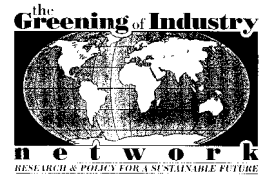


GLOBAL RESTRUCTURING— A PLACE FOR ECOLOGY?



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This introductory article summarizes the discussions and results of the Fifth Annual Greening of Industry Conference, *Global Restructuring—A Place for Ecology?*, held in Heidelberg, Germany, November 25–27, 1997. The Greening of Industry Network is concerned with the transition of industry towards sustainable production as an essential part of achieving a sustainable society. The Network conferences, held at different locations around the world, promote this goal by bringing together participants from different regions and with different backgrounds (academia, industry, governments and NGOs). The conferences are venues for information exchange, learning and dialogue about different aspects of the greening of industry and possible pathways to a sustainable society. © 1997 John Wiley & Sons, Ltd and ERP Environment.

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INTRODUCTION

Societies and their economies throughout the world are experiencing a rapid globalization, which is the result not least of a fast evolution of computerized information systems and communication technologies. This evolution has not only opened up totally new ways of production technologically, it has also changed the way in which production and business is organized. While it is clear that business is increasingly outgrowing national limitations (Dyllick, 1996), the consequences of this transformation are far less clear. Among the worrying questions is whether globalization will threaten or support the spread and integration of environmental concerns in business operations.

The 1996 conference of the Greening of Industry Network asked whether there is a place for ecology in the process of globalization. The answers provided by the papers and presentations at the Heidelberg conference were partial and inconclusive, which is hardly surprising. The question is so large and the reality it addresses so complex that no single answer could possibly be given. The conference papers focused mainly on different step-by-step improvements in the greening of industry, and if the formulation of a general conclusion of the conference were to be attempted it was perhaps that the ultimate goal of sustainable production is unlikely to be attained in a major quantitative leap.

Given the multidimensional nature of the task, there was a general agreement that the move towards sustainability will require the cooperation, perseverance and dedication of all actors involved. Sustainable production will by definition involve and affect all sectors and systems in society, i.e.

consumption, production, technology and finance, and addressing the particular problems and obstacles of each of these systems is therefore necessary.

As has been the case at previous conferences of the Greening of Industry Network, considerable attention was paid to structures, processes and forces of change within organizations, but the Heidelberg conference also emphasized the need to broaden the discussions to include the role of, for example, NGOs, citizens and the financial sector. The main problem discussed in 2 is whether or to what degree change can be driven by internal forces and motives within industry itself. To the degree it cannot, the question is who or what outside forces will provide the necessary push. The role of government seems to be diminishing, and 4 will discuss the other external forces of the greening of industry identified in the conference papers. 3 is devoted to transparency, which is seen as a central element in facilitating the interaction of the self-driving forces of industry and the external forces in society.

IS CHANGE TO BE EXPECTED FROM INDUSTRY ITSELF?

Internal changes in business organizations required for the design, development and implementation of environmental and sustainable strategies constituted a major theme at the Heidelberg conference. In this section, we will focus on two of the issues brought up in the conference papers, i.e. to what degree companies have institutionalized environmental management, e.g. by setting up specific environmental management structures, and what changes in companies' environmental behaviour have actually been achieved.

Integration

With regard to internal structures and processes in business, the contributions to the conference raised issues such as the design of organizational procedures, the integration of environmental concerns into regular business functions as well as the measurement of progress. All business functions including purchasing, marketing and research and development are increasingly confronted with environmental concerns. (Green, 1996) This is the case even within sectors such as finance where environmental concerns have not traditionally played much of a role. Thus, companies are no longer confronted with environmental demands only through legislation and consumer demands. In addition, environmental pressures are channelled through supply chains, credit institutions and other

external networks. This proliferation of outside environmental pressures have led companies, especially larger ones, to seek to integrate environmental concerns into all business functions.

The need for integration changes the role for specialist departments. Engineers in design functions have traditionally seen environmental issues as a separate, add-on set of design criteria. The development of specific Design for Environment (DfE) did not solve the problem. As pointed out by Ehrenfeld and Lenox (1996), integration of environmental concerns in business organisations is not primarily a technical problem. On the basis of a comparison of the evolution of environmental design in four companies, they conclude that the content of the communication between various internal partners in the design process is crucial and that integration of the design function in all stages of product development is more important than the further evolution of tools for DfE.

