new environmental initiatives (McCormick 2001: 63). According to this principle environmental problems should be dealt with at the appropriate level of action, as e.g. the local, regional, national or European level.

Moreover, consolidation prevailed because the European political institutions were challenged by a crisis of legitimacy. At the end of the 1990ies public debates on a lack of democracy related to the political institution of the European Union as well as to its legislative and decision-making process intensified. In the field of environmental policy such debates were initiated and advocated by non-governmental organisations, above all environmentally oriented interest groups, consumer protection activists and trade unions (cf. Röscheisen 1992; Hildebrandt 1992). These interest groups - among other aspects - criticised the European Commission's stakeholder consultation in the process of developing legislative proposals. In response to this public debate the European Commission developed and distributed a larger number of green and white papers on environmental and other issues which aimed at stimulating public discussions on environmental problems and at the involvement of interest groups. Therefore, the European Commission opted for a strategy of 'stimulating more and legislating less' (McCormick 2001: 65). This new strategy was reinforced by political and public debates on the implementation gap of European environmental policy. Therefore, the European Commission was bound to assess critically environmental legislation and their implementation within European member states. This debate on apparent implementation problems fostered indirect

regulation to be recognized as an alternative or at least complementary approach to the dominant regulatory approach.

The fourth period of European environmental policy contains also an innovative character, which starting points were a critical evaluation of the regulatory approach, the problem of implementation and the crisis of social legitimacy related to European institutions. Facing these challenges the European Commission developed the Fifth European Action Programme on the Environment (1993 – 2000). It is in at least three respects a further milestone of the European environmental policy: First of all, it proposed an enlargement of the range of environmental policy instruments to give priority to new forms of indirect regulation (Gorißen 2002: 190). Procedural forms of regulation combined with market-based instruments were preferred to achieve a greater flexibility in environmental measures (cf. Kraemer 1995; Barnes/Barnes 1999). Moreover, the fifth action program emphasised the principles of subsidiarity and shared responsibility and stakeholder participation in European environmental policy. The principle of stakeholder participation was reflected in the establishment of different stakeholder networks (e.g. the European Consultative Forum on the Environment and Sustainable Development) as consultative bodies to the European Commission making recommendations and reviewing initiatives proposed by the Commission (ibid: 43). Therefore, the fifth action program provided the political framework, in which the EMAS regulation was developed. Secondly, the environmental policy of the European Union was directed to the new guiding 'philosophy' of sustainable development referring to the World Conference of the United Nations on the Environment and Development (UNCED), the so-called first Earth-Summit in 1992, and its core document, the Agenda 21. Sustainable development rests on the "magical triangle" of economic growth combined with social justice and sustaining natural resources for the present generation as well as for generations to come (cf. Harborth 1993; Lutz/Roth 1999).

Last but not least, the fifth environmental action programme triggered also a significant impact on the European Treaty of Amsterdam coming into force in May 1999. The principle of sustainable development was incorporated in the preamble of the treaty. According to Article 2 of the treaty one of the main goals of the European Community consists in "a harmonious, balanced and sustainable development of economic activities" (McCormick 2001: 63). Despite the introduction of sustainability to the Treaty of Amsterdam economic integration still prevails as primary goal of the European Union. Compared to this goal environmental policy remains in a subordinate position as an "advocating side-policy" (Wepler 1999: 243). On the one hand European environmental policy evolved as a fully institutionalized and progressive field of European policy. On the other hand its effectiveness is limited by the primacy of economic goal attainment and by contradictory demands and goals of European policies which attained a comparatively stronger position than Environmental policy (ibid: 245).

Recent developments may lead to a sixth stage of European environmental policy, which is characterised by embedding environmental policy in a sustainability strategy. The following four core areas of a European sustainability policy were formulated at the Göteborg meeting of the European Council in June 2001 (cf. Dyllick 2003: 236):

- The fight against climate change and an enhanced utilisation of renewable energy sources
- Safeguarding an environmentally oriented mobility
- Risk reduction in respect to the area of health

- Enhanced responsibility in the utilisation and reproduction of natural resources

This sustainability policy is closely connected with the Lisbon strategy the European Council agreed on in 2000. The Lisbon strategy focuses on an ambitious goal attainment: The European Union is to develop to the most competitive, dynamic and knowledge-based economic region worldwide. Initially, the Lisbon strategy embraced only economic and social aspects. Therefore, the sustainability strategy agreed on by the European Council in Göteborg supplements the Lisbon strategy in environmental respect (cf. Klasing/Meyer-Ohlendorf/von Homeyer 2004: 74).

The core areas of the European sustainability strategy provide a general framework for the sixth environmental action program which was adopted in March 2003. The action program, which covers a time span of a decade, i.e. 2002 to 2012, defines three focal areas of action: climate, biodiversity and health and environment. For these focal areas targets and actions are formulated. The sixth action program also underscores the political intention to maintain the pacesetter role of the European Union in international environmental policy. It remains to be seen whether this proclamation will be implemented in practise. In contrast to previous environmental action programs the sixth program is advocated by the European Council, the European Parliament and the European Commission. Therefore, it provides a politically well accepted framework for further negotiations at the European level. However, the sixth action program consists of often vague formulations, above all in respect to quantitative environmental policy goals and time schedules for environmental policy action and its related goal attainment. The program reflects a compromise between the European Commission, which favoured an action program which was mainly taking account of industry interests in face of a global economy, and the European Council and the European Parliament, which preferred a more ambitious environmental action program. Because of disagreement among European member states the European Commission succeeded in negotiating at least a compromise (cf. Gorißen 2002: 196 p.). Moreover, the European sustainability strategy can hardly characterised as coherent because it has to take account of different policy processes, documents and initiatives. In 2004 the European Commission as well as the European Council advocated competitiveness to be regarded as the prime objective of the Lisbon process. Therefore, the environmental dimension of the European sustainability strategy might be marginalised (cf. Klasing/Meyer-Ohlendorf/von Homeyer 2004: 74)[5]. It remains to be seen whether and to what extent the environmental dimension of sustainability will maintain its political significance in the Lisbon process. Moreover, it can hardly be predicted whether the European Union will develop a sustainability strategy which also reflects the interdependencies between social, economic and ecological dimensions of sustainability and creates political procedures to balance the three dimensions of sustainability in order to eschew that the sustainability strategy is dominated by a single dimension, above all the economic dimension as a significant point of reference to increase the competitiveness of the European Union in the global economy. However, a balanced approach of sustainability may lead to competitive advantages which can hardly be achieved by the preference of the economic dimension of sustainability. Such competitive advantages may consist in a high level of social integration and a high extent of the reproduction of natural resources (cf. Müller-Christ/Remer 1999) as prerequisites of a sustainable economy.

[5] Among the 14 core indicators whereby the Lisbon process is to be monitored only three indicators are related to the measurement of environmental improvements at the European level (Klasing/Meyer-Ohlendorf/von Homeyer 2004: 74).

4. Political Genesis of the EMAS-Regulation

The development of EMAS as an instrument of indirect regulation cannot be explained without taking account of political processes. These processes refer on the one hand to an arena, in which a debate on environmental legislation, its effectiveness and efficiency took place. This debate focused on implementation problems linked with the regulatory approach in environmental regulation, which had dominated European Environmental policy until the 1990ies. In my view the debate on the 'implementation gap' (Glachant 2001: 1) reflects a more fundamental conflict, in which regulatory core beliefs were at stake. Regulatory core beliefs refer to basic assumptions underlying approaches of regulation and of interventions political actors prefer with regard to specific policy domains. They contain sets of expectations related to the roles of legislators and public authorities in processes of formulating, legislating and implementing environmental norms. Moreover, regulatory core beliefs are reflected in political actors' convictions both about regulatory problems the European Union faces and the available solutions (cf. Hannigan 1995). These core beliefs are closely tied to legal and political cultures political actors are embedded in. Taking account of regulatory core beliefs the public and political debate on the implementation gap of European environmental policy can be regarded as a discursive arena, in which different social constructions of reality regarding environmental legislation are negotiated. Regulatory core beliefs prove to be essential for another political arena of European environmental policy, i.e. political processes of agenda-setting and policy formulation, which create a path dependency for legislating environmental norms and law.

4.1 Regulatory Core Beliefs and the 'Implementation Gap'

In public and political debates on the 'implementation gap' the positive outcomes of the European environmental policy were often overshadowed by problems of implementation. Until then the European environmental policy had contributed to an improvement of the state of the environment in many member states. These improvements did not alone cover member states with a comparatively low level of environmental standards and a narrow range of national environmental legislation, as e.g. Spain, Italy and Portugal, but rather the European environmental policy proved to be innovative even in member states regarded as environmental frontrunners, as e.g. the introduction of the EU-directive on environmental impact assessment (cf. Weizsäcker 1990a; Rasch/Schlüter 1992; Taschner 1994). Another example of a high environmental standard legislation are the directives on the protection from pollutants, such as sulphur-dioxide or ozone (Eichener 1996: 261-262). The limiting values fixed in these directives went across environmental standards in Germany, which were supposed to be very high. Moreover, it became apparent that the environmental frontrunners among the European member states did not suffer from economic disadvantages in relation to other member states but rather opened up new markets and potentials of innovation, as e.g. the case of the development of environmental technologies in Germany illustrates (Nordhause-Janz/Rehfeld 1995). These outcomes were underscored by studies in environmental policy which hinted at high environmental standards to foster processes of industrial innovation often combining environmental protection, resource productivity and competitiveness (cf. Wallace 1995; Porter/van der Linde 1995)[6]. These positive results of European

[6] A good example of positive results both in economic and in environmental aspects attributed to the regulatory approach is the chemical sector being one of the most important and economically prosperous sector of the

environmental policy were mainly attributed to the prevailing regulatory approach of environmental regulation. This approach was especially advocated by Germany, The Netherlands and Scandinavian member states of the European Union. They succeeded in transferring their national environmental policy approach to the European level minimising costs of implementation related to European environmental legislation. European member states whose national environmental policy was based on market-related approaches, as e.g. in the United Kingdom, or was characterised by a comparatively low level of national environmental standards, such as Portugal and Spain, had to face higher transaction and implementation costs induced by European environmental legislation. Therefore, these countries opted for a greater flexibility and a broader variety of environmental policy instruments.

The implementation of European environmental policy contains a "two-stage-process" (Glachant 2001: 2); at each stage implementation may fail. The first stage covers the transposition of European legislation in member states' national legislation. The second stage deals with the practical application of European Community law by national administrations. The range of activities which is available to such competent authorities covers e.g. individual decision-making, permissions, monitoring and legal enforcement. Hence it follows, that European legislation faces a dual risk of non- or partial implementation: Polluters as well as some member states eschewed or delayed the transposition of European law. Problems of implementation embrace different forms, such as non-implementation, non- or partial compliance and an incorrect application of European legislation on the environment within member states.

In the public debate on the 'implementation gap' of European environmental policy annual reports on the application of European Union law published by the European Commission are a central point of reference. These reports illustrate that only 91 per cent of the entire 200 European directives were completely transposed into national legislation in 1995. Moreover, the reports hint at an increase of infringement proceedings against single member states for the previous two decades (cf. Wepler 1999: 236; Glachant 2001: 1 p.). Implementation problems can be attributed to a variety of causes: They reflect a lack of power related to the legal enforcement of environmental legislation at the European level. For example, the European Court of Justice did not impose any sanctions or formal punishments on non-complying member states. Although the Maastricht Treaty opened legal options to fine non-complying member states, this option has been hardly made use of by the European Court of Justice (ibid: 3). The weakness of enforcement of EU law against member states can also be explained by limited monitoring and enforcement capacities of the European Commission. For instance, the legal department of the DG Environment consists only of about 20 employees (Glachant 2001a: 25). Therefore, European political institutions depend on member states and non-governmental organisations (NGOs) or citizens to report violations to or deviations from European environmental legislation in the process of policy implementation (McCormick 2001: 65).

The problem of implementation is linked with the prevailing orientation of environmental policy at the EC-level which resides in an approach of 'command and control'. This approach "sets uniform standards, mandates the methods required to

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European economy which consists of approximately 9000 companies. Environmental legislation and regulatory control fostered the introduction of new cleaner technologies into the chemical sector reducing long-term costs and enhancing industrial competitiveness since the 1970ies (cf. Barnes/Barnes 1999: 175).

meet such standards, and tries to assure compliance through monitoring the activities of member states" (ibid: 67). Besides the lack of legal enforcement or problems of policy implementation this approach was criticised by several member states because of its inefficiency related to the imposition of uniform environmental standards and objectives which did not take account of the different socio-economic situations in member states. A detailed harmonisation of environmental standards was linked with the disadvantage of a high demand on time and information in order to modernise production technologies to comply with legal provisions and altered limiting values (Héritier 1997: 182). Moreover, the regulatory approach was regarded to be inappropriate to meet the new challenges of economic globalisation and economic crisis combined with an increase of unemployment in several member states. Therefore, the European Commission was interested in a more flexible, cost-effective and competitive approach on environmental regulation which favoured market-oriented forms of indirect regulation and enabled tailored solutions to different environmental situations in European member states (McCormick 2001: 67.). The regulatory approach was also opposed by member states which criticised its inefficiency or promoted different approaches on environmental regulation.

