

# IV

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## Climate Action among Firms, Campuses, and Individuals



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## Business Strategies and Climate Change

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### Introduction

Corporations are central players in carbon governance through their roles as greenhouse gas (GHG) emitters, investors, innovators, technical experts, manufacturers, lobbyists, and marketers (Levy and Newell 2005). Businesses not only emit GHGs from their own operations, they also purchase energy-intensive inputs and sell products that generate substantial emissions over their lifetime. Businesses transmit practices, technologies, and standards to their suppliers and customers, influencing GHG emissions along their supply chains. Business is also a political actor, influencing governmental policy and developing private codes and initiatives. Governments and NGOs have recognized that large firms possess organizational, technological, and financial resources needed to address climate change. This acknowledgment of corporate potential has occurred, not entirely coincidentally, in a period of growing concern with the limitations of the Kyoto Protocol (Najam, Christopoulou, and Moomaw 2006), and more broadly, in a response to a “governance deficit” at the international level (Haas 2004).

During the 1990s, much of the energy of North American business, particularly in sectors related to fossil fuels, was directed toward preventing any caps on GHG emissions. Indeed, industry groups such as the Global Climate Coalition and the Climate Council played a major role in the U.S. withdrawal from Kyoto (Levy 2005). Since then, many businesses have adopted a more constructive stance that acknowledges the reality of climate change and their responsibility for addressing the issue (Margolick and Russell 2004). In this respect, climate change is increasingly portrayed as a business opportunity rather than a burden (Lash and Wellington 2007). A 2006 report from Ceres—a leading coalition of investors, firms, and environmental organizations working collectively on climate change—typifies this optimistic view:

Companies at the vanguard no longer question how much it will cost to reduce greenhouse gas emissions, but how much money they can make doing it. Financial markets are starting to reward companies that are moving ahead on climate change, while those lagging behind are being assigned more risk. (Cogan 2006, 1)

This new approach toward GHG mitigation is reflected in high-profile corporate initiatives, such as GE's Ecoimagination and Wal-Mart's plan to cut GHGs from stores and transportation. Some sectors, such as agriculture and insurance, face risks from the physical impacts of climate change, including rising sea levels and more frequent and intense storms (Haufler, this volume). Civil society organizations such as the Investor Network on Climate Risk and the Climate Group have played an important role recently in highlighting the risks and opportunities facing various sectors and encourage companies to assess and manage these risks rather than ignore them (The Climate Group 2007a, 2007b; INCR 2008). A more proactive stance could provide companies with some protection against litigation and damage to their reputation (Wellington and Sauer 2005), as well as more influence in shaping new regulations and governance systems.

Meanwhile, local government and voluntary initiatives have emerged in response to the perceived lack of guidance from national and international authorities. In the United States, Canada, and Mexico, subnational authorities are formulating a multitude of policies (Farrell and Hanemann, this volume; Gore and Robinson, this volume; Rabe, this volume; Selin and VanDeveer, this volume). Recent agreements include the Regional Greenhouse Gas Initiative (RGGI) and the Western Climate Action Initiative; both are centered on cap-and-trade mechanisms for reducing GHG emissions. The prospect of mandatory cap-and-trade systems, standards for power generation, and subsidies for renewable energy are driving more active corporate climate strategies. Business journals and consultants proffer advice on carbon management systems that entail assessing risks, conducting emissions inventories, setting targets, and assigning responsibilities (Hoffman 2006).

The Pew Center on Global Climate Change and the Climate Group, two organizations promoting business action on climate change, have documented climate change actions taken by numerous companies as well as the related financial and environmental benefits (The Climate Group 2007a; Margolick and Russell 2004). These initiatives cannot be dismissed as mere public relations exercises, as they entail organizational changes and investments in the development of low-emission technologies and products. Yet, despite this beehive of corporate activity, global GHG emissions in 2005 were 28 percent higher than in 1990, and show no sign of declining (EIA 2006). The growth in North American emissions during 2000–2005 was slower than from 1990–2000, but still substantial (UNFCCC 2008). Emissions from manufacturing and construction have declined, reflecting new process tech-

**Table 11.1**  
GHG emissions by country and sector (megatons CO<sub>2</sub> equivalent)

		1990	2000	2005	Percent change 1990–2005
<b>European Union</b>	Total	4258	4135	4193	–1.5
	Energy	1165	1122	1200	3.0
	Mfg & Const.	619	559	555	–10.3
	Transp.	700	841	880	25.7
<b>United States</b>	Total	5529	6391	6432	16.3
	Energy	1818	2293	2392	31.6
	Mfg & Const.	864	882	847	–2.0
	Transp.	1463	1812	1906	30.3
<b>Canada</b>	Total	596	721	747	25.3
	Energy	147	199	202	37.4
	Mfg & Const.	63	64	63	0.0
	Transp.	149	183	198	32.9
		1990	2000	2002	1990–2002
<b>Mexico</b>	Total	425	558	549	29.2
	Energy	105	157	153	45.7
	Mfg & Const.	57	54	51	–10.5
	Transp.	89	113	114	28.1

Source: UNFCCC 2008.

nologies, but emissions from transportation and energy continue to rise (see table 11.1).

