



INTERNATIONAL HUMAN DIMENSIONS PROGRAMME ON GLOBAL ENVIRONMENTAL CHANGE Science Project 'Industrial Transformation'

GERMAN POLITICAL SCIENCE ASSOCIATION Environmental Policy and Global Change Section

2003 Berlin Conference on the Human Dimensions of Global Environmental Change



Governance for Industrial Transformation

Berlin, 5-6 December 2003

Conference Programme









Environmental Policy Research Centre (FFU) Freie Universität Berlin SUSTIME Project

German Association for Ecological Economic Research (VÖW e.V.) **Global Governance Project**

The 2003 Berlin Conference on the Human Dimensions of Global Environmental Change

Governance for Industrial Transformation

Berlin, 5-6 December 2003

IS ORGANISED BY THE	Environmental Policy Research Centre (FFU), Freie Universität Berlin
ON BEHALF OF THE	Environmental Policy and Global Change Section of the German Political Science Association (DVPW)
endorsed by	Industrial Transformation A Science Project of the International Human Dimensions Programme on Global Environmental Change (IHDP)
In Cooperation with	SUSTIME Project A joint BMBF research project "Innovation, Time and Sustainability" of the University of Applied Sciences Lausitz, Technical University Berlin, Institute for Ecological Economy Research and MERIT, funded in the program "Frame- work for Innovations towards Sustainability" (RIW)
	German Association for Ecological Economic Research (VÖW e.V.)
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- CONFERENCE CHAIR DR KLAUS JACOB Environmental Policy Research Centre (FFU), Freie Universität Berlin jacob@zedat.fu-berlin.de
- CONFERENCE MANAGER BIANCA BARTH Environmental Policy Research Centre (FFU), Freie Universität Berlin bc2003@zedat.fu-berlin.de

CONFERENCE VENUE

The 2003 Berlin Conference takes place in the Henry Ford Building located on the Dahlem campus of the Freie Universität. The subway station 'Thielplatz' (metro line U1) is a few meters from the conference venue.

Henry Ford Building, Garystraße 35, 14195 Berlin

Lower Floor: Registration Paper Room

Hörsaal (Lecture Hall) A

Upper Floor: Akademischer Senat Conference Room (Konferenzraum) 1 Conference Room (Konferenzraum) 2

Conference Room (Konferenzraum) 3

FRI, 5 DEC. 08:00 - 09:00	Registration						
09:00 - 09:20	Klaus JACOB, Environmental Policy Research Centre, Freie Universität Berlin Governance for Industrial Transformation: An Introduction						
09:20 - 09:25	Karsten SCHOMAKER, Chairman of the German Association for Ecological Economic Research Welcome address						
09:25 - 09:45	Pier VELLINGA, IHDP-IT Transformation Research to address Global Environmental Change						
09:45 – 10:00	Wolfram MAUSER, Nationales Komitee für Global Change Forschung Research on Global Environmental Change in Germany						
10:00 - 10:30	Rainer BAAKE, State Secretary, Federal Ministry of the Environment, Nature Conservation and Reactor Safety The Conversion of the Energy Supply in Germany						
10:30 - 11:00	Franciscus VOLLENBROEK, European Commission, DG Environment Towards a thematic strategy on the sustainable use of natural resources						
	Multi-actor and multi- level Governance	Transition Strategies	Sustainable Business	Technologies for a Sustainability Transformation	New Generation of Instruments		
11:15 – 13:00	Panel A.1 – Sub-National Strategies	Panel B.1 – Conceptual Approaches to Transition Strategies	Panel C.1 – Business and Society	Panel D.1 – Global Development: Past and Future	Panel E.1 – Environmental Management Systems		
13:00 - 14:00	Lunch Break						
14:00 - 14:30	Frans BERKHOUT, Director of the Sustainable Technologies Programme, University of Sussex Governance with foresight: the creation and role of guiding visions						
14:30 - 15:00	Marina FISCHER-KOWALSKI, member of the IHDP-IT Scientific Steering Committee, University of Vienna Regional roles in a global game: A neglected aspect of sustainability transition research						
15:00 - 15:30	Ashok JAITLY, Rural Energy Division, The Energy and Resources Institute (TERI), New Delhi Partnerships for the Sustainable Management of Natural Resources: A case for Decentralised Governance						
15:45 – 17:30	Panel A.2 – Governments and Governance: Natio- nal and local Experiences I	Panel B.2 – Addressing Early Phases of Transitions	Panel C.2 – Utilities	Panel D.2 – Understanding Technological Development	Panel E.2 – Extending the Information Base for Sustainable Development		

SAT, 6 DEC. 08:00 - 09:00	Registration (continued)						
09:00 – 10:45	Panel A.3 – Governments and Governance: National and local Experiences II	Panel B.3 – The Role of Time in the Governance of Transition	Panel C.3 – Industries	Panel D.3 – Foresight as an Instrument for Governance	Panel E.3 – Internalising external costs		
11:00 – 11:30	Stefan ZUNDEL, University of Applied Sciences Lausitz Time Strategies for Innovation Policy towards Sustainability						
11:30 – 12:00	René KEMP, Maastricht Economic Research Institute on Innovation and Technology (MERIT) Evolutionary Governance for Sustainability						
12:00 - 12:30	Nicholas ASHFORD, Director of the Technology and Law Program, Massachusetts Institute of Technology, Cambridge Conceptualizing pathways for sustainable transformations: Overcoming market and state failures						
12:30 - 14:00	Lunch Break						
14:00 - 14:20	Martin JÄNICKE, Environmental Policy Research Centre, Freie Universität Berlin Industrial Transformation between Ecological Modernization and Structural Change						
14.20 - 14:40	Jan ROTMANS, Director ICIS, University of Maastricht The Dutch Knowledge Network on Transitions towards Sustainable Development: structure, focus and research agenda						
14:40 – 15:00	Ken GREEN, Director CROMTEC/Institute of Innovation Research, Manchester School of Management Policies for Industrial Transformations in Food Systems						
15:00 - 16:00	Roundtable Discussion with Jan ROTMANNS, Martin JÄNICKE and Ken GREEN						
16:30 – 18:15	Panel A.4 – Sustainable Development: An International Challenge		Panel C.4 – Agriculture	Panel D.4 – Renewables	Panel E.4 – Stimulating voluntary action		
18:30	Adjourn						
20:00	Dinner in traditional Berlin restaurant (by invitation)						

FRIDAY, 5 DECEMBER

08:00- Registration

09:00

PLENARY SESSION

Room: Hörsaal A

- 09:00- KLAUS JACOB
- 09:20 Environmental Policy Research Centre, Freie Universität Berlin Governance for Industrial Transformation: An Introduction
- 09:20- KARSTEN SCHOMAKER
- 09:25 Chairman of the German Association for Ecological Economic Research Welcome address
- 09:25- PIER VELLINGA
- 09:45 IHDP-IT

09:45- WOLFRAM MAUSER

- 10:00
 Nationales Komitee f
 Global Change Forschung

 Research on Global Environmental Change in Germany
 Comparison
 <thComparison</
- 10:00- RAINER BAAKE
- 10:30 State Secretary, Federal Ministry of the Environment, Nature Conservation and Reactor Safety

The Conversion of the Energy Supply in Germany

- 10:30- FRANCISCUS VOLLENBROEK
- 11:00 European Commission, DG Environment Towards a thematic strategy on the sustainable use of natural resources

PANEL SESSIONS

11:15- PANEL A.1—SUB-NATIONAL STRATEGIES

13:00

Chair: Ashok Jaitly, Rural Energy Division, The Energy and Resources Institute (TERI), New Delhi, India

Room: Akademischer Senat

ROLF-ULRICH SPRENGER

Institute for Economic Research at the University of Munich (Ifo), Germany

Territorial bottom-up approaches aiming at integrating environmental and employment objectives: A comparative analysis of 170 case studies in the EU

Territorial initiatives, partnerships, networks and other forms of collaboration represent an increasingly important response to problems of unemployment, social exclusion and environmental disruption. The aim of such "bottom-up" approaches is to harness the skills and resources of the key local actors –such as public authorities, employers, intermediary organisations, voluntary organisations and local community groups– in developing and implementing local strategies for integration of employment and environmental concerns.

While the principles of bottom-up initiatives are now quite widely accepted, relatively little evidence is available about the different approaches, and about the outcomes for different players and stakeholders. Moreover, while the establishment of local partnerships for a better integration of employment and environmental issues has become increasingly widespread in recent years there has been only limited ex-post evaluation and ex-ante assessment of specific initiatives, particularly on a cross-national basis.

The methodology for this paper was developed with the following objectives in mind:

- the need to develop an analytical framework to guide identification and understanding of the different forms of territorial bottom-up initiatives
- to understand the rationale for bottom-up initiatives
- to gain an overview of the major drivers of these initiatives
- the need to survey and document a significant number of territorial initiatives, in
 order to gain a grasp of the various types and experiences which exist, but also to
 analyse how bottom-up approaches actually work.

To meet these objectives, the paper includes

- an analysis of the main features of 170 bottom-up approaches across the EU identified by literature review, official information, country case studies and internet search
- the effects of territorial initiatives in terms of employment, social inclusion and environmental improvements and wider policy impacts
- an analysis of factors of success or failure
- policy conclusions.

FRANK BIERMANN/HANS-DIETER SOHN

Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, The Netherlands

Transnational Public-Private Partnerships for Industrial Transformation: Theoretical and Empirical Exploration of a New Governance Mechanism

Successful policies in support of industrial transformation often require not only national activities, but also international co-operation. The traditional instrument of such cooperation has long been the conclusion of legally binding treaties between states that harmonise national policies to transform a certain industry sector, for example by requiring countries to phase out specific substances and to enact certain supportive policies. The slow progress in many regime-building processes, however, has led to the emergence of new forms of transnational, non-legally binding partnerships that have recently been created by various civil society actors, sometimes with the assistance of some governments. While the effectiveness of intergovernmental environmental regimes in fostering industrial transformation has been analysed for almost two decades, it is still unclear in what ways these new governance mechanisms of private and state actors, on different governance levels, can bring about industrial transformation in targeted countries in addition to, or even as a complement of, interstate law-making. We will develop, first, a theoretically informed typology of public-private and private-private partnerships that will assist empirical research in explaining the emergence and effectiveness of these new modes of governance. Second, we will offer a quantitative-qualitative analysis of the vast number of partnerships that have evolved in the process around the 2002 World Summit on Sustainable Development, the so-called "type-2" outcomes of the Johannesburg summit. Since most of these partnerships are relatively new, we will focus on explaining the creation of such partnerships. We also seek to present some preliminary findings on possible effects of such partnerships on industrial transformation in specific countries and specific sectors. Our research is part of a larger collaborative research effort of a number of institutions in India, Germany, the Netherlands and the United States.

11:15- PANEL B.1—CONCEPTUAL APPROACHES TO TRANSITION STRATEGIES

13:00

Chair:

René Kemp, Maastricht Economic Research Institute on Innovation and Technology (MERIT)

Room: Hörsaal A

TIM FOXON/ZEN MAKUCH/MACARENA MATA/PETER PEARSON

Environmental Policy and Management Group, Dept. of Environmental Science and Technology, Imperial College, London, United Kingdom

Innovation systems and policy-making processes for the transition to sustainability

A key factor in the transition to more sustainable socio-natural systems concerns the interactions between 'technological systems' and 'institutional systems' and the innovation processes occurring within them. This transition will be greatly influenced by how policies and regulatory frameworks (within the policy-making process) influence innovation in these systems, and, in turn, how innovation processes influence governance frameworks. A research project being undertaken by the authors, under the UK ESRC Sustainable Technologies Programme, is investigating the interaction between the policy-making process and the innovation process, with the aim of developing guidelines for the design of a better mix of policy instruments for promoting innovation towards sustainability.

