ETH-PhD-Academy on Sustainability and Technology Academy 2007: "Managing Carbon Constraints"

Paper Abstracts

Markus Åhman, Swedish Environmental Research Institute, Stockholm

New Entrant Allocation in the Nordic Energy Sectors: incentives and options in the EU ETS

In the EU Emission Trading Scheme (EU ETS), the treatment of new entrants has proven to be one of the most contentious issues. This paper analyses the impact of allocation to new entrants in the energy sector, and identifies options for improved regulation in this field. The point of departure for the discussion is a comparative analysis of the allocation in phase I and phase II of the EU ETS to two hypothetical energy installations should they be located in different EU Member States. The study focuses on the Nordic countries due to their integrated energy market. The quantitative analysis was complemented with interviews with policy makers and industry representatives.

The results suggest that current allocation rules can significantly distort competition. The annual value of the allocation is comparable to the fixed investment costs for a new installation and is not insignificant compared to expected revenues from sales of electricity from the installation.

The study finds that the preferred option would be that Nordic countries should not allocate free allowances to new entrants in the energy sector. This should be combined with adjusted rules on allocation to existing installations and closures in order to avoid putting new installations at a disadvantage. A second less preferred choice would involve harmonised benchmarks across the Nordic countries.

Asel Doranova, United Nations University Maastricht (Netherlands)

Clean Development Mechanism and Technological Development

The proposed research aims to investigate 1) the process of technological capability building in developing countries under the Clean Development Mechanism of the Kyoto Protocol and 2) the role of business companies in this process. Two sets of issues will be under the research focus: first, the implication of the CDM projects for developing countries in terms of their technological advancement, skills and knowledge acquisition; and second, the participation of business companies form developed countries in CDM, their motivations and role as technology providers in the "north-south" technology transfer process.

Christian Engau, ETH Zurich (Switzerland)

Strategic Responses to Regulatory Uncertainty in Emission Trading – A Capability-Based Perspective

Firms currently face a high degree of regulatory uncertainty related to the European CO_2 Emission Trading Scheme. To respond to this uncertainty, they can choose from a variety of different strategies. An especially suitable strategy to adapt to the discrete scenario structure characteristic for the resolution of regulatory uncertainty is the increase of a firm's flexibility. This paper draws on the concept of a firm's resource endowment as a determining factor for its strategic choice and examines the role of capabilities for the pursuit of a flexibility strategy as response to regulatory uncertainty. It proposes that an organization's capabilities for the management of complexity, organizational learning, and change are positively correlated with the extent to which it responds to regulatory uncertainty by choosing a flexibility strategy. Further research into the relationships between firm-specific capabilities, strategy, and performance is suggested.

Dora Fazekas, Corvinus University Budapest (Hungary)

Assessment of the EU Emissions Trading Scheme

As governments face up to pressing environmental issues such as global warming and sustainable development, they are turning to flexible market-based mechanisms to achieve desired environmental goals at the lowest possible cost.

The objective is the stabilization of greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system (according to the Kyoto Protocol). Entities – countries or facilities – receive emission quotas based upon a measure of their need or their previous pollution history. If a given country or installation does not need all of its allowance, it may offer it for sale to another organization that has an insufficient allowance for its emission production. The idea is based upon the reasoning that markets solve – environmental – problems more effectively and efficiently than taxes, norms, penalties or other indirect or direct regulation methods.

This paper presents an overview of the European Union Emissions Trading Scheme (EU ETS), and an assessment of its operation of the first trial phase.

Climate change is driven by the slow build-up of atmospheric concentrations of greenhouse gases. Hybrid instruments that combine indirect and direct economic regulators, such as emissions trading, are always more efficient than either simple taxes or quotas. (Philibert, 2006)

Frank Gagelmann, Martin-Luther-University, Halle-Wittenberg (Germany)

Participants' Treatment of Allowance Price Uncertainty: How are risk-aversion and real option values related with each other?

