

Introduction*

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It is an uncomfortable fact that reductions in greenhouse gas (GHG) emissions are needed on a large scale and in a relatively short time if we are to avoid the more extreme risks associated with higher CO₂ equivalent concentrations in the atmosphere. This has been articulated in the UK government's target of reducing GHG emissions to 60% of 1990 levels by 2050. Given this background, awareness that action will be required by corporations at all levels has been relatively low.

However, climate change has been climbing up the business and political agenda in recent years. The 2001 Marrakech Accords were a significant step forward in assuring the continued progress of countries (with the notable exceptions of the United States and Australia) towards meeting targets agreed under the Kyoto Protocol to the UN Framework Convention on Climate Change. While the Rio+10 Conference in Johannesburg in 2002 reinforced the need for progress towards ratification, now that Russia has come on board and the Kyoto Protocol has been ratified, there is even greater impetus for the development of national and EU emissions trading schemes, forcing organisations to consider their strategies for responding to these pressures.

With these drivers in place, emission reduction targets of GHGs are now becoming a reality, with the focus for action turning to the private sector. Business and industry have a crucial role to play in the implementation of the Kyoto Protocol and emissions trading schemes. They are major emitters of GHGs and pressure is mounting for them to engage in a range of mitigation strategies, from emission inventories and trading schemes to development of and investments in low carbon technologies.

* The chapters in this book were written before the entry into force of the Kyoto Protocol on 16 February 2005. Many of the initiatives described in these pages will now become key elements in helping 35 industrialised countries and the European Community to reduce their combined emissions of six major greenhouse gases during the five-year period 2008–12 to below 1990 levels.

Behind the scenes a number of companies have started to construct strategies to curtail GHG emissions in advance of these developments. These strategies can be very diverse in nature. At a political level, companies try to influence policy implementation and, more specifically, to test ideas in anticipation of possible regulation on the climate change issue.

At a more practical level, there are a burgeoning number of initiatives to conserve energy use in production, transportation and buildings, to develop renewable sources of energy, to measure carbon emissions and sequestration at a detailed level, and to develop various markets for trading carbon credits among companies and countries. Some technologies are entering the marketplace, such as hybrid cars and compact fluorescent lighting. At the same time, one must acknowledge that many companies have taken a wait-and-see approach. Incumbent companies, particularly in fossil fuel-related industries, are interested in protecting their existing assets and competences. Even the more progressive oil companies are firmly committed to stay in and even expand their presence in oil and gas markets while diversifying on a small scale.

Common to all these initiatives is that they operate in an environment of high complexity and uncertainty. The political implementation of the Kyoto Protocol is far from certain and many details remain unspecified. Economic instruments such as emissions trading are favoured and their implementation is becoming clear, though the future price of credits is unknown. New markets for low-emission products and technologies appear, but there are currently few regulatory drivers for these markets. Whatever the regulatory climate, the impact of potential regulation on business will vary tremendously between companies and between sectors of industry. Indeed, direct and indirect contributions of companies to GHG emissions vary a lot. It is not a surprise that sectors with large direct emissions are often at the forefront of climate change discussions, but sectors with large indirect emissions, such as the retail sector with its substantial need for energy for heating and cooling, also need to be part of the debate. Last but not least, the impact of climate change on businesses can be very substantial: for example, in the insurance and agricultural sectors. In the context of remaining uncertainties about climate change itself, strategies to reduce risks in the long run have to differentiate between sectors and have to be flexible. For individual companies, the sharp uncertainties demand some type of contingency planning.

On the eve of climate policy implementation, it is appropriate to present early corporate experiences with the climate change issue. Description and assessment of various approaches will help to identify more effective strategies and promote the diffusion of proactive corporate practices. Moreover, identifying the factors that cause companies to pursue low-carbon strategies and support the Kyoto process will be helpful in formulating policy. Present climate strategies are in their infancy and are characterised by their great variety and disparity. We will not hide from this unsettled state of the art. Rather, we hope to pick out some trends and present some promising ways forward.

About this book

The contributions to this book follow from a call for contributions in 2002. From over 50 proposals, the editors invited 20 authors to write full papers. The contributions in the book move from a more general, abstract plane towards more concrete and specific examples.

In 'Part 1: Introduction and overview' four chapters present a broad perspective on climate policies and organisations of industry. The four chapters in 'Part 2: Policy instruments' present early experiences with different types of policy instrument to curb GHG emissions. Examples range from emissions trading to voluntary agreements.