Until very recently, innovation policy and sustainability policy have been pursued separately, but this is now changing as a result of greater understanding of innovation processes and recognition of their importance for sustainability. Recent theoretical

and empirical advances paint a richer picture of innovation as a systemic, dynamic, non-linear process, involving a diverse range of actors, giving rise to both positive and negative feedback. The new picture emphasises the roles of knowledge flows between actors; expectations about future technology, market and policy developments; political and regulatory risk; and the institutional structures that affect incentives and barriers. A similarly complex picture exists of the paradigms, principles and frameworks underlying the policy-making process.

The project is undertaking theoretical and empirical analyses of the interactions between policy-making processes and innovation systems in two case study areas low carbon technologies and integrated product policy, both in the UK, and through comparisons with other European countries. The roles and likely effectiveness of approaches such as strategic niche management, long-term targets and obligations and other market creation mechanisms are currently being investigated for the two case study areas, with results expected by the time of the Berlin Conference in December.

ADRIAN SMITH/FRANS BERKHOUT/ANDY STIRLING

Environment & Energy Programme, SPRU - Science and Technology Policy Research, University of Sussex, United Kingdom

Transforming industrial sustainability under different transition contexts

Analysis that seeks to understand the underlying evolution of 'socio-technical regimes' could provide a firmer grounding for sustainable industrial governance. Socio-technical regimes are relatively stable sets of rules and practices – embedded in networks of state, civil society and market-based actors and institutions - that determine the 'normal' use of technology by society (e.g. housing regimes, food regimes). Regime transformation is a function of the way selection pressures and adaptive capacities interact, i.e. the way rules and practices change is a function of:

- 1. the degree to which regime selection pressures are coordinated towards a common outcome or not; and
- 2. the extent to which adaptive capabilities (to these pressures) emanate from within the incumbent regime or are drawn from beyond it.

We argue that recent 'transition management' theory places too much emphasis on the role of socio-technical 'niches' as the principal locus for change. Instead, we argue that a range of 'transition contexts' exists, depending on the way that selection pressure and adaptive capacity interact. A typology of four transition contexts is developed, each of which implies a particular pattern of transformation processes: reorientation of trajectories, endogenous renewal, emergent transformation, and purposive transition. Transition management is an example of a purposive transition. In contrast, the Freeman-Perez theory of long-term shifts in techno-economic paradigms fits an emergent transformation pattern. We illustrate all four transformation types with examples from energy regimes.

This plurality of transformation processes carries important implications for sustainability governance. The dynamics of each context provides different levers around which governance strategies can be built. Exploring these governance implications, the paper will elaborate a series of transition principles relevant to industrial governance, e.g. diversity, reversibility, inclusion.

CHRISTIAN SARTORIUS

Technical University Berlin, Energy Systems Unit, Germany

Time strategies in environmental innovation policy – the case of the mobile fuel cell and its infrastructure

In many cases, the advantageous effects of environmental innovations do not arise spontaneously for two reasons. On the one hand, the competitiveness of environmentally sound technologies is often impaired by the opportunity of its conventional counterpart to externalize part of its environmental costs. On the other hand, in particular the environmentally more effective fundamental innovations can face a barrier to market entry which is due to the specific stabilization (i.e. lock-in) of the established technology and, thus, goes clearly beyond the effect of externalities. While offsetting the competitive disadvantage from externalization has become one of the central tasks of environmental policy in many countries over the last decades, the latter effect gave rise to frequent complaint that such interventions have taken place at the wrong time, used inappropriate instruments, and the time horizon employed was not adequate.

In our study, the case of the automobile fuel cell is analyzed very thoroughly because the successful market launch of the fuel cell itself will additionally depend on the existence of a suitable fuel infrastructure. Here, the role of the government is very crucial since by sponsoring the introduction and compensating of initial competitive disadvantages of the new fuel, it assumes the role of a coordinator who, intentionally or by accident, will contribute to the selection between a variety of different objectives (local air pollution, climate protection, sustainable resource use) on the one hand and several alternative infrastructures on the other. Thereby, special attention needs to be paid to self-reinforcing effects such as positive returns to adoption, political agenda setting, or the formation of interest groups which render it difficult, if not impossible, to revise a political and economic path once it is widely adopted. It goes without saying that such a decision will not be a national one, but requires supranational coordination.

11:15- PANEL C.1—BUSINESS AND SOCIETY

13:00

Chair:

Joseph Huber, Martin-Luther-University, Halle/Saale, Germany Room: Conference Room 1

PHILIPP PATTBERG

MecGlo Research Group, The Global Governance Project, Germany

Private Environmental Governance and the Sustainability Transition: Emergence and Impact of NGO-Business Partnerships

Global governance denotes a fundamental change in the mechanism of steering employed by governments and international organisations as well as in the relation between public and private interests in the provision of public goods. Next to publicprivate partnerships and public policy networks, private co-operations between different private actors – ranging from transnational corporations and global business associations to non-profit organisations and scientific institutions – enter the centre stage of environmental policy research.

This explorative paper aims at developing a conceptual framework to understand the function and impact of private transnational governance institutions in world politics. While the structure and rationale of government-private sector interaction has been studied in some detail under the headline of public-private partnerships and global public-policy networks, relatively little is known about the role private institutions play as a mechanism of global governance.

The first part of this paper introduces global governance as an analytical concept to understand the profound changes in the nature of the global political system and proposes a clarification of the concept of private governance institutions, respectively different forms of private cooperation in relation to other, rival concepts, such as private regimes, voluntary agreements or private organisations. Afterwards the paper assesses one of the existing collaborative institutions in the field of environmental politics, namely the Forest Stewardship Council, according to its function and impact. It argues that the FSC performs, next to rule-making, three distinct functions: providing a solution, brokering knowledge, and constituting a learning network. The remainder of the paper discusses the political impact of private governance. I argue that the FSC performs varying degrees of private authority with regards to close stakeholders, national, and global political systems.

RAIMUND BLEISCHWITZ/THOMAS LANGROCK Wuppertal Institute, Germany

Governance of Sustainable Development: Co-Evolution of Corporate and Political Strategies

The article proposes a policy framework for analysing corporate governance toward sustainable development. The aim is to set up a framework for analysing market evolution toward sustainability. In the first section, the paper briefly refers to recent theories about both market and government failures where some scepticism about setting the framework conditions for market actors becomes visible. For this reason, multi-layered governance structures seem advantageous if new solutions are to be developed in policy areas concerned with long-term change and stepwise internalisation of externalities. The paper introduces the principle of regulated selfregulation. With regard to corporate actors' interests it presents recent insights from theories about the knowledge-based firm where the creation of new knowledge follows from absorbing societal views. This is why some scope for an endogenous internalisation of externalities emerges, which leads to a variety of quite different corporate strategies. Because governance ought to set incentives for quite a diverse set of actors in their daily operations, the paper finally discusses innovation-inducing regulation. In both areas, regulated self-regulation and innovation inducing regulation, corporate and political governance co-evolve. The paper concludes that these coevolutionary mechanisms may assume some of the stabilising and orientating functions, which have previously been exercised by framing activities of the state. In such a view, the governments' main function is to facilitate learning processes, thus departing from the states' function as known from welfare economics.

11:15- PANEL D.1— GLOBAL DEVELOPMENT: PAST AND FUTURE

Chair:

Matthias Weber, ARC Seibersdorf research, Department Technology Policy, Austria Room: Conference Room 2

MANFRED BINDER

Environmental Policy Research Centre, Freie Universität Berlin, Germany

Environmental Benefits of Unintended Economic Developments: Results from a Comprehensive Analysis of Carbon Dioxide Emission and Energy Balances

Since the 1970s, energy saving policies have been of major prominence, and since the late 1980s the global warming issue has given rise to the most important and elaborate international environmental regime. But despite these decades long efforts, hardly any country has yet experienced significant declines in national energy consumption or carbon dioxide emissions. The only exceptions to this rule have hardly been caused by environmental or energy saving policies but were mostly the unintended side-effects of the decline of energy intensive or at least carbon intensive industries during the 1990s:

- the decline of the socialist system resulting in economic structural change in the European countries in transition in the early 1990s and in Germany's new Bundesländer,
- the "dash for gas" in the United Kingdom, i.e. the switch from coal to less carbonintensive gas as fuel in the production of electricity following the privatisation and de-regulation of the energy industries and
- the de-commissioning of Luxembourg's last blast-furnaces and major electricityproducing facilities.

Public policies, on the contrary, have usually been designed in order to prevent sectoral crises, e.g. by special provisions in energy taxation for energy-intensive industries. This anecdotal evidence raises several questions:

- Inasmuch has the development in CO2 emissions by now been merely the result of changes in GDP and structural changes within the energy industries and manufacturing?
- Inasmuch may the different attitudes of national governments towards the commitments of the Kyoto protocol be simply the result of differences in emission development rather than vice versa?
- Could and should energy policies be re-designed in order to cause structural changes of comparable size?
- What, if not?

The presentation tries to answer these questions based on a comprehensive analysis of IEA's carbon dioxide emission and energy balances.

BERND MEYER/CHRISTIAN LUTZ/MARC INGO WOLTER

University of Osnabrück and Gesellschaft für Wirtschaftliche Strukturforschung, Germany

Global Multisector/Multicountry 3 - E Modelling: From COMPASS to GINFORS

The global dimension of environmental policy, which has become a subject of international policy with the concrete discussion of targets and instruments, constitutes a huge information gap for environmental politics. The author postulates, that this can only be filled by the application of global economic environmental models, which have to meet certain requirements: A multisector and multicountry system with global coverage and bilateral trade linkage with econometrically estimated parameters is needed. The author presents the system COMPASS (Comprehensive Modell of Policy Assessment) and the improved system GINFORS (Global Interindustry Forecasting System), which is just in construction based on the experiences made with COMPASS.

13:00

A discussion of the application of GINFORS in the EU project MOSUS (Modelling Sustainable Europe) gives an impression of the power of the model to analyze global economic environmental questions and to forecast important environmental indicators.

11:15- PANEL E.1— ENVIRONMENTAL MANAGEMENT SYSTEMS

13:00

Chair:

Dirk Scheer, Institute for Ecological Economy Research, Heidelberg, Germany Room: Conference Room 3

ANJA SCHAEFER

King's College London, United Kingdom

The Social Construction of Environmental Management Systems

Environmental management systems (EMS) have become a key element of corporate pro-environmental management efforts. Yet, the effectiveness of such systems in bringing about actual environmental improvements or industrial transformation has been debated. This paper looks at EMS as something whose significance, purpose and shape is actively constructed by people (managers, policy makers, academics, etc.) through social interaction. This social construction of EMS is embedded in organisational culture, business and political systems and other social institutions and influenced by personal backgrounds and organisational roles.

The paper seeks to establish how environmental management systems are understood and constructed by managers in four UK utility companies, with respect to their purpose for strategy and competitive positioning, their usefulness as a tool for improving environmental performance, and their implementation in the particular organisational context. The paper is based on a longitudinal (1996/97 - 2001/02), qualitative, comparative case study approach, involving in-depth interviews with between 6 and 12 managers in each company, in different functional and hierarchical positions. This data is supplemented by company documents. The analysis methods draw on ethnographical principles and critical discourse analysis.

The results show considerable differences in the ways in which environmental management systems are constructed, both between individual managers and between different companies. EMS are variably understood as a means to support the company's competitive positioning, necessary to achieve competitive parity, reassurance to regulators and a critical public, or as a tool which can help in achieving compliance with environmental regulation and avoiding prosecution. Understanding of the scope and implementation of EMS also differs considerably, from a bottom up approach of building on accreditations for individual sites to a system spanning the entire organisation. These different conceptualisations and constructions of EMS will reflect on their likelihood of achieving improved environmental performance in ecological terms.