In political debates on the 'implementation gap' opponents to the regulatory approach among European member states, business associations and within the European Commission succeeded in underscoring the implementation problems attributed to the regulatory approach as core problems of implementation. In their criticism of the regulatory approach uniform mandatory standards as means to attain or sustain a relative high level of environmental protection within the European Union were rejected. Their regulatory core beliefs rested on convictions that market-based and voluntary approaches combined with measures of deregulation and an enhanced public awareness of environmentally friendly establishments and products would provide more efficient and effective solutions to environmental problems than 'command-and-control-strategies'. Additionally, these core beliefs often reflected the assumption that the principle of subsidiarity should be strengthened in order to prioritise national, regional or local entities to develop appropriate solutions to environmental problems. Centralised mandatory measures at the European level were regarded as insufficient to address environmental problems because they were said to negate specific circumstances and prerequisites at national, regional or local levels. The increased significance of market-based regulatory core beliefs for European environmental legislation during the 1990ies can be attributed to political changes in many European member states which were marked by an increase of conservative and liberal parties' governments on the one side and a reorientation of social democratic parties, such as the Labour Party in England or the Social Democratic Party in Germany, opening up towards supply-side economics and market-oriented policy strategies.

The debate on the 'implementation gap' of European environmental policy is a good example of the social construction of reality: On the one hand implementation problems of European environmental problems cannot be ignored or solely attributed to social construction, but on the other hand it is striking, that the variety of implementation experiences was rarely taken account of in the debate (cf. Glachant 2001: 4 pp.): Firstly, the co-existence of implementation problems on the one hand and 'over-compliance' of several member states in respect to specific European environmental regulation on the other hand was often negated. Over-compliance reflects the 'leader-laggard'-dynamics of single European member states. Such member states adopted national regulations on specific environmental problems

which contained more ambitious environmental standards than legal norms of European environmental policy. Secondly, the debate on the 'implementation gap' ignored the impacts of other policy processes on the implementation of European environmental law. These impacts resulted partly from other European policies and partly from domestic policies of single member states. These policy interactions distorted the goal attainment of European environmental policy in several cases. They reflect that the implementation processes of European law embraces different governance levels, i.e. international, European, national, regional and local levels, and involve different environmental as well as other policy arenas (ibid: 5). The different governance levels and policy arenas as well as the dynamic policy interactions often prevent environmental regulators from forecasting implementation problems. Therefore, the process of policy implementation and its outcomes remain to a high extent contingent across a multi-level and multi-centred European policy system. Thirdly, national administrative structures and traditions which contain formal and informal sets of policy beliefs, routines, habits and procedures may turn out as barriers to the implementation of European law or at least cause implementation delays (Glachant 2001a: 26). The neglect of these and other factors which had influenced the implementation process of European environmental law went along with the political debate directed to defects of implementation which were attributed to the regulatory approach. Political actors who opposed to this approach succeeded in challenging the legitimacy of the regulatory approach and in promoting an enlarged spectre of environmental policy instruments.

4.2 Political Competition on Regulation

The political genesis of EMAS can be explained in terms of "competition on regulation" (cf. Héritier 1997; Héritier et al. 1994) between member states at the European level. The European Commission plays a crucial role as a gatekeeper in the agenda-setting of the European legislative process. The Commission obtains the right to initiative for the legislative process. This right is limited by the obligation of the European Commission to take account of the superior programmatic norms and political decisions made by the European Council as well as the proposals of European member states in the process of agenda-setting. The European Commission can utilise the diversity of national policy traditions and policy instruments which exist in the European Union as a resource for its legislative proposals, i.e. the Commission may combine different instruments and policy concepts embedded in diverse national backgrounds or institutional settings in order to develop the Commission's legislative proposals.

The European Commission does not develop its proposals in a political vacuum, but rather co-operates even at the stage of agenda-setting with member states. In face of a broader spectre of European policy fields and an increase of European member states the (intended) political action and strategies promoted by member states and other collective actors at the European level can hardly be forecasted by single member states or political actors. Therefore, member states which act as policy-pacesetters on the European level can create opportunity structures to influence European environmental policy by co-operating successfully and effectively with the European Commission as gatekeeper to legislative agenda-setting (Héritier 1997: 193). The development of EMAS is an example of such an effective co-operation between the European Commission and some European member states, above all the United Kingdom (cf. Héritier et al. 1994).

During the 1980ies the dominant regulatory approach of environmental policy lost in significance compared to market-oriented approaches of indirect regulation. These approaches are based on political convictions and ideas of deregulation, market-based instruments, economic incentives for environmentally friendly measures by industry and voluntary action within the European Union and the European Commission. In face of implementation problems and inefficiency attributed to the regulatory approach the European Commission looked for alternative, more flexible environmental policy concepts and instruments. The Commission was receptive to environmental policy approaches practised within the United Kingdom. The latter had cooperated closely with the European Commission on the agenda-setting of European clean air policy because the Commission's basic environmental policy orientations had coincided to large extent with the British political interests and policy tradition, especially in respect to the conservative government led by Margaret Thatcher. Moreover, the plans of the European Commission fitted with new British environmental legislation, as e.g. the Environmental Protection Act of 1990. Therefore, the Commission preferred in its initiative on clean air policy the British to the German approach of an "engineer-driven", i.e. technologically oriented approach of direct regulation (Wätzold/Bültmann 2001: 136), which until then dominated the European policy against air pollution. Instead of provisions of precise limiting values of emissions the British approach favoured to define goals of environmental quality, broad information of the public and self-regulation of firms via environmental management systems. The information of the public about the quality of air and their involvement in procedures of the official approval of plants was meant to put pressure on firms at local and regional levels to improve their environmental performance by self-regulation (Héritier et al. 1994). This basic idea was also compatible with the principle of subsidiarity of European environmental policy.

In the competition on regulation the British government – supported by the European Commission - promoted successfully its approach of indirect regulation with regard to clean air policy at the European level, whilst Germany as a main promoter of the regulatory policy failed. In the political decision-making process on the EMAS-regulation the European Commission and the European parliament, the member states and relevant federations, such as employer associations and trade unions, were involved. The European Commission and its General Directorate for the environment, consumer protection and nuclear safety presented its first draft of a consultation document on an EMAS-directive in December 1990, which was based on a paper of the International Chamber of Commerce focussing on environmental audits (cf. Butterbrodt/Tammler 1996) and US-experiences with compliance audits. The European Commission also employed the British Standard 7750 on in-company environmental management systems as a kind of blueprint for their first proposal of the EMAS-regulation. The British Standard 7750 was the first environmental management standard developed worldwide by the British Standards Institute and was published in 1992 (Starkey 1996: 61). To sum up the British government achieved a competitive advantage being a pace-setter in clean air policy and EMAS regulation by influencing the process of agenda-setting in early co-operation with the European Commission (Héritier et al. 1994).

The employer or industrial associations rejected the first draft because it included a mandatory participation of firms in EMAS. Therefore, the Commission developed a new legislative proposal which contained only provisions of voluntary participation of companies. Most of the involved industrial federations - with the exception of the representatives of German industry - supported the second draft. The new proposal

was also welcomed by all of the member states except Germany. Member states, as e.g. France and The Netherlands, voted for the second draft because of different reasons: They referred on good experiences with still existing environmental management standards within their countries or preferred the voluntary approach of the second draft or the idea of indirect regulation (cf. Wätzold/Bültmann 2001: 136). The political decision-making process was especially marked by the dispute between the United Kingdom and Germany (cf. Kraemer 1995; Leitschuh-Fecht 1993; Wätzold/Bültmann 2001): The British intended to push for an EMAS-legislation, in which EMAS was conceptualised as a voluntary instrument of environmental self-regulation of firms combined with improved information to the public. The British at first objected to a legal compliance of firms and an intervention of public authorities. Contrary to this position the German government preferred legal compliance and was sceptical of the management-oriented approach to environmental protection. Moreover, it supported the idea of an incorporation of product-oriented approaches into EMAS-regulation. The German government and the German industry federations proved to be the strongest critics of EMAS. The German business associations above all criticised the European Commission's proposal in respect to the information and participation of the public. They rejected a relative unlimited access of the public to environmental and company-related information, which might give direct competitors hints at trade secrets damaging the competitiveness of firms. German industrial federations also regarded the EMAS-proposal as unfair because companies in European member states with a lower level of environmental standards would as well obtain a validated statement of participation as firms in member states with relative high national environmental standards, as e.g. Germany and the Scandinavian countries.

In the end Germany surrendered after having previously negotiated some concessions at the Environment Council Meeting in March 1993, above all the legal compliance of firms participating in EMAS. In face of final ratification of the Maastricht Treaty the German government was aware of being only able to delay the decision-making process on EMAS because a ratification based on majority vote would be sufficient to pass legislation. After the formal consultation of the European Parliament and the committees on economic and social affairs and two further steps of amendments the EMAS-regulation entered into force in July 1993 being valid since April 1995 (Baumast 1998: 45).

The solution of compromise on the EMAS-regulation reflects two different cultures of law (cf. Thimme 1998; Altmann 1997): In the anglo-saxon culture of law a primacy of economic and company-related self-regulation exists with regard to environmental law. Interventions by the state or public authorities are of secondary meaning compared to voluntary agreements and self-control or self-monitoring of economic actors. In the German culture of law a state-driven regulation combined with direct controls of companies by public authorities in respect to legal compliance are emphasised. The negotiated compromise of EMAS contains innovative features because in its core EMAS is an environmental instrument of a publicly supervised and monitored self-regulation of companies (Dyllick 1995: 302). For the first time environmental management systems are legally standardised and combined with external supervision and control. Acting on behalf of this control are members of a newly established profession called environmental verifiers who exercise the functions of external environmental auditors, monitors and trustees with regard to company participants in EMAS (cf. van Bon/Müller 1998; Dyllick 1995; Altmann 1997). Moreover, EMAS opens up chances of the implementation of an in-company

or site-related environmental management system which enables companies to define their own environmental goals and priorities. Last but not least, EMAS is said to contain market-oriented incentives which foster company-related or corporate responsibility in environmental respect.

5. Key Features of EMAS

EMAS rests on the guiding principle of "controlled self-responsibility of companies" (Dyllick/Hamschmidt 1999: 508) combining the self-regulation of companies in environmental respect with external controls by competent and independent environmental verifiers and market-based incentives. EMAS is based on a voluntary participation of companies. Initially, the EMAS regulation did not cover a whole company or corporation but concentrated on singular sites of a company. Companies willing to have a site registered under EMAS have to meet the requirements of the regulation. Therefore, I will turn to these requirements and its related in-company introductory process of EMAS (cf. Freimann 1996: 138-145; Wätzold/Bültmann 2001: 137-138; Becke et. al. 2000: 20 pp.; Butterbrodt/Tammler 1996: 104-108): First, a company has to develop an environmental policy which defines its environmental goals and the guiding principles of environmental action. Although companies are free to formulate their environmental goals and principles they are obliged to comply with all environmental regulations relevant to a specific establishment or company and to a continuous improvement of their environmental performance.

The second step consists of an initial environmental review, i.e. an analysis of environmental impacts and performance related to the site which is to be registered. Thirdly, an environmental program is defined which is based on the general aims of the environmental policy of the company as well as on the results of the initial review. An environmental program should contain specified environmental goals related to the site and a description of detailed measures to be taken also including a time table of realisation and responsibilities for the implementation of environmental measures. The fourth step consists in the establishment of an environmental management system laying down the organisational structure on the site-related environmental management, responsibilities, resources for the environmental goal attainment and organisational procedures. Next, an environmental audit is carried out, in which the effectiveness of the management system with respect to legal compliance and the attainment of environmental goals are evaluated. According to the results of the environmental audit corrective actions are to be taken.

These four steps form the in-site or in-company related steps of EMAS which are followed by further steps related to the public sphere: The fifth step contains of writing an environmental statement in order to inform the public about the environmental policy of the company, the environmental program, the management system and the results of the environmental impact assessment. Next, an independent environmental verifier examines the environmental statement and its components, i.e. the described environmental policy, the environmental management system and program, the internal environmental review and audit procedures. Moreover, the verifier checks whether the environmental management system contributes to legal environmental compliance of the site or company. In case the verifier declares the environmental statement to be valid, management can apply for an EMAS-registration of the site by

a specific registration body. In Germany the function of a registration body is carried out by the chambers of industry and commerce. The registration body will list the site in a register of EMAS-sites open to the public after having checked that local authorities, i.e. the supervisory authority board of control being competent for environmental matters on a local or regional level, did not object to the registration of the site because of any violations to environmental laws or legal provisions. After the EMAS-registration the site or company obtains the right to utilise the environmental statement and the official EMAS-logo for advertising purposes. It has to be taken into consideration that product marketing with the EMAS-logo is prohibited. Registration is only granted for three years. A site may renew its EMAS-registration after having repeated the environmental audit, updated the environmental program and statement and after a further examination and validation by an independent verifier. Furthermore, the site is obliged to have improved its environmental performance at least within the three-years-period.

