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## **Report from the 2003 Berlin Conference on the Human Dimensions of Global Environmental Change: „Governance for Industrial Transformation“**

### ***Organisational Background***

The 2003 Berlin Conference on Governance for Industrial Transformation that took place on Dec 5-6 2003 at the Freie Universität Berlin, was the third of a series of conferences initiated in 2001 by the Environmental Policy and Global Change Section of the German Political Science Association (DVPW). It was organised by the Environmental Policy Research Centre at the Freie Universität Berlin in cooperation with the SUSTIME project led by the University of Applied Sciences Lausitz, the international Global Governance Project (GLOGOV.ORG) and the German Association for Ecological Economic Research (VÖW). The conference was endorsed by the Industrial Transformation Core Project of the International Human Dimensions Programme on Global Environmental Change (IHDP-IT). The steering committee of this IHDP core project and its project office at the Vrije Universiteit Amsterdam provided valuable support in every preparation phase of the conference. Financial support was particularly provided by the SUSTIME project and the German Science Foundation (DFG).

### ***Objectives of the Conference Series***

The main objective of the Berlin Conference series is to provide a forum for social scientists to internationally exchange their research while at the same time confronting them with the needs of policy makers. The conference focuses on policy problems rather than academic questions. All of the Berlin Conferences were endorsed by different IHDP projects. Plenary speakers are chosen by the organisational committee, while the call for papers is spread by international mailing lists. Contributions for panel presentations are publicly invited. The proposals are reviewed anonymously by a board of experts. The papers that are handed in are initially published on the conference website. After reviewing and editing the papers, a selection of the most important contributions is published in form of an edited volume or a special issue of a journal. In this way, we aim at developing an internationally acknowledged institution for social scientists in the field of Global Environmental Change.

## ***Objectives of the 2003 Berlin Conference***

The 2003 Berlin Conference “Governance for Industrial Transformation” focused on political strategies capable of limiting the overuse of natural resources and the emissions from industrial activities. In general, markets largely fail to give sufficient signals in favour of an internalisation of the environmental effects of the production and consumption of goods. Due to potential conflicts with other policy objectives, particularly economic growth and employment, effective regulatory interventions in industries to correct these market failures have proven to be a difficult task for governments. Moreover, governmental actors often lack the necessary information required for an effective and efficient correction of market failures. Up to now, governmental regulations have not been sufficient. Their effects have often been compensated by economic growth, or – in particular if it comes to global effects – governments failed to adopt effective policies at all. Therefore, there is a simultaneous failure of markets to internalise external effects as well as of states to correct this market failure.

The conference aimed at taking stock recent research on the possibilities to overcome this situation. Contributions had been invited around five themes:

1. Historical experiences with the management of industrial transformation, the stimulation of environmental innovations and the emergence of markets for environmental technologies.
2. Methods and indicators for the forecast of future technological development in order to devise appropriate policy measures.
3. Contributions regarding the scope of policies for an industrial transformation.
4. Analysis of new strategies and instruments, such as the so-called “3<sup>rd</sup> generation policy instruments” or evolutionary approaches.
5. Contributions analysing the interconnectedness of the different levels of policy-making and the different actors involved.

Altogether, 132 abstracts from 34 different countries were submitted, out of which 78 were accepted for presentation at the conference. From the accepted papers, 57 were actually presented.. The remaining authors could not participate for various reasons. Most of the papers and some of the presentations have been made available through the conference web site [www.fu-berlin.de/ffu/akumwelt/bc2003](http://www.fu-berlin.de/ffu/akumwelt/bc2003). A selection of the most important papers will be published.

## ***Proceeding of the Conference***

The opening plenary session of the conference defined the scope of the policy problem and identified research activities conducted in the field. In his contribution entitled “Governance for Industrial Transformation – The Scope of the Challenge”, **Klaus Jacob** (Environmental Policy Research Centre, Freie Universität Berlin), reviewed recent research in policy science explaining opportunities and barriers for a “greening” of production and consumption. He asked in how far new trends in governance (new actors, levels of policy making other than the nation state, and new instruments) are likely to contribute to a more far-reaching industrial transformation. The systemic approach of IT research is likely to open up new opportunities for intervention by broadening the view on the chains of economic activities that fulfil societal needs.