'Part 3: Sector analysis' contains five chapters that assess developments within sectors of industry that are expected to play an important role in future climate policies: oil, cement, chemical, automotive and insurance. The final section, 'Part 4: Case studies', discusses the bottom-up initiatives to combat climate change of five different organisations.

Part 1: Introduction and overview

Part 1 introduces the playing field for GHG policies at the corporate level. Contributions cover political, economic and technological dimensions of climate policies. Political developments around the Kyoto Protocol are assessed as well as industry initiatives to influence government policies. Part 1 ends with an oft-forgotten aspect of climate policies, the climate–biodiversity interface.

Buen, Christiansen, Skogen and Tangen start with the prospects for the Kyoto Protocol. Based on a business-as-usual scenario for economic developments, the authors expect in the period 2008–2012 a considerable oversupply of allowances from countries such as Russia, Ukraine and new EU Member States. As a consequence, carbon prices will remain modest, with a mean estimate of US\$10/t CO₂e (ton of carbon dioxide equivalent).

Next, Buen *et al.* provide an up-to-date market round-up of developments in the carbon trading market. They discuss the expected effect of the EU emissions trading scheme and predict an increase in market activity with a value increasing to more than €7 billion by 2007. The imminent submission of the national allocation plans will provide clarity on companies' positions for moving to the new carbon-constrained future. In comparison, the performance of the existing trading schemes in the UK and Denmark are disappointing. As discussed in detail by Roeser and Jackson in Part 2, there are problems with the UK scheme. Similar constraints have affected the Danish emissions trading scheme so that neither have delivered the required market liquidity. Project-based mechanisms have not developed to the extent expected but there are signs of improvement after the problems of approvals of CDM (Clean Development Mechanism) projects from the executive board. The uncertainty surrounding the ratification of the Protocol continues to affect the carbon markets; although traded volumes decreased from 2002 to 2003, the value

of the global carbon market increased from €63 million in 2002 to €96 million in 2003, an increase of 50%.

Seth Dunn's contribution discusses the emerging business responses to the climate issue, focusing on engagement with the international negotiations and particularly the design and implementation of the Kyoto mechanisms. Responses are differentiated across sectors, countries and companies, revealing evidence of divergence, prospects for convergence and the importance of leadership.

The technological and economic dimensions of climate change are essential to understanding and formulating corporate responses. Over the past decade, progress in greenhouse gas mitigation technologies, the refinement of economic models and their underlying assumptions, and the emergence of emissions trading and other flexible market-based policy instruments have significantly improved understanding of the potential for innovative technologies and policies to limit the costs of reducing emissions. These developments, accompanied by growing scientific evidence of climate risks and political momentum towards binding emissions requirements, have prompted an increase and diversification of corporate responses.

Pulver's chapter compares the advocacy activities of the business and environmental communities in the multilateral climate change negotiations. Pulver finds that while environmental NGOs campaigning on climate change have successfully organised consensus across national boundaries and participate in the climate debates through a single international network (the Climate Action Network), the business community has been riven by conflicts and represented by a changing array of business and industry associations. Focusing on the oil industry, she argues that the particular demands placed on business and industry groups by their member companies in the climate negotiations make it difficult for them to accommodate internal conflict and to generate consensus between oil companies grounded in different national policy environments.

Totten and Pandya focus our attention on the need to consider not just climate change issues and measures but also the concurrent global problem of biodiversity loss and the interrelationship between biodiversity and climate change. They highlight the need for land use projects that maximise benefits for both climate change and biodiversity, and they point to practices within two major companies that can act as examples for others to follow. However, there are many poorly implemented climate actions that are producing adverse biodiversity impacts. Corporate actions can reduce this problem through good practice including early action, maximising all benefits to include biodiversity, and pursuit of suitable projects with a biodiversity conservation strategy. The recent establishment of the WWF gold standard approach to projects will aid this process. It is important that there is growing awareness that corporations can make a difference to two major global problems while generating carbon returns and reducing their compliance costs and risks.

Part 2: Policy instruments

The Kyoto Protocol offers new policy instruments, among which emissions trading schemes (ETSS) are most prominent. Awaiting the EU ETS in 2005, the first chapter assesses results of a pilot ETS in the United Kingdom. Of course, traditional instruments of environmental policy will also play a role in climate policies. This section contains contributions about specific GHG management systems, the role of voluntary agreements and GHG policies embedded in business environmental management systems.