Participants' treatment of allowance price uncertainties has so far been analaysed either as reductions of "market exposure" resulting from risk-aversion, or as "wait-and-see" strategies in the sense of real option theory. This paper analyses how these two reactions could interact. The following conclusions can be drawn from this integration under the assumptions that participants are at least on aggregate risk-averse, that relative market positions (seller or buyer) are a result of differences in abatement cost and not of systematic differences in risk-attitude, that investments are to a significant degree irreversible, and that no dominant "flipping" of buyers becoming sellers occurs: Under free allocation according to historic emissions, a higher price risk is likely to lead to an aggregate reduction of abatement investment at any point in time. Innovative investment is also reduced, plausibly to an even stronger extent than investment in general. Auctioning generally leads to higher abatement investment than free allocation under risky allowance prices, since under auctioning all agents are "buyers" in the market. The overall effect of price risk on abatement investment is ambiguous under auctioning, and depends on the relative importance of the revenues foregone while "waiting-in-line", compared to the option value of waiting, which depends on the relative importance of the "random" price factors.

Nardia Haigh, University of Queensland (Australia)

Corporate response to climate change: Some preliminary results

In this paper, I report preliminary results for a study that is combining the dynamics of the natural environment with the resource-based view and institutional theory to explain how organisations respond to climate change issues. The role of uncertainty in response is also considered, along with how responses might differ along the product supply chain. Preliminary results for one organisation-level case study are reported from an emerging set of five. The organisation is an electricity transmitter in Australia's electricity supply industry.

Eight climate change issues were identified by the organisation; the top three of which are analysed in detail here. Three nascent trends are emerging from the qualitative data. First, the issues appear to have predominantly been made sense of by the organisation as operational issues, and this was followed by (largely) operational actions being taken in response. Second, the level of uncertainty observed in the issues was polar - either negligible or extreme; though it is too early to attribute any meaning to this. Third, the organisation indicated a sense of having no control over several key issues, which may offer some insight for cross-case analysis when responses at various positions of the electricity supply chain will be compared.

I aim to make three main contributions through this study. First, to broaden the scope of the theories by including the natural environment within them as a central element of theoretical and practical importance to management theory. Second, to explore how combining the theories with the dynamics of the natural environment might highlight theoretical tension. Third, to expand our understanding of the organisation—natural environment interface by considering both directions of impact.

Harish Jeswani, University of Surrey (UK)

How warm is the corporate response to climate change? Evidence from Pakistan and the UK.

In response to growing consensus among scientists and governments to act fast to avoid dangerous impacts of climate change, many industries have started to prepare for a carbon-constrained world. However, this response is far from being uniform. Often action is predicated on economic, technological, organisational and institutional drivers and barriers, which vary between countries and across industrial sectors. In order to understand the effectiveness of industry response, it is therefore important to analyse corporate response across different sectors in different countries.

Focusing on the nine most energy-intensive and greenhouse gas (GHG) emitting industrial sectors, this paper compares corporate responses to climate change in Pakistan and the UK. By analysing the divergence of strategies adopted by industries across different sectors in two countries, the paper examines the key factors influencing corporate adoption and implementation of GHG reduction and energy-efficiency strategies in Pakistan and the UK.

Eun-Hee Kim, Stephen M. Ross School of Business, U. Michigan (USA)

Greenhouse Gas Reductions or Greenwash?: The DOE's 1605b Program

This paper presents the first empirical analysis of the factors that lead electric utilities to participate in the Department of Energy's voluntary greenhouse gas registry, and the impact of participation on their actual emissions performance. We find that firms are more likely to participate when the cost of participation is lower and when the pressure to participate is higher. We also find that participating in the 1605b program has no statistically significant effect on a firm's carbon intensity, i.e., carbon emissions per unit of electricity generated. This suggests that firms' participation may be a form of greenwash, that is, an attempt to appear more environmentally friendly than is really the case.

Martina Linnenlücke, University of Queensland (Australia)

A Comparative Study of Organizational Responses to Global Climate Change in Australia and Germany: Conceptual Model

A conceptual model is presented to describe how organizational decision-makers formulate strategic decisions in response to changing conditions in the natural environment, in particular those posed by climate change. It is suggested that organizational responses to climate change issues and the formation of capabilities for organizational adaptation depend on how managers perceive the uncertainty and risk surrounding climate change issues, which in turn is influenced by (1) the level of institutional pressure on the organization and (2) specific organizational characteristics. It is outlined how this framework can be applied to investigate organizational adaptation to climate change issues in Australia and Germany. A comparative study of a Kyoto and non-Kyoto country will provide insights into how national institutional environments shape corporate responses to climate change.