The continuously contradictory political activity of much North American business toward climate policy initiatives, however, may appear puzzling. For example, the three major U.S. automobile manufacturers are members of the U.S. Climate Action Partnership, which advocates for national mandatory emission controls, while simultaneously fighting California's efforts to regulate automobile carbon emissions. To explore this paradox, we examine several dimensions of corporate responses to climate change. We argue that business is generally willing to undertake measures consistent with the emerging weak and fragmented system of global GHG governance. Indeed, business has played a substantial role in shaping this system. North American firms are undertaking a range of voluntary measures and are increasingly willing to accommodate a national mandatory carbon-trading system.

In this respect, interests of North American businesses and policymakers appear to be converging on regulatory systems setting relatively low carbon prices that do not threaten the core business models of politically and economically important

industrial sectors and firms. Much North American business continues to oppose, however, more stringent subnational initiatives that target particular sectors and are believed to constitute more immediate economic threats. While low-emission energy technologies are attracting increasing attention from venture capital, most businesses have not yet incorporated climate change into their strategic planning for core products and markets. Instead, climate change strategy is oriented toward organizational preparation, corporate branding, carbon accounting systems, and modest efficiency measures.

The chapter begins with a brief summary of the history of business action toward climate change. The next section examines current corporate responses to climate change. This section begins with an analysis of reports and databases that survey corporate initiatives, followed by a discussion of three sets of corporate responses: business investment in clean energy and low-emission technologies; measures taken toward carbon accounting, reporting, and trading; and political action and membership in associations or alliances active on the climate change issue. The final section assesses the many complex and sometimes contradictory corporate responses to the climate change challenge.

### **A History of Business Response to Climate Change**

Climate change presents a profound strategic challenge to business. Despite the considerable attention given to economic opportunities, the primary issue facing many sectors is the regulatory risk of higher costs for fuels and other inputs, and lower demand for energy-intensive products (Wellington and Sauer 2005). Measures to control the emissions of GHGs most directly threaten sectors that produce and depend on fossil fuels, such as oil and automobiles, and energy-intensive industries including cement, paper, and aluminum. Companies also face considerable competitive risk, as changes in prices, technologies, and demand patterns disrupt traditional business models and make existing competencies obsolete. Investing in new technologies is a treacherous business, however.

It is therefore not surprising that a wide range of sectors responded aggressively to the prospect of regulation of GHG emissions. During the 1990s, U.S.-based companies were particularly active in challenging climate science, pointing to the potentially high economic costs of GHG controls and lobbying government at various levels. Businesses formed a strong issue-specific organization, the Global Climate Coalition, to coordinate lobbying and public relations strategies (Gelbspan 1997; Leggett 2000; Levy and Egan 2003). Canadian energy firms engaged in political action similar to their U.S. counterparts (Smith and Macdonald 2000). In contrast,

state-owned Petroleos Mexicanos (Pemex) adopted a more cooperative climate strategy similar to European oil companies BP and Shell (Pulver, this volume).

These divergent strategies defy simple explanation, but studies of the oil and automobile industries identify institutional environments as important determinants of strategic responses (Levy and Kolk 2002; Levy and Rothenberg 2002; Pulver 2007; Rowlands 2000). Expectations concerning markets, technologies, and regulation vary with corporate histories, headquarters location, and membership in industry organizations. Senior managers of European companies believed that climate change was a serious problem and that regulation of emissions was inevitable, but they were optimistic about the prospects for new technologies. Key Mexican managers within Pemex were also convinced by these beliefs. American and Canadian companies, by contrast, tended to be more skeptical concerning the science, more pessimistic regarding the market potential of new technologies, and more confident of their political capacity to block regulation.

By 2000, key firms on both sides of the Atlantic began to converge toward a more accommodative position that acknowledged a need to curtail GHGs. Companies began to invest substantial amounts in low-emission technologies and to undertake a variety of voluntary schemes to inventory, manage, and trade carbon emissions. One source of convergence is the participation of senior managers in global networks, which tend to induce similar expectations and norms concerning appropriate responses (Levy 2005). Competitive dynamics and interdependence also create convergent pressures (Chen and Miller 1994). American auto companies were initially skeptical of hybrid vehicles, for example, but soon followed Toyota with plans of their own.