Another area that serves to demonstrate the shift to integration of environmental considerations in all organizational functions is the development of management accounting analysed by Bennett and James (1996). In an analysis of the practical challenges of developing an environmental accounting system for a telecommunications company, they discuss the differences between the US and the UK. In general, the development of systems has progressed further in the US than in the UK. However, a lot of tricky issues still need to be tackled along the way. One central issue seems to be the manner in which environmental costs can be dealt with in an even-handed way. Also, life-cycle cost accounting needs to be developed, but until now little progress has been made, regardless of the emergence of industrial ecology and metabolism concepts. They conclude that "there does appear to be a consensus that practical environmental accounting is closely related to the development of activity based costing. The introduction of these techniques should mean that many more environmental costs will be identified and allocated in the future. The field could therefore be coming up to a 'step change' where a previously small-scale activity becomes widely adopted. However it is less apparent that any significant development is in immediate prospect in either environment-related capital budgeting, or the costing of externalities." (Bennett and James, 1996, p.22)

Processes of change

An interesting issue at Network conferences is the reporting on the actual changes in the companies' environmental behaviour. Jose (1996) pointed out

GLOBAL RESTRUCTURING—A PLACE FOR ECOLOGY?

that companies seeking to move beyond easy prevention measures to more sustainable production often hit a "green wall", where it no longer pays to become greener, at least not in the short term. This raises the question of whether companies are able to transcend this green wall and truly reduce their environmental impact and not merely shift the burden up or down the production and/or supply chains.

This was also a central concern raised in papers contributed by people working in industry: how to move beyond end-of-pipe measures and the easy first steps of picking the "low-hanging fruits" constituted by glaring inefficiencies in resource use. Moving beyond this point requires a change of attitude in the company as well as a continuous attention to and design of new operational methods. Some papers emphasized the importance of involving external stakeholders since environmental risks caused by the company cannot be defined objectively and therefore need to be assessed in the context of an improved communication with stakeholders. (Fehsenfeld, 1996) Others put a larger emphasis on developing internal programmes and processes with attention to assessing long term potential of various measures and strategies. (Stevens and Cramer, 1996).

Halme (1996) sees change towards sustainable organizations as a continuous process of measuring, performing and learning. This concept of a learning organization is used and discussed in an in-depth case study of two Finnish paper producers. She argues that while individuals can be important drivers for environmental improvements, it is important that companies institutionalize procedures through which to attain constant improvements in terms of reduction of environmental impacts.

Catasús *et al.* (1996) also point the role of individuals in change processes. They deal with the important, but often difficult role of environmental managers. They find that one of the dilemmas for managers is the need to sell environment issues by translating them into business terms which are easily understandable and appealing to business people. "It pays to be green" is an obvious case in point. The problem is that such appealing slogans do not necessarily lead to a correct translation of environmental concerns and do not always capture the full scope of complexities involved. However, there seems to be no easy solutions to this dilemma, since specialist environmental language, which may provide a more precise description of the environmental problems confronting the firm, may create a barrier to their solution.

De Bruijn and Lulofs (1996) raise the question of external drivers vs internal dynamics in their study of the introduction of environmental management in organizations. Based on a quantitative, statistical design they find that the progress of organizations can at least be partially explained by external drivers. At the same time they find indications that the reactions from organizations depend quite heavily on a number of intra-organizational characteristics, and hence on the internal dynamics of an organization. Concerning this point Halme states that "external pressure can trigger a change, but will not keep it going" (Halme, 1996, p. 18).

Change within one company can also be the result of interactions between a number of companies. Andersson and Östlund (1996) reported on change processes within a food retail chain in Sweden. They suggest that there is a need for tools and frameworks for describing, analysing and developing knowledge of the dynamic aspects of sustainable change. They make use of a combination of theoretical insights leaning mostly on the concept of coupling discussed by Weick. Weick has argued that loosely coupled systems are easier to change, while tightly coupled systems might operate more efficiently at standardized tasks. Therefore, Anderson and Östlund propose that alternating tight and loose couplings of companies in networks over time would make it possible to both stimulate innovation and retain positive aspects of standardization and efficiency.