6. EMAS in Practise: A European Project?

The EMAS-regulation is one of the most significant environmental policy instruments in the framework of indirect regulation. An impact-assessment of EMAS may hint at potentials and barriers to indirect forms of regulation. In this paper the impacts of EMAS are assessed in a two-level analysis. At the first level the distribution of EMAS within the member states of the European Union is examined. Therefore, I will mainly refer to current statistical figures provided by the European Commission. The second level of an "EMAS-impact-assessment" will concentrate on an 'in-depth-analysis of practical experience' with EMAS related to a European member state in which EMAS has been taken up very well compared to other European member states. This step of evaluation also includes results of case studies on companies which participated in EMAS. Case study results may deepen the understanding of specific problems and innovations of EMAS-implementation. In this chapter the distribution of EMAS within the member states of the European Union is analysed. The 'in-depth-analysis' of EMAS in Germany will be dealt with in the following chapter. Empirical findings of different evaluation studies on EMAS in Germany, which refer to EMAS I, are presented. The revision of EMAS by the European Union came into force in 2001. As far as I know there are no evaluation studies available which concentrate on the impacts of EMAS II at national or European level.

6.1 Competition on Environmental Management Standards

A discussion on the effects of EMAS as an instrument of indirect regulation has to take account of the competition between EMAS and comparable standards from the very beginning. National environmental management standards were introduced since the early 1990ies in different European member states: In the United Kingdom the British Standard 7750 was utilised and well accepted before the EMAS-regulation came into force. In Ireland the environmental management system standard IS 310 was published in 1994 in order to complement the Irish series of quality management standards. As the BS 7750 the Irish environmental management standard is applicable to different forms of organisations (Starkey 1996: 81 pp.). These national standards of environmental management systems are sufficient for companies which focus their business activities mainly on national markets in order to demonstrate

their environmental commitment to customers and public authorities. Notwithstanding, the main competitor to EMAS proved to be the environmental management standard developed by the International Standards Organisation, i.e. the ISO 14001. Before turning to the distribution of EMAS at the European level it is necessary to sketch the development of ISO 14001 and characterise its main feature compared to EMAS.

The International Standards Organisation can be characterised as a non-governmental umbrella association of the national standardisation organisations, in which larger companies or corporations and business associations play an important role with regard to the development and formulation of standards, as e.g. the series of quality management standards ISO 9000 - ISO 9004.The headquarter of the International Standards Organisation is in Geneva, Switzerland. Preparations for an international environmental management standard date back to 1991 when the ISO founded the Strategic Advisory Group on Environment (SAGE). SAGE-subcommittees were to develop series of standards on environmental management which should be compatible with the ISO 9000 series of standards on quality management (Schwaderlapp 1999: 89). The Technical Committee 207 dealt with the development of a standard for environmental management systems and presented its first draft in 1994. The final draft was published in August 1995, but it took another year to integrate proposals of amendments by several national standardisation organisations. In September 1996 the ISO 14001 was finally agreed on to become the first worldwide coverage standard of environmental management systems (cf. Wätzold/Bültmann 2001: 139; Thimme 1998: 267-268). The ISO 14001 fosters a self-regulation of companies in environmental respect on grounds of a standardised management system. Especially, companies which operate internationally may establish an environmental management system according to the ISO 14001. The typical stages of ISO 14001 resemble environmental management systems being introduced in accordance to EMAS (cf. Wätzold/Bültmann 2001; Schwaderlapp 1999): First of all, companies have to define their environmental policy, which is followed by a second stage of planning procedures to identify the environmental impacts of their economic actions or products. The planning stage also requires an identification of legal norms to comply with by a company. It also obliges companies to define their environmental goals and targets and to establish an environmental action program to attain environmental goals or targets. The program is to include means and time-frames to attain set goals. The third stage covers definitions, implementation, operation structures and responsibilities to implement the environmental action program. Moreover, employees have to be trained in order to improve their environmental awareness and competence. Additionally, procedures and processes of internal and external communication on relevant environmental aspects should be introduced to companies. The third stage requirements also consist in the documentation of the environmental management system as well as procedures of document and operational control including precautions for cases of emergency. The fourth step refers to checking and taking corrective action if necessary. Checking embraces legal compliance, the realisation of defined environmental goals and targets and monitoring environmentally relevant activities. The final stage requires periodic audits of the environmental management review and a management review carried out by the top management of a company.

Table 1: Comparison between EMAS and ISO 14001

Comparative Features	EMAS	ISO 14001
Coverage	European	Worldwide
System of Verification	Specific (environmental verifiers)	Verification integrated in the existing ISO certification system
Focal Locus of Reference	All Organisations according to EMAS II, but in EMAS I only site-related	Every Organisation
Branches	Limitation of branches in EMAS I, all branches in EMAS II	Companies of all branches
Involvement of Public Authorities	Yes, in the process of registration	No
Legal Compliance	Yes, it is a prerequisite for registration also involving public authorities	Yes, but less tight than EMAS: legal requirements should be met
Preliminary environmental Review	Verified initial review	No review
Product-Orientation and indirect environmental Impacts	Since EMAS II reference to products and indirect environmental effects of economic action, e.g. in services	Reference to products and their environmental effects
External Communication and Verification	Publication of an environmental statement containing environmental policy, objectives, outline of environmental management system, environmental program and environmental performance	Environmental policy has to be made accessible to the public
Environmental Management System (EMS)	Less transparent structure	Clear Structure
Audits	Audits refer to the EMS and to the environmental performance with specified frequency and methodology of audits; frequency of audits: intervals of no longer than 3 years, annual "updating" of environmental performance to demonstrate continuous improvements	Audits of EMS, no specification of frequency and methodology
Contractors and Suppliers	EMAS II requires influence over contractors and suppliers	Relevant procedures are to be communicated to contractors and suppliers
Commitments and Requirements	Employee involvement (EMAS II), only employee information and training in EMAS I; continuous improvement of environmental performance	Commitment of continual improvement of the EMS, rather than a continual improvement of environmental performance

Source: Own Compilation with regard to information provided by the European Commission in April 2001 and to Schwaderlapp (1999)

In Table 1 common features as well as differences between EMAS and ISO 14001 are illustrated. Both of the environmental management standards share some common goals (cf. Dyllick 1999: 117 p.): Firstly, both of them aim at establishing an effective environmental management system for a self-regulated environmental goal attainment. Secondly, they pay attention to legal compliance. Thirdly, both standards oblige firms to a continuous improvement of environmental protection without providing compulsory criteria for environmental performance. Notwithstanding, there exist a variety of differences between both standards.

The compilation in Table 1[7] illustrates that EMAS provides in several respects a tighter and more ambitious environmental management system standard than ISO 14001. First of all, companies or establishments registered under EMAS have to inform the public about their environmental performance, their environmental program and the key features of their environmental management system. Therefore, their environmental performance can be easier evaluated by different stakeholders and are a potential starting point of voice by stakeholders, especially in the case of environmental damages induced by a validated firm. Contrary to EMAS, a certification of environmental management systems (EMS) according to ISO 14001 does not oblige firms to publish an environmental statement available to the public or a broad variety of stakeholders. Moreover, EMAS contains an involvement of public authorities which underscores the relevance of legal compliance as a prerequisite of successful validation. The EMAS-regulation is tighter than ISO 14001 on the environmental performance of companies or sites because EMAS puts the screw on participants to continuously improve their environmental performance combining this requirement with an annual external monitoring. Therefore, an internal force is created to set new or more ambitious environmental goals in the process of environmental self-regulation. ISO 14001 emphasises above all the continuous improvement of the environmental management system.

Statistical data provided by the General Directorate on the Environment of the European Commission in 2004 (see the webpage quoted before) illustrates that the distribution of sites or companies registered under EMAS in the European Union continuously increased between the end of 1997 and March 2002 reaching its peak with 3912 validated companies or establishments. Afterwards a decline in EMAS-registration can be observed with 3498 registered plants or companies in December 2003. This decline can be explained by at least two different factors. The decrease reflects that obviously a relevant number of companies or sites, which had been successfully validated, withdrew from EMAS-participation. These firms often quitted EMAS in favour of ISO 14001 or took their leave of EMAS but simultaneously maintained ISO 14001 (Loew 2003: 7). Such a management decision of withdrawal can be attributed to a disappointment of expectations related to EMAS, above all in Germany as a frontrunner state in EMAS registration. During the introductory period of EMAS in Germany which started in 1995 German federal environmental authorities, the ministry of the environment, consumer protection and nuclear safety and the German government as well as environmental consultants and other actors willing to push EMAS emphasised the advantages of EMAS-participation for firms. The list of potential advantages included e.g. an improved competitiveness of firms, direct and indirect cost-reductions, enhanced environmental protection and risk

[7] For further and actual information on EMAS and ISO 14001 see the following webpages: www.europa.eu.int/comm./environment/emas/index.htm and www.ecology.or.jp/isoworld/english/analy14k.htm. These websites also contain information of the validated or certificated companies under ISO 14001 and EMAS.

management, a higher level of legal compliance, innovations, improved public reputation of companies with regard to different stakeholders, a higher environmental motivation and awareness of employees and better options to secure employment by reducing non-personnel related costs (cf. Becke et al. 2000: 10 pp.). In some respect the expectations stimulated by different promoters of EMAS proved to be exaggerated as will be described below. Moreover, the decline in companies or plants registered under EMAS reflects a competitive edge of the ISO 14001 environmental management standard over EMAS.

Table 2 supports the latter explanation illustrating that ISO 14001 evidently outnumbered EMAS with regard to the participation of companies or establishments in all European member states. Worldwide 61.287 organisations were certified according to ISO 14001 in December 2003 (see the ISO-website quoted before). This competitive edge of ISO 14001 over EMAS can be attributed to several reasons (cf. Wätzold/Bültmann 2001: 156): For companies which economic activities are oriented towards global or international markets the ISO-standard became an attractive alternative to EMAS. Firms which had introduced before a quality management system resting on the series ISO 9000 could adapt more easily to ISO 14001, because the ISO environmental management standard is highly compatible with the quality standards, whilst EMAS is based on a structure which is quite alien to ISO-standards of quality management. This argument especially counts for firms within the supply chain of corporations. Focal firms in supply chains consider ISO-quality or environmental standards as a prerequisite for any further co-operation with suppliers, as e.g. in the automobile industry. Additionally, the tighter demands of EMAS to firms in comparison with ISO 14001 may be a reason to quit EMAS in favour of ISO 14001. Tighter demands refer e.g. to legal compliance or to the continuous improvement process related to environmental performance. To avoid the screws of an environmental performance continuously to be improved firms may opt for ISO 14001 instead of EMAS. This option will especially be favourable, if a further improvement of environmental performance can only be met by new financial investments in environmentally safe technologies or procedures or by new concepts of production. Such investments are avoided if their positive outcome is questionable or linked with a longer time span of amortisation. Last but not least, ISO 14001 may be preferred by firms which experienced an imbalanced relationship between expenditures or efforts on the one hand and returns on the other hand. This counts especially for EMAS-participants who were disappointed by little interest of the public or stakeholders in their environmental statement. Disappointment of EMAS spread also among the management of companies whose expectations to be granted regulatory relief of environmental norms and provisions or to gain competitive advantages were not fulfilled. Moreover, other expectations, e.g. with respect to cost reductions and employee motivation, were only met partly (cf. Loew 2003: 7). Last but not least, the introduction of and the further participation in EMAS induced comparatively higher costs than ISO 14001 which can be attributed mainly to the publication of the environmental statement (ibid).

Table 2: Distribution of Companies or Sites with regard to EMAS and ISO 14001 in December 2003 and in June 1999 (statistical figures in brackets)

Country	No. of EMAS-Registrations	No. of ISO 14001-Certifications
Germany	**2.218 (2085)**	**4.150 (1400)**
Spain	**314 (36)**	**4.860 (234)**
Austria	**298 (189)**	**500 (200)**
Italy	**169 (18)**	**3.121 (150)**
Denmark	**121 (102)**	**711 (350)**
Sweden	**115 (155)**	**2.310 (645)**
United Kingdom	**75 (70)**	**2.917 (947)**
Norway	**42 (58)**	**350 (72)**
Finland	**39 (20)**	**1.059 (191)**
The Netherlands	**29 (23)**	**1.162 (463)**
Belgium	**25 (9)**	**303 (130)**
France	**23 (33)**	**2.344 (285)**
Portugal	**12 (2)**	**248 (8)**
Greece	**9 (1)**	**90 (6)**
Ireland	**8 (7)**	**170 (82)**
Luxembourg	**1 (1)**	**32 (6)**

Sources: DG XI, EMAS Helpdesk, Brussels, www.europa.eu.int/comm./environment/emas/index.htm and ISO World/Peglau, www.ecology.or.jp/isoworld/english/analy14k.htm.