The shift in the position of American industry can also be linked to the evolution of new organizations supportive of a proactive industry role. Efforts by the GCC and other industry groups to challenge climate science sometimes produced a damaging backlash (Gelbspan 1997; Hamilton 1998). The growth of organizations committed to a climate compromise further undermined the GCC's claim to be the voice of industry on climate. The Pew Center and other groups provide not only a channel of policy influence for member companies, but also a vehicle for legitimizing the new position in the business community. These realignments have been stabilized by the growth of the win-win rhetoric of ecological modernization (Hajer 1995; Porter and van der Linde 1995), which puts its faith in technology, entrepreneurship, voluntary partnerships, and flexible market-based measures (Casten 1998; Hart 1997; Romm 1999).

The win-win concept is reinforced by widespread case study evidence that emission reductions can generate significant cost savings and open new market

opportunities (The Climate Group 2007a). Environmentally oriented business associations, such as the Business Council for Sustainable Energy and the World Business Council for Sustainable Development, have adopted this language. Influential environmental NGOs in the United States, especially the World Resources Institute and Environmental Defense (Dudek 1996), have initiated partnerships with business to pursue profitable opportunities for emission reductions. Governmental agencies find win-win rhetoric attractive for reducing conflict in policymaking, as exemplified in the pitch made by the U.S. EPA for its Climate Leaders program (EPA 2007).

### **Current Business Responses to Climate Change**

Growing corporate expectations of GHG regulation, pressure from civil society, and optimism regarding market opportunities are driving corporate responses along a number of dimensions. Simultaneously, continued uncertainty regarding the nature and timing of regulation, future carbon prices, and the impact on existing markets combine to make business cautious. This section examines several dimensions of the multifaceted business response.

#### **Surveys of Business Initiatives**

A growing number of surveys of corporate climate change actions have been conducted since the early 2000s. Four reports are analyzed here in some detail: by Ceres (Cogan 2006), by the Climate Group (2007a), by McKinsey (2007), and by Deloitte (2006). These reports have different criteria for inclusion and evaluation, but together they provide a reasonable indicator of corporate responses. The lack of standardized reporting, however, makes sectoral and geographic analysis difficult. We also examined data from the Pew Center's Business Environmental Leadership Council (BELC), which comprises forty-two large companies (thirty-six from North America) who have committed to supporting action on climate change. The Pew Center web site lists company profiles and emission reduction activities, but does not provide summaries or analysis.

The most recent report by the London-based Climate Group was based on a survey and responses to the 2006 Carbon Disclosure Project to describe emission reduction achievements of 137 organizations (84 corporations and 53 city and local governments from 20 countries) with "the most impressive results." The data are largely unverified and based on self-reporting. Some companies report cutting GHG emissions by more than 25 percent, though clearly these are best performers rather than representative cases. The geographic profile of the corporations is approximately 40 percent European, 40 percent North American, and 20 percent Japanese. Twenty-seven corporations reported emission reductions combined with cost



savings, with an average emission reduction of 18 percent. The three most frequently reported mitigation measures were energy efficiency, waste management, and use of renewable energy. Dow Chemicals, for example, claims to have saved \$4 billion between 1994 and 2005 from reduced energy use, while DuPont reported \$3 billion saved between 1990 and 2005. A high proportion of companies also report development of management systems for carbon and engaging in carbon offset activity.

The McKinsey survey of over 2,000 executives highlights a gap between high levels of corporate attention and limited action. It suggests that the core business case for action is weaker than claimed by the more selective reports from the Pew Center and the Climate Group. The survey indicates that 82 percent of executives expect some form of climate regulation in their own countries in the next five years, while 60 percent considered climate change to be strategically important. Notably, 70 percent of executives see climate change as important in corporate reputation and brand management, but “relatively few companies, however, appear to be translating the importance they place on climate change into corporate action” (McKinsey 2007, 2). Among CEOs, 44 percent report that climate change is not a significant item on their agendas.

The ranking of drivers for action are also revealing: corporate reputation, customer preferences, and media attention are ranked first, second, and third. Drivers with low rankings include investment opportunity, competitive pressure, and physical threats to assets. Companies in the United States appear to be lagging behind their international counterparts. Only 51 percent of executives based in North America considered the role of climate change in corporate strategy to be very or somewhat important, the lowest proportion for any region; the corresponding figure for European executives was 65 percent. European executives were significantly more optimistic than their North American counterparts concerning the potential impact of climate change on profits over next five years.