Roeser and Jackson examine early experiences with the first ever national, industry-wide ETS, launched in April 2002 by the British Government. In their opinion, the scheme has serious weaknesses. The voluntary approach, exclusion of key industry sectors and incentive payments for companies willing to participate reduce the scheme's environmental credibility. Low emissions monitoring and reporting standards within UK businesses do not improve the picture either. Looking at the limited number of direct participants in the emissions market, it will not be possible to establish an efficient market. The authors conclude that the UK ETS fails to facilitate short-term emission reductions and also does not provide credible incentives to move the economy into a low-carbon future. In their opinion, a fundamental review of the ETS is required, not only to improve its effectiveness and efficiency but especially to bring it in line with the planned EU-wide trading scheme.

In the chapter titled 'Building a greenhouse gas management programme' the Partnership for Climate Action (PCA) reports on its activities. This is a partnership of major companies over a diverse range of sectors (Alcan, DuPont, BP, Entergy, Ontario Power, Pechiney, Shell, Suncor Energy and Environmental Defense). Environmental Defense is an environmental NGO that receives less than 1% of its income from corporate donors. The companies involved in the PCA have voluntarily undertaken actions to reduce greenhouse gases in their operations. The chapter describes a project undertaken by the PCA to compare the range of greenhouse gas reduction programmes across the companies, which will be of interest to other companies considering moving in this direction. Common elements of these programmes included target setting, emissions measurement, mitigation actions and accountability. These key elements were all considered to be important in the design of any programme, and are interdependent, so that all are needed to perform well to produce a successful programme. Each of these major areas is described in detail in the chapter, raising some questions on related topics such as minimum reporting. Naturally the policy environment and the company strategies have developed further since the compilation of the cross-company comparison. It nevertheless provides insights into the key areas that companies must address in moving to a low-carbon future and the internal incentives to be put in place to achieve change.

The resistance of German companies to emissions trading is astonishing, given that estimates of German emission reduction costs are generally below the European average. Michaelowa, Butzengeiger and Bode argue in their chapter that resistance is due to the specific situation of German climate policy, which started in the late 1980s with a declaration of an ambitious emissions reduction target. The chapter focuses on the specific situation in Germany after reunification; it examines

the voluntary agreements that did not go (far) beyond business-as-usual and finishes with the reactions of German industry to the proposal for a directive on a mandatory EU-wide emissions trading system presented by the EU Commission in 2001.

A case study on the Hamburg Electricity Utility describes how a formerly proactive company has been preparing for emissions trading and how the company's attitude changed after becoming one of the largest emitters in Germany following some mergers and acquisitions.

In their chapter, Rory Sullivan and John M. Sullivan examine the potential contribution that environmental management systems (EMSs) can make to corporate performance on greenhouse gas and energy management. Their analysis demonstrates the important role that can be played by EMSs in assisting companies to identify cost-effective opportunities for greenhouse gas emission reductions, to implement emission reduction strategies, and to monitor, assess and report on performance. However, their chapter also highlights the limitations inherent in relying solely on voluntary approaches to reduce greenhouse gas emissions. The evidence that they present regarding the Australian Greenhouse Challenge and the ISO 14001 Specification for Environmental Management Systems indicates that, in situations where energy prices are low and where there is a lack of strong regulatory or other drivers, companies tend not to set ambitious targets or to diverge from business-as-usual performance on greenhouse gas emissions. They conclude that measures such as taxes, tax rebates, emission limits or emissions trading have a critical role to play in debates around corporate responses to climate change.

Part 3: Sector analysis

In Part 3, we take a closer look at sectors of industry that are major emitters of GHGs (cement, oil, chemical) or have an important role to play in endeavours to curb GHGs (automobile, insurance). It is clear that responses so far have been far from uniform, even from industries that superficially face identical challenges. Several authors try to explain why responses have been so different. Social and cultural differences certainly play a role here, as do different systems of business government relations and variations in economic structure.

Nordqvist, Boyd and Klee focus on cement production, which is a large source of non-energy CO₂ emissions. The chapter shows a dividing line that is splitting the sector in two. On the one hand, large cement groups in the Western world initiated the Cement Sustainability Initiative. Almost unobserved by the public, the Initiative elaborated plans for a 10–20% reduction of greenhouse gases in the period 1990–2010. On closer inspection, energy efficiency improvements and fuel substitution seem sufficient to reach this target. All in all, it can be viewed as a clever initiative to get public acclaim for an almost business-as-usual scenario.

On the other hand, cement production in China is large, includes mainly small producers and is based on outdated technology. How do we approach this fast-

growing market that has no commitments under the Kyoto Protocol? Nordqvist *et al.* hope that an ongoing restructuring of Chinese cement production can go hand in hand with energy and greenhouse gas improvements. However, effective tools to deliver win–win options are not available yet.