Table 2 shows that ISO 14001 outweighed EMAS in all member states of the European Union (before the eastern extension of the European Union took place in 2004) between 1999 and 2003. The number of sites or companies having established an EMS according to ISO 14001 increased in most of the European countries rapidly, whilst the pace of EMAS-distribution slowed down or stagnated. In some member states even a decline in EMAS registered sites or companies took place.

A remarkable shift related to the ranking of member states according to the number of registered EMAS-sites or organisations occurred: In 1999 Austria, Sweden, Denmark and the United Kingdom followed Germany as frontrunners in EMAS-distribution. With the exception of the United Kingdom all member states are marked by a prevailing regulatory approach in national environmental policy. In relation to 1999 the number of registered organisations in Denmark and the United Kingdom

nearly stagnated within the last four years, in Sweden the number of validated organisations even decreased from 155 to 115 EMAS-companies. In the meantime the number of validated EMAS-companies or establishments increased partly drastically in Spain and Italy. According to the European Commission Italy was the member state with the fastest pace in the increase of validated organisations in 2003. The reason why member states with a legal culture of 'command and control' were among the EMAS-frontrunners at the end of the 1990ies can be explained by the high level of environmental standards in these countries. Having adopted a high level of environmental protection EMAS offered a good opportunity to many a company, especially to larger companies, in these countries to improve their returns on material or immaterial investments in existing structures and procedures of environmental protection. The participation in EMAS was combined with high expectations to benefit from it, as e.g. to improve customer or stakeholder relations or to gain competitive advantages as "environmental-pioneers". Moreover, a high level of environmental protection proved to be a good starting point for an efficient EMAS-implementation. The decrease or stagnation of registered organisations in those countries might be attributed to a lack of benefits from EMAS or limited positive effects on the side of EMAS-participants.

Member states, as e.g. Spain and Italy, faced different circumstances. Both of the countries are characterised by a comparatively low level of legal environmental standards and institutionalisation in national environmental policy. Therefore, a lower level of in-company environmental protection required stronger efforts to meet the demands of EMAS. Additionally, time-lags in the national implementation of EMAS mattered. For instance, Italy lacked a national infrastructure of registration bodies until the end of 1998 (Kottmann 1999: 20). After this infrastructure had been implemented the number of registration rose more or less continuously. The increase of EMAS-participants in Spain and Italy can be attributed to companies which above all focus their economic action on the European market.

The competition on environmental management standards is an example of the impact parallel policies or international policy schemes, such as the ISO 14001 standard, exert on the implementation of European environmental policy and its outcomes. In this case the key goal of EMAS to promote a European standard of environmental management in the European industry was not achieved because the ISO 14001 standard proved to be a successful competitor to EMAS (cf. Glachant 2001b). However, the competition between ISO 14001 and EMAS reflects also processes of policy learning because the European Commission proposed amendments to EMAS I which aimed strategically at adapting EMAS in some respect to the demands of ISO 14001 in order to enable firms a smooth transition between ISO 14001 and EMAS and to foster compatibility between EMAS and ISO 14001. This transition rests on a 'division of labour' between both of the environmental management standards: In this perspective ISO 14001 is regarded as basic environmental management standard, whilst EMAS is recognised as advanced standard in environmental management (cf. Landesanstalt für Umweltschutz Baden-Württemberg 2001: 28). For instance, in EMAS II the limitation of EMAS to establishments was lifted, extending the locus of reference to 'organisations' as stated in the ISO-norm (ibid: 2). Policy learning also referred to the implementation process and experience with EMAS I. For example, EMAS I neglected an active participation of employees and their representatives because above all business associations objected to participation in environmental matters regarding it as a 'trojan horse' to an extension of co-determination. However, the implementation of

EMAS I illustrated that a lack of employee participation often turned out as 'Achilles' heel': A lack of employee participation undermined e.g. the continuous improvement process and the in-company-implementation of EMAS because the knowledge basis and tacit skills of employees were not recognised as contributions to solve environmental problems at the establishment level. Contrary to EMAS I the new version of EMAS underscored the significance of employee participation and contains a guide to employee participation (ibid). Therefore, EMAS II can be understood as an outcome of reflective policy learning drawing on experience with EMAS I and the competition between EMAS I and ISO 14001. EMAS II came into force on April 27th 2001.

6.2 The Paradox of EMAS

At first sight the distribution of EMAS-registered establishments or companies in the European Union offers an amazing and paradoxical impression: The member state which had strongly opposed to EMAS counts more registered organisations than the entirety of other member states. Therefore, the conclusion can be drawn that EMAS is more a 'teutonic', rather than a European project - including also the Austrian EMAS-companies. Taking account of this paradoxical impression one may inquire after the reasons why EMAS as an environmental policy instrument of indirect regulation proved to be comparatively successful in Germany[8]. There are several factors contributing to this success of EMAS. In my view some of these influencing factors can be attributed to the specific institutional setting in Germany, whilst others might be generalised as potentials or structures of opportunities which might foster an implementation of European forms of indirect regulation at national or even regional levels.

Turning to the institutional factors which influenced the EMAS-implementation in Germany above all German (environmental) law and its law culture are to be taken account of. The German environmental law culture can be described by a regulatory approach which underscores strict-non-flexible standards, legal compliance, monitoring and law enforcement by public authorities as well as an "engineer-driven" understanding of environmental problems and their possible solutions. This engineer-driven perspective on the environment is reflected in some basic, i.e. implicit assumptions about dealing with environmental problems which are in most cases neither debated nor reflected publicly (cf. Schein 2003). These assumptions rest on the idea that environmental problems triggered by economic activities are problems to be solved by technology. Therefore, in German environmental law references to the actual state of technology and technical guidelines, such as e.g. the TA Luft 1986, play an important role (cf. Héritier et al. 1994; Lulofs 2001). Combined with this 'technological fix' is the idea to combat environmental problems by setting limit values of pollutants as a demand to companies. Higher environmental limit values require at least in the middle or in the long run more advanced technology to be introduced by firms if they do not want to violate legal environmental standards. Therefore, more ambitious limit values combined with controls by public authorities are important means to push companies to introduce environmentally safer technologies which are

[8] The frontrunner position of Germany relates to the absolute numbers of sites registered under EMAS. The General Directorate for the Environment provides interesting statistical data which limit this frontrunner position of Germany. If the number of organisations registered under EMAS by country is weighted per one million inhabitants then Austria reaches the pole position with 36.65 registered organisations per one million inhabitants. The second rank goes to Germany with ca. 27 validated organisations per one million inhabitants followed by Denmark, Sweden and Norway (see the EU-website quoted before).

to lead to a reduction of environmental pollution. In the German culture of environmental law technology is regarded as a main problem solver or remedy to environmental problems induced by companies and utilisation of technology which negated environmental impacts of production.

In companies this law culture fosters an organisational push of environmental protection (Schwaderlapp 1999: 96) characterised by a legally obliged establishment of environmental representatives in firms which might be relevant polluters to the environment. These representatives are to control emissions and pollutants and are to support the top management of a firm to ensure compliance with environmental law. Moreover, firms with a higher potential of environmental pollution or impacts also have to report regularly to public authorities and to inform public authorities or law enforcement agencies in good time about changes in their organisation of environmental protection or the planned establishment of new works or plants which then according to environmental laws have to be approved by public authorities.

The culture of environmental law in Germany fostered in at least two ways a distribution of EMAS as an instrument of indirect regulation: Firstly, the EMAS-regulation confronted the public authorities as well as companies in Germany with a new approach on environmental protection which was until then alien to the prevailing culture of law and to in-company structures of environmental protection. This new approach consisted in the establishment of environmental management systems as a means of company-related self-organisation or self-regulation in respect to environmental matters. Without any precursors of environmental management systems in Germany, as e.g. the BS 7750 in the United Kingdom, EMAS and its environmental management system were taken up by environmentally oriented companies after the launch of EMAS in Germany. During the early years of EMAS there hardly existed any competitive environmental management standard in Germany. Secondly, the German law culture fostered in many larger and even in medium-sized companies a relative high level of environmental protection. EMAS offered to these firms an opportunity to utilise their high internal level of environmental protection as a competitive edge: For instance, EMAS was regarded as a means to improve stakeholder relations. Moreover, the high level of environmental protection reduced costs related to the implementation of environmental management systems and procedures. In companies which embraced a high level of in-company environmental protection efforts to attain EMAS-registration were comparatively lower than in firms with lower internal standards of environmental protection. Until the mid 1990ies the German environmental law did hardly provide any economic incentives to firms with a high level of environmental performance.

Comparing experience of the EMAS-implementation in different member states, i.e. France, Germany, the United Kingdom and The Netherlands, Frank Wätzold and Alexandra Bültmann (2001: 151 pp.) provide some explanations for the German pole position on EMAS, which also might serve as principles of ‘good practise’ for indirect regulation by the example of EMAS. First of all, the authors attribute the surprising German success to the specific system of accreditation, supervision and registration which emerged as contingent outcome of political dispute[9]. The compromise solution

[9] The conflict focussed on the degree of influence industry or business associations were to exert on this system. The Federal Environment Ministry (FEM) and environmental interest groups were opposed to business associations and another German ministry, the Federal Ministry of Trade and Industry (FMTI) (cf.

ensured as well political influence of public authorities as of non-governmental interest groups, such as business associations, trade unions and environmental organisations on the German system of accreditation and supervision of verifiers and registration of companies under EMAS. Because of their key role in the German system of EMAS-implementation the involved business federations were strongly interested in EMAS becoming a story of success, i.e. in high rates of company participation in EMAS. This also counts for the chambers of crafts and the chambers of industry and commerce as bodies of registrations. The influence which is guaranteed to business federations on the German system of EMAS-implementation did not only enhance their commitment and promotion in favour of EMAS among their members. It also underscored a trustworthy image or at least an acceptance of EMAS on the side of companies as members of business federations.

In member states, in which national business federations was denied an important role in the establishment of the EMAS-implementation system, the rate of participating firms was comparatively moderate. This especially counts for France with its tradition of political centralisation. In France the EMAS-system was dominated by the French Ministry of the Environment, which also functions as the competent body for EMAS. French business associations and companies rejected the strong influence of the ministry on the system of accreditation, supervision and registration. Therefore, the confidence of firms in EMAS was relatively low conveyed in minor rates of EMAS-participation.

Therefore, the conclusion can be drawn, that EMAS as an indirect European regulation also requires a balancing of interests at the national level, especially with regard to the design and the establishment of federal implementation systems. If EMAS-systems at national levels reflect a balance of interests the probability of a broad support of indirect regulation is enhanced because different interests are taken account of. It also stimulates a support of EMAS by different political or social actors which are involved in the EMAS-system. Although such a balancing of interests at the federal level is an important prerequisite for the effectiveness of European indirect

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Wätzold/Bültmann 2001: 151 pp.). At the time of the conflict Germany was governed by a coalition of conservative and liberal parties. The latter was in charge of the ministry of trade and industry. The FEM opted for a strong influence of public authorities on the German system of accreditation, supervision and registration in order to enhance the social credibility and acceptance of the system. Therefore, the FEM proposed the Federal Environmental Agency (FEA) as the core institution of the planned system. In order to gain the support or at least acceptance of business associations the FEM preferred an agreement with all involved interest groups. The FMTI acted mainly as governmental supporter of business interests and associations and intended to minimise the influence of public authorities on the system. In this view the system was to take account of business interests and to set incentives for an EMAS-registration of companies. The involved business associations were interested in a system being in charge of business organisations and rejected any public intervention. In the end the dispute was resolved by compromise in 1995: The new system rests on several pillars. A new organisation or body for the accreditation of environmental verifiers was founded. In legal terms it is a company of limited liability by German business associations. The FEM exerts a monitoring or supervisory function on this newly created body of accreditation, mainly directed to ensure legal compliance of its actions and decisions. In order to support as well as to control the body of accreditation a second new pillar was established: the environmental verifiers' committee. Members of this committee are mainly representatives of different interest groups and political or administrative actors, such as environmental NGOs, trade unions, business organisations and representatives of the FEA. The function of registration bodies is exercised by the chambers of industry and commerce for industrial organisations or by the chambers of crafts. The registration procedure requires the chambers to inform relevant public enforcement authorities about company applications for registration. If these public authorities do not interfere, i.e. in case of legal compliance with environmental law by applicants, the registration of a company will be accepted.

regulation the influence of the political culture of single European member states has to be taken into consideration. For instance, a balancing of different interests can be better accomplished in a political culture of corporatism, in which the state acts more or less as mediator and moderator of interests and different interests groups are consulted in processes of policy making, than in political cultures to which a stronger participation of interest groups is alien to, as e.g. in a political culture of etatism, as e.g. in France (cf. Visser 1996).