Deloitte’s survey of 80 large Canadian GHG emitters, primarily in the oil and gas, manufacturing, and power generation sectors, is in broad alignment with the McKinsey survey. Though 80 percent of firms ranked GHG emissions management as an issue of moderate to critical importance, half of the companies still do not include emission management in their overall risk management strategy. The survey found that 91 percent of respondents claimed to have the management capability to complete a GHG emissions inventory, and 84 percent had actually completed one. Nevertheless, only 46 percent said they had the capability to execute the purchase or sale of emission credits and only 40 percent had established internal emissions targets and schedules.

The Ceres survey of 100 of the largest firms in ten carbon-intensive industries also found that U.S. firms lagged behind. The companies were scored with a 100-point

**Table 11.2**  
Top ten firms in climate governance

Firm	Industry	Base	Score
BP	Oil and gas	UK	90
DuPont	Chemicals	U.S.	85
Royal Dutch Shell	Oil and gas	Netherlands	79
Alcan	Metals	Canada	77
Alcoa	Metals	U.S.	74
AEP	Electric power	U.S.	73
Cinergy	Electric power	U.S.	73
Statoil	Oil and gas	Norway	72
Bayer	Chemicals	Germany	71
Nippon Steel	Metals	Japan	67

*Source:* Cogan 2006.

checklist, with a mean of 48.5, based on a review of specific actions in certain governance areas including board oversight, management execution, public disclosure, emissions accounting, and strategic planning. Of those companies rated, all have significant operations in North America: seventy-two firms are based in the United States, two in Canada, nineteen in Europe, and seven in the Asia-Pacific region. The top-ten list includes only four companies from North America, five from Europe, and one from Japan (see table 11.2).

North American firms are thus somewhat underrepresented among the best performers, given their predominance in the group of companies rated. All the bottom twelve companies are moreover from the United States (see table 11.3). Ceres also found significant differences between industries. In general, chemicals, electric power, and automotive firms have the highest scores; air transport, food, coal, and oil the lowest; and industrial equipment, metals, and forest products are in the middle. The differences, however, between firms within industries are substantial: European oil and resource extraction companies, for example, fare much better than U.S. and Canadian ones. This suggests the existence of significant space for discretionary managerial action.

### **Business Investments in Clean Energy and Low-Emission Technologies**

An important dimension of business responses to climate change is the rapid growth of renewable energy, energy efficiency, energy storage, and other low-emission technologies (see table 11.4). Global markets for fuel cells, biofuels, wind power, and solar power reached an estimated \$77 billion in 2007 and are growing at annual

**Table 11.3**  
Bottom twelve firms in climate governance

Firm	Industry	Base	Score
UAL	Airline	United States	3
Williams	Oil and gas	United States	3
ConAgra	Food	United States	4
Bunge	Food	United States	5
Foundation	Coal	United States	5
Southwest	Airline	United States	6
Murphy	Oil and gas	United States	6
Phelps Dodge	Metals	United States	6
Arch	Coal	United States	8
AMR	Airline	United States	9
PepsiCo	Food	United States	9
El Paso	Oil and gas	United States	9

*Source:* Cogan 2006.

**Table 11.4**  
Revenue in global clean energy (\$US billions)

Sector	2007	2017 (projected)
Biofuels	\$25.4	\$81.1
Wind power	\$30.1	\$83.4
Solar power	\$20.3	\$74
Fuel cells	\$1.5	\$16
Total	\$77.3	\$254.5

*Source:* Makower, Pernick, and Wilder 2008.

rates of approximately 30 to 40 percent (Makower, Pernick, and Wilder 2008). Worldwide markets for associated power control electronics, energy efficiency, materials, construction, and services are even larger, estimated at \$115 billion in 2005, though growing more slowly (Makower, Pernick, and Wilder 2006). Consumer support for clean energy also points to important business opportunities. Surveys and hedonic analyses consistently indicate consumers are willing to pay a premium for renewable energy (Roe, Teisl, Levy, et al. 2001; Zarnikau 2003).

The size and growth of these markets, as well as a recognition that the regulatory drivers are likely to intensify, are drawing the attention of entrepreneurs as well as established firms. In the clean energy sector, U.S.-based companies attracted nearly \$2.7 billion of venture capital in 2007, an increase of 71 percent since 2006. The

share of clean energy in total U.S. venture capital investments was 3 percent in 2004, 6 percent in 2006, and 9.1 percent in 2007. The largest recipients are solar, biofuels, and energy efficiency technologies (Makower, Pernick, and Wilder 2008). Established firms in related industries are also investing in these sectors. In 2007, for example, GE reported wind revenues of \$4.5 billion, and utilities Pacific Gas & Electric and Florida Power & Light announced multibillion dollar investments in large-scale solar thermal power (Makower, Pernick, and Wilder 2008). Investor interest has also led to the development of several stock indexes that track the clean-energy sector in North America and facilitate portfolio investments through mutual funds and exchange-traded funds.