JULIA HERTIN¹/FRANS BERKHOUT¹/DANIEL TYTECA²/WALTER WEHRMEYER³

1 Freeman Centre, SPRU – Science and Technology Policy Research, University of Sussex, United Kingdom

2 Université catholique de Louvain, Institut d'Administration et de Gestion, Belgium 3 School of Engineering, University of Surrey, United Kingdom

Management systems and the environmental performance of companies

'Soft' policy instruments - i.e. those that rely on voluntarism, learning and procedures rather than coercion - are playing a more prominent role in the environmental policy mix of many industrialised countries. They have been promoted by those who maintain that traditional hierarchical regulation is ill-equipped to promote environmental improvement and that environmental policy should become more decentralised and self-regulatory. Critics, on the other hand, point out that there is insufficient evidence that soft instruments deliver real environmental improvements.

This paper contributes to this debate by presenting new evidence on the effectiveness of one of the most prominent 'soft' instruments: environmental management systems. It draws on a MEPI project funded by DG Research under the Fourth Framework Programme, which collected and analysed environmental performance data for 280 companies and 430 production sites in 6 manufacturing sectors in 6 EU countries.

The first section discusses the rationale behind the increased adoption of voluntary and procedurally-based instruments in general and policies to promote the diffusion of EMS in particular. We then review existing empirical evidence regarding the link between EMS and environmental performance stemming from research carried out in Germany, Austria, Switzerland, the UK and Sweden. The main part of the paper presents the authors' analysis of the MEPI dataset which uses three methods: 1) Statistical analysis on the firm-level (multiple regressions) 2) Statistical analysis on the production site-level (simple regressions) and 3) Longitudinal analysis on the site-level. The final part draws conclusions about the potentials and limits of environmental management systems, and explores wider implications for the role of 'soft' policy instruments in the environmental policy mix.

ULRIK JØRGENSEN/ERIK LAURIDSEN HAGELSKJÆR

IPL / Innovation and Sustainability, Technical University of Denmark, Denmark

Coherence in Environmental Efforts for Industrial Transformation

The success of ecological modernisation with regards to e.g. the ability to decouple economic growth and consumption from environmental degradation in the industrialised parts of the world is still an open question. But when it comes to supporting the newly industrialised or about-to-be industrialised parts of the world the individual elements that have been developed in the ecological modernisation process are readily exported. In this manner the environmental governance in newly industrialised countries of e.g. South East Asia has been influenced by separately introduced elements as legislative emission standards, strategic concepts as 'cleaner production', scientific expertise (and equipment), enforcements schemes and now also environmental management standards. The success of the various promotion programs have measured by counting the uptake of these elements even though the limits to their impact are well known also in countries where they have been established in coherence.

Based on studies of the coherence of Danish environmental efforts introduced by government policies, industrial management schemes and public actions and discourse, positive and negative interdependencies of these efforts are identified emphasising the introduction of more radical schemes for the support of best available technologies and product oriented environmental policies. The construction of objects for environmental concerns and the development of integrated policy measures transgressing the market-state dichotomy are important elements of the analysis. The need for a coherently working of environmental efforts in both government, industry and public awareness is highlighted based on the examples, and the consequences for development policies is outlined based on experiences from Thailand.

The paper will address the issues: (1) History, (4) New Generation of Strategies, and (5) Multi-actor Governance.

SANNA ERKKO¹/ PER MICKWITZ²/MATTI MELANEN²

1 Union of the Baltic Cities, Commission on Environment Secretariat, Finland 2 Finnish Environment Institute, Finland

Eco-efficiency in Finnish EMAS Reports: All Talk No Action or Just Action without Talk

The concept of eco-efficiency emerged in the 1990s as a "business link to sustainable development" and if this were the case it would be a key concept for industrial transformation. In order to achieve such a transformation several organisations have made frameworks on how eco-efficiency could be reported, e.g. the World Business Council for Sustainable Development. The whole eco-efficiency concept has, however, also been criticised as just an industrial buzz word by which traditional environmentalism is hijacked. In our study we examine whether the concept of eco-efficiency is incorporated into Finnish EMAS reports. Our empirical sample consisted of

40 EMAS statements and eight group environmental reports. Our results show that the concept of eco-efficiency has clearly not become popular in corporate environmental reporting in Finland. If eco-efficiency has had an impact, then it is the underlying thinking that has been adopted not the word. This could be the cased, since weak eco-efficiency indicators are frequently used. This is, however, in most cases not due to internalising of eco-efficiency thinking, but rather because it has been common to relate e.g. emissions or energy use to production irrespectively of the eco-efficiency concept. While it has often been assumed that eco-efficiency would translate the concept of sustainable development into specific terms and thus become a route to industrial transformation. Our findings suggest that this is not the case, at least not in Finnish environmental reporting.

13:00- LUNCH BREAK

14:00

PLENARY SESSION

Moderator:

Frank Biermann, Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, The Netherlands Room: Hörsgal A

- 14:00- FRANS BERKHOUT
- 14:30 Director of the Sustainable Technologies Programme, University of Sussex Governance with foresight: the creation and role of guiding visions
- 14:30- MARINA FISCHER-KOWALSKI
- 15:00 Member of the IHDP-IT Scientific Steering Committee, University of Vienna Regional roles in a global game: A neglected aspect of sustainability transition research
- 15:00- ASHOK JAITLY
- 15:30 Rural Energy Division, The Energy and Resources Institute (TERI), New Delhi Partnerships for the Sustainable Management of Natural Resources: A case for Decentralised Governance

PANEL SESSIONS

15:45-PANEL A.2—GOVERNMENTS AND GOVERNANCE: NATIONAL AND LOCAL17:30EXPERIENCES I

Chair:

Hans-Dieter Sohn, Institute for Environmental Studies (IVM), Vrije Universiteit, Amsterdam, The Netherlands Room: Akademischer Senat

TANIA BRAGA/IRINA MIKAILOVA/FLAVIA RAVSKY/ANA PAULA GONÇALVES DE FREITAS

Centro de Desenvolvimento e Planejamento Regional - CEDEPLAR/UFMG, Brazil

Industrial stress, economic performance and local governance as drivers of local sustainability: measurements and determinants

The paper investigates industrial stress, economic performance and local governance as major drivers of local sustainability and environmental stress. The study area is the Piracicaba river basin in Brazil, chosen for the numerous possibilities it presents for the analysis and study of sustainability drivers.

The Piracicaba Basin has a large protected area within Brazil's Atlantic Forest. It has the most important iron-steel industrial complex in Latin America, mining areas exploited both industrially and on small-scale basis, an expanding Japanese-Brazilian cellulose industrial complex, enormous areas of eucalyptus monoculture plantations, and a rapid growing urban system that includes major regional urban centers.

The first part of the paper seeks to track progress toward urban sustainability in the 26 municipalities of the basin through the construction of the Urban Sustainability Index, which combines measures of environmental quality, human welfare, institutional capacity, industrial stress, urbanization stress and agricultural stress. We use the Index to compare the performance of the 26 localities in the different dimensions of sustainability.

The second and third parts of the paper analyse industrial transformation within the studied area. We measure the environmental stress posed by the major industrial plants in the area through modeling energy consumption, water effluents emission and water consumption. We conclude by investigating direct and indirect drivers of local sustainability and environmental change within the studied area.

The paper investigates statistically industrial stress, economic performance and local governance as major drivers of local sustainability. The study area is the Piracicaba river basin in Brazil, chosen due to the numerous possibilities it presents for the analysis and study of sustainability drivers.

KNUT RICHTER¹/NADEZDA PAKHOMOVA²

1 Europa-Universität Viadrina Frankfurt (Oder), Germany 2 St. Petersburg State University, Russia

Industrial transformation and business liability for ecological damage in the Russian Federation

In the paper the application and the problems of the implementation of the main approaches to business liability for ecological damage in Russia are studied. Business

liability is treated here as one of the main preconditions for ecologically sound industrial transformation. Emission taxes, direct negotiation between local communities and investors on compensation and precaution of environmental damage, and various forms of legal liability based on norms of civil, criminal and administrative law are used among the instruments for the realisation of business liability in Russia. The performance of these instruments and their influence on industrial structure depend, on one hand, on market factors (competitive or monopolistic structures, etc.), and on the other hand, on the ecological policy of the state and its readiness and willingness to follow its own guidelines. The mentioned problems of these two fields are explored in the paper and some ideas to overcome the problems are proposed.

KENJI OTSUKA

Environment and Natural Resource Studies Group Inter-disciplinary Studies Center Institute of Developing Economies, Japan External Trade Organization, Japan

Critical Review for Multidimensional Governance of Environmental Policy in China—Focusing on Industrial Pollution Control—

China has developed environmental policy, mainly focusing on industrial pollution control, for thirty years. At the beginning, environmental policy in China was initiated by central government under leadership of top leaders in communist party, and then administrative and law system has been strengthened year by year. Since 1990's, State Council, central government in China, has called all industries to comply with emission standards and also issued implementing guideline to order local governments to shutdown small-scale industries that cause heavy environmental pollution. On the other hand, government has cooperated with newly reformed People's Congress and mass media, which has been under control by government and communist party, to supervise and inspect the implementing process of strict "command-and-control" regulations. Engineering companies, NGOs and residents have also come to play important roles in implementing the regulations in these years. We can say that China has already step toward building multidimensional governance system in implementing environmental policy. Discussing effectiveness of multidimensional governance for environmental policy in China, it should be aware of not only development process in environmental policy itself, but also its interplay with socioeconomic institutions under economic, social and political reform over twenty years. In order to study interplay between environmental policy and socio-economic institutions, I have analyzed the policy process through official documents, articles in newspapers and interviewing with stakeholders in China. I have also joined with some cooperative research projects between Institute of Developing Economies (IDE) and Chinese research institutes to get firsthand materials on environmental policy implementation in China. I have found that some leaders who were responsible for environmental policy have been aware of effectiveness of multidimensional governance system to strengthen policy implementation, but that development of the system has been linked strongly with economic, social and political change since 1990's.

15:45- PANEL B.2— ADDRESSING EARLY PHASES OF TRANSITIONS

17:30

Chair: Jan Nill, Institute for Ecological Economy Research, Germany Room: Hörsaal A

JOSEPH HUBER

Martin-Luther-University, Halle/Saale, Germany

Environmental Policy Shift through Technological Innovation

This paper is based on empirical research on a taxonomy of technological environmental innovations. It draws on a databank with 300 datasets on new technologies (materials, products, processes and practices) coming with benign environmental effects. The approaches applied to interpreting the datasets are innovation life cycle analysis, and product chain analysis. Main results include the following:

1. Innovations merely aimed at "eco-efficiency" do in most cases not represent significant contributions to improving the properties of the industrial metabolism. This can better be achieved by technologies that fulfil the criteria of "eco-consistency" or "eco-effectiveness".

2. Ecological pressure of a technology is basically determined by its conceptual makeup and design. Most promising thus are technologies in earlier rather than later stages of their life cycle (i.e. during R&D and customisation in growing numbers), because it is during the stages before reaching the inflection point and maturity in a learning curve where technological environmental innovations can best contribute to improving ecological consistency of the industrial metabolism while at the same time delivering their maximum increase in efficiency as well.

3. Moreover, environmental action needs to focus on early steps in the vertical manufacturing chain rather than on those in the end. Most of the ecological pressure of a technology is normally not caused end-of-chain in use or consumption, but in the more basic steps of the manufacturing chain (with the exception of products the use of which consumes energy, e.g. vehicles, appliances).

There are conclusions to be drawn for a shift of emphasis in environmental policy from regulation to innovation. Ambitious environmental standards, though, continue to be an important regulative precondition of ecologically benign technological innovation.

ALBERT FABER/TRUDY ROOD/JAN ROSS

National Institute for Public Health and the Environment (RIVM) and Netherlands Environmental Assessment Agency, The Netherlands

Evaluation of system innovation processes - a pilot study on the transformation of Dutch agriculture to sustainability

The aim of the paper is to present a method for the evaluation of policies for system innovations. The Dutch government has developed a policy of *transition management* or the management of system innovations for sustainable development. The long term nature and the integrated character of such policies complicate proper monitoring and assessments.