Another prerequisite of a successful implementation of EMAS at the national level are enhanced promotional activities by different interests groups or actors supporting EMAS. The German case illustrates that such a differentiated promotion of EMAS creates a higher awareness of EMAS among companies of different sizes and branches. In Germany, especially the federal and regional governments as well as their affiliated public agencies and the chambers of commerce and industry or the chambers of crafts promoted the EMAS-system (Wätzold/Bültmann 2001: 154). The promotion contained information and advice to companies. Nevertheless, promotional activities are necessary but not sufficient to increase the participation rates of firms in the EMAS-system.

Barriers to EMAS-participation can be lifted if (additional) incentives to firms are offered which are directly linked with EMAS-participation. Contrary to other European member states the incentives for EMAS-participation of firms rested on two pillars in Germany: They embraced financial subsidies as well as a preferential treatment with regard to regulatory relief. According to Wätzold and Bültmann (2001) by estimations between 30 per cent and 60 per cent of firms participating in EMAS obtained subsidies. These subsidies were often granted as an indirect financial support. For example, the federal and also several regional governments launched initiatives to attract companies to the EMAS-system. These initiatives included among other measures pilot projects directed to the implementation of EMAS in firms related to specific industrial core sectors or branches, as e.g. in the German state Northrhine Westphalia. Firms being interested in EMAS were invited to participate in these pilot projects. The pilot projects also involved environmental consultants who provided firms with expertise and advice to establish an environmental management system according to EMAS. The costs related to environmental consultancy were financed by the federal or regional governments. Financial incentives were also linked with governmental innovation programs at the federal or regional level. For example, in some German states employment programs co-financed by the European Social Funds, as e.g. the Northrhine Westphalian programme QUATRO, were opened up to environmental management as a relevant field of in-company innovation. These programmes were especially tailored to medium-sized and smaller companies.

German business associations and chambers of commerce and industry were in favour of regulatory relief for firms participating in EMAS. Most of the German states which are in charge of environmental monitoring, licensing and legal enforcement, answered to these demands of partial deregulation with different measures of regulatory relief limited to EMAS-participants. For example, such measures contained fewer external controls of EMAS-registered companies by enforcement agencies (as also practised in France) or the substitution of control duties and documentation and reporting requirements by in-company mechanisms of self-control and documentation related to EMAS. A more ambitious attempt to environmental deregulation was practised in the German state Bavaria on grounds of a concerted action between the Bavarian industry and the government (Wätzold/Bültmann 2001: 154-155). The

negotiated “Bavarian Environmental Pact” is based on the guiding principle of providing regulatory relief for an improved environmental performance of companies. The pact also included a specific agreement on EMAS: The state of Bavaria granted lighter regulatory relief and financial subsidies for the introduction of EMAS and environmentally oriented new technologies under the prerequisite that 500 sites were registered under EMAS until October 2000. The regulatory relief for EMAS-participants rested on the principle of functional equivalence which stated that company-related measures as substitutes of legal reporting and monitoring duties had to be comparable in quality and scope but not identical with the until then required duties. The regulatory relief offered by German public authorities and state-governments turned out to be incentives in order to increase the number of companies participating in EMAS. The relief was limited to ensure a high level of legal environmental standards in Germany. Notwithstanding, the concept of deregulation related to EMAS also provoked resentment arguing that regulatory relief might undermine existing legal environmental standards and abolish regular external controls of firms participating in EMAS (cf. Lübbe-Wolf 1998).

The examples of financial subsidies and granted regulatory relief illustrate that an effective implementation of environmental policy instruments which rest on the concept of indirect regulation requires an activating and supporting role of states or governments and its affiliated public agencies and authorities at the national level as well as at the regional level.

7. EMAS-Implementation at the Establishment Level

Turning to the impact assessment of the EMAS-implementation at the establishment level by the example of Germany I will refer to EMAS I compiling core results of different, but mainly quantitative evaluation studies carried out in Germany supplemented by research results of qualitative case studies. Further and detailed descriptions of several studies, their methodology and survey methods are not delivered in this paper, but can be obtained from the quoted studies. German evaluation studies referring to EMAS II have not been published yet. My secondary cross-over analysis on EMAS-implementation at the plant level is structured by two focal points of reference: Firstly, the external effects of EMAS on firms are examined. Secondly, an evaluation of the internal effects of the EMAS-implementation is provided which focuses on an ecological modernisation of firms.

The results of my secondary cross-over analysis refer to EMAS I, i.e. the end of the 1990ies. At that time 2085 sites were registered under EMAS in Germany (December 1998). The distribution of registered sites illustrates that focal branches in EMAS-implementation existed. The highest EMAS-participation was observed in chemical industry (216 sites), followed by steel and metal industry (204 sites), food industry (197 sites) and mechanical engineering (153 sites). Moreover, 56 establishments in retail trade were registered under EMAS I.[10]

[10] An extension of EMAS to the entirety of branches or industries and organisations was accomplished after the revised EMAS II was adopted in 2001. Since then such diverse organisations as universities (cf. Bogun 2004; Bastenhorst et al. 2000), production plants, hospitals and construction firms or local administrations are registered under EMAS.

Most of the branches with a relatively high number of EMAS-sites share one or two common features: An EMAS-participation seems to be attractive for establishments related to industries with a high potential of environmental damage or a higher degree of environmental impacts, as e.g. the chemical and the metal industry. Such EMAS-sites display a high sensitivity to environmental concerns. They expect EMAS to save costs in materials, resources and energy as well as to improve environmental communication with stakeholders. Moreover, EMAS became attractive to sites which adhered to branches marked by a production of goods for private consumers and related services. In these industries environmental aspects are often closely linked with health aspects, as e.g. in food industry and retail trade. Therefore, these sites expect from EMAS to enhance their competitiveness by emphasising their roles as frontrunners in environmental and health related respects.

In EMAS-participation size matters: Environmental management systems according to EMAS were mainly introduced by larger companies with a high potential of environmental damage. EMAS proved to be a 'success story' among larger companies in Germany because 82 per cent of large companies with an annual turnover of 255.65 million € had established an environmental management system in 1997, mainly on the basis of EMAS (cf. Fichter 2000: 13). Smaller firms or establishments with less than 100 employees are underrepresented in EMAS-participation. Compared to their share among the entirety of industry, which is about 52 per cent in Germany, only 22.6 per cent of smaller establishments participated in EMAS (Heinelt/Malek 1999: 550-551). These statistical figures hint at barriers to an EMAS-implementation in smaller companies, which are dealt with later in this paper.

7.1 External Effects of EMAS-Participation

An evaluation of EMAS-implementation at the company or establishment level has to take account of internal and external effects. External effects refer to different social or economic environments EMAS-participants are embedded in or related to, such as customers, neighbours and other stakeholders, public authorities and markets. Internal effects are related to the in-company impacts of EMAS-implementation as far as they can precisely attributed to. Summarising the economic benefits of EMAS-participation at the company or site level managers appreciate above all the internal effects of EMAS-participation, such as cost reductions, employee motivation and environmental awareness and transparency of tasks and responsibilities in in-company environmental management, whilst high hopes in positive external effects, as e.g. improved relationships to customers, public authorities, banking and insurance companies or competitive advantages, were mainly disappointed (cf. Dyllick 1999; Becke 1999).

Several studies on the EMAS-implementation in Germany emphasised the negative external effects of EMAS. This result is remarkable because many managers opted for EMAS-participation because of their high hopes to benefit from EMAS in stakeholder-relations. The effects of EMAS on the social reputation of firms and their external environmental communication are at least ambiguous. On the one hand managers or environmental representatives interviewed in studies about the EMAS-implementation at the site-level expressed their opinion that EMAS contributed to a better public image of the establishment and to an improvement of environmental communication enhancing the environmental commitment of the firm. This especially was attributed to the environmental statement (cf. Weber 1998: 24). This result contrasts with several other studies which illustrate that there was hardly an interest

in the environmental statements on the side of neighbours to firms or the local public. Moreover, even social and environmental interest groups showed little or no interest in environmental statements (cf. Höppner et. al. 1998; Dyllick/Hamschmidt 1999). Several studies show that the relations of establishments with public authorities or legal enforcement agencies have not improved since the day sites were registered under EMAS; regulatory relief was seldom granted (cf. FEU 1998: 11; UNI/ASU 1997: 7). Even one in ten EMAS-participants was confronted with additional controls by legal enforcement agencies after having successfully passed the EMAS-requirements (cf. ibid.; Steger 2000: 476). This result can mainly be attributed to the low level of information on the side of local enforcement agencies about EMAS after EMAS started in Germany. High attention towards EMAS-sites was only paid to by universities and environmental consultants. The negative reaction of the public to EMAS-registered sites is underlined by the same experience of firms in other member states of the European Union (Wätzold/Bültmann 2001). This problem hints at a demand for a more co-ordinated approach of EMAS-promotion between the levels of the European Union and its member states. Therefore, the revision of EMAS in 2001 was linked with a promotion campaign and a new logo of EMAS. It remains to be seen whether this campaign is a solution to the problem or rather a solution addressed to the wrong problem.

In my view the lack of public attention to EMAS reflects that one of the basic assumptions of EMAS as an instrument of indirect regulation turns out to be inappropriate. Political promoters of EMAS state that consumers or citizens of the European Union should have a full or at least a maximum of transparency of all relevant information for their economic action. Therefore, the publication of registered EMAS-sites is to create such a transparency in order to reward environmentally oriented firms by an increased sale of their products by European consumers or citizens. Behind the image of the responsible citizen or consumer an environmentally oriented version of the neo-classical model of the ‘homo oeconomicus’ can be detected. Having transparency on all relevant information consumers can decide rationally in favour of goods or services provided by EMAS-sites. There are some assumptions which are to be criticised with regard to this model: Firstly, the model and its related assumptions neither take enough account of the social diversity of consumers within the European Union nor do they take into consideration that even consumer decisions are embedded in social contexts people live in, as e.g. social milieus, or people display, as e.g. different life styles. The assumption of rational decision-making in consumption negates the complex nature of human beings, especially their emotional quality and their relevance to processes of decision-making (cf. Fineman 2003). Moreover, the promotion activities of EMAS on the European level and national levels are mainly directed to a specific part of the public, i.e. the economic public (Freimann 2001: 7). The economic public is to be attracted to increase participation numbers of EMAS, whilst information on EMAS provided for different target groups of European citizens were scarce.

Moreover, EMAS confronts single establishments with demands of an environmental dialogue with different stakeholders and citizens. Especially small and medium-sized businesses (SME) are often overcharged to cope with these demands lacking personnel resources for such a task. The publication or distribution of the environmental statement is insufficient and too passive as a means of communication to address a diverse public. A solution to this problem of external communication may consist in the development of networks on the levels of branches and regions

providing SME with support in the implementation of EMAS and an environmental dialogue with different target groups (cf. Glasze/Zöllner 1998).

The expectations of managers to gain benefits from EMAS in terms of a better market-performance or competitiveness were partly disappointed. Until now EMAS did not turn out to be a “voluntary force” (Miller 1997: 156) in the case of inviting entries for public commissions, as e.g. by local public authorities, in which EMAS-registered sites might be preferred to competitors who had not participated in EMAS. Unlike systems of quality management the EMAS-registration is not regarded as a necessary prerequisite of suppliers co-operating with larger companies, though an EMAS-registration improves the evaluation of suppliers in German automobile industry. In the banking and insurance sector a preferential treatment of EMAS-registered sites only sometimes occurred (cf. Weber 1998; Höppner et al. 1998), though banks in the meantime regard an EMAS-registration as an indicator of low environmental risks (Miller 1997). It remains to be seen whether an economic evaluation of firms on grounds of the Basel II-agreement will be linked with better credit conditions for firms which established an EMS according to EMAS.

In most of the empirical EMAS-studies it is underscored that the participation in EMAS enhanced the legal environmental compliance of the involved establishments (cf. FEU 1998; Weber 1998; ASU/UNI 1997; DGB Bildungswerk 1997). This result can be attributed to the detection and removal of environmental defects in environmental reviews and audits (cf. Ankele et al. 1998: 41). Moreover, gaps of knowledge in respect to legal environmental provisions and laws being valid and relevant to a specific site were overcome. The positive evaluation of the improved legal compliance by interviewed managers or environmental representatives also reflects their specific focus of environmental action which is directed to efforts which ensure legal compliance. This strong orientation on legal compliance partly absorbs initiative to foster a continuous environmental improvement process (Weber 1998: 39). It also conveys that German managers and environmental representatives are still accustomed to the ‘command and control’ approach of German environmental policy. To put it in a nutshell the disappointment of management with low external effects of EMAS-registration explains why even in Germany the development of EMAS-participation stagnates or slows down and participation-rates in ISO 14001 rise simultaneously in all European countries. If EMAS fails to gain positive effects in communication with different stakeholders, then efforts and costs to publish an environmental statement are regarded as avoidable. In this view a shift from EMAS- to ISO 14001-participation seems to pay off for environmentally committed establishments.