Overall, positive as well as negative trends became visible at the conference. A positive development is the growing integration of environmental concerns into all business functions. A more pessimistic trend was the reporting on the so-called "green wall" that companies seem to be hitting on.

ARE DEVELOPMENTS TRANSPARENT?

Transparency of developments, changes and progress in the greening of industry is an important factor in order to facilitate a constructive interaction of internal and external forces. There are two important aspects of transparency. The first is how to make progress and the contents of the process towards sustainability *measurable*. What should be measured in order to determine the actual performance of a specific firm and how should it be done? The second aspect relates to making the performance visible and thereby possible to discuss. Information on performance can and should be communicated in different ways to different audiences or publics. Different instruments and options

exist such as environmental reporting, environmental statements, product labelling and mediation. Irrespective of the method, transparency should aim at opening up the process by which the firm is moved towards sustainability.

With several workshops and papers devoted to EMAS/ISO 14.000, environmental reporting, mediation, and performance indicators, transparency became a major theme at the Heidelberg conference. We review the contributions to the conference from two perspectives: (1) measurement of progress and (2) visibility and communication.

Measurement of progress

In the summary report of the 1995 conference, Angel and Huber (1996: 131) identified a growing interest in indicators of environmental management and performance, and as pointed out elsewhere, organisations are increasingly under pressure to quantify their environmental performance (Young, 1996:151) Also at the 1996 conference a considerable number of papers addressed the issue of measurement and indicators. The key question, however, is whether all the internal efforts and external pressures for the greening of industry actually makes a difference and leads to measurable results in terms of reduced environmental impacts and more efficient use of energy and other resources. The general picture that can be painted on the basis of the papers of the 1996 conference is rather diffuse with large blind spots.

Most of the papers on measuring performance focused on the measurement of improvements in general rather than progress towards sustainable production. Measuring sustainability involves difficult questions such as the definition of the standard according to which to measure the sustainability of a firm and outlining what changes it must make to become sustainable (Young, 1996: 173). Given these difficult questions, the perspective of sustainability was lacking in a lot of papers. In the contribution of Lehni and Stieger (1996), however, a cautious first step towards defining indicators of sustainability can be found. In order to develop a set of indicators that would contain easy collectable, interpretable and indicative data covering most industries, they propose a set of seven. Four of these are related to environmental effects: global warming, ozone depletion, smog creation and acidification.

While indicators and other means of measuring environmental progress such as environmental accounting are important, they remain merely prerequisites for progress. As pointed out by Bennett and James (1996), environment-related management

accounting is generally more discussed than implemented although they expect significant progress over the next few years. Bouma (1996) arrives at more or less the same conclusions based on a survey among 20 German and 11 Dutch companies. He expects a growth of the future importance of especially capital budgeting (identification of costs and benefits of environmental projects), the book-keeping-system (defining and accounting environmental costs) and the allocation of environmental costs to products and processes. Yet, as emphasized by Bennett and James, these developments will not automatically move businesses closer to sustainability. A better insight into the cost of environmental measures could scare off companies. On the other hand, the costs of environmental inaction could be significant and the benefits of action greater than is suggested by conventional accounting procedures.

Given the minor role of environment-related management accounting at present, one may also question whether companies are sufficiently equipped to use such instruments. Kuhlmann and Esser (1996) have assessed current production planning and control systems and conclude that these systems cannot fulfil future requirements of environmental accounting. They have to be extended with due consideration of the ecological questions and requirements, but a key problem here is how to construct a valuation of environmental goods. As a possible solution Ahlheim (1996) proposed to use the Contingent Valuation Method (CVM), which is based principally on an interview method. However, tackling the main problem, i.e. the absence of objective data, requires a careful planning procedure for the central element of CVM, i.e. the interviews.

Another way of assessing the performance of companies is through certification. In recent years several norms have been developed, the best known ones being the Eco-Management and Audit Scheme (EMAS) of the European Union and ISO 14.000. Since the 1996 Greening of Industry Network conference was held in Germany, EMAS received a lot of attention. As Mrs Wenning (Commission of the European Union DGXI) reported in a plenary session, nearly 80% of the EMAS registered firms are located in Germany. This was also reflected by the fact that the conference was co-organized by the German Institute of Environmental Verifiers and Consultants, IdU.