**Pier Vellinga** (chair of the IHDP-IT Scientific Steering Committee) gave an introduction to the basic rationales of IT related research. Vellinga pointed out that environmental policies had been successful in reducing local emissions. When it comes to emissions that are globally distributed and have long-term effects on future generations, however, effective policies contributing to a minimisation of these emissions are missing. The protection of the global environment requires the involvement of the society as a whole, and cooperation at the international level. Vellinga introduced the audience to the scientific work plan of the IHDP-IT that addresses these issues. IT related research should address the interlinkages between technological and institutional change and its effects on the environment. Furthermore IT related research focuses on systems and system changes in view of the global environment while relating both the producer and the consumer perspective, as well as their respective incentive structure. It is international in scope and necessarily multi-disciplinary, encompassing a number of natural and social sciences including political science, economics, psychology, sociology and history. However, there is a need for a common terminology to study transformation processes.

**Wolfram Mauser** (chair of the National Committee on Global Change Research) introduced the conference participants to the national research activities in global change research. The main international programmes in this respect are reflected in the German National Committee which focuses mainly on developing integrative research activities. The main objective is to develop a coherent national research strategy on global environmental change, to be implemented by the main funding agencies (DFG and BMBF) as well as core research institutes.

In his presentation, **Rainer Baake** (Secretary of State of the Federal Ministry for the Environment) gave an outline of the German energy policy. Since 1998, when the government was formed by a coalition of the Social Democratic Party (SPD) and the Green party (Bündnis

90/Die Grünen), the energy policy has been brought in line with environmental requirements. The three main achievements have been the phase out of nuclear energy, the introduction of an eco tax on energy and the introduction and expansion of financial subsidies for the use of renewable energies and energy saving technologies. The fulfilment of the international obligations of Germany in the framework of the climate protection regime is of high priority for the government and its sustainability strategy.

**Frans Vollenbroek** (European Commission, DG Environment) presented the recently adopted Communication on the Sustainable Use of Natural Resources by the European Commission. The communication aims at developing strategies for a decoupling of environmental impacts from economic growth. The basic objectives are the identification and assessment of the environmental impacts of resource use and the determination of the biggest potentials for improvement. The use of resources is related to many different policies, hence their management requires a multi-level approach rather than add-on measures by specific organisations. For the implementation of a strategy, an advisory forum and working groups will be established in order to develop policies that enable stakeholders to reduce their environmental impacts in an economically viable way.

The second plenary session was at the same time an introduction to the possibilities and obstacles of long-term policy approaches as well as to regional aspects of industrial transformation. It was opened by **Frans Berkhout** (SPRU, University of Sussex and IHDP-IT SSC) lecturing on the role of visions as guidance of transformation processes. Berkhout underlined the central role of the development and diffusion of visions as a part of transition management. At the same time, however, he pointed out that there is little systematic research on the role of visions in technological activity. Furthermore, Berkhout presented a number of different visions that have played an important role in the past. Their common elements are objectives (to do something new), orders (relationships to achieve this objectives) and technologies (the means). In the past, there have often been visions that did not match the actual developments either because they were too modest or exaggerated in their demands. To make things worse, a great variety of different and often competing visions exists, coming from different sources and with different interpretations, often depending on the respective social interest. Berkhout thinks that visions for a sustainability transition should follow a set of principles: They should be based on simple objectives, encourage a plurality of orders and technologies, promote dissent about alternative futures and build adaptive capacity into vision.