Jonas Meckling, London School of Economics (UK)

The Drivers of Corporate Climate Strategies in Europe and the United States: The Role of Transnational Governance and Diffusion

This paper lays out the main thrust of my research on the corporate climate strategies in the oil and electricity sectors in Europe and the United States. Particular emphasis is put on the theoretical argument and the analytical framework. It is argued that firm-level factors as well as national and international policy development do not provide satisfactory explanations for the shift in corporate strategies from fierce opposition to accommodation with climate policies in the late 1990s. Instead, institutional processes within and across industries, that is, transnational governance and diffusion, are crucial in understanding the spread of new responses to global climate change. To capture transnational institutionalization, the paper distinguishes four causal mechanisms that underlie institutional processes between firms: strategic calculation, market and NGO pressure, modelling, and normative suasion. By highlighting the role of transnational institutionalization, the paper contributes to our understanding of firm-firm interaction and private sources of governance in institutional change at the global level.

Emanuela Menichetti, University of St. Gallen (Switzerland)

Climate change and innovation in the electricity sector: identifying selective strategies of EU electricity utilities

Since the entering into force of the EU ETS directive and the Kyoto Protocol in 2005 an increasing number of studies have emerged, focusing on various aspects of a carbon constrained society. Academic research has discussed the implications of climate change for both policy and business, but there is still a lack of studies basing on empirical analysis. The ongoing doctoral study aims at providing further contribution to academics by investigating one of the most relevant industrial sectors targeted by the EU ETS: the power generation industry. The latter has benefited from a generous allocation of quotas during the first round of the EU ETS, but is currently being looked at as the sector where most stringent caps are needed in order to foster innovation.

Within this framework, the research aims at exploring what strategies the electricity companies are establishing in order to accomplish their climate goals, and how they integrate their climate change activities with corporate strategy.

Some preliminary findings will be presented with respect to the following three countries that have been already identified as relevant case studies: France, Italy and Spain. In addition, the general architecture of the research work will be presented, the relevant literature will be analysed and commented and the research method will be described. The relevance of the topic for both business and academia will also be discussed.

Malte Schneider, ETH Zurich (Switzerland)

Exploiting Business Opportunities Created by Changes in the Natural Environment: *A multi-level analysis of firm strategies in the CDM*

This paper attempts to establish a framework for analyzing firm responses to changes in the natural environment which will be used as a guiding structure in my dissertation. Traditionally, changes in the natural environemnt and especially climate change have been regarded as threats to the business world. This view was for a long time accompanied by discussions about the uncertainty of the phenomenon which served as argument to postpone action. However, since the magnitude of the nowadays increasingly accepted trend starts to outweigh the complexity and uncertainty that had covered it before, this paper wants to change perspective. We emphasize business opportunities that are created by changes in the natural environment and we adopt the theoretical concept environmental munificence, instead of uncertainty, as main driver for explaining firm action. Finally, we take a multi-level perspective because changes in the natural environment have repercussions at various environmental levels of analysis and thus impact on firm behaviour differently.

Masachika Suzuki, Erasmus University Rotterdam (Netherlands)

Business Strategy of Climate Change: Empirical Study of the Steel Industry

This study investigates how the firms in the energy-intensive industry sector formulate their strategy and management on global climate change. The steel industry sector is selected as a case study in this research. Research questions have threefold; [1] what are the similarities and differences in corporate strategy and management on GHG emissions among firms; [2] What are the similarities and differences in corporate responses to the climate change policy instruments among firms; [3] What are the main factors (economic, technological or institutional?) that contribute to formulate their responses to the climate change policy instruments? This thesis addresses these questions with a view to finding a common strategic platform among firms towards the post-Kyoto period.

Simon Tywuschik, IMD International, Lausanne (Switzerland)

A longitudinal perspective on corporate environmentalism in the German chemical and automotive industry

Until recently, only historians and social scientist have provided research on the longitudinal development of environmentalism in Germany. Specific knowledge concerning the development of corporate environmentalism has been hardly available. Partly based on international contributions, I intend to go beyond this broad to a more specific level and examine the development of corporate environmentalism for two types of industries in Germany. For this, I am linking relevant historical facts with data collected on constructs form stakeholder and institutional theory. In this discussion paper, I present first evidence that reveals that there are more differences than commonalities between these industries in terms of the significance of environmentalism to their corporations, but also concerning the composition of the stakeholders and the institutional framing of this issue.