Certification raises important questions not only about the process of certification, but more importantly about the value of certification as such for the greening of industry. Clegg (1996) reported on the current situation in the UK concerning the imple-

GLOBAL RESTRUCTURING—A PLACE FOR ECOLOGY?

mentation of EMAS and BS 7750 (a British predecessor to ISO 14.000). Nearly 200 companies are certified under BS 7750, while some 20 British companies are registered under the EMAS scheme (approximately 4% of the total registrations). Based on five case studies Clegg identified problems of certification and perceived potential advantages. Problems do not seem to be extensive. The development of an environmentally pro-active culture in the firm was not seen by any of the companies as a major problem, but it should be added that the sample of companies was not random. Clegg describes the companies as being receptive to an environmental culture since each of them had a commitment to quality standards and energy saving. Among the advantages identified were cost savings and increased market share.

The conference provided little in terms of critical analysis of the value of certification for the development of sustainable production. Most of the input was concerned with implementation problems and less attention was paid to more fundamental issues, such as the lack of any performance standards in existing certification schemes. An exception is the contribution of Clancy (1997). He made an in-depth, critical analysis of Z808, a Canadian norm for sustainable forest management. This analysis led to four comments. Clancy questioned: (1) the focus on the management process instead of environmental impact; (2) the operationalization of the concept of sustainability; (3) the under-specification of the role of public actors; and (4) the implicit, hidden political character of the scheme. Most of these comments would seem to apply to certification in general. On the other hand, Clancy concluded that because of its in-built flexibility, Z808 opens a wide potential for adoption throughout the sector, depending on the performance standards chosen and the procedure by which they are chosen.

Visibility and communication

No paper addressed the issue of how companies communicate and control their environmental management internally. All attention was devoted to external communication. The importance of good communication and the danger of negative media coverage was well addressed by Hummels (1996) particularly with regard to multinational corporations. Information spillovers will tend to tie together the various international markets, and a decline of sales therefore may not only hit the market in the country that is directly affected by the environmental damage. A clear example is provided by Shell during the Brent Spar-affair. Hummels attri-

butes this to the psycho-social utility decrease of products.

Given the crucial importance of communication, the next question is how to communicate. Freimann (1996) concentrated on environmental statements, which form the central element in the EMAS system. He asked himself whether these statements provide a valid basis for the public to measure the environmental success of a company. Based on the study of 37 German statements he finds a great variety, but overall the statements emphasize the successes and keep silent about environmental problems of the company. Also they do not give sufficient insight into the organizational structure of the company and the budgets and responsibilities in environmental matters. He concluded that most of the statements examined do not meet the basic conditions enabling public scrutiny and dialogue.

Clausen and Fichter (1996) also studied EMAS-statements and regular environmental reports in Germany. They compared the reports from 1994 and 1995 with a view to assessing whether the quality and quantity have improved. Based on the analysis of 97 reports (including 33 statements) and an extensive list of evaluation criteria, they find that some progress has been made from 1994 to 1995 in terms of the systematic structure and the completeness of the statements. Nonetheless they share Freimann's conclusion that the reports examined fail in highlighting essential environmental issues and formulating environmental objectives in a verifiable way. Also, and perhaps as a consequence, Clausen and Fichter concluded that the reports are used too little as an opportunity for dialogue with the public.

Other ways of communicating were not well addressed at the conference, but there were a few exceptions. Based on the assumption that the potential dialogue options are not fully utilized by environmental statements Glasze (1996) introduces the idea of organizing an Environmental Forum. This is an institutionalised discussion and mediation platform moderated by an independent mediator. Groups invited were chosen mainly by their close proximity to the plant site. Based on experiences with the Siemens/Bensheim plant in Germany Glasze pleaded for continuous, informal meetings combined with an Environmental Forum every third year.