**Marina Fischer-Kowalski** (Fakultät für Interdisziplinäre Forschung und Fortbildung IFF, Vi-

enna and IHDP-IT SSC) presented her research on the socio-metabolic transitions in Latin America and South-East Asia compared to industrialised world regions (Western Europe and Japan). The comparison aims at revealing interdependencies and tries to answer the question: In how far are favourable developments of a dematerialisation in Europe and Japan triggering unfavourable changes in developing regions? The data on the economic development in the developing regions as well as on the use of materials points out an externalisation of material intensive processes and the associated environmental burden from by the highly developed northern regions. More sustainability on the national level may be achieved by a regional externalisation of environmental impacts.

In his presentation, **Ashok Jaitly** (The Education Resources Institute, TERI, New Dehli) analysed the partnerships for the sustainable management of natural resources prominently introduced at the Johannesburg summit in 2002. Although there have been some positive experiences with these partnerships, they are likely to be limited to cases that are profitable for all partners involved. However, additional research is required to evaluate these types of regional forms of governance.

Plenary sessions on the second day of the conference primarily focused on political strategies for industrial transformation. **Stefan Zundel** (University of Applied Science Lausitz) gave an overview of the research on the timing of political interventions. Interventions are likely to be more successful during unstable periods of techno-economic development. If this coincides with instabilities in the cultural and political system, windows of opportunity may open up, allowing for far-reaching changes in the technological trajectories. By observing the different relevant trends and intentionally building such windows of opportunity, the costs of transition may be kept low.

**Rene Kemp** (Maastricht University, MERIT) introduced the conference to the Dutch concept of transition management. This concept was developed in the context of the fourth National Environmental Policy Plan that focused on so called persistent environmental problems, among the others climate change, the loss of biodiversity, depletion of resources and threats to human health. Although these problems require a transition of systems, they are not sufficiently addressed by conventional policies. Transitions are a result of many different technological, institutional, economic and cultural changes that, as a whole, represent system innovations. Examples are the transition from coal to natural gas based energy systems although this was not a transition on environmental grounds as opposed to possibly even further changes towards a hydrogen economy. Transition management is the deliberative effort for a stepwise and explorative process

to stimulate such system innovations. It is of long-term character, includes a multi-actor network, the development of sustainability visions, the execution of projects and experiments, and continuous evaluation and learning. It requires the integration of sector policy, science policy and innovation policy. Transition management should, however, not be misunderstood as planning the future, but rather as experimenting.

In his lecture, **Nicholas Ashford** (Massachusetts Institute of Technology, MIT, Cambridge) addressed the requirements for markets and governments facing sustainability transition. Policies have to address not only the environment, but also competitiveness, and employment issues. However, there are different market failures such as monopolies, prices that allow for negative externalities, and a lack of long-term planning. Governmental interventions are essential in order to guarantee many different functions: to provide education and infrastructure, to invest in R&D, to serve as a trustee of workers, citizens, future generations and new technologies. In all of these questions, many different governmental agencies have to be involved rather than just a single department. Government should not act only as a referee for competing interests, because neither future generations nor new technologies are adequately represented by the existing stakeholders.

**Martin Jänicke** (Environmental Policy Research Centre, FU Berlin) proposed to distinguish strategies that primarily aim at ecological modernisation from strategies focusing on structural change. Modernisation strategies may build on and use market forces for the development and diffusion of environmental innovations. On the other hand, industrial policies aiming at reducing environmentally intensive industries are likely to meet heavy resistance from often powerful stakeholders. There are few examples for such industrial policies, one of them is the organised withdrawal from the use of nuclear power in Germany. Such policies require integrated approaches by both governmental agencies responsible for the environment and for industries, which are difficult to achieve.