Arrayed against these important opportunities are significant technological, institutional, and economic barriers to deployment of low-carbon technologies (Dias, Mattos, and Balestieri 2004; Goldemberg, Coelho, and Lucon 2004). The scale of changes needed is not matched by the technology investments thus far (Hoffert, Caldeira, Benford, et al. 2002; Pilke, Wigley, and Green 2008). Rapid growth is from a tiny base, and aside from wind, renewable energy is far from competitive with coal or gas-fired power. The U.S. Energy Information Agency predicts that less than 12 percent of total primary energy supply will be met by nonhydro renewables by 2030, most of that in the form of biomass (EIA 2008). Biofuels compete with food production, and cellulosic biofuels face significant technological and cost hurdles to commercialization. Efficiency gains in automobile transportation are largely offset by rising vehicle weight and miles traveled, and emissions from air travel are rising rapidly.

Clean energy markets present substantial market risks. Many technologies under development will prove to be dead ends, while new low-emission technologies often require radically new capabilities that threaten to undermine the position of incumbent companies and open industries to new entrants (Anderson and Tushman 1990; Christensen 1997). The most successful companies in solar photovoltaics, for example, have been Japanese electronics companies with expertise in silicon. Many of the small firms active in these areas remain in a precarious financial position, dependent on subsidies and new venture-capital investments.

Outside of the energy sector, business is still relatively complacent about climate change. In the insurance industry, for example, despite rising insured losses that many attribute to climate change, major North American firms are reluctant to take action on the issue due to a tradition of conservatism, their reliance on the federal government for disaster relief, and the lack of clear financial benefits from action (Haufler, this volume). Business in the agricultural sector has tended to be more concerned about the impact of carbon regulation on fuel prices than changing climatic patterns and extreme weather events. If anything, companies are pursuing

adaptation rather than mitigation. Monsanto, for example, is investing in genetically modified seeds to cope with drought, which may become a more pressing problem in many parts of the world as the climate gets warmer and dryer.

### **Measures on Carbon Accounting, Reporting, and Trading**

Carbon trading, in various forms, has emerged as the centerpiece of governmental policies and private initiatives to constrain carbon emissions (Aulisi, Farrell, Pershing, et al. 2005). In the absence of federal action, states and regions have been developing carbon trading systems, such as RGGI (Rabe, this volume; Selin and VanDeveer, this volume). In response, many firms are preparing for emissions trading by developing the capacity to inventory, report, and trade GHG emissions. Firms might be anticipating mandatory controls, attempting to shape future trading systems, establishing baselines to gain credit for early action, or hoping to gain a competitive advantage through early trading experience. Many larger companies need to develop an emissions management system for their European operations.

Firms are also participating in the Chicago Climate Exchange (CCX), which opened in October 2003. By 2008, CCX membership had grown to over seventy companies committed to reducing their emissions from North American operations. Due to the voluntary nature of the cap, carbon prices have been very low, around \$3–5 per ton of carbon dioxide during 2007 and 2008, which is unlikely to induce significant emissions reductions. Moreover, the U.S. federal government sponsors voluntary industry programs. The EPA's Climate Leaders program enlists companies to set goals for emission reductions and to "strategically position themselves as climate change policy continues to unfold." The Department of Energy's Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities Now) enlists trade groups to reduce their members' GHG intensity. Participants in these voluntary programs have not always met their commitments, however, and do not bear any consequences (Stephenson 2006).

A number of groups are exerting pressure on companies to track and report their emissions by asserting that carbon management and accounting provides a mechanism for managing and assessing climate-related business risks and opportunities (Lash and Wellington 2007). The Investor Network on Climate Risk and the Carbon Disclosure Project (CDP) attempt to leverage the influence of institutional investors to create demand for carbon accounting, with implications for asset valuations. In response, some of the largest investment banks, including Citigroup, JPMorgan Chase, and Morgan Stanley have issued restrictive guidelines for new coal investments that note that "investing in CO<sub>2</sub>-emitting fossil fuel generation entails uncertain financial, regulatory, and environmental liability risks" (Makower, Pernick, and Wilder 2008, 4). Plans to develop more than fifty new coal-fired plants in the United

States were delayed between 2006 and 2008 due to a combination of environmental and investor concerns (Makower, Pernick, and Wilder 2008).