Dlugolecki and Keykhah examine responses to climate change in the insurance industry. Although insurance companies were among the earliest business observers to the UNFCCC (UN Framework Convention on Climate Change) negotiations, the insurance industry has been slow to take action to address climate change. With a focus on adaptation, a few reinsurers have carried out awareness raising and research, while the UK insurance industry has been active in terms of risk reduction. Mitigation will mean redirection of investment away from fossil fuel. This will involve institutional investors, such as pension funds, because of the huge assets they control. Again, the leading-edge activity is occurring in the UK through initiatives such as the Carbon Disclosure Project. The UNEP (UN Environment Programme) Insurance Industry Initiative seeks to discover best practice globally and inform the international policy-making process. Its research reveals that public–private collaboration is the most effective way to engage the insurance industry in reducing vulnerability. The same principle can help to avert the further progression of climate change through more enlightened investment policies.

Uzzell compares the 1990–2002 responses to the climate debate of the oil and cement industries. Both sectors have much in common: they are an essential component of economic infrastructure, dominated by a handful of companies, with conservative business cultures, and they are major emitters of greenhouse gases. For his study, Uzzell uses institutional theory, which focuses on the influence that external stakeholders (the organisational field) have on organisations.

From literature and interviews, he finds remarkable differences between the oil and cement sectors. NGOs immediately targeted the petroleum industry as the ‘bad guys’. After fighting an uphill struggle, BP and Shell broke away from the anti-Kyoto lobby and pioneered a proactive engagement strategy. In spite of the political schism among the oil majors, recent observers state that actual strategies of pro- and anti-Kyoto companies are rather similar: an emphasis on risk mitigation and relatively low investments in renewable energies. Evidently, policy statements are not enough to change business cultures.

In contrast to the oil industry, cement companies drew little public attention. Alarmed by events around the oil industry, major cement companies decided to operate in concert to develop proactive policies for climate change. In this process, personal contacts in the Geneva-based World Business Council for Sustainable Development (WBCSD) played a decisive role. By the late 1990s there were no longer any major American-owned cement companies. Results of the 1999–2002 Cement Sustainability Initiative seem a solid basis for partnerships with, for example, WWF International. Evidently, the cement sector succeeded in a clever initiative to retain public acceptance.

Van der Woerd compares the climate strategies of six major corporations in the chemical industry. He observes that the US–Europe dichotomy of anti- and pro-Kyoto lobbies, dominant in, for example, the petroleum industry, does not exist in the chemical sector. Heterogeneity in the product mix of chemical companies offers an explanation. Corporations can shift production from highly GHG-intensive bulk

chemicals (basic chemicals, plastics, fertilisers) to less GHG-intensive speciality chemicals (paints, additives, healthcare). In the 1995–2003 period, two of the six companies followed such a strategy, while a third plans to follow suit.

CFC production before 1995 offers a trump card for some chemical companies. Because these highly potent GHGs are included in the Kyoto Protocol, three of the six companies are able to present GHG emission reductions since 1990 of 30–68%. CFC reductions far outweigh relatively stable CO₂ emissions. As for monitoring, all companies worked hard to get a complete picture of both CO₂ and non-CO₂ GHGs. The chemical companies under review seem to be ready for emissions trading.

Levy and Kolk analyse the strategic responses by US and European multinational enterprises (MNEs) in the oil and automobile industries to the global climate change issue. The authors examine the differences across regions and industries, and the changes over time. Traditional economic drivers of strategy do not provide a satisfactory account for these differences, and the chapter focuses instead on the conflicting institutional pressures on MNEs and the implications for their climate strategy. The home-country institutional context and individual corporate histories can create divergent pressures on strategy for MNEs based in different countries. At the same time, the location of MNEs in global industries and their participation in ‘global issues arenas’ such as climate change generate institutional forces for strategic convergence. It appears that local context influenced initial corporate reactions, but that convergent pressures predominate as the issue matures.

Part 4: Case studies

Low-carbon projects are still in an experimental phase. Part 4 of the book presents five case studies. The first two cases originate in the electricity sector. Next, we present a creative way to use indigenous forest sinks. Part 4 ends with two early examples of Kyoto flexibility instruments, a Clean Development Mechanism (CDM) project and a Joint Implementation (JI) project. Among others, these examples show that bottom-up initiatives are necessary to enable smooth implementation of the Kyoto Protocol.