This idea comes close to the input provided by Renn *et al.* (1997). They reviewed the potential of mediation and public participation in resolving environmental conflicts. After defining mediation and identifying conditions for successful conflict resolution, Renn *et al.* presented their own model of

cooperative discourse. The concept and elements of the three-step model were described and illustrated with experiences in three different countries. They concluded that public participation helped to include particularly local interests into the decision-making process.

Environmental labelling systems have been developed in the last couple of years making the products of a company important means of communication. Not much attention was paid to this instrument of communication at the 1996 conference, but Bertolini and Motta (1996) did provide an overview of labels for the textile industry. One of their observations is that labelling has grown in relevance. Some 10% of products in the USA claim to have green product qualities. After examining the most widely used label in Italy (Oeko-Tex) they conclude that at least in some cases an environmentally sound product is more of an image communication vehicle for companies than a real business area. If reduction of environmental impact is the purpose, labelling may not be an adequate answer in itself. Attention to continuous improvement and measuring might be a more useful mechanism.

Overall, transparency was recognized at the conference as a field of major importance. There was general agreement on the need for more communication based on reliable, high-quality information. At the same time a lot of work on issues concerning transparency still needs to be done. In particular there is a need for more discussion and research on communication methods where EMAS-statements and environmental reports seem to fall short. Thus, the important questions are what is communicated, how is it communicated, who is addressed, and with what effect. Besides a focus on transparency issues on the company-side, there also seems to be a need for education of the public since the lack of public interest was repeatedly mentioned.

FILLING THE POLITICAL VACUUM OF THE STATE

In the conference papers dealing with business and society, there was widespread agreement that the role of government is changing from a coercive force of environmental change to a more withdrawn role of a facilitator of change. Theories differ in their explanations of why the state is retreating as well as in their predictions of what driving forces will fill the relative vacuum left by governments. A comparison of two of the main contenders in the theoretical debate, i.e. the theories of ecological

modernization and risk society, will be used to structure the review of the conference papers in this area.

Ecological modernization

According to the theory of ecological modernization, succinctly presented by Mol *et al.* (1996), "state failure" to achieve environmental progress through traditional command-and-control measures combined with broader trends of deregulation and privatization explains the retreat of the state to a more back-seat position. The vacuum left will, according to this theory, increasingly be filled by business, aided by modern technology, as the main driving force of future ecological reform. Environmental groups, on the other hand, will, to the degree that they continue to play a role, tend to be coopted into a constructive participation in solution oriented work. (Mol, 1995).

Regarding the role of technology in the greening of industry, conference papers reflected a guarded optimism. In most cases, new and sustainable technologies are available, and the main problem lies in their commercialization. In explaining why, traditional theories of innovation have emphasized the inertia created by an inherent conservatism in engineering, which tends to limit all technological innovation to refinements of existing and proven technological designs. Kemp *et al.* (1996), while accepting that engineers tend to be blindfolded by existing technological paradigms, emphasize that the problem is much larger. Dominant technologies are embedded in broader technological, governmental and cultural systems, which all constitute obstacles to the radical technology shifts needed to ensure a sustainable development.

Based on the history of earlier technology shifts and breakthroughs, Kemp *et al.* found that "niches" created, for example, by military demand often provided the protected nursing ground for radically new technologies to mature. This pattern, it is proposed, gives hope of overcoming obstacles to radical technology shifts through a deliberate "strategic niche management" in which inter alia governments will need to play a role, but a more facilitating one.

While the more facilitating role of the state, as shown by Verheul and Termeer (1996), does not rule out the occasional use of traditional command-and-control measures, the new balance between state, business and the market has tended to promote new types of instruments such as eco-taxes, covenants or voluntary agreements between business and gov-

GLOBAL RESTRUCTURING—A PLACE FOR ECOLOGY?

ernment, certification and audit schemes, and eco-labelling.

Of these new instruments, many conference papers focused on covenants. Seyad *et al.* (1996) investigated a rather limited case of reduction of air pollution from two Belgian power plants, while Holm *et al.* (1996) and Mol *et al.* (1996) conducted a broader comparative analysis of the use and effectiveness of covenants in the Netherlands, Denmark and Austria. The Netherlands is clearly the country, where most covenants have been signed (about 100), while Denmark can show only some 25 voluntary agreements and Austria many fewer. Covenants involve an implicit deal between business and government by which business gets a voice in goal-setting and greater flexibility in implementation in exchange for a greater commitment by business to reach the agreed goals. This in turn implies less enforcement costs for the state.