The CDP was launched in 2000 as a London-based coordinating secretariat for institutional investors to gain insight into the climate risk profiles of the Financial Times 500 companies, though it now surveys a much larger and more international group of companies. By the end of 2007, the CDP comprised 385 signatory investors with more than \$40 trillion in assets, including large investment firms such as Merrill Lynch and Goldman Sachs, and state pension funds. This represents very rapid growth from just thirty-five investors in 2003, with \$4.5 trillion in assets. It should be noted that there are no costs or carbon commitments for signatory investors. More than 1,300 companies responded to the fifth survey by the Carbon Disclosure Project (CDP5) in 2007, reporting on various aspects of their carbon management (Innovest 2007).

Significantly, CDP5 indicates that the gap between corporate attention and action is beginning to close. In 2007, 76 percent of responding companies across all regions reported reduction targets with timelines, compared to 42 percent in the 2006 survey (Innovest 2007, 18). However, far fewer companies had begun to implement these programs, and Canada and the United States still lag behind Europe (no data are available for Mexico). This gap is particularly evident with respect to disclosure of GHG data and implementation of emission reduction programs with targets (see table 11.5). It should also be noted that 91 percent of companies in the London Stock Exchange "FTSE 100" index reported data, compared with only 54 percent of the U.S. Standard & Poor 500 companies and 34 percent of companies in the Canada 200. The North American response rate, however, improved significantly between CDP4 and CDP5. Table 11.5 summarizes responses by region.

The Investor Network on Climate Risk (INCR) is a smaller U.S.-based initiative of Ceres with about fifty signatories, representing approximately \$1.75 trillion under management, including state treasurers and controllers, public pension funds, asset management firms, and venture capital funds. Some notable examples include the California Public Employees' Retirement System (CalPERS), the Pennsylvania State Treasurer, and Domini Social Investments LLC. As with the CDP, INCR encourages financial analysts, ratings agencies, and investment banks to address climate risks and opportunities. The INCR goes further, however, and secures commitments from the signatory investors. At the February 2008 summit, INCR launched an action plan with a goal of deploying \$10 billion in additional investment in clean technologies over the next two years, and to aim for a 20 percent reduction over a three-year period in energy used in core real estate investment portfolios (INCR 2008).

The effort to enlist investors in the institutionalization of carbon accounting and management represents a sophisticated strategy on the part of environmental

**Table 11.5**  
Carbon accounting, reporting, and trading

	Total responses	Firms see business risks	Firms see business opportunities	Disclosed GHG data	Senior management responsibility for climate change	Considered emissions trading opportunities	Implemented emission reduction programs with targets
Canada 200	86	85%	86%	66%	53%	27%	24%
S&P 500	269	81%	69%	65%	50%	36%	29%
FTSE 100	91	98%	82%	83%	53%	38%	41%
German 200	104	77%	80%	67%	38%	20%	35%
France 120	67	88%	84%	72%	34%	31%	43%

Source: Innovest 2007, 28.

groups. Outside the coal sector, however, it is difficult to gauge its success. Investors have been quick to sign up when it imposes no commitments, but more reluctant when they are called to play a more active role. The value of carbon reporting to investors is unclear; they certainly do not appear to be clamoring for this information. As with the Global Reporting Initiative, a broader program also launched by Ceres with a parallel logic to assess corporate social and environmental performance, carbon disclosure generates volumes of detailed information in a form that is difficult to compare, interpret, aggregate, and analyze (Brown, deJong, and Lessidrenska 2007).

Carbon accounting for purposes of emissions trading is a much more narrow project that does little to indicate the potential financial impact of climate risks. Carbon accounting is an exercise in commensuration, defined by Levin and Espeland (2002, 121) as “the transformation of qualitative relations into quantities on a common metric”; just as financial accounts reduce a firm’s myriad activities to monetary terms, carbon accounting attempts to render complex organizational operations involving multiple gases and impacts in terms of a common, tradable currency. This commoditization of carbon is a political project, requiring a legal and bureaucratic infrastructure to define and measure carbon units, allocate and adjudicate property rights, and impose conditions for the transfer of credits across systems and jurisdictions.

The politics of carbon commensuration provide a degree of flexibility in reporting and exempt entirely certain regions and sectors. For example, emissions from military activities and international air travel and shipping are not counted under the Kyoto Protocol mechanisms. Moreover, the politics of carbon trading can produce systems with low prices, high transaction costs, and large-scale import of credits from uncapped countries and unverified sources, as with the Clean Development Mechanism and various retail carbon offset schemes (Haar and Haar 2006; Michaelowa and Jotzo 2005). These credits frequently do not even necessarily generate absolute GHG reductions, as they originate in projects that are compared to hypothetical “business as usual” cases of growing GHG emissions (Bumpus and Liverman 2008). Perversely, the value generated by these credits can also provide economic incentives for projects with net GHG emission increases that would not otherwise have been undertaken (Bradsher 2006).