We have developed a practical framework for an evaluation by splitting a system innovation in six analytical arenas, each defined as 'a set of activities and the relevant actors involved'. These arenas roughly cover the well-known S-curve of a system innovation and are distinguished as follows:

- 1. problem perception;
- 2. (development of) future visions;
- 3. research and development (R&D);
- 4. pilot projects and first movers;
- 5. (motivation and resistance to) system changes;
- 6. final institutional polishing of the innovated system.

The arenas are separated for analytical purpose, but clearly affect each other in the

process of system innovation. Different existing methods and models can be used for analysing each of the arenas, describing in their own methodological way the activities and actors involved. This approach was used in a pilot project to monitor the transformation of Dutch agriculture towards a more sustainable system.

The R&D-arena is elaborated somewhat more, following earlier work on the driving forces and the fundamental barriers behind technological change. This method was applied on an array of technological developments in present Dutch agriculture, to assess the chances for a breakthrough. A linkage can be made between R&D-results and future visions or pilot projects, considering that the other arenas will have to be assessed as well in order to give a valid evaluation of the full system innovation.

MATTHIAS WEBER¹/PHILLIPP SPÄTH²/I. OEHME²/H. ROHRACHER²

1 ARC Seibersdorf research, Department Technology Policy, Austria 2 Inter University Research Centre Graz (IFZ), Austria

Transition processes in production-consumption systems: How research programmes contribute to shaping transition processes towards sustainability

The recognition that system innovations are needed in order to achieve a transition to more sustainable systems of production and consumption is now widely recognised in policy. From the perspective of individual research programmes, it is necessary to understand if and how concrete and operational research initiatives undertaken are actually likely to contribute to a transition path or not. Moreover, mechanisms need to be foreseen in programme development and implementation to enable the adjustment of policy actions to improved knowledge and shifts in objectives, comparable to a second-order learning process.

As an accompanying support process to the Austrian national research programme on the factory of the future, the contribution of the programme's project portfolio will be assessed in terms of its likely contribution to a transition path towards sustainability under the conditions of different future scenarios. This activity focuses on two key areas addressed in the programme: new approaches to construction using renewable materials, and dying of textiles.

In the paper, we will introduce the conceptual foundation of this policy support process, inspired by the concept of transition management, and outline the approach for implementing it. This comprises also a characterisation of the two areas under study. Finally, first sketches of framework scenarios for the two areas will be outlined.

15:45- PANEL C.2—UTILITIES

17:30

Chair:

Lutz Mez, Environmental Policy Research Centre, Berlin Room: Conference Room 1

KORNELIA KONRAD¹/JAN-PETER VOSS²/BERNHARD TRUFFER¹

1 Centre for Innovation Research in the Utility Sector, Swiss Federal Institute for Environmental Science and Technology (EAWAG), Kastanienbaum, Switzerland 2 Oeko-Institut – Institute for Applied Ecology, Freiburg, Germany

Transformation Dynamics in the Utility Sector

Network-bound infrastructure systems as electricity, gas, water and telecommunications currently undergo transformations on various levels and in various action domains. Liberalization, globalization of markets, technological innovations and socio-cultural dynamics are part of it. These transformations may have a considerable impact from an environmental point of view. However, they also open up today degrees of freedom for developing future more sustainable utility sectors.

To understand utility sector transformation from a theoretical perspective a concept is necessary which spans different levels and different action domains such as provision, consumption and governance. We will draw on the concept of socio-technical regimes (Geels 2002; Rip and Kemp 1998) to analyze the actual structure of these sectors and to deduce possible dynamics. A variety of possible dynamics of transformation are relevant here. Among them technological transition to radically different regimes of the provision of energy, water or telecommunication services based on technical innovations. Other paths of transformation may exhibit less radical changes or go without the stabilization of a new regime. Dynamics may also be predominantly triggered off by non-technical innovations. The concept of sociotechnical regimes is adapted to this research interest, for example by using a generalized concept of niches and by considering ecological elements more explicitly. This reflects the specific dependence on as well as the specific relevance of the analyzed sectors for ecological systems.

The paper is developed in the context of the project "integrated microsystems of supply", a participative foresight project which comprises the analysis of dynamics in the electricity, gas, water and telecommunications sectors, the construction of scenarios together with representatives from major actor groups, an evaluation of their sustainability potential and the development of strategies for and with actors who have influence on the future development of the utility sector.

DAVID AUBIN¹/PIERRE CORNUT²/FRÉDÉRIC VARONE¹

1 Association universitaire de recherche sur l'action publique (AURAP), Université catholique de Louvain, Belgium

2 Institut de gestion de l'environnement et d'aménagement du territoire (IGEAT), Université libre de Bruxelles, Belgium

Property Rights on Water and Ownership of Water Operators: What Accounts (More) for Resource Management and Sustainability?

Property rights determine resource access and organise exclusion between competing resource users (producers of drinking water, water for irrigation, hydropower, etc.). As such, they play a crucial role in the sustainability of water resource management. Our paper focuses on the way property rules influence the behaviour of water operators producing drinking water from groundwater. "Property" means both the property and use rights on the aquifer and the ownership structure of the water company. These two dimensions are combined in order to assess their relative influence on sustainability.

Which strategies do water operators put into action in order to secure drinking water provision from an aquifer? Does the company status, public or private, exert an influence on the strategy the company follows? Are the property and use rights on the aquifer more relevant to understand the (un-)sustainable management of the resource? We seek some empirical evidence about the linear link postulated between resource property and operator's ownership. Such questions have launched a vivid political debate, at least under the current controversy about the liberalisation and privatisation of water services.

The question is analysed from two historical cases studies located in Belgium (1880-2000). One is the Brussels public water company (CIBE) that produces and distributes drinking water. The other is Spa Monopole, a private mineral water producer. As a result, we observe that water rights on the resource predominate over the status of the operator in the strategy of resource access. If the operators are depending on the local resource, they adopt the same strategy of resource appropriation, notwithstanding their legal status. As a result, we advocate more clearly defined property rights on water, coupled with a liability of the operator, and mechanisms of redistribution of the resource access.

SIMONE KLAWITTER

Department of Environmental Economics and Policy, University of Technology Berlin, Germany

A methodical approach for multi criteria sustainability assessment of water pricing in urban areas

A consensus has emerged that sustainable development refers at once to economic, social and environmental concerns. Water pricing issues are among the most pressing economic water subjects in many cities, often a major constraint of sustainable urban water management development in general. These water pricing issues can only be addressed with a consistent and comprehensive multi – criteria approach that helps to

design policy strategies for sustainable urban water management.

To understand the complexity of the water pricing issues in urban areas the paper will first set out a strategic approach for a sustainability assessment model of water pricing using a Multi-Criteria Decision Method. Water pricing related indicators were developed to describe significant characteristics. The weights of their input were discussed in a moderating process to describe the value of sustainability of urban water pricing systems from the view of different stakeholder groups. This multi-criteria system aims to offer several advantages for policy decisions in urban water management, where conflicting interests between different water users have to considered.

Second, analysing urban water pricing policy within a framework of a case study aims to achieve a better understanding of drivers and mechanisms of price setting practises in the current economic, environmental and social setting of urban area in general. As a large modern urban area situated in a semi-arid region Tel Aviv-Jaffa displays all characteristics of problematic urban water economy and therefore water pricing policy.

The paper will present first results of applying the sustainability assessment model described above. Examining the historical, legal, environmental and economic perspectives of the water economy of Tel Aviv-Jaffa the paper includes actual water and social-economic statistics.

Discussing actual water pricing needs within a framework of a case study using a assessment model the paper will hopefully make a contribution to improving sustainable urban water management.

15:45- PANEL D.2— UNDERSTANDING TECHNOLOGICAL DEVELOPMENT

17:30

Chair:

Jürgen Blazejczak/University of Applied Sciences Merseburg, Germany

Room: Conference Room 2

BRYN SADOWNIK/MARK JACCARD

Energy and Materials Research Group (EMRG), School of Resource and Environmental Management, Simon Fraser University, Canada

Incorporating Consumer and Business Preferences in Industrial Technology Evolution: a Policy Modelling Application

Industrial production practices are constantly being altered through a dynamic process of technology innovation and consumer adoption. Historically, analytical approaches that have explored the potential and cost of reducing greenhouse gas (GHG) emissions in the economy have typically treated this dynamic both simplistically and inadequately. Technological change has either been conceived of as an abstract, aggregate phenomenon, or alternatively, where models are technologically explicit, as a matter strictly determined by financial cost evaluated at a social discount rate. The latter approach ignores consumer and business preferences (for instance, concerns over reliability and performance), and overlooks other factors such as cost heterogeneity and time preference.

There is a pressing need to gain a much clearer picture of this process, particularly to aid in the debate and design of newer policy tools that are specifically focused on providing long term signals for market transformation.

This need has been central to EMRG's development of CIMS, a technologically-explicit model that allows policy makers to assess alternative environmental policies. CIMS simulates technological evolution based on a decision algorithm that includes preferences and cost heterogeneity in addition to financial cost.

By looking at an application of the CIMS model, which assesses climate change policy options for the Canadian government, we demonstrate how this type of model can allow policy-makers to explore the uncertain relationship between policies and the evolution of technologies and preferences, which are critical factors in the long-run cost dynamics of GHG emission reduction.

CORINNA FISCHER

Environmental Policy Research Centre, Freie Universität Berlin, Germany

Transformation in the electricity system: the case of MicroCHP

The electricity system is one example for a large socio-technical system which is undergoing transformation in several respects. Technical, economical, organizational and regulative aspects are interconnected in these transformations.

One interesting development that demonstrates such interconnections is the emergence of distributed generation. New technologies are becoming available that allow decentralized power generation. But to succeed, these technologies must be accompanied by corresponding changes in network regulation, operating arrangements, and user behavior.

The paper will explore the introduction of micro-combined heat and power plants (MicroCHP) in individual dwellings as a case study for distributed generation. Considerable market potential for these plants is assumed, especially in the context of conventional heating system replacement. After a short introduction to ecological aspects and market potential of MicroCHP, the paper will focus on the interaction between the technology on the one hand, and user behavior and perceptions on the other. Topics for investigation are the preconditions for the acceptance of MicroCHP, user satisfaction, and possible changes in electricity consumption patterns and energy consciousness that may be stimulated by the experience with the MicroCHP plant.

The paper will be based on a survey and interviews with potential buyers in Germany. If possible, the data will be complemented by interview and survey data from participants in model experiments that are, at the moment, being conducted by German power utilities (EWE, Oldenburg, and EnBW, Baden-Württemberg). Because data on this rather new technology is still rare, the paper will also draw some conclusions from analogous cases (e.g. buyers of solar home systems).

We hope to show in detail in which ways technology, operating arrangement and user behavior must interact in order to open the way for innovative sustainable technologies that may transform the market.

15:45- PANEL E.2— EXTENDING THE INFORMATION BASE FOR SUSTAINABLE DEVELOPMENT

17:30

PANEL E.2 - EXTENDING THE INFORMATION BASE FOR SUSTAINABLE DEVELOPMEN

Chair:

Kerstin Tews, Environmental Policy Research Centre, Freie Universität Berlin, Germany Room: Conference Room 3

DONALD A. BROWN¹/SHARON MORAN²

1 Pennsylvania Consortium for Interdisciplinary Environmental Policy, Commonwealth of Pennsylvania, Department of Environmental Protection, USA 2 Temple University Philadelphia, Pennsylvania, USA

Sustainability Initiatives: A View From the United States

In the United States, progress on sustainability initiatives at the federal level has been stymied by changes in political leadership, yet programs at the state and regional levels have persisted. This paper explores progress on sustainability initiatives at the state, regional, and local scales, focusing primarily on indicators projects.