**Jan Rotmans** (International Centre for Integrative Studies, ICIS, Maastricht) presented the Dutch Knowledge Network on System Innovations and its work on transition management and system innovations. The network aims at contributing to system innovations by developing a fundamental knowledge basis on transitions, providing an interface to link fundamental research and practice, and contributing to a critical mass of actors and competences. Transition processes are characterised by their multi-causality and irreversibility, they take place in many stages and on different levels. Transition management has to be adaptive and anticipative. Knowledge for transition processes has to be acquired interactively. Current fields of research of the network are

historical and current transitions and governance issues. The concept of transition management is characterised by evolutionary steering, multi-actor and multi-level governance, management of complexity and uncertainty, and by steering through learning. In practice, transition management is based on the set-up of innovation networks, the development of a shared long-term sustainability vision, the design and execution of transition experiments, and finally the monitoring and evaluation of transition processes. In the Netherlands, a transition policy is officially endorsed by the government, with five domains (energy, agriculture, mobility, biodiversity, space use) being selected to set up transition arenas and to design experiments.

In his presentation, **Ken Green** (Manchester School of Management, CROMTEC and IHDP-IT SSC) analysed in how far the systems approach as applied in the framework of the IHDP-IT, is useful for an analysis of the environmental impacts of food production and consumption. In order to illustrate his ideas, he used the example of growing and processing peas. The production chain is linked to various organisational, institutional and cultural structures framing economic activities. By this analysis, it is possible to identify the interlinkages and determinants of environmental impacts as well as the points for intervention.

### ***Panel Discussions***

The plenary lectures provided a framework for in-depth discussion on a broad range of issues in the panel sessions, which were organised around five themes:

1. Multi-actor and multi-level governance (panel section A);
2. Transition strategies (B);
3. Sustainable business (C);
4. Technologies for a sustainability transformation (D);
5. New generation of instruments (E).

In panel section A, participants were invited to reflect upon the most appropriate and most effective level of governance to achieve a sustainability transition. Several papers described and analysed the emergence of new governance structures both on the international level as well as on the sub-national level. On the basis of a large-N study, one paper analysed regional bottom-up initiatives for employment and the environment in the EU (Sprenger). Other case studies on sub-national initiatives came from South America (Braga et al. and Steinberger/Schild Becker) and

China (Otsuka). Further contributions focused on recent trends in governance patterns at the international level, in particular on the so-called type-2 agreements of the Johannesburg summit (Biermann and Sohn) and on the emerging NGO-Business Partnerships such as the Forest Stewardship Council (Pattberg). Meyer and Baltes critically discussed the durability of networks that aim at contributing to global governance. Finally, a special focus was given to the European Union through the analysis of the legal dimension of sustainable development (Frerichs) and the discussion of a model that represents the interrelation of economic, social and environmental domains in Europe (Glijum and Hinterberger).

**Contributions in panel section B** analysed the potentials of and obstacles for strategies towards sustainability transition. In this respect, the participants asked for ways to govern the innovation system (Foxon et al.) and how R&D programmes may be designed to contribute to transition processes (Weber et al.). A number of papers dealt with the appropriate time frame for intervention. In this context, Jan Nill proposed a framework for the analysis of time strategies that can be applied to transformation process. This concept was discussed in particular for mobile fuel cells (Sartorius), and for the substitution process of a chemical (Weiner). Hartmut Aden discussed the role of time in the process of European policy making from a legal and political perspective and stressed the fact that an appropriate timing may in the mid-term lead to higher environmental standards. Accordingly, governance needs to be based on a differentiated time perspective. Furthermore, a typology of different driving forces of transitions (endogenous renewal, re-orientation of trajectories, emergent transformation, and purposive transformation), was presented by Adrian Smith et al., challenging the focus of the transition management concept on purposive transformation that starts from niches. .

**Panel section C** focused on the role of business actors in transformation processes. Contributions in this panel centred on the question how policies may facilitate learning processes in corporations (Bleischwitz and Langrock) and on the potentials for collective learning among different social actors as a contribution to transformation processes (Siebenhüner). Several papers evaluated the effects of environmental management systems (Schaefer, Hertin et al., and Erkko et al.). Ulrik Joergens and Erik Lauridsen Hagelskjaer discussed the question in how far northern regulatory patterns of environmental governance may be transferred to countries in South-East Asia or if these instruments are likely to fail because of a lack of institutional coherence. A great variety of presentations analysed transformation processes in different industrial sectors such as energy supply (Konrad et al., Voss), the water sector (Aubin et al.), pulp and paper (Kivimaa and Mickwitz) and agriculture (Wolff, de Boer, Feindt). For these different sectors, the driving forces and impediments of a sustainability transformation were discussed.