### **Business Political Action**

North American business generally has moved away from aggressive opposition to GHG controls toward a more accommodating position that acknowledges climate change as a serious issue and expresses a willingness to engage in a variety of carbon management measures. Nevertheless, there has been a resurgence of opposition to



carbon regulation, particularly at the state level in the United States (Rabe, this volume). Some companies are simultaneously members of multiple organizations and initiatives with apparently conflicting agendas. About half of the organizations participating in the U.S. Department of Energy's Climate VISION, for example, are also members of CARE, which strongly supports coal power and opposes any emissions caps. This picture reflects the complex politics of the emerging climate compromise around a weak and flexible regime.

While the Business Council for Sustainable Energy serves as an industry association for the fledgling clean energy industry, the Pew Center has developed a more broad-based coalition of major firms around a more proactive position. The Pew Center helped launch the U.S. Climate Action Partnership (USCAP) in 2007 as a coalition of major businesses and environmental organizations advocating a national U.S. cap-and-trade system (rather than a patchwork of state and regional rules). They support mandatory limits but with modest reductions, credit for preregulatory action, and carbon price limits. Though USCAP calls for substantial long-term cuts in GHG emissions, it only calls for stabilization at 90 to 100 percent of current levels within ten years of policy enactment. The INCR has also joined the call for a mandatory national U.S. policy, with more drastic long-term cuts of 60 to 90 percent below 1990 levels by 2050.

Pockets of corporate resistance to U.S. emission controls remain. These include industry-funded groups such as the Coalition for Affordable and Reliable Energy, the American Council for Capital Formation, and the Center for Energy and Economic Development. The model legislation advocated by the American Legislative Exchange Council (Greenblatt 2003) and U.S. state ballot initiatives have attempted to limit state enactment of more aggressive climate change policy (Rabe and Mundo 2007). As in the 1990s, these organizations typically mount a multipronged attack: casting doubt on climate science, highlighting costs of emission limits, and opposing specific legislation.

The Competitive Enterprise Institute funded a series of advertisements in 2006 featuring the line: "Carbon dioxide: some call it pollution, we call it life" (Zabaranko 2006). Shortly after the release of the fourth assessment report of the Intergovernmental Panel on Climate Change in February 2007, the American Enterprise Institute offered a \$10,000 incentive to scientists and economists to write papers challenging the IPCC findings. The American Enterprise Institute continues to receive significant funding for its climate change lobbying from ExxonMobil and many other companies in the energy sector.

Business organizations have mobilized to oppose local and regional initiatives, particularly those that target particular sectors. The Alliance of Automobile Manufacturers, which includes U.S.CAP members General Motors and Ford as well as

foreign companies with U.S. operations like Toyota, is vigorously contesting efforts by California and sixteen other states to exert direct regulatory control over vehicular carbon emissions (Hakim 2005). This industry pressure was widely seen as an important factor behind the EPA's ruling in December 2007 that California lacked authority to regulate vehicular carbon emissions (Broder and Barringer 2007). In April 2008, a coalition of states, cities, and environmental groups sued the EPA in a Federal Appeals Court in an attempt to force the agency to regulate GHG emissions from new cars and trucks. The suit built on a Supreme Court ruling in 2007 that the Clean Air Act gave the EPA the power and duty to regulate these emissions (Barringer 2008). Meanwhile, industry lobbyists are increasing their efforts to thwart these state-level initiatives (Stoffer 2008).

Corporate lobbying by the Associated Industries of Massachusetts was also implicated in former Governor Mitt Romney's decision to withdraw Massachusetts from RGGI in early 2006 (Selin and VanDeveer, this volume). The Associated Industries of Massachusetts, moreover, condemned Governor Romney's successor, Deval Patrick, for rejoining RGGI in 2007. It is evident that while North American business is slowly moving toward a "carbon compromise" based on a flexible trading system, it has not abandoned more aggressive lobbying and litigating when core interests are perceived to be at stake.

### **Concluding Remarks**

While press releases and press coverage of private sector GHG reduction policies are increasingly common, overall GHG emissions continue to increase across North America. The coexistence of a beehive of corporate activity on climate change with few tangible outcomes presents an intriguing paradox. It might simply be too early to evaluate the impact of corporate efforts; some investments in innovation are unlikely to yield short-term gains, and emission reduction programs require the development of an institutional infrastructure for carbon management and trading. Nevertheless, this review suggests that business responses, especially in North America, are uneven and rather ineffective, at least in relation to the scale of action needed.