In order to clarify the efficacy of sustainability indicators programs at sub-national levels, we examined several state level programs, including those in New Jersey and Washington. Using sources including published materials, interviews with key informants, and "grey" (informally-produced) literature, we review the structure of these programs in terms of their breadth, scope, and context. In addition, we considered selected regional and local projects, in order to illuminate the ways that nested hierarchies have influenced the institutional architecture of these initiatives. We also examine how sustainable development indicators, properly used, can help overcome problems of institutional fragmentation that have often contributed to previous failures to implement sustainable development plans and programs.

Our inductively-oriented study concludes that state level programs may qualify as an

institution which could be designated "...most likely to bring forward substantial changes in the relationships between societies and the natural environment," (answering the question 5 from your Call for Papers). The specific attributes of this scale within the American political system, and why it mediates in favor of effective programs, will be discussed. The way that the state-level initiatives simultaneously spring from, and contribute to, leadership among elected officials and agency staff, will be reviewed. We conclude that any effective sustainability indicator program will need to address the cross-scalar dimensions of both a. the phenomena which undermine sustainability, and b. the processes by which we can address it.

SHREEKANT GUPTA

Delhi School of Economics, University of Delhi, India

The impact of public disclosure of environmental performance on financial performance: evidence from India

A growing body of research highlights the important role of voluntary measures coupled with public disclosure for pollution prevention and abatement. This so-called 'third wave' of environmental regulation (preceded by direct command and control (CAC) regulation, and market-based instruments (MBIs) such as pollution taxes and tradable permits) is of great relevance to rapidly industrializing economies of the South such as India. The reason being that weak monitoring and enforcement capabilities limit the role of conventional CAC regulation and MBIs. At the same time, empirical evidence on the efficacy of 3rd generation instruments, particularly in developing countries is scarce and often anecdotal.

In this paper we examine in a rigorous manner the role of public disclosure of environmental performance of firms in a developing country (India) that is industrializing and growing rapidly. In particular, we conduct an empirical study to test the hypothesis that capital markets react to environmental news and thus create incentives for pollution control. The paper uses the event study methodology to examine the impact of environmental ratings by an environmental NGO of pulp and paper, automobile and chlor alkali firms in India on their stock prices. We find that the market generally penalizes environmentally unfriendly behaviour in that announcement of weak environmental performance by firms leads to negative abnormal returns of up to 43 percent. A positive correlation is found between abnormal returns to a firm's stock and the level of its environmental performance. These findings should be viewed as preliminary evidence of the role that disclosure of environmental performance could play in making industrial transformation more sustainable, particularly in developing countries where institutional capacity is limited.

RAMESH RAMASWAMY

Technology Exchange Network (TEN), India

Industrial Ecology – A New Platform for Planning Sustainable Societies

The issue of resources is critically relevant in the developing countries. Although some of these countries are considered to be rich in natural resources, their availability to the local society is often extremely limited. Any effort to improve the productivity of resources would greatly enhance their economies, quality of life, and sustainability

Industrial Ecology offers a new platform for developing strategies that leverage the resources of different societies in various contexts, and ensure their long-term prosperity.

This platform helps to understand the flow of resources through the system (material, energy, land and manpower) and use the data for policy planning. Such an understanding could help societies to assess the opportunities available to them, which maximize the productivity of the limited resources, and to more fully assess the threats from their use (or misuse).

Four MFA exercises were carried out in India, which illustrated the use of MFA in planning. Concepts and data from the case studies are presented in this paper. Each case study highlights some specific aspect of the applications of MFA concepts in planning development.

In summary:

1. An MFA the town of Tirupur, led to new business opportunities and new methods to

optimize resources and solve an old environment problem.

- 2. An MFA in Haora, New Calcutta, led to the development of new raw material options for the survival of the foundry cluster.
- 3. The study of the tanning industry in Tamil Nadu led a re-definition of the problem and to new potential strategy options to sustain the industry.
- 4. An analysis of the resource flows in the Damodar Valley region in (steel and coal rich region) provided possible approaches to analyzing the Industrial Metabolism of large area and use the analysis in policy planning.

SATURDAY, 6 DECEMBER

8:00-9:00 **REGISTRATION (CONTINUED)**

PANEL SESSIONS

09:00-PANEL A.3— GOVERNMENTS AND GOVERNANCE: NATIONAL AND LOCAL10:45EXPERIENCES II

Chair:

Angela Oels, Department of Political Science, University of Hamburg, Germany Room: Akademischer Senat

JÜRGEN BLAZEJCZAK¹/DIETMAR EDLER²

1 University of Applied Sciences Merseburg, Germany 2 German Institute for Economic Research, Germany

Could Too Little and Too Much Turn Out to be Just Right? – On The Relevance of Strategic Environmental Policy

National governments usually have limited incentives to take account of environmental damages occurring abroad. This externality results in a policy failure, namely national environmental standards which are too low from an international perspective. On the other hand, there are situations when national governments have an incentive to set standards higher than suggested from a national perspective. This is the case of strategic environmental policy: national governments try to increase the profits of national firms on international markets by "moving ahead" with early and strict environmental policy. The net result of externalities and strategic policies could be an environmental policy which is less off the international optimum.

The paper reviews the various rationales for strategic environmental policy and derives the conditions under which such policy could be successful. It further investigates various cases of environmental policy related to international problem settings. We find that the conditions for successful strategic environmental policy are rather restrictive. This may explain why obvious cases of strategic environmental policy seem to be somewhat hard to identify.

MARÍLIA STEINBERGER¹/OLGA MARIA SCHILD BECKER²

1 Nucleus of Urban and Regional Studies - University of Brasília, Brazil 2 Geography School - University of Rio de Janeiro, Brazil

New Environmental Instruments in the Brazilian Amazonia: Ecological-Economic Zoning and the extractive

The Amazonia we know today is the result of the National Integration Policy engendered by the Brazilian Government, which has defined the region as the economic frontier since the 1960s. The goal then was twofold: to answer the new demands of the international market and to boost the economic modernisation of the domestic one. This has led to changes in the exploration pattern of natural resources, as extractive activities, more and more connected to the industrialisation of mineral and forest products in a global entrepreneurial scale, have been responsible for serious socio-economic damage. Such damage is manifest not only in the degradation of natural capital, but also in a populational uprooting, whose consequences are, among others: deforestation, presence of hot spots, rural exodus, and migrant concentration in urban areas. Acknowledgment of these facts has led to severe questioning of the sustainability model adopted by this policy. Thus, since the half of the 1980s, the Brazilian Government has urged the adoption of two instruments:

- Economic-Ecological Zoning (EEZ), part of a territorial planning strategy, which intends to reach a compromise between economic development and the preservation of natural capital. It is used as an instrument for shared decision-making among representatives of various socio-economic agents, including NGOs; and
- Extractive Reserves (RESEX), created by traditional Amazonian populations as an instrument of productive conservation of the forest, aiming at re-settling the native population, incorporating technical development to the traditional extractive system, and using neo-extractive technologies linked to micro-agroindustries.

The object of this paper is to discuss the extent to which such instruments can be effective in minimising damages caused by globalised industrial activities. To accomplish that, we will present a survey of the industrial sector in Amazonian economy, and analyse the industrial interfaces suggested in the EEZ and RESEX proposals. As a conclusion, we will highlight the potential advantages and disadvantages of both instruments.

09:00- PANEL B.3— THE ROLE OF TIME IN THE GOVERNANCE OF TRANSITION

10:45

Chair:

Nicholas Ashford, Director of the Technology and Law Program, Massachusetts Institute of Technology, Cambridge Room: Hörsaal A

JAN NILL

Institute for Ecological Economy Research, Germany

Time Strategies of Transitions and the Transformed Role of Subsidies as Innovation Policy Instrument: A Policy Framework demonstrated by Empirical Cases

Fostering innovation is often seen as important for policies towards sustainable development. Yet, given the ambitious environmental targets implied by sustainability, it might not be sufficient to stimulate incremental innovations alongside wellestablished techno-economic trajectories. However, public choice theory as well as evolutionary economics give hints that due to economic and institutional path dependencies such policies aiming at innovations which might change those technological trajectories are difficult. The ongoing SUSTIME research project, on which this paper is based, develops a time strategic policy framework to respond to these challenges, emphasising the role of (techno-economic) windows of opportunities and

timing for an appropriate policy.

Within such a framework, the paper aims at a reappraisal of the role of (innovationoriented) subsidies therein. It is based on a critical review of the literature, and, in particular, two empirical case studies of low energy housing and iron and steel production technologies. The paper shows that also for new strategies, the temporary use of such an "old" and in the view of recent policy debates also "old-fashioned" policy instrument, may remain important. One reason is that if applied in a time strategic way, such an instrument may fuel the emergence of an instable phase of techno-economic development by supporting change actors. Moreover, given the resistance to trajectory changes by established actors, positive incentives like subsidies may be easier to implement politically than instruments based on negative incentives, aiming at the internalisation of external costs. These advantages have to be weighted against the well known economic and political pitfalls of subsidy-type instruments.

HARTMUT ADEN

Universität Hannover, Germany

Industrial transformation in the European Union – the ambiguous role of time

European environmental policy is for a large part industrial policy. While EC industrial policy initially aimed to harmonise national policies and standards in the view of establishing the internal market, environmental protection has become more and more important in this field.

Protecting the environment by industrial standard setting meets important difficulties. In a short-term perspective, adapting old industrial branches to higher environmental standards, especially for emissions and energy consumption, usually is expensive. The costs of industrial production will rise for a while because of the required investment; but often they will be cut down later, especially if new facilities demanded by environmental standards help to save energy or raw material.

In my paper I will show that European environmental policy and legislations tend to react to these ambiguous effects of higher environmental standards by differentiated forms of governance in the dimension of time. While the unanimity rule sometimes led to exceptions for single member states openly named in the legislation, the differentiation in time has become more sophisticated during the 1990s. The prolongation of the transitional periods for the recycling obligation established by the used car directive 2000/53/EC shows that governance by differentiation can still be the result of vested interests. But in a series of other cases, differentiation has become a strategy to create a dynamic towards higher standards of environmental protection in a medium range perspective of time.

I will develop a typology of differentiation in time in European environmental governance and show that regulation of industrial transformation tends to anticipate the resistance by actors for whom higher standards will be expensive by a sophisticated differentiation of transitional periods and by standards getting more severe in several steps.

DANIEL WEINER

University of Applied Sciences Lausitz, Department of Economics, SUSTIME-Project, Germany

Uncertainty towards time as a determining factor for the success of political regulations in the case of EDTA

A central assumption of the paper is that there are windows of opportunity for innovation. At times of such time windows, policy can be very successful in bringing forth innovation. When there is no time window for change or the duration of the window is highly uncertain, policy will be ineffective or even counter-effective by forcing a problem sector to invest in non-innovative solutions. This basic approach is followed by the project "SUSTIME" and illustrated by a historical case where the importance of time windows and certainty was not heeded by political actors.

The discovery of high Ethylenediaminetetraacetate (EDTA – a chemical substance used in numerous applications) concentrations in surface waters, combined with an uncertainty of EDTA's environmental properties, served to open a politically forced

techno-economic window of opportunity for innovations concerning the substitution and retrenched application of EDTA. Environmental political administration generated pressure towards the reduction of EDTA, occasionally threatening a legal ban in the case of proof for environmental risk, creating an aura of technology-forcing within an uncertain time span.

The first consequence was that many economically and ecologically sub-optimal solutions have been developed (creating huge sunk costs). As a second consequence, more "uncommon" solutions were discriminated against because of the unknown time horizon for their development and a lack of subsidies. These innovations had no opportunities to prove their possible economic and/or ecological superiority.

The thesis is that superior solutions could have been implemented if industry had been given the opportunity to develop them within specified time.