The two comparative analyses, while showing a mixed picture of successes and failures of covenants, point to some important limitations as well as conflicts surrounding covenants. First, covenants appear to work best when limited to single sectors with a limited number of companies. The paper by Seyad *et al.* (1996), analysing the success of the Belgian energy sector covenant involving only two companies fits this picture. In a reverse manner, so does Eden's analysis (Eden, 1996) of the failure of self-regulation by the British packaging sector, where the large number and the heterogeneous character of the companies in the sector made it impossible for the industry itself to reach an agreement.

A second limitation is that the successful use of covenants, according to the eco-modernist theory, requires the existence of closed and consensual, neo-corporatist policy styles of which exactly the Netherlands, Denmark and Austria are seen as prominent examples. Thus, covenants would seem to hold less promise for an important country like the US. In this context, it is worth noting that Nordberg-Bohm and Rossi (1996), in their analysis of the US pulp and paper industry, showed that command-and-control measures may not be as helplessly static, inflexible and failure-prone as suggested by Mol *et al.*, but may be redesigned to include dynamic regulatory incentives. But even in a country like Denmark, which traditionally has had strong neo-corporatist policy traits, covenants seem to be enjoying less popularity now than at the start of the decade.

One may ask whether the Netherlands, the mother country of covenants, is not the only country, where the use of covenants has a solid basis in

terms of policy styles and political culture. More important, it may be asked if neo-corporatism is not a dying political culture. In her recent book, *The Retreat of the State* (Strange, 1996), Susan Strange argues that since state authority has been one crucial component of neo-corporatist arrangements, neo-corporatism will tend to weaken along with state power.

Among the criticisms levelled against covenants, one is that the aims of governments inevitably get watered down in covenant negotiations with business. In addition, covenants suffer from a serious democratic deficit by excluding both parliament and environmental groups from playing any role in covenant negotiations. There does not seem to be any easy solution to this democratic deficit since exactly the exclusion of environmental groups and other difficult actors appears to be one of the key attractions of covenants to business. Thus, none of the Danish covenants have been concluded within the framework of the Danish Environmental Protection Act, where section 10 and 11 provides for a certain involvement of interest organizations and NGOs. And in explaining the relative lack of covenants in Austria, Mol *et al.* (1996, p. 22) noted that "command-and-control policies in Austria are to a large extent negotiated and exclude non-governmental interests to a major extent, which limits the demand for voluntary agreements by industry and the certain state sectors".

The risk society perspective

While the democratic deficit may not be seen as a serious problem from the perspective of eco-modernism, a very different perspective is provided by the theory of risk society, initially expounded by Beck (1992). In this theory, the failure of industrialized society to control the environmental side-effects of industrial modernization in this century has negatively affected the legitimacy of not only the state, but also its two main partners in the modernization project: business and science/technology. Reduced legitimacy combined with citizens' increasing use of democratic rights of direct participation has removed the state as the political steering centre of society and created a political vacuum which is likely to be filled by a far more activist public, in some cases organised in citizen groups and environmental NGOs. A more prominent role of civil society, it is worth noting, was also predicted by the Secretary-General of the International Chamber of Commerce, Maria Livanos Cattai, in her keynote address to the Heidelberg conference. Such a more prominent role of civil

society actors presents business with a challenge of developing procedures and mechanisms of public participation and dialogue (Beck, 1997; Hajer, 1995).

The importance of environmental NGOs as external stakeholders is confirmed in the paper by Fineman and Clarke (1996). In extensive interviews with senior managers of four UK branches of business, i.e. automotive, power, chemicals, and supermarkets, it was found that environmental groups, along with regulators were seen clearly as the most important external stakeholders. Surprisingly, three other categories of stakeholder, i.e. consumers, financial institutions and employees, whose potential influence has been extensively elaborated in business-environment literature, were perceived by the senior managers as uninfluential in corporate greening.