7.2 Internal Effects of EMAS-Participation

First of all, the internal effects of EMAS-participation refer to the economic relation of costs and benefits, environmental performance, the design of environmental management as a continuous process of improvement and employee involvement. Secondly, in-company processes of EMAS-introduction are examined in respect to innovative potentials for organisational learning and a further ecological modernisation of companies.

The economic relation of costs and benefits

The cost-benefit-ratio of EMS according to EMAS is limited in respect to its measurement: Some of the cost relevant potentials, such as employee motivation and the public image of registered companies, consist of 'soft factors' which evade a quantitative measurement. Moreover, middle-range or long-term potentials cannot be forecasted after some years of EMAS being in practise (cf. Steger 2000: 474).

Managers expected – among other aspects – that the EMAS-participation would pay off and additional potentials of cost reduction would be exhausted. This expectation ranked high among German managers whose firms participated in EMAS. A quantitative study carried out by the agency of education and training of the German trade union congress among works councils and environmental representatives or managers of EMAS-registered sites, which mainly belonged to the metal industry, showed that nearly 50 per cent of the interviewed managers or environmental representatives of EMAS-sites stated that expected economic benefits were a main motivation to participate in EMAS (DGB Bildungswerk 1997).

According to another EMAS-study financed by an employer association the average in-company costs of an in-establishment EMAS-introduction was about 80.340 €; 60 per cent of the entire costs were attributed to internal factors (UNI/ASU 1997: 25). However, one has to take into consideration that the actual costs of implementation differed strongly in dependence from the size of establishments and of the level of environmental protection before EMAS was introduced to a site. For example, the average costs for small companies with less than 100 employees amounted to 2.500 up to 5.000 €. Especially small and medium-sized businesses are confronted with comparatively higher costs of the EMAS-introduction than larger establishments. Because of an often very limited range of personnel and a lack of know how in building up an environmental management system, smaller firms were highly dependent on cost-inducing environmental consultancy (cf. Weber 1998: 33-34; Dyllick 1999: 119). Costs induced by external consultation amount up to approximately 25.000 € for more than every second of the smaller firms being registered under EMAS (Seidel/Weber 1998: 24). The average entire costs of EMAS-participation related to firms with less than 20 employees were about 34.5000 € (Freimann 1998: 75). Moreover, costs for registration fees and environmental verifiers proved to be a stronger financial burden to small firms than to larger ones. The time span of EMAS-amortisation decreases with the size of companies (Seidel/Weber 1998). Information on costs in respect to the administration of environmental management systems is not available in studies on the EMAS or ISO 14001 implementation at the site or company level (Dyllick 1999: 119).

In most cases the EMAS-introduction paid off, at least in the short run. After an average time span between ten and 15 month costs were balanced by economic benefits (cf. UNI/ASU 1997; Höppner et al. 1998). Costs were mainly reduced in waste reduction and disposal, energy saving and in the usage of water and sewage (UNI/ASU 1997: 35). In several studies dealing with the introduction of EMAS the interviewed managers or environmental representatives expected additional cost reductions by a further development of the environmental management or the continuous environmental improvement process in the middle or long run. In several EMAS-studies only the quantitative costs and benefits were asked for, neglecting that so-called soft factors may in a longer run also pay off, as e.g. an improved environmental awareness of employees (cf. Weber 1998: 33; UNI/ASU 1997: 35-36).

However, mangers did not expect higher than average cost reductions. This scepticism related to further cost reductions may be explained by the prevailing character of environmental protection in German firms which is marked by an application of end-of-the-pipe technologies rather than integrated and environmentally more efficient technologies (Dyckhoff/Jacobs 1994: 720). If managers rely on established end-of-the-pipe-technologies the potentials of more innovative forms of production technology combined with EMS will hardly be exhausted. Another explanation might arise from their scepticism whether the efforts to achieve a continuous improvement of environmental performance will be efficient. As far as I know there do not exist any empirical findings on the site-related cost-benefit-relations of EMAS in a longer perspective. Last but not least, the negative external impacts of EMAS influence managers' cost-benefit ratio (cf. Steger 2000): If costs related to the environmental statement or declaration do not pay off in improved stakeholder relations or competitive advantages, EMAS will then lose its attraction. The rinsing numbers of companies which eschew a renewal of EMAS in favour of an EMS-certification according to the ISO 14001 standard reflect the fragility of this cost-benefit-ratio.

Environmental performance

The level of environmental protection improved strongly and contributed to a partly remarkable reduction of site-related impacts on the environment in EMAS-registered sites. Often potentials of environmental improvements were detected in the course of the environmental review. Above all, environmental measures referred to technical improvements of machinery and production processes and the substitution of hazardous substances being harmful both to the environment and human beings. A reduction of environmental impacts concentrated mostly on the prevention and reduction of waste, followed by savings in the usage of water and sewage, energy savings and a reduction of emissions improving resource efficiency (cf. UNI/ASU 1997; Höppner et al. 1998; Dyllick 1999). However, these environmental improvements related to the introduction of EMAS did not initiate a fundamental change from an end-of-the-pipe oriented environmental protection to an integrated approach of in-company environmental management. Nevertheless, the EMAS-implementation partly enhanced the in-company level of reflection and dialogue as a platform for further steps to ecological modernisation, as e.g. a company-related mobility management or an environmentally oriented product design (cf. Heinelt/Töller 1999; UNI/ASU 1997). To sum up, the implementation of EMAS might not make a qualitative difference compared to environmental performance outcomes of the regulatory approach (Freimann 2001: 8). This also counts for ISO 14001 because their environmental performance is not distinguishable from EMAS (ibid). Moreover, there exists no empirical evidence that firms participating in EMAS set more ambitious environmental goals than before (Dyllick 1999: 121). The introduction of EMAS at the establishment level focused mainly on environmental improvements related to the site, rarely taking account of services and products. This limited environmental scope can partly be attributed to the legal provision of EMAS I which excluded products.[11] The ecological effectiveness between EMS according to ISO 14001 and to EMAS did not differ at the site level, which undermined EMAS-

[11] The exclusion of products may lead to paradoxical situations: Taking part in an international trade union meeting on the environment in Liege in 1998 I learned that managers of Belgian nuclear power plants prepared to have their site-related EMS validated in accordance with EMAS.

promoters' emphasis on the more ambitious environmental character of EMAS (ibid: 122).

7.3 Ecological Modernisation of Firms via EMAS?

The introduction of EMAS initiated partly processes of ecological modernisation in establishments. It modernised and improved the environmental protection in participating firms. The environmental management system contributed to establish or improve an organisational structure and procedures to integrate environmental aspects in in-company operational and even decision-making processes. In three out of four validated sites the relevance of environmental criteria in decision-making processes was enhanced (DGB-Bildungswerk 1997). Managers took on their environmental responsibility, i.e. environmental management became a task of the top management of establishments. Although introductory process of EMAS rested mainly on the shoulders of top-management, environmental or quality representatives and in-company production units (Weber 1998: 29), the range of in-company-participants was broadened in two out of four sites registered under EMAS by the establishment of steering committees on environmental management (DGB Bildungswerk 1997). Besides environmental improvements and an enhanced legal compliance the transparency of internal responsibilities, tasks and procedures was increased (Seidel/Weber 1998). Moreover, instruments of environmental management, as e.g. regular internal audits, were applied in more than 80 per cent of the registered sites (UNI/ASU 1997).

Nevertheless, the introduction of EMAS often did not trigger processes of an advanced ecological modernisation of firms. There are several barriers to implement a more ambitious concept of ecological modernisation which are to be taken account of: Firstly, the range of environmental management is limited in regard to its strategic meaning as well as to its scope. Although the environmental responsibility of managers is emphasised and the importance of environmental criteria is reinforced in decision-making processes environmental aspects are often neither (equally) integrated in the core business nor a constituent of the company strategy (cf. Freimann 2001; Birke 2003; Dyllick 1999, Schmidt 2004). For example, environmental management systems are hardly regarded as a platform for more innovative and inventive forms of management, as e.g. an enlargement of the strategic scope of companies towards an integration of environmental aspects in supply-chain-relationships or product policy in order to take competitive advantages of environmental management. Another innovative step might be the establishment of stakeholder dialogues in which stakeholders are recognised as contributors to solve environmental problems of firms instead of limiting external communication to the publication of environmental statements. Moreover, the implementation of EMAS is often closely linked with the improvement of an environmental protection-level focused on end-of-the-pipe solutions neglecting advanced options of environmental management and the application of pollution preventive technologies.

Secondly, an ecological modernisation via EMAS-participation is restricted in many companies because options to initiate processes of environmental and organisational learning are not or hardly exhausted (cf. Meier 2002; Becke 2004; Brentel 2001). Organisational learning can be defined as "the process in which organisations acquire knowledge, integrate it in their knowledge base and re- or newly organise it for future solutions of problems" (Schreyögg 1998: 538), i.e. organisational learning rests on restructuring the organisational knowledge base. In order to integrate

knowledge in the organisational knowledge base it has to be collectively accepted as crucial to the organisation. In this view organisational learning requires collectively shared and accepted knowledge (Dirks et al. 2002).

The implementation of EMAS illustrates in several ways restrictions to an environmental and organisational learning: The legal institutionalization of environmental representatives compulsory to companies being relevant polluters to the environment has at least an ambivalent impact on organisational learning and ecological modernisation. The build up of an environmental management system and the preparation for validation is often delegated by the top-management of establishments to these functional, highly qualified experts. On the one hand environmental representatives often act as promoters and 'net-workers' in environmental management initiating processes of environmental improvement and innovation. Therefore, they can stimulate organisational learning in respect to environmental matters. On the other hand, their orientation of action is often directed to ensure legal environmental compliance. They often regard environmental problems mainly as technical problems because of their professional socialisation as engineers or technicians. This especially counts for full-time environmental representatives in medium-sized or larger companies. EMAS enhances the significance of expert knowledge because it creates an increased demand of expert knowledge: auditable facts, data, management structures and environmental evaluation criteria are necessary for an effective operation as well as an external control of the EMAS-management system (cf. Power 1997). Companies have to build up such expert knowledge on their own or become more dependent on environmental consultants. Functional experts with such an action orientation of technological rationality[12] prefer technical solutions to environmental problems. They often negate the organisational, social or behavioural dimension of these problems (cf. Becke 2003: 48). Therefore, this preferential technical treatment of environmental matters by environmental representatives or environmental departments restricts opportunities of organisational environmental learning. Technological rationality can prevent functional experts from integrating employees in environmental management. Hence it follows, that employees' tacit skills and knowledge are only marginally involved in environmental management.

In Germany small and medium-sized businesses with less severe potentials of environmental impacts often appoint environmental representatives voluntarily. Functional experts in small businesses face a different situation in respect to EMAS-implementation: They often work only part-time as environmental representatives. Therefore, they have to balance demands from at least two different jobs. In order to cope with these demands they often concentrate their environmental activities on the build up and the further development of an environmental management system according to EMAS and on ensuring legal compliance. These part-time environmental representatives often lack time resources necessary for initiating further environmental innovations or a stronger involvement of employees (Becke et al. 1997). Unlike functional experts in larger establishments they often can hardly count on support by internal networks because the small number of employees is often absorbed by regular workaday job activities (Grüneberg et al. 1997: 41).

[12] In recent years training modules were developed and tested successfully to enhance the social competence of functional environmental experts and to sensitize them for the social process of organisational and environmental change in companies (cf. Becke et al. 2000).

Therefore, options of combining the EMAS-implementation with processes of organisational learning are only partly realized.

Thirdly, organisational environmental learning via EMAS is restricted by the strong impact of the regulatory approach on the administration of environmental management in German firms. The strong impact of the German environmental law culture and its dominant regulatory approach often create an imbalance between activities ensuring legal compliance on the one hand and environmental improvements and learning on the other hand. Although EMAS provides an excellent opportunity structure to combine legal compliance with continuous environmental improvement and learning at the site level, functional experts and managers often give priority to attain or enhance legal compliance and to comply with EMAS-prerequisites instead of establishing EMAS as a platform for organisational and environmental learning and innovation (cf. Seidel/Weber 1998: 25). In Germany the close linkage of EMAS to legal compliance proves to be a brake on in-company ecological modernisation if in-company promoters of EMAS emphasise compliance with environmental law and define solely modest environmental goals.