Outside the energy sector, corporate responses tend to be directed toward reputation management, organizational changes, and peripheral emission reduction programs rather than fundamental changes to business models, products, and technologies. Climate change is still seen as a corporate social responsibility concern rather than a core strategic challenge. These corporate responses can be understood in the context of a global GHG regime that is still fragmented, carries weak price signals, and is still largely voluntary outside Europe. This GHG regime is simply

not yet up to the task of a radical restructuring of economic activity that could deliver emission reductions of 60 percent by 2050, as contemplated by the United Kingdom. Thus GHG emissions are caught on a treadmill; incremental improvements in efficiency and the growth of renewable energy are more than offset by economic growth, particularly in India and China.

Even the actions of climate leaders are somewhat limited and tentative. The operating GHG emission reductions achieved by BP and Shell, for example, are a tiny fraction of the emissions produced by the use of their products (The Climate Group 2005). The Alternative Energy Division of BP invests approximately \$800 million a year, but this includes natural gas along with solar, wind, and hydrogen. This figure is still less than 4 percent of 2007 net profits and less than 0.3 percent of 2007 sales revenues. The Ecomagination campaign of GE amounts to seventeen products with sales of \$10 billion within a diversified \$150 billion revenue company, and R&D commitments of about 10 percent of the \$14 billion GE invests in development. The products other than wind turbines mostly comprise incremental improvements to efficiency and production processes for existing products, as would be expected to occur in normal technological development.

While North American companies increasingly realize that climate change is a long-term issue to which they will need to develop market and technological responses, in the short term they face only modest political and economic incentives for action. The reliance on voluntary measures reflects a wider trend in environmental governance toward various forms of industry self-regulation (Cashore, Auld, and Newsom 2004). Ironically, it is largely the resistance of fossil-fuel-dependent countries and industries to more stringent regulation that has induced the fragmentation and flexibility of the current governance system (Levy and Egan 2003). North American efforts on climate governance are clearly gathering pace, but there is not yet a firm regulatory or economic incentive for firms to adopt radical changes in their strategies. This uncertainty presents an obstacle for corporate planning.

Furthermore, RGGI illustrates some of the problems of emerging efforts on carbon trading in North America (Selin and VanDeveer, this volume). The initiative only covers the power sector in its initial phase and has modest emission reduction goals. Initially RGGI includes a “safety valve” to allow for the import of relatively cheap external credits should the price of carbon exceed \$8 a ton, effectively setting a price cap that is insufficient to drive substantial efficiency measures or a switch away from fossil fuels (Fischer and Newell 2003; Neuhoff 2005). Advocates for RGGI argue that once the trading infrastructure is in place, the cap can be ratcheted down when a political window of opportunity arises. It is unclear, however, how binding a cap will prove to be. Moreover, RGGI covers only a very small part of North America. Overall, proposed cap-and-trade systems are stimulating

considerable corporate activities in North America, preparing the organizational infrastructure for emissions trading, but carbon prices are likely to be too low to induce fundamental market and technological changes.

In the absence of a significant price signal or other regulatory action, the basic economic and political forces that structure energy markets ensure the continued growth of fossil fuels for the foreseeable future. Coal remains the cheapest source of fuel for power generation, even with a modest carbon price in the range of \$10–30. The oil industry maintains sufficient political influence to secure subsidies and favorable tax treatment. Supply limitations are beginning to constrain oil production, but at higher prices, vast reserves of oil shale and deeper ocean sources become viable (Stoett, this volume). Oil majors are also well diversified into natural gas, the demand for which is booming. Biofuels such as ethanol from corn can slowly be incorporated into existing infrastructure and business models, but they will supplement rather than substitute for oil as a liquid fuel.

North American companies appear to be hedging their bets by undertaking substantial organizational preparations and modest investments in new products and technologies, while acting to preserve the value of their technological and market assets in the medium term. Increasingly, business is recognizing the inevitability of carbon regulation, and moving to accept emissions trading as the heart of the emerging consensus around market-based instruments. Simultaneously, business is striving to shape this system so that it does not unduly disrupt existing markets. With state and regional policy initiatives threatening to impose more immediate and stringent caps on emissions, business is reverting to its oppositional stance of the 1990s (Levy and Newell 2005). A dramatic environmental “shock” or an unlikely assertion of political leadership might well be required to provide the necessary impetus for more radical change.

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