**Panel section D** dealt with technologies that may contribute to a sustainability transformation. Joseph Huber presented a typology for innovations in order to assess their potential for transformation. Focusing on the Dutch agricultural sector, Albert Faber et al. contributed an empirical analysis of system innovation. Several contributions (Borup, Quist and Vergrat, Geyer and Scapolo) discussed methodologies to forecast technological developments in order to allow for adapting policies accordingly. Two contributions discussed the role of consumer preferences concerning development and diffusion of technologies (Sadownik and Jaccard, Fischer). Other papers took a macro perspective: Manfred Binder analysed in how far endogenous economic developments lead to environmental relief and Bernd Meyer et al. introduced a model capable of representing the economic and environmental performance of different sectors and countries as dependent of policy measures. Jürgen Blazejczak and Dietmar Edler presented a study on Lead Markets for environmental innovations and analysed in how far it is economically worthwhile for countries to step ahead in environmental regulations from an economic point of view. A special emphasis was placed on the role of renewables as well as on policies that contribute to their diffusion (Faber et al., Holzer, Reiche).

**Panel section E** discussed if the new generations of policy instruments such as market based approaches and persuasive instruments –might prove to be effective. Participants analysed initiatives to develop indicators for sustainable development in the USA (Brown and Moran), a framework of industrial ecology for developing countries (Ramasway) and the impact of public disclosure of companies' environmental information on their performance on stock markets in India (Gupta). Taplin analysed the application of such new environmental policy instruments in Australia's effort to cope with challenges of the greenhouse effect. Roger Pierrad presented the results of a European research project on the relief potentials of green public procurement. Dirk Scheer presented the concept of an integrated product policy and analysed in how far new trends in governance may be used in this context. Several papers discussed the potential and the effects of economic instruments, i.e. liability rules in Russia (Richter and Pakhomova) and India (Prasad). The contributions of Deborah S. Davenport and Dave Barnes as well as the paper of Johan Albrecht asked for the suitability of eco-taxes to internalise external costs. The contribution of Simone Klawitter developed a method to assess the prices for a sustainable use of scarce resources and applied it to water pricing in Tel-Aviv.

## ***Outlook***

The contributions to the conference provided a broad overview on the various issues related to a sustainability transformation. So far, research focuses on single issues of industrial transforma-

tion, e.g. on specific instruments, actors, sectors or regions. The systemic approach as it is brought forward by the IHDP-IT is so far of minor importance. Nevertheless, it should prove as a useful starting point for future research since it offers opportunities for combining different stocks of knowledge and broadening the perspective on useful points for intervention. The most elaborated approach for a practical use of this perspective is the Dutch concept of transition management. It remains open, however, if the management of transition processes will work in practice and if it is transferable to other countries.

The transferability of northern concepts of policy making to developing countries represented a cross-cutting issue of the conference. The results remain heterogeneous. While some concepts and instruments seem to work successfully in the institutional context of developing countries as well, others fail to be effective because of the lack of institutional and economic capacities.

A transformation towards sustainability remains a great challenge for governments. Since it affects many different policy domains, conflicts are likely to arise between various policy objectives. An effective policy for industrial transformation therefore has to integrate the policies of different governmental actors. Since this has proven to be a difficult task, instruments and strategies for policy integration require a closer analysis.

The 2004 conference in this series will address these issues of policy integration more closely. Entitled “Greening of Policies – Policy Integration and Interlinkages”, it is scheduled for Dec. 3-4 in Berlin. A call for papers will be distributed in spring 2004.