A forth potential restriction to an advanced in-company ecological modernisation rests on EMAS-implementation as a social process in which different in-company actors with specific interests are involved in. Introducing EMAS-EMS contains efforts to strengthen environmental goals and their attainment in firms. Moreover, it often includes at least a partial redistribution of diverse scarce in-company resources, above all financial resources and the social resources of power and recognition. If the introduction of EMAS is combined with e.g. a differentiated attribution of entire environmental costs to specific organisational units or departments, such efforts might alter the internal cost-situation of specific units and redefine economic criteria of success in respect to internal economic comparisons between different organisational units. Therefore, the implementation of EMAS at the establishment level turns often out to be a 'contested terrain', i.e. it is accompanied by conflicts and resistance of specific actors to EMAS which is regarded as a threat to their power position (cf. Klemisch/Rohn 2002: 21 p.)[13]. Therefore, an in-company definition of rather modest environmental goals can also be explained as a solution of compromise between different actors. The implementation of EMAS at the establishment level evokes resistance, if established workaday practises and routines are challenged which constitute a focal point of reliability and stability for in-company actors (cf. Becke et al. 2001; Brüggemann/Riehle 1995). For instance, construction workers, who worked for a firm consulted by some colleagues and me in respect to the implementation of an EMS at the end of the 1990ies, at first rejected EMS because they regarded it as a restriction of their work-related range of action and as interference in their work practises.

Last but not least, organisational learning related to EMAS is restricted because employees are either rarely or marginally involved (cf. Klemisch/Rohn 2002: 25 pp.; Freimann1998: 75). At first sight such a statement seems amazing because several studies on EMAS-introduction to German establishments underscore that EMAS contributed to increased environmental motivation or awareness of employees (cf. UNI/ASU 1997; Heinelt/Töller 1999; Weber 1998). An increase in environmental motivation of employees can be explained by training measures offered to

[13] The relevance of micro-political processes for an environmental modernisation of German companies was also illustrated in previous studies (cf. Birke/Schwarz 1994).

employees. These trainings enabled them to acquire ecological knowledge mainly related to their job or workplace and basic knowledge on EMAS (cf. DGB-Bildungswerk 1997). Environmental trainings sensitised employees for site-related environmental problems and provided them with knowledge about ways and demands of environmentally oriented work behaviour. Moreover, the increased motivation may reflect a high level of environmental awareness of employees (cf. Bogun et al. 1990; Lange et al. 1995; Heine/Mautz 1989) who regard the EMAS-implementation as a new structure of opportunity to take account of environmental concerns at the establishment level.

At second sight several studies also observed that employees and even works councils were mainly involved in the introduction of EMAS by information and internal communication instead of forms of direct employee participation or co-determination by works councils. Two out of three employees of EMAS-sites were only involved by information, mainly resting on written information about EMAS, as e.g. the environmental statement or in-company newsletters. In 50 per cent of the EMAS-sites employees were informed about EMAS by works or shop floor meetings. An active involvement of employees was mainly based on traditional systems of formal employee improvement proposals (Fichter 2000). Innovative forms of direct employee participation were only observed in ten to 20 per cent of EMAS-registered establishments (cf. ibid; DGB Bildungswerk 1997). These statistical figures illustrate that employees and their work-related tacit knowledge and creativity were seldom involved in the establishment of EMAS and in continuous environmental improvement processes[14]. Therefore, organisational learning in respect to environmental management focused mainly on functional experts and different levels of management involved in project teams or environmental steering committees. Organisational learning was reduced to “vicarious learning” (cf. Staehle 1999; Becke 2004) often excluding employees. In larger companies this exclusion is often attributed to the definition of EMAS-implementation as a task of functional experts or managers. In smaller businesses, especially in traditional ones, an environmental participation of employees often fails because of a paternalistic leadership culture (Becke 2001): Employers’ self-understanding can be characterised as a ‘paternalistic shepherd’ acting on behalf of and in the ‘common interest’ of employees. Creating innovations is closely linked with the self-understanding as entrepreneur. In this perspective employees are not recognised as promoters of ecological modernisation or innovations.

[14] However, in several projects dealing with the introduction of EMAS-EMS publicly co-financed, participative approaches, procedures and instruments, such as SAFE, i.e. ‘Sustainability Assessment for Enterprises’ (Rohn 2003), were developed and tested successfully. These participative projects indicated that drawing on the skills, knowledge and motivation of employees proves to be a focal prerequisite for an ecological in-company modernisation via EMAS (cf. ibid, Becke et al. 2000).

8. Conclusion

In summary EMAS turns out to be an ambivalent instrument of indirect regulation in respect to its internal and external impacts of firms which participated in EMAS voluntarily as well as in respect to the effects of EMAS on European environmental policy. A company-related assessment of EMAS demonstrates that EMAS enhanced the legal compliance of participants and increased partly the level of in-company environmental protection. Moreover, it contained an improvement of the environmental organisation structure of companies, i.e. the transparency of responsibilities and tasks in environmental management were increased. EMAS proved to be successful in respect to a publicly supervised self-regulation of firms by the establishment of a company-related environmental management. This especially refers to European member states, in which self-regulation via environmental management had not been practised before. Nevertheless, EMAS did seldom foster environmental innovations or an advanced ecological modernisation of firms: In member states with a legal culture dominated by the regulatory approach, as for instance Germany, emphasis was laid on legal compliance or meeting the formal requirements of the EMAS regulation instead of environmental innovations. Although EMAS embraces potentials of environmental organisational learning these potentials were not exhausted because environmental management was seldom linked with internal dialogues which involved and recognised employees and their knowledge and tacit skills as actors of environmental in-company improvements.

In respect to stakeholder relations and competitiveness EMAS often proved to be a failure. This failure can be attributed to the construction of EMAS which on the one hand underestimated the social diversity of European consumer groups, as e.g. in respect to different life styles, adherence to social milieus, age groups, gender relations and income. On the other hand it overestimated the economy as part of the public sphere because the promotion of EMAS was mainly focused on economic actors neglecting social actors or target groups. Moreover, firms overestimated the effects of the published environmental statement on stakeholder relations. They often negated a discursive strategy in communicating their environmental performance. In respect to competitive advantages the participation in EMAS often did not pay off because the banking sector and insurance companies hardly appreciated the company participation in EMAS. Consumers did not increase their demand to products made by EMAS-participants. Public authorities granted only minor regulatory relief to firms registered under EMAS.

In terms of a European wide distribution EMAS can also be regarded as a failure: Firstly, it is rather a German and Austrian than a European project. Secondly, EMAS was outweighed by its main competitor, i.e. the ISO 14001 standard of environmental management, in all member states of the European Union. Thirdly, compared to the circa ten million companies which exist in the European Union (Przybilski 1997: 37) the percentage of companies registered under EMAS remains marginal, i.e. less than one per cent (cf. Wätzold/Bültmann 2001). This tendency has yet not been altered by the revision of EMAS, i.e. EMAS II. However, EMAS was at least adopted by many larger companies or corporations. Therefore, it remains to be seen, whether these large companies will also expect their suppliers to introduce an environmental management system according to ISO 14001 or EMAS. Nevertheless, the implementation of EMAS in SMEs turned out to be an ‘Achilles’ Heel’. Therefore, the

increase of SME-participation in EMAS remains a future challenge to European environmental policy.

EMAS is one of the core environmental policy instruments related to the ‘reflexive law’ or indirect regulation approach the European Union adopted in the 1990ies. This leads to the question whether EMAS as an instrument of indirect regulation achieved better results in environmental performance or outcomes in comparison with conventional instruments affiliated to the regulatory approach in European environmental policy. Taking account of the substantial environmental outcomes EMAS did not ensure a more ambitious environmental goal attainment than conventional regulatory instruments. In respect to its main competitor EMAS cannot be regarded as the more effective environmental standard. Although EMAS can be characterised as the tighter and more ambitious standard of environmental management both of the environmental standards, i.e. EMAS and ISO 14001, lead to similar environmental outcomes at the company or site level.

Indirect regulation is often regarded as a means to overcome the defects of implementation related to regulatory instruments of European environmental policy. This ambitious expectation towards EMAS as a significant example of indirect regulation is disappointed. EMAS faced implementation problems similar to conventional regulatory instruments of European environmental policy: Firstly, the implementation of EMAS within the European Union was accompanied by considerable time-lags in the establishment of national bodies to adopt the EMAS regulation. Secondly, parallel policy processes interfered with EMAS. This especially counted for the competitive international policy scheme of the ISO 14001 standard (cf. Glachant 2001b). However, some general prerequisites of an improved implementation of EMAS could be identified. For instance, public financial incentives to SMEs can trigger an increased participation of such firms. Moreover, a balance of interests between different political, social and economic actors in respect to the national implementation of the EMAS-system proved to be as a key prerequisite of a broader support of EMAS.

The revision of EMAS is an excellent example of policy learning at the European level. It illustrates that in a relative short period of time significant amendments to the EMAS regulation were adopted in order to sharpen its profile and to restructure its relationship to its main competitor. EMAS was redesigned as the high profile environmental management standard which enables firms a smooth transition from ISO 14001 as the ‘bottom-line’ standard to the advanced EMAS standard. Hereby, the pressure on EMAS to achieve a broad distribution within the European Union was reduced: It is not expected anymore that the majority of firms interested in environmental management are registered under EMAS as the superior, high profile environmental management standard. In this view quality counts more than quantity. Moreover, EMAS II contains starting points to overcome some severe defects of EMAS, such as the lack of employee participation.

Finally, I would like to focus on some potentials of modernisation, which are directed to European environmental policy as well as to EMAS as a specific instrument of indirect environmental regulation.

8.1 The Modernisation of European Environmental Policy Structures

Focusing on policy instruments or approaches might negate the institutional problems of policy implementation at the level of the European Union. If environmental policy instruments are related to direct or indirect regulation remains of secondary significance in relation to problems of environmental policy implementation which are attributed to the complex multi-level and multi-centred structure of the European policy system involving a variety of supranational, national and even regional and local political, economic or social actors.

In my view the effectiveness of indirect and direct environmental policy regulation could be enhanced, if an environmental policy assessment of different European policies were fully established and integrated into different European policy fields. Moreover, an improved horizontal co-ordination between different fields of European policies could increase capacities of action to cope with unanticipated parallel policy processes or interactions which interfere with the implementation of European environmental policy (cf. Glachant 2000: 8). The enforcement of European environmental policy could be supported by concerted action among member states and a broader scope of political influence and sanction power on the side of European institutions to improve legal enforcement. However, this requires a further redistribution of political power to the European policy institutions. Therefore, it may trigger further conflicts between national political interests and European interests.

With respect to indirect regulation national governments and its related agencies play a crucial role in policy implementation. First of all, they are responsible for establishing in due time the political or administrative infrastructure essential to the adoption of indirect environmental regulation at the national level. Secondly, national governments are confronted with demands to balance different social, political and economic interests to establish appropriate, consensus-based structures dealing with the implementation of indirect regulation. If national governments fail in negotiating a compromise of interests, a broad support of Environmental policy instruments of indirect regulation is questionable. Thirdly, the implementation of indirect Environmental regulation requires co-ordinated action between different levels of national, regional and local governments to create compatible opportunity structures, as e.g. publicly co-financed inter-company networks in environmental management. An important role of governments at the national, regional and local level consists in the creation of multi-actor network structures at each level whereby the implementation of Environmental policy instruments affiliated to indirect regulation can be promoted (cf. Becke 1999: 312). This may include e.g. spaces of dialogue on EMAS in the arena of local agenda 21 directed to SMEs or utilising different publicly co-funded programs to offer SMEs a low level entrance to EMAS. For instance, in some regions of the German federal state Northrhine Westphalia, as e.g. in a district called Märkischer Kreis, regional governments initiated regional agenda 21 processes, in which smaller companies were offered the opportunity to join so-called external ‘group-audits’ in order to reduce costs related to the validation of EMAS-EMS.[15] Networks are not the remedy to solve problems of indirect regulation, but they may create a platform to balance different interests enabling a concerted support for an effective application of instruments of indirect regulation. Moreover, problems of indirect regulation can be reduced or at least better dealt with, if

[15] A broad variety of proposals tailored to an enhanced EMAS-participation of smaller firms are provided by Klemisch and Rohn (2002: 32 p.).

communication strategies and resources to enhance the public awareness of environmentally committed firms and environmentally safe products take account of the diverse composition of 'the public' by means of differentiated communication strategies instead of a focus on the economic public.

Although the effects of indirect regulation are limited with respect to EMAS this new approach should not be abolished but rather regarded as complementary to direct regulation. Both approaches are directed to sustain a relative high environmental standard at the European level. Complementing each other seems to be necessary because both approaches of regulation have different strength and defects. Therefore, an instrumental mix of different policy instruments may in the longer run prove to be more effective than a preferential application of either indirect regulation or direct regulation. On the one hand, the regulatory approach is still essential to European environmental policy in order to maintain a relative high environmental standard in Europe, which cannot be solely ensured by indirect regulation. Moreover, the regulatory approach proves to be a main driver of environmental investments and innovation at the level of companies or establishments. For instance, 90 per cent of investments related to environmental protection in German companies are induced by regulatory law (cf. Seidel/Weber 1998: 22). On the other hand, the regulatory approach offers hardly incentives to firms to improve their environmental performance voluntarily, leave alone to guarantee a high degree of legal enforcement. Therefore, the further development of this 'instrumental mix' of European environmental policy will be a future challenge to European environmental policy[16].