09:00- PANEL C.3—INDUSTRIES

10:45

Chair:

Philipp Pattberg, MecGlo Research Group, The Global Governance Project, Germany Room: Conference Room 1

Bernd SIEBENHÜNER

Carl-von-Ossietzky-University of Oldenburg, School of Computing Science, Business Administration, Economics and Law, GELENA Research Group, Germany

Multi-Actor Learning Processes towards Sustainable Consumption and Production Patterns

Changing consumption and production patterns is a core issue of industrial transformation that has been called for in several documents such as the Agenda 21, the IHDP-IT Science Plan and the Johannesburg Plan of Implementation. Industrialized countries, in particular, are expected to promote changes towards more sustainable forms of consumption and production given the means at their disposal and their high consumption rates. As yet, little has been achieved in practical per-capita reductions of resource and energy consumption.

The paper, therefore, discusses the potential for collective learning processes among different social actors including consumers and producers to bring about transformation processes towards sustainability in industrialized countries. How could different social actors learn from each other in order to find innovative solutions? Who are the key promoters for change? Which role could consumers play in these transformation processes?

To address these questions, the paper applies an institutionalist framework to the study of multi-actor learning processes that are conceptualized as interorganisational learning. Thereby the exchange of knowledge and experiences across the boundaries of single companies could be captured that has been somewhat neglected in the organizational learning literature so far.

This concept is applied to the findings of a recent empirical study on the framework conditions for sustainability transitions in the field of mobility and transportation. The expert survey focused on the current status of climate protection in this field in Germany, on possible trends and the relevant actors for changes. It particularly focuses on the role of consumers in these changes since consumer behavior such as in the use of private automobiles has proven most crucial for any changes towards less emissions and resource and energy use. With the help of the conceptual framework, the potentials and drawbacks of multi-actor learning processes could be understood a little better.

PAULA KIVIMAA/PER MICKWITZ

Finnish Environment Institute, Finland

Driving forces for environmentally sound innovations: The case of Finnish pulp and paper industry

Moving towards sustainability requires that new environmentally sounder technologies are developed and widely adopted. Policy instruments advancing this industrial transformation are necessary, yet it is clear that public policy is far from the only factor affecting innovation. There is comparably little consensus on the relationship of policy and innovation, and empirical studies are relatively rare. A lot could be learnt from empirical experiences to see what forms of governance have been successful in the past and in what instances a new generation of strategies and instruments is required.

Based on a previous examination of selected claims on the policy-innovation relationship, specific innovations in the Finnish pulp and paper sector were chosen for further examination of the driving forces for innovations and their diffusion. Three innovation cases, namely the development of black liquor recovery technologies, a paper machine pump system, and an effluent concentrate combustion system, were selected to present innovations with reduced environmental impact but different innovation settings in order to illustrate how different issues affect the innovation process. Also the combined impacts of environmental policies and public R&D support measures were studied. The effects of the industry's investment strategies and the globalising markets were also accounted for.

The findings partly support earlier views, while surprising effects were also found. Unlike expected, the Finnish energy tax appears to have had little effect in the studied industry, whereas in some cases environmental regulations and their anticipation have created incentives for innovations and their diffusion. For a successful environmental innovation to emerge and diffuse, often a combination of R&D support and environmental policy measures is required. The increased globalisation increases the potential markets for innovations. If the prediction of one emerging market is wrong, there might be market potential for the new technology in other countries.

JAN-PETER VOSS

09:00-

10:45

Oeko-Institut - Institute for Applied Ecology, Freiburg, Germany

Transformation in utility systems and the prospect of Evolutionary Governance

The utility sector in industrialised countries is undergoing a process of transformation. Liberalisation and privatisation policies have triggered changes in the social, technological and ecological dimension of the provision of electricity, gas, water and telecommunications. These processes interact in complex ways, bringing about transformation dynamics which are highly uncertain while having large potential impact for the sustainability of industrial society.

My contribution analyses the specific governance problem of shaping long-term transformation processes in utility systems as one of a) uncertainty about the complex dynamics of socio-technical change, b) ambiguous goals linked to the contested notion of sustainability and c) distributed control by various actors in the field of production, consumption and policy-making.

Against this background I present the general rationale of Evolutionary Governance as mode of problem-solving which actively works with complexity by putting a focus on the following elements: integrated knowledge production, adaptive strategies and institutions, anticipation of systemic effects, iterated participatory goal formulation and interactive strategy development. Conceptual reference is given to literatures on governance in policy and management contexts, science and technology studies with a focus on innovation in large technical systems and fundamental research on the dynamics of complex adaptive systems.

The conceptual elaborations set the scene for an exemplary discussion of the governance of transformation in the German and the Dutch electricity system. Empirical cases are related to the concept of Evolutionary Governance. Conclusions are drawn as hypotheses about the relevance of Evolutionary Governance in real world policy contexts. Further leading research questions are formulated with regard to explaining the empirical differences in the governance of transformation within the German and the Dutch electricity system and with regard to the transferability of successful strategies from one sectoral governance systems to the other.

PANEL D.3— FORESIGHT AS AN INSTRUMENT FOR GOVERNANCE

Chair:

Julia Hertin, Freeman Centre, SPRU – Science and Technology Policy Research, University of Sussex, United Kingdom Room: Conference Room 2

MADS BORUP

Technology Scenarios Research Programme, Risø National Laboratory, Roskilde, Denmark

Green Technology Foresight as Instrument in Governance for Sustainability

There is increasing focus on foresight exercises as a tool in public governance of research and industrial innovation systems. Technology foresight (i.e. systematic analysis and discussion about possible technology futures) has been carried out in many of countries, usually, however, with a relatively narrow and simplified technology focus and with little or no emphasis of environment and sustainability aspects. In recent years, however, examples of Green Technology Foresight (GTF), or environmentally oriented technology foresight, have occurred. Green technology foresight employs principles and methods that include environment aspects and that deal with the complex relations between environment and innovation. Characteristics of green technology foresight are typically that the technological futures are treated at the level of socio-technical systems taking into consideration patterns of production, consumption and use as well as 'demand pull' from environment problems, socioeconomical trends etc. (not exclusively considering 'technology push' aspects). Multiactor approaches and integration of competences and expectations of different actor types are also typical characteristics of green technology foresight. The paper aives an overview of the method principles of green technology foresight and analyses the set of actors and institutions involved. It discusses experiences and perspectives and the improvements needed to contribute to environmentally responsible industrial innovation. The examples show that green technology foresight can be valuable in long-term strategy development and prioritisation and that it can be an important tool for the integration of environment policy with policies of technology development and industrial innovation. The perspective of the paper builds on social studies of science, technology and society dynamics (STS), on governance studies, and on studies of the connections between environment problems and innovation.

JACO QUIST¹/ PHILIP J. VERGRAGT²

1 Technology Assessment Group, Faculty of Technology, Policy & Management, Delft University of Technology, The Netherlands

2 Tellus Institute, Boston, USA

Backcasting for Industrial Transformations and System Innovations towards Sustainability: is it useful for Governance?

Radical changes to present production and consumption systems, especially in the developed world, are required to achieve sustainable development. Those changes on a system level are often described as industrial transformations, while terms like system innovations or transitions towards sustainability are also used. These require combinations of technological, cultural, social, institutional and organisational changes, while affecting many stakeholders when diffusing into society, and involving complex processes of social change on the long term.

Backcasting has been applied in the Netherlands as a participatory approach to identify and explore system innovations towards sustainability, while also aiming at follow-up and implementation in public research, at companies & public interest groups, and at the government. Backcasting can be defined as first creating a desirable (sustainable) future vision or normative scenario, followed by looking back on how this desirable future could have been achieved, before defining and planning follow-up activities and developing strategies leading towards that desirable future. Though quite some results of backcasting have been reported already, rather little has

been done on comparing different backcasting experiments, on conceptual issues, on how useful they are for governance, and how they relate to other recently emerging approaches like transition management and strategic niche management. This paper focuses on these issues and includes:

- A brief history of backcasting since the 1970s, paying attention to energy backcasting and further development in Sweden and the Netherlands.
- A 'generic' description for a participatory backcasting approach existing of five stages. It also includes core features, an outline of a toolkit and four main activities: Orientation, Design, Analysis, and Participation.
- A brief description of two cases in the Netherlands on food production and consumption in which backcasting involving a wide range of stakeholders was applied.
- Conclusions and discussion with respect to backcasting, its broader relevance, related approaches, government and governance.

ANTON GEYER/FABIANA SCAPOLO

European Commission - Joint Research Centre, Institute for Prospective Technological Studies (IPTS), Unit J3: Support to the European Research Area, Spain

What can we learn from scenario building for RTD policy in support of sustainable manufacturing?

The paper reflects on the scenario building exercise which formed part of the FP5 project "The Future of Manufacturing in Europe 2015-2020: The Challenge for Sustainability (FuTMaN)".

The approach applied in the FutMan project drew upon the knowledge and experience of an expert group coming from academia, industry, and governments with various professional backgrounds. This approach proved instrumental for coming to grips with the complexity, uncertainty and interdependencies of global, economic, societal, policy and governance and science & technology factors and their impacts on sustainable development.

The paper shows how scenario building can be applied as a valuable tool to provide strategic policy intelligence for RTD policy makers in the area of industrial technologies. The scenarios have provided a sounding board to assess RTD policy options and priorities in the light of potential future socioeconomic, political and technological developments.

One of the main challenges faced in elaborating on the scenarios was to describe plausible futures that also demonstrate credible links between socioeconomic developments and specific technological imprints.

Most important for the project's success was the involvement of the client (i.e. the principal user of the scenarios) in the process. The in-depth discussions at different stages of the process, for example, stimulated strategic thinking and challenged some prior assumptions about the scope and pace of future socio-technical developments.

Among the lessons learnt in the FutMan exercise is that scenario building on sustainable development in manufacturing requires paying sufficiently attention to consumers and demand side issues. This calls for an even broader inclusion of stakeholder groups in such exercises. Further, scenarios are not an end in itself. They are inputs into the policy strategy debate and as such should be understood as the starting point rather than the end of the process.

09:00- PANEL E.3— INTERNALISING EXTERNAL COSTS

10:45

Chair:

Klaus Dingwerth, MecGlo Research Group, The Global Governance Project, Germany Room: Conference Room 3

PANTA MURALI PRASAD Gokhale Institute of Politics and Economics, India

Environmental Protection: The Role of Liability System in India

India established the liability (Courts) system under the provisions of the Constitution in order to safeguard the public against actions and inaction of the State. She even amended the Constitution and incorporated the environmental protection measures. The Amendment empowered the Central Government to enact rules and regulations to implement the decisions made at International Conventions. The Parliament, as a result, enacted the Environmental Protection Act, 1986 in order to improve the environmental quality in the country. The purpose of this article is to evaluate the functioning of the Courts as an ex- post approach with the help of the theoretical arguments of liability versus regulation. The analysis of this paper is based on both the primary, as well as, secondary data. The data has been collected from the original environmental case files of the selected Courts. Based on review of cases, questionnaires have been prepared for the complainants in order to obtain their opinion on the functioning of the Courts. With the help of Multiple Regression Analysis the hypothesis 'Environmental Quality Improvement through Liability System is not influenced by other determinants' has been tested. The questions were also prepared for the counsel for complainants to get their opinion about the functioning of the Courts. The inferences drawn form the empirical work has been critically evaluated in the light of the theory of liability system to see whether the Courts are really trying to protect the environment. The study revealed that the liability system is unable to improve the environmental quality, effectively and efficiently, in the country.

DEBORAH S. DAVENPORT/DAVE BARNES

Political Science Department, Mississippi State University, USA

Reform and Recovery: A New Taxation System for Environmental Restoration

This paper addresses the conference themes of governance and necessary scope of industrial transformation. The authors argue that government is an essential catalyst for wide scale industrial transformation. Far from lacking capacity to intervene in market activities, government is uniquely capable of serving as guardian of the full range of a society's interests and values. This role is largely fulfilled by means of government's authority to redistribute wealth through taxation.

Taxation can and should be—indeed already is in some cases—used also as a social instrument to discourage harmful activities or encourage socially beneficial ones. Taxes can internalize costs associated with those activities that are otherwise external to market prices; where alternatives are available and the tax is sufficiently high, taxation can alter calculations of the costs and benefits of the activity. Government's monopoly on taxation as a policy instrument makes taxation the tool of choice for addressing comprehensively the environmental problems in which industry is implicated.