Two papers dealing with banks as external stakeholders provide a more nuanced picture of the role of financial institutions, but without fundamentally challenging Fineman and Clarke's findings. Schrama and Schelleman (1996), analysing trends in the Dutch banking sector, found that while environmental and ethical investment opportunities are increasingly being offered by Dutch financial institutions, in most cases as a niche activity, environmental risk assessment played only a marginal role in their general lending activities. Ensuring adequate environmental protection was seen as a governmental responsibility and an area that banks would rather stay out of. Nitsche and Hope (1996), reporting the results of a questionnaire survey of nearly 450 German and UK lending institutions, showed that respondents expected that environmental issues will become more important in future. Yet, at this point, more than half of the respondents felt only "slightly" affected by environmental issues, and less than 5% felt greatly affected. The greatest impact was in terms of "internal" operations such as energy and paper saving. In terms of risk assessment of borrowers, the institutions were rated as somewhat active, but it is not clear from the paper what this activity involved.

With regard to the role of consumers, other papers similarly added nuances without fundamentally challenging Fineman and Clarke's findings. Schelleman (1996) reported on the results of the Dutch EcoTeam project involving households in exchanging ideas on how to reduce waste and energy consumption. He found that presently available options would make it possible for consumers to cut the environmental impact up to 26% of the current average consumption. However, not surprisingly, the project had attracted mainly the elite of "already" green consumers. Grunert-Beck-

mann and Knudsen (1996), reporting the results of a series of consumer surveys in Denmark in the early 1990s, found that while citizens express great environmental concerns, these concerns do not consistently translate into green consumerism. Consumers, however, played a more important role in encouraging the greening of the Swedish Coop supermarket, reported by Andersson and Östlund (1996). Also, future research seeking to understand the European consumer boycotts in mid-1995 against Shell's plans of dumping its oil storage platform Brent Spar and against the French nuclear testings in the Pacific might seriously modify Fineman and Clarke's findings regarding the influence of consumers.

The strategies of environmental groups were only covered in one paper by Noppeney (1996), dealing with Greenpeace Germany's new style of campaigning, targeting the CEOs of key corporations found to be particularly responsible for atmospheric pollution. This started in spring 1990 with a national poster campaign showing the pictures of the CEOs of the German chemical corporations Hoechst and Kali-Chemie stating "Alle reden vom Klima—Wir ruinieren es" (everyone talks about the climate—we ruin it). It is a type of campaigning that Greenpeace Germany has continued. Noppeney sees this kind of campaigning as a reflection of recent trends of identifying the corporation with its top-executive as well as an attempt by Greenpeace to deal with increasing information overload and competition for media attention.

Since these are general trends, the personalization of attacks may also become a more common phenomenon even if it involves an escalation of the conflict level.

The alternative of social dialogue between business and environmental groups was not covered by any papers at this conference. While the contribution by Renn et al. (1997), presents a wealth of valuable experience from dialogue and environmental mediation between government authorities and the public, very little is known about such dialogues involving business and the public. Novo Nordisk and Unilever are known to practice roundtable meetings with environmental groups, and Shell is currently engaged in a major public dialogue process in a number of North Sea countries on how to dispose of the Brent Spar. Shell is at the same time negotiating an agreement with the Dutch NGO, Stichting Natuur en Milieu, on air emission reductions and promotion of solar energy. (Versteegh, 1997) These and other forms of discursive interactions between business and the public seem

GLOBAL RESTRUCTURING—A PLACE FOR ECOLOGY?

to be a crucial area, where far more research and systematic knowledge is required in the future.

LOOKING BACK AND BEYOND

The Greening of Industry Network was initially set up in 1991 as a 10-year project. Thus, the Heidelberg conference marked the half-way point of the Network. This, naturally, called for celebration, which was done in pomp and circumstance with a ball for participants, organizers and network coordinators at the Heidelberg Castle. But the half-way point also calls for some reflection on the achievements of the past years, and the challenges for the years to come.