8.2 How to give fresh Impetus to EMAS-Participation?

The core idea behind EMAS II consists of sharpening EMAS' profile as a higher, i.e. more ambitious standard of environmental performance on grounds of controlled self-regulation by firms, whilst ISO 14001 would be a minor, less ambitious standard. EMAS II acknowledges the EMS of ISO 14001 as a possible element of EMAS and offers firms certified under ISO 14001 options to join EMAS. Despite this strategic reorientation of EMAS as 'standard of excellence' it still faces stagnation or even a decline in numbers in most of the European Union member states[17]. The prospect of 'excellence' proves to be an insufficient incentive to firms to participate in EMAS or to advance from ISO 14001 to EMAS. Therefore, debates on measures to increase the participation in EMAS linger on. A line of argumentation supports the idea to enhance

[16] In this context an interesting proposals of an ‚instrumental mix' in environmental policy is provided by Constanza et al. (2001: 272 pp.): They propose a combination of different environmental policy instruments, in which a specific set of instruments is related to a certain levels of environmental quality or environmental health. In this perspective polluters are permitted to induce emissions without an obligation to pay environmental taxes, if these emissions remain within a legally defined area of emissions, in which they do not induce any measurable environmental damage. If polluters' emissions cause measurable damages or pollution to the environment, they are liable to environmental taxation related to the pollutants concentration. The third set of environmental policy instruments consists of regulatory instruments. If polluters' emission can cause irreversible long-term damage to the ecological system market-based instruments will be substituted by regulatory instruments.

[17] A turnaround in EMAS-participation seems to be rather unlikely taking account of preferences of companies in new member states of the European Union in central or eastern Europe: In some of these countries, such as Poland and the Czech Republic, EMAS is known to 90 per cent or 50 per cent of managers, but only one in ten planned to introduce an EMS according to EMAS in the middle range. In both countries a majority of managers (50 per cent to 65 per cent) preferred the ISO 14001 standard as basis for a future establishment of an EMS. This planned preferential treatment of ISO 14001 may be attributed to the fact that many firms had established before a quality management system according to the ISO 9000 series (cf. Kramer 1999: 158).

incentives to participating firms by offering forms of deregulation in legal environmental demands. Even if deregulation were the key to a strong increase in EMAS-participation, it would enclose an important side effect: The strategic position of EMAS as environmental standard of excellence would be undermined. Then EMAS would suffer from a lack of social recognition losing its reputation. A second line of argumentation proposes to loosen the screws on EMAS-participants' in respect to the requirement of continuous improvement of environmental performance (cf. Rau/Lange 2004: 11-13). In this perspective environmental management is subdivided into different stages: The first stage focuses on the introduction of an EMAS-EMS which also contains the achievement of goals fixed in the first environmental program. Then the second stage is entered. It embraces processes of monitoring internal and external demands to the EMAS-EMS, maintaining basic procedures, structures and information processes affiliated to EMAS, taking account of employees' initiatives or proposals in environmental respect and communicating the attainment of goals to employees and external stakeholders. Processes of continuous improvement are substituted by processes of continual improvements which rest on specific projects defined by relevant in-company actors in decision-making processes. To define a project is a core starting point to the third stage of continual improvement. A fresh impetus to start a new project may rest on altered internal or external demands, as e.g. new legal environmental norms or the introduction of new products to markets (ibid: 13). In the latter case a new project might e.g. contain the implementation on clean production technologies and an environmentally safe design of new products. This example illustrates that a structure of projects as backbone of continual improvements to environmental performance provides structures of opportunity to set ambitious environmental goals. In my view this approach would loosen the pressure of continuous environmental improvements to companies as well as enable companies to define ambitious environmental projects improving their environmental performance.

In my opinion the barriers to participate in EMAS can also be lowered if a differentiated structure of environmental management systems on the basis on ISO 14001 and EMAS is created which enables firms to advance more easily from a lower to a higher level of environmental management (systems). In Germany and Austria such low level entrances to environmental management supported by public authorities exist. One of them is called 'eco-profit'. This initiative run by environmental consultancies is subsidised by local governments and offers firms a first environmental review and the development of an environmental action plan related to the review at low costs. Therefore, 'eco-profit' may be a first step, especially for smaller businesses to consider participation in ISO 14001 or EMAS. Another example of such low level entrances to environmental management provides the crafts agency of the German state Bavaria. It set up an initiative addressed to crafts firms all over Germany. Crafts companies can join the 'Quality Network of environmental friendly Crafts Firms' which leads them step by step to build up a certified environmental management system tailored to small firms of different crafts. The EMS rests on the basis of EMAS but requires less documentation and a less formalised structure (cf. Barth et al. 2001). In order to eschew a patchwork of numerous low level entrances to environmental management, the spectre of low level entrances has to be limited but should also contain entrances which are tailored to SMEs of different industries.

8.3 From EMAS to Environmental Product Policy?

Several studies on EMAS illustrated that EMAS increased the eco-efficiency of companies, especially by the improvement of resource efficiency. Positive environmental outcomes of eco-efficiency concepts and approaches, such as e.g. EMAS, prove to be fragile because they are consumed by economic growth. To establish a linkage of EMAS-EMS-goals to national environmental quality goals and environmental goal priorities might serve as a promising starting point to avoid that EMAS is caught in the 'trap of economic growth' (cf. Dyllick 1999: 122; Seidel 1999: 309 p.). However, EMAS II is not an appropriate policy instrument to foster processes of dematerialisation. Therefore, it has to be combined with policy instruments of environmental product policy, as e.g. product life cycle analysis or eco-labels. The European Union adopted an eco-labelling scheme in 1992, which rests on voluntary registration of participating companies. Eco-label criteria were developed for 12 product groups. Although the European Commission regards the European eco-label as a success (cf. EC 2001), until 1999 only 42 licenses were granted to 31 manufacturers and two importers for an entirety of 216 products, which bear the European blue flower logo (Barnes/Barnes 1999: 185). Moreover, the European eco-labelling can be characterised as a marketing tool because it is not granted as a reward for improved environmental product quality: "Eco-labels are based on rewarding the least environmentally damaging and not the most environmentally friendly. On its own, therefore, an eco-label does not give enough information to the consumer about the environmental credentials of the product" (ibid). At the level of the European Union ideas to strengthen the eco-label, as e.g. by the abolition of its voluntary character, are rejected by the European Commission and several member states being regarded as a potential distortion to trade (ibid: 186).

To enhance an environmentally friendly product policy, the European eco-labelling proved to be an insufficient approach. However, environmental product policy will remain a key domain of European environmental policy in order to reduce flows of materials and resources and to environmentally optimise product life cycles. The European Union could provide structures of opportunity to promote environmental relief by means of product policy. In my view promising starting points are inter-industry and inter-company co-operations in product life cycle innovations (cf. Ammon et al. 1997; Henseling 2001). Such co-operation could be stimulated e.g. by economic incentives or on the basis of voluntary environmental agreements between industries and public authorities at the European and at the national level. Environmental agreements foster the introduction of more cost-effective measures because the agreed on solutions are tailored to environmental problems and to the involved industries (cf. Barnes/Barnes 1999: 180). Moreover, the European Union could create structures of opportunities to enhance local or regional capacities of action in respect to build up eco-industrial parks or to transform established conventional industry parks to eco-industrial parks. An interesting approach consists in the creation of eco-industrial networks, i.e. eco-industrial parks, in which firms of different branches are located enabling them to use the by-products or waste of one company as resource inputs to the production process of another company (cf. Willms 2004). Such eco-industrial networks may contribute to an environmentally advanced management of resources and material flows at the local or regional level. It remains to be seen, whether EMAS will be closer linked to or co-ordinated with approaches of European environmental product policy in future.

8.4 From EMAS to a European Standard of Sustainability Management?

The principle of sustainability was established in the European Treaty of Amsterdam. Since then several initiatives were launched at the European Union level to promote sustainability. One of these initiatives, the European Commission's green paper on a European policy strategy on corporate social responsibility underscores the triple bottom line approach on sustainability (EC 2001) which embraces the economic, social and environmental dimensions of sustainability. The green paper underlines the importance of EMAS in a European strategy on corporate social responsibility providing an appropriate instrument to evaluate the environmental performance of companies. It also contains proposals to assess the sustainability performance of companies by the introduction of social audits. In my view this European debate on corporate social responsibility might stimulate initiatives to develop a European standard for sustainability management systems embracing forms of financial, social and environmental auditing. EMAS may prove as one of the blueprints for such a new standard in respect to the voluntary participation and basic procedures of auditing and validation. There are hints that the policy competition on such a European standard started when the British Standard Institution published its new version of an integrated sustainability management standard developed during the SIGMA-project[18]. Just to remember: In the case of EMAS one of the main blueprints the European Commission drew on in order to develop a first draft was the British Standard BS 7750.

A potential new European standard of sustainability management might even face more severe problems than EMAS. Similar to EMAS such a standard would also be challenged by implementation problems of multi-level and multi-centred European policy structures. However, if such a standard of sustainability management consists of three different forms of financial, environmental and social auditing some specific problems will arise. An evaluation of the performance of companies in respect to sustainability is complicated because of interdependencies of social, economic and ecological dimensions of sustainability[19]. Therefore, three separate audits will not provide sufficient information to assess the sustainability performance related to specific companies, if there do not exist any precautions to detect and evaluate such interdependencies. Moreover, problems might occur related to an overall assessment and measurement of an entire company-sustainability performance covering the diverse dimensions of economic, social and ecological sustainability. There exists a variety of approaches to define the social dimension of sustainability. This variety requires processes of negotiation to agree on a set of sub-dimensions related to social sustainability at the company level. In recent debates and studies on sustainability work was acknowledged as a core category of social sustainability (cf. Brandl/Hildebrandt 2002; Ammon et al. 2002). However, problems arise from the

[18] SIGMA denotes ‚Sustainability: Integrated Guidelines for Management'. More information on the SIGMA-project is available on the British Standard Institution's webpage www.bsi-global.com.

[19] For instance, if a company introduces clean production technologies preventing waste and pollution this investment may prove to be sustainable in economic terms because of costs reductions in waste and transaction costs related to the interaction with public authorities. In ecological respect the environmental performance of firms is improved. In social respect pollution and waste preventive technologies may threaten in-company jobs related to waste disposal or treatment. Dismissals can be regarded as a significant problem in respect to the social dimension of sustainability. To avoid dismissals would require trainings offered to these employees in order to meet requirements of job alternatives provided by the company. Trainings would enhance employees' human resources but induce costs - at least in the short run - at the same time.

altered character of work by new postfordistic production concepts. Scientific criteria of a humane design of work, organisation and technology were developed with reference to Fordism and Taylorism. They prove to be inappropriate to work situations in postfordistic production or service regimes, in which e.g. new forms of psychological stress and health problems occur, often related to the disentanglement of work. In labour studies a set of established criteria appropriate both to the evaluation of and a humane design of work in postfordistic work regimes has yet to be developed (cf. Becke 2003a). In case of an introduction of sustainability management systems to firms a core prerequisite for its successful implementation consists of the establishment of in-company spaces for dialogue to reflect interdependencies and side-effects of sustainability strategies and to enhance organisational sensitivity in respect to internal change processes and to the environments of firms (cf. Weick/Sutcliffe 2003).

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The Research Center for Sustainability Studies is a central unit of Bremen University. In 1989, the artec was established as Work and Technology Research Centre. artec focuses on achieving an interdisciplinary research spectrum by combining competencies of scientists from different faculties. Within the scope of research activities and courses the sustainability topic is being studied with respect to social, economic and ecologic perspectives. The scientific consultancy aims at supporting sustainable development in relevant fields of activity.
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Research Group 'Social Sustainability and Work'

Research is concentrated on topics of decent work facing the new global economic structures and new normative demands on organisational and work culture. The regulation of work conditions in global structures is centred. Sustainability, Corporate Citizenship and generativity are the main foci. Two fields of research are of interest:

- Global economic structures and economic imperatives, new management systems and new technologies are analysed with respect to the impact they have on relations of employment and work in Germany as well as other highly developed industrial societies. By which policies is it possible to create validity for fundamental social standards and norms in the context different groups of actors: governments (as members of international organisations), workers and employers associations and non-governmental initiatives. In this context discourses on good governance and good practice which are conducted in the political arena of the International Labour Organisation and the European Union are to be considered.
- New forms or work organisation and work design as well as changing processes in the companies' structures and in organisational culture and work culture are analysed. Research focuses on the question, how interests are defined and collectively bargained by the employees. How can wishes, needs and competencies of employed men and women be reconciled with goals of the organisation in a sustainable manner? Special attention is paid on the relationship between the different spheres of work and life and on the subjectivity of employees as organisational members. How do organisations deal with emotions of their members in their everyday work?