We extend others' arguments for environmental tax reforms with a specific proposal to replace current systems of distortionary taxation on profits, earnings and savings with a single system of positive taxation on consumption, based on pollution caused by the production process, use of non-renewable versus renewable resources, and the durability and recyclability of the goods produced. This positive taxation is to be combined with "negative environmental taxes" that replace current piecemeal subsidies given to encourage certain behaviours.

These two types of taxation result in a complete and consistent system of incentives for industry to transform its impact on environmental sustainability. The potential political obstacles this proposal may face in different societies, given variation in cultural norms and political systems, are also addressed in depth and a range of solutions considered.

JOHAN ALBRECHT

Universiteit Gent – Faculteit Economie & Bedrijfskunde, Center for Environmental Economics and Environmental Management, Belgium

Green fiscal reforms for industrial transformation: rigidities and inertia in mature welfare economies

An industrial transformation requires attractive markets for environmentally sound

products and process technologies. This type of market creation can be stimulated by economic incentives and by regulation. Since the 1980s, environmental taxes and other economic incentives are widely used in the richest European economies. The recent years however indicate that the importance of green tax incomes remains rather modest although several governments declared to gradually shift the fiscal burden from labour to pollution. This paper tries to explain this fiscal inertia by analysing the dependence of government budgets on economic growth and especially on the consumption and production of goods and services. Governments that fail to reduce, stabilize or even limit the increase of total expenditures, continue to depend on new incomes and hence economic growth to balance their budget. In this macroeconomic environment, a strong increase of energy prices and environmental taxes can lower energy demand and pollution – the intended consequences- but also brings the risk of negatively impacting aggregated consumption and hence economic growth.

The central thesis of this paper is that governments first should limit their fiscal dependency on consumption-driven economic growth in order to realise real progress in shifting the tax burden away from labour. The most realistic approach for this government challenge is to learn from strategies developed by private companies that operate on markets with an unpredictable and turbulent business cycle. Only very flexible and adaptive organisations can survive in these environments. The relevant policy implications from these business strategies can make some hidden trade-offs more explicit for all involved stakeholders and can improve discussions on green fiscal reforms and governance for industrial transformation.

PLENARY SESSION

Moderator:

Frans Berkhout, Director of the Sustainable Technologies Programme, University of Sussex

Room: Hörsaal A

- 11:00– STEFAN ZUNDEL
- 11:30 University of Applied Sciences Lausitz **Time Strategies for Innovation Policy towards Sustainability**
- 11:30– RENÉ KEMP
- 12:00 Maastricht Economic Research Institute on Innovation and Technology (MERIT) **Evolutionary Governance for Sustainability**

12:00– NICHOLAS ASHFORD

12:30 Director of the Technology and Law Program, Massachusetts Institute of Technology, Cambridge

Conceptualizing pathways for sustainable transformations: Overcoming market and state failures

12:30-14:00

PLENARY SESSION

Moderator:

Bernd Siebenhüner, Carl-von-Ossietzky-University of Oldenburg, School of Computing Science, Business Administration, Economics and Law, GELENA Research Group, Germany

Room: Hörsaal A

- 14:00– Martin JÄNICKE
- 14:20 Environmental Policy Research Centre, Freie Universität Berlin Industrial Transformation between Ecological Modernization and Structural Change

14.20– JAN ROTMANS

14:40 Director ICIS, University of Maastricht

The Dutch Knowledge Network on Transitions towards Sustainable Development: structure, focus and research agenda

- 14:40- KEN GREEN
- 15:00 Director CROMTEC/Institute of Innovation Research, Manchester School of Management Policies for Industrial Transformations in Food Systems

15:00– ROUNDTABLE DISCUSSION WITH JAN ROTMANNS, MARTIN JÄNICKE AND KEN 16:00 GREEN

PANEL SESSIONS

16:30- PANEL A.4— SUSTAINABLE DEVELOPMENT IN THE EU

18:15

Chair:

Per-Olof Busch, Environmental Policy Research Centre, Freie Universität Berlin, Germany Room: Akademischer Senat

SABINE FRERICHS

Otto-Friedrich-Universität Bamberg, DFG-Graduiertenkolleg, "Märkte und Sozialräume in Europa", Germany

The legal dimension of sustainable development in the European Union

European legislators included a constitutional clause on sustainable development in the 1999 Amsterdam Treaty and launched a political strategy for sustainable development at the 2001 Gothenburg European Council. Yet, there still is no European Directive clarifying the general principles of sustainable development.

This fact can be regarded as a form of regulatory failure as the European Court of Justice (ECJ) needs these principles to reach decisions on the growing number of "sustainability cases", i.e. cases dealing with conflicts between economic, environmental and social interests. In order to guarantee a consistent jurisdiction, the ECJ is thus forced to develop those missing sustainability principles by itself.

In developing these principles, the ECJ may drive the transformation of the EU constitution towards sustainability in a similar way as it shaped the development of the EU's economic constitution. So to speak: The judges succeed where the politicians fail. The result could be a new regulatory paradigm for the globalized economy, or – in short – a legal recipe for industrial transformation.

In the paper, I analyze the more recent tendencies in the ECJ's jurisdiction with special emphasis on environmental conflicts in common market policy and development conflicts in foreign trade policy. In my analysis, I view the ECJ either as a mediator between system integration and social integration (theory of differentiation), or, alternatively, as an independent agent in a fiduciary relationship with his principals, the EU member states (regulation theory). Sustainable development is seen in terms of Ecological Economics (scale – distribution – allocation). The primary goal of the paper is to identify court decisions in which the ECJ actively shapes general principles of sustainable development.

STEFAN GILJUM/FRIEDRICH HINTERBERGER Sustainable Europe Research Institute (SERI), Austria

Is Europe sustainable? Modelling opportunities and limits for restructuring Europe towards sustainability (MOSUS)

The MOSUS project aims to integrate three major themes of European policies within a macroeconomic, multi-sectoral framework representing the interrelation of economic, social and environmental domains. These policy themes are (a) sustainable development, (b) competitiveness and social cohesion in the knowledge-based society and (c) globalization and international trade. Based on an existing economic model, this project will develop and apply an integrated ecological-economic driving forces and the state of the environment. The analysis will be done within a multi-country, multi-sectoral macroeconomic framework, including trade flows within Europe as well as between Europe and all other economically relevant parts of the world. The model will be the first such tool to directly integrate comprehensive bio-physical data

(material and energy flows as well as land use data) in European and global simulations up to the year 2020 and put them in relation to structural indicators of social and economic developments. The 4 key objectives and targets of this project are: (1) assessing and quantifying the European use of resources (scale), including "ecological rucksacks" induced by international trade, (2) formulating and evaluating sustainability scenarios, linking economic performance with resource use and environmental deterioration, (3) refining environmental indicators to assess resource productivities, material and energy intensities and labor intensities of resource use for the EU and (4) elaborating policy strategies and actions that reconcile long-term economic development, international trade and environmental protection. The outcomes of MOSUS will clarify, which policy instruments are best suited to enhance industrial transformation towards sustainable development.

WOLFGANG MEYER/KATRIN BALTES

Saarland University, Department of Sociology/Center for Evaluation, Germany Network Failures: How realistic is durable cooperation in global governance?

The advancement of globalization causes hardships for coming generations and current inequalities in the world. To date, the worldwide economic development widely ignores a sustainable use of the finite resources. At the same time, the influence of sovereign nation states and national markets within a globalized economy diminishes. Facing this simultaneous failure of markets and states regarding the sustainable use of resources, some have proposed the concept of policy-networks as an alternative. Just recently it had been discussed at the UN Earth Summit in Johannesburg in September 2002: Networks of various actors - representatives of nation states and civil society supported by transnational organisations - ought to steer global policies with regard to a sustainable development. There is the hope that such networks could exhibit a higher potential for solving the known problems - an assumption that can be challenged, because networks themselves exhibit a number of prerequisites in order to function. These are, e.g., a stable and trusted cooperation among the network members, which can only be secured with at least some degree of institutionalization. This, in turn, tends to invoke a mechanism of closing the network for new members. The longer the network exists, the stronger it establishes formal rules, which reduces the likelihood of fluctuation of network actors. It is the aim of this paper to develop theoretically to what extent this process inhibits the capability of a network to solve problems - which in itself would question its existence. Based on these considerations, we regard the concept of policy-networks only as a temporarily fruitful instrument to manoeuvre global political processes towards sustainable development, if at all.

16:30- PANEL C.4—AGRICULTURE

18:15

Chair:

Ken GREEN, Director CROMTEC/Institute of Innovation Research, Manchester School of Management

Room: Conference Room 1

FRANZISKA WOLFF

Oeko-Institut - Institute for Applied Ecology, Freiburg, Germany Industrial Transformation and Agriculture: Agrobiodiversity Loss as Sustainability Problem

Since the 1960s, industrialisation has seized the primary sector: Agriculture has undergone intense mechanization and rationalisation with the introduction of new crops, irrigation, fertilizers, and pesticides ("Green Revolution"). The spread of modern

agriculture and high-input production represents the chief cause of today's dramatic loss of agrobiodiversity. Agrobiodiversity indicates that part of agricultural-related biodiversity contributing to nutrition (crops, productive livestock), livelihoods (delivery of raw materials, medical plants, animals used for transport etc.) and the maintenance of habitats. The term relates to the diversity of agroecosystems, plant- and animal species and the genetic variance within populations, varieties and races.

Dwindling diversity is considered substantial, as today's world nutrition mainly derives from a mere ten crops (FAO 2000). Experts estimate that in Germany, 75% of both agricultural and horticultural plants and inner-variety diversity ("genetic erosion") have disappeared since the early 20th century (UBA 2002, TAB 1998). Concerning livestock, only 5 out of at least 35 indigenous German cattle breeds remain. This global process endangers food security and exasperates low-input, sustainable agriculture, which resorts to crops/livestock adapted to regional conditions. Furthermore, it jeopardizes future breeding efforts as developing new breeds/varieties e.g. in response to unpredictable environmental changes, depends on a broad genetic basis. The industrial transformation of agricultural production is necessary to reverse the current development towards sustainability.

This article recognizes today's agrobiodiversity loss as a socio-ecological conflict and a second order problem (Jahn/Wehling 1998), as it significantly stems from earlier attempts to solve social problems (namely food insecurity in the early 20th century). By way of an extended governance-analysis it will be shown that beyond economic and technological processes, interest-formed multi-level governance structures – the EU Common Agricultural Policy, national and international seed regulation and intellectual property regimes on plant varieties (UPOV, TRIPS, WIPO, Patent Law), animal breeding and husbandry law – have contributed to the standardisation of production systems and narrowing of breeding targets (high yield, homogeneity), thus destroying diversity. In addition to existing regulatory and market-based approaches, reflexive strategies will be necessary to overcome this sustainability problem characterised by structural uncertainty.

JOOP DE BOER

Institute for Environmental Studies, Vrije Universiteit Amsterdam, The Netherlands

Combining long-term and short-term perspectives on food choice: The case of meat's animal origin

This paper examines long-term and short-term perspectives on food choice with the aim of securing a healthy diet for consumers and a more sustainable food system for society. The paper combines insights from the relevant disciplines (i.e. psychology, sociology, anthropology, history) to get a better understanding of socio-cultural impacts on food choices, with a particular reference to the question how current food choices are shaped by a long-term change in attitude towards the animal origin of meat. Although Europe, and particularly north-western Europe, has often been characterised as a meat eating continent, there are indications that meat is losing its position as an attractive source of proteins, which is only being criticized by marginal groups. The indications do not only refer to the negative role of meat in several recent food safety crises but also to a number of socio-cultural changes that might gradually gain importance in the long-term. Some relevant examples are the increasing significance that consumers attribute to animal welfare and the growing appreciation of vegetarian meals not only by consumers but also by nutritionists. Given the various manifestations of these changes, the question can be raised whether they will continue and get a substantial impact on the consumption of meat. This question is particularly important in view of the environmental pressure that is attributed to the current system of meat provision. The paper's main argument is that gaining more insight into socio-cultural changes and their linkages with food choice criteria might contribute to the pursuit of a system that is more sustainable.