The Greening of Industry Network embraced a new and emerging field of research and has sought to provide a dynamic framework within which ever expanding areas of research could evolve in mutual dialogue. One important step has been the development of a common research agenda. It has evolved over the past years, was discussed at workshops and previous conferences and was published this spring (Schot et al., 1997). The authors present two different visions of the transformation process towards sustainability and of how business may contribute to such a transformation. The "eco-efficiency" vision emphasizes a continuous and step-by-step learning process for business while the "system change" vision emphasizes that companies—and the economic system—need to be perceived as part of larger ecological and social systems and consequently need to be compatible with these larger systems. Based on our discussion in this article, it is fair to say that the ecoefficiency vision dominated the papers and debates in Heidelberg. The system change perspective, which played an important role in previous conferences, might have been expected to play a larger part in Heidelberg given the theme of the conference and at any rate needs to become a more dominant perspective at future conferences.

The diversity of areas covered have increased compared to previous Network conferences. This is not only the result of the increasing number of participants. The debate on the greening of industry has definitely broadened over the past few years to include new sectors, such as for instance the financial sector, and new issues and themes such as transparency and alternatives for government regulation. While this broadening of the debate is encouraging and indeed necessary, it raises important challenges to the Network of ensuring an

integrated dialogue and an accumulation of knowledge such that the increasing amounts of research leads to an increasingly common body of knowledge.

Judging by the references of the Heidelberg papers, the goal of an integrated dialogue and accumulation of knowledge still seems a distant one. Much of the activity directed at new areas of concern is still in an emergent stage and the systematic digesting of earlier information generated by the network, we feel, could be improved. A very specific challenge is integrating the information gathered through research in other political cultures. A review of the pattern of references suggest that while researchers in North-West European countries such as the Netherlands and most Scandinavian countries seem to be aware of each others' activities, work on greening of industry in the US and Germany appear to some extent to be separate islands of research and theory development.

In addition to the papers and presentations, the Greening of Industry Network conferences provide an important place at which people meet, renew old acquaintances, make plans for joint research etc. Are the Networks' conferences good places for doing this? Several arguments can be given for saying that they are. One reason for this is the broad composition of participants. In Heidelberg 22 nationalities were present with an increasing representation from countries beyond Northern Europe and North America. In addition, there was a broad mix of backgrounds ranging from PhD-students (who had their own Doctoral Workshop for the first time; see the report elsewhere in this volume) to professors, consultants and business people. In the past, a lot of research plans have been made at the Network's conferences. Among these, several research proposals and projects for the "Environment and Climate" program of the European Union have been prepared during the conferences. Last, but not least, people keep coming back to the conferences. This is a signal that they probably find what they are looking for.

Yet, there is room for improvement in extending the reach of the Network conferences. Although the participation from industry was higher than ever in Heidelberg, we still feel that there is a need to broaden the participation outside the academic world. It is unsatisfactory that while the actions of industry are the subject of the researchers meeting at Network conferences, the very same industry actions are seldom informed by the research undertaken or the theories or explanations used in this research. We feel a need for a more intense

interaction and involvement of actors outside the academic society in a debate between equal partners with different perspectives and interests.

Also, special attention to the concept of sustainability in different regional settings is needed. There seems a worrying gap between discussion and research focused on companies in developed market economies and the problems analysed and described by contributors from the Eastern European countries or the contributions from the Third World. These gaps need to be addressed by more careful attention to differences in culture and environmental problems in different geographical areas and to how they may give rise to different perspectives on challenges of sustainability and the related strategies for industrial greening.

SUMMARY

After reviewing and discussing the input provided at the 1996 Greening of Industry Network we feel that it is safe to conclude that the scope of actors involved in the transition of society towards sustainability is broadening. While the role of government seems to be getting smaller, other organisations increasingly provide an outside pressure on the greening of industry. This trend emphasizes the need to pay greater attention to the issue of transparency.

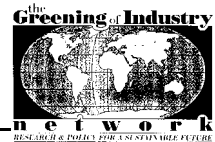
Concerning the Network itself we feel that the first 5 years have resulted in an open and yet increasingly coherent community of researchers with a lot of relations inside as well as outside the Network. While major steps forward have been taken, it is clear that a lot of work still needs to be done. In terms of scope of participation, efforts should be made to further expand the Network to include the business community and NGOs as well as countries beyond the OECD, which has so far been the geographical centre of gravity. In terms of the direction of work, a more cumulative and coherent body of knowledge needs to be developed in order to contribute to a sustainable society.

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