Hofman analyses the strategy and successes of a first mover on green electricity supply. A company in the electricity sector in the Netherlands defined an innovative response to the combined influence of liberalisation and climate change. The company invented the concept of ‘green electricity for consumers’ and developed an innovative facility for biomass combustion. Internally, these new practices were facilitated by changes in corporate culture and strategy. Externally, corporate changes enabled the company to influence policy frameworks and to build networks of technical competence. The author concludes that social networks have been key elements in the momentum towards green electricity. Two remarks remain. Attractiveness of green electricity still very much depends on government policies: for example, tax exceptions. In a recent government reshuffling, this system almost broke down. Furthermore, it will be difficult to enlarge biomass combustion in the Netherlands. In the absence of substantial forests, import of

biomass is essential to increase production. The discussion on biomass trade is still in its infancy.

Siikavirta *et al.* describe the early experiences with climate policies of an energy company. The Finland-based Fortum corporation launched its Climate Initiative in 2000. A ten-year programme contains a mixture of technical developments (bio-fuels, wind power) and emissions trading (pilots for JI/CDM, investments in the Prototype Carbon Fund of the World Bank). It must be kept in mind that in 2000 non-carbon sources already produced the majority of Fortum's electricity. Siikavirta *et al.* conclude that the main contribution of the Climate Initiative so far has been to direct company thinking towards climate-benign decisions in investments and acquisitions. As for climate-benign products, it is easier to develop new products than to find a market for them. Early JI/CDM pilots suggest that Fortum is too small to develop this type of project on its own. Because of uncertainties in markets and in flexible mechanisms, it is very difficult to say how the 2010 picture will look.

Frame, Gordon and Turney present an interesting initiative to combine corporate climate policies with biodiversity restoration. The Emission/Biodiversity Exchange (EBEX21[®]) programme operates in New Zealand. On the one hand, the project helps organisations to improve their GHG footprint. On the other hand, EBEX21 offers GHG compensation through the regeneration of indigenous forests. Adapted to the New Zealand situation, reversion of marginal hill farmland to scrub is used as an indigenous CO₂ forest sink.

In preparation for Kyoto, EBEX21 started a 'grey' market for carbon certificates. Future projects will co-operate with local governments, electricity providers, retailers and the tourist sector.

De Gouvello, Mollon and Mathy investigate opportunities for private investors under the CDM. The CDM is a flexible mechanism of the Kyoto Protocol with the double aim of providing developing countries with investment funds for sustainable development and of reducing the costs of Kyoto commitments for industrialised countries. De Gouvello *et al.* argue that CDM projects will be implemented only if the objectives of both host-country authorities and private investors are accomplished. They distinguish between classical commercial rent, social or developmental rent in the host country and a carbon rent in the form of CDM certificates. Sale of CDM certificates at future carbon markets improves the commercial attractiveness of CDM projects. The chapter elaborates on a project for a hydroelectric power plant in Bolivia, to be built instead of diesel plants and to be co-financed by electricity companies from industrialised countries. In simulations the authors show that there are several possibilities for sharing the carbon rent between host country and private investor. This choice depends not only on the (as yet unknown) market price of CDM certificates but also on the host-country government decision either to maximise direct carbon income by retaining a high share of certificates or to maximise capacity to attract additional foreign investment by leaving the certificates to project developers.

In the final chapter, Kubo presents the potentials and pitfalls of Joint Implementation (JI). This is a project mechanism similar to the CDM where a host country receives the investment flow while the investing company can use the carbon reductions to offset its target reductions. In this case the host country is an Annex B country with targets rather than a developing country without targets, as in the

CDM in De Gouvello's chapter above. The chapter reviews a case study of a US electric company-sponsored forestry project in Southeast Asia, which began in 1992, as an example of an early corporate response to climate change. The key question is how to address accountability for our actions and to implement strategies to take responsibility in practice, rather than inventing new accounting practices to justify massive GHG emissions.

Concluding remarks

Taken together, the material presented here shows the large variety of corporate responses and points towards conceptual frameworks for understanding them. The editors hope this book offers insight into an emerging field and provides both companies and academics with inspiration for future development of corporate climate strategies. As we mentioned above, climate strategies are still in their infancy. We expect that a full spectrum of business strategies will unfold in the years to come. That will certainly become a fruitful source of practical learning and theoretical reflection.

This book was elaborated as a co-operative effort of three editors. As is common nowadays, co-operation mostly took place in virtual reality. However, we could not have progressed without several individuals and organisations. We appreciate the support of the managing editor John Stuart and staff at Greenleaf Publishing. But, most importantly, we thank the people who answered our call for proposals and, more specifically, the people who wrote the chapters.