Peter FEINDT

University of Hamburg, Research Center on Biotechnology, Society and the Environment, Germany

Different levels – different concerns. European agricultural policy

reform between national, European and WTO discourse and bargaining arenas

The agricultural sector contributes remarkably to the environmental problems in the European Union (EU) in terms of loss of biodiversity, emissions, soil degradation and water quality, accompanied by food safety and animal welfare issues. Being among the most tightly regulated sectors in economic history, the current situation can be characterized as state induced market failure. The 2003 reform of the European Common Agricultural Policy (CAP) now claims to both reduce market disturbing intervention and environmentally detrimental subsidies while at the same time securing the income of the rural population, e.g. by the "second pillar". While its rhetoric relates the CAP reform to the paradigm of ecological modernization, the driving forces arise from strategic and tactical necessities of the current WTO Doha round. Based on an institutional analysis, more than 40 in-depth interviews with key policy actors in Germany and the EU and interviews at the 2003 WTO conference at Cancùn, this paper analyzes the strategies of the diverse actor groups with special reference to German policy actors (agricultural stakeholder groups, environmental and consumer protection groups, political parties, administration and government). It is argued that under the conditions of multi-level governance, actors have to reframe their issues according to the leading institutionalized concerns and the different actor constellations in the respective bargaining arenas at the different levels of governance: free trade and the justification of exceptions at the WTO level; food security, sector income, fiscal austerity and rural and environmental policy at the EU CAP level; sector income, environmental and consumer issues at the national level. While stimulating the integration of more encompassing rhetoric and discourse, this constellation poses major challenges to the implementation of a coherent sustainability strategy for the sector.

16:30- PANEL D.4—RENEWABLES

18:15

Chair:

Simone Klawitter, Department of Environmental Economics and Policy, University of Technology Berlin, Germany Room: Conference Room 2

ALBERT FABER/M. T. J. KOK/E. L. LA ROVERE/S. MINMAN Netherlands Environmental Assessment Agency, The Netherlands

Linking development priorities and climate policies: the case of Brazilian biomass production

National sustainable development strategies adopted by developing countries can also translate into lower future greenhouse gas emissions in these countries. For developing countries, climate change issues are usually low on their list of priorities, therefore mitigation strategies must unfold as by-products from national development policies. Currently, even in industrialised countries climate change policies hardly provide the incentives and instruments to realise the innovations in the energy system. One of the main challenges for future stages of the climate change regime is to involve developing countries. In order to do so from a perspective of development, climate change policies will have to be embedded in sectoral policies, first of all addressing the fundamental needs of developing countries.

One example of a national sustainable development policy allowing for a positive contribution to mitigating climate change is the ethanol programme in Brazil. The programme was initiated to reduce the dependency on oil imports. The main development benefits for the country are resource independence, rural employment generation and reduced local air pollution in big cities. As a co-benefit, the programme has also resulted in large reductions in carbon dioxide emissions. The potential and experience with large scale use of biomass for energy production has put Brazil in a unique competitive position for biomass export.

This paper addresses the question of how Brazil can advance its development in a sustainable direction, including an effective climate change policy. A national system

of innovation approach is used to analyse opportunities and threats in the current Brazilian policy frameworks. It will furthermore analyse international policies that are relevant for national innovation and link these to discussions on the future of the climate change regime.

VERENA LEILA HOLZER

University of Potsdam, Department of Economics, Germany

Ecological Objectives and the Energy Sector – the German EEG and the European Emissions Trading System –

Regarding the justification of the German instrument to promote innovation and diffusion of renewable energies, the so called "Erneuerbare Energiengesetz" (EEG), we can distinguish conflicting policy objectives: Environmental objectives, mainly the reduction of harmful industrial emissions, e.g. greenhouse gases; technological objectives, mainly promoting innovations through a combination of rigid environmental laws and financial support; securing the energy supply through the reduction of oil and gas dependency and finally social objectives like reducing unemployment and structural heterogeneity.

The paper discusses the possibilities of different economic instruments to meet the traditional objectives of stable energy supply and competitive energy prices as well as the new demands to fulfil ecological and social requests. First, it identifies conflicts and congruence between the objectives. An analysis of the actual German attempt to meet these multiple objectives, the EEG, follows. The question is whether the EEG is an appropriate instrument and whether the combination of different objectives is effective. Methodically the adequacy of the EEG is deduced from a cost comparison of different instruments used to reach the objectives.

The European wide Emissions Trading beginning in 2005 can address the objectives of ecological soundness, social justice and economic efficiency directly. Like the EEG it is designed for ecological purposes, combined with other objectives. The paper focuses on the evaluation of the instruments concerning their ecological objectives in relation to other outcomes of the instruments. The central question, answered through the comparison with other instruments is whether the combination of different objectives within one instrument has positive or negative effects on the efficiency of achieving the ecological objectives.

DANYEL REICHE

Environmental Policy Research Centre, Freie Universität Berlin, Germany

Governance towards renewable energy sources (RES) in the EU Accession States (AS)

The aim of this paper is to discuss the transformation of the energy sectors in the EU-AS with the main focus on obstacles and success conditions for RES. Besides the ten states which will join the EU in 2004, Bulgaria and Romania which will probably join in 2007 as well as Turkey are analysed. Most of these countries have had a century-long tradition in the utilisation of RES, primarily in biomass and hydro power. However, the communist regimes were convinced of the superiority of large-scale systems and converted the energy sectors into centralised units. Due to this dominating belief system more decentralised applications such as installations using renewable energies had to close. The new transition democracies are a better environment for RES. Old hydro installations are reactivated, the use of biomass is being extended and wind, solar as well as geothermal paths are taken up.

The factors which influence renewable energy development in the AS are described as the path dependencies/starting positions in energy policy (natural conditions for RES, availability of fossil resources, use of nuclear power), the instruments for promoting renewable energies (as feed-in tariffs or quota obligations), the economic (level of energy prices, for example), technological (i.e. grid capacity), and cognitive environment.

My main argument is that a crucial driving force for renewable energy development in the AS comes from the stipulations set by the EU. The EU-Directive on the promotion of electricity produced from RES gives all AS targets for their RES-development until 2010. Due to the Directive many AS have already begun to pay more attention to the topic and to introduce more systematic policies. Five AS have introduced a minimum payment system which was one of the main success conditions (besides favourable background conditions) in the leading wind energy countries Germany and Spain.

16:30- PANEL E.4— STIMULATING VOLUNTARY ACTION

18:15

Chair:

Johan Albrecht, Universiteit Gent – Faculteit Economie & Bedrijfskunde, Center for Environmental Economics and Environmental Management, Belgium Room: Conference Room 3

Ros TAPLIN

Environmental Management Program, Graduate School of the Environment, Macquarie University, Sydney, Australia

Australian Experience with 'New' Environmental Policy Instruments: The Greenhouse Challenge and Greenhouse Friendly Programs

In association with international moves to address the impacts of global climate change some governments including those in the EU, the US, Canada and Australia have taken steps to reduce greenhouse gas emissions via 'new' environmental policy instruments (NEPIs) (e.g. voluntary agreements, emissions trading and eco-labelling). This has been in response to the Framework Convention on Climate Change and in anticipation of the Kyoto Protocol coming into force.

This paper focuses on Australian experience with two particular NEPIs: the Australian Greenhouse Office's Greenhouse Challenge and Greenhouse Friendly programs. The Australian Greenhouse Challenge program was initiated in 1995 to facilitate voluntary cooperative agreements between industry and government whereby enterprises undertake to abate their greenhouse gas emissions through energy and process efficiency and by enhancing greenhouse sinks. As at May 2003, there were 820 participants in the Greenhouse Challenge. The Greenhouse Friendly program was launched in 2001 and involves promotion and certification of eco-labelling for climate change abatement. Consumer goods and services, that have all cradle to grave greenhouse gas emissions offset, by corresponding emissions abatement, can be certified.

These policy instruments have been implemented notwithstanding that the Australian government's current position regarding Kyoto is against ratifying the Protocol. The programs were formulated with regard to the 'no regrets' framework set out in Australia's National Greenhouse Strategy and are not intended to compromise business objectives of profitability and growth.

The paper relates empirical evidence on the evolution and effectiveness of these Australian programs to theoretical discussion on the role of NEPIs in industrial transformation, social learning and sustainability. The success or effectiveness of the greenhouse NEPIs adopted in Australia appears to be dependent on industry motivations and incentives for participation, the implementing agency's procedures and the design of the process for collaboration and information sharing between government and industry.

ROGER PIERRARD

Institute of Public Finance and Infrastructure Policy, Vienna University of Technology, Austria

The European Relief Potential of Green Public Procurement: Methodology and Results

Green procurement often is considered as a complementary tool for environmental policy. A change in procurement practice, focusing on environmentally compliant products, is assumed to have a huge potential in reducing environmental burdens. Green public procurement in particular also could serve as a positive example for procurement in general. One of the targets within the European research project RELIEF was to calculate this relief potential for the first time.

Based on the comparison of products with regard to their environmental impacts over their lifecycle, the relief potentials, in terms of saved environmental impacts on the European level, for the respective environmental impact categories familiar from lifecycle assessment were determined. As an appropriate basis to perform the comparisons a measurable common functional unit derived from the service function of the compared product alternatives was used.

The product groups for which the relief potentials were calculated were selected in close cooperation with the city-partners in the RELIEF project in order to consider those products having a high relevance for the public authorities. The calculation of the relief potential was performed for electricity, personal computers, copiers, buses and food.

The relief potentials related to a change in public procurement practice expressed in person equivalents for the most important environmental impact categories amount to 7.8×10⁶ person-equivalents for "global warming", 4.6×10⁶ person-equivalents for "acidification" and 3.6×10⁶ person-equivalents for "nutrification".

DIRK SCHEER

Institute for Ecological Economy Research, Heidelberg, Germany

Policy transformation from Government to Governance? The Case of Integrated Product Policy (IPP)

Power exercise in modern societies relates to democratic legitimation and problem solving capacities seeking efficiency. Coping with theses challenges, one may state a transformation process of European Governance. New models of governance, therefore, rely on stronger involvement of stakeholder in the policy process and the extended use of self-regulation.

Taking environmental policy as example, there has been a fundamental change during time. Early environmental policy focused on different environmental media, i.e. air, water, soil, noise and waste removal. The outcomes of this 'end-of-pipe'-strategy were dissatisfying revealing inefficiencies of fragmented policy making. The need for a more systematic approach regarding both conceptualising and implementation of environmental policy became obvious. The idea of taking an integrative perspective led to 'end-of-live' thinking.

With regard to products the concept of Integrated Product Policy (IPP) has been elaborated. The concept of IPP differs from traditional environmental policy approaches in that it covers all products and services and their environmental effects, while taking the lifecycle as the lead principle and avoiding shifts of environmental effects between different media.

On an empirical level one may look at the present political situation within Europe. Several countries (e.g. Denmark, Germany, the Netherlands, Sweden, Switzerland) have elaborated their own (national) policy approaches in the area of IPP. The European Commission published a Green Paper on IPP in 2001 and – as a follow-up – a Communication in June 2003.

Taking a governance perspective, the scope of IPP includes steering approaches ranging from 'traditional' regulation patterns (command & control) to new forms of self-regulation (push & pull). Self-regulation models came along with deregulation and privatisation starting in the late nineteen-seventies.

In sum, the contribution will present the concept of Integrated Product Policy, give an overview about existing empirical IPPs in Europe, and discuss IPP in the context of the governance debate.

18:30

ADJOURN

20:00 DINNER IN TRADITIONAL BERLIN RESTAURANT (BY INVITATION)