CHAPTER - 4
Chapter 4

Kyoto Protocol: Responses Priorities and Strategies

The potential impacts of climate change are the subject of many studies and investigations.\(^1\) Studies generally agree that, for better or worse, several critical sectors of the U.S. economy and other aspects of human welfare will be affected by climate change. A critical component of understanding how societal systems will be affected by climate change is understanding as to how these systems will or can adapt to the changes. Adaptation to social and environmental change is a fundamental human trait. Humans have always been able to adapt to environmental changes. Some of the physical features that distinguish fully modern humans from their ancestors were evolutionary adaptations to climatic changes occurring in eastern Africa during the Miocene global cooling.\(^2\) For example, as grasslands emerged out of closed canopy forests, natural selection favored species that could walk on two legs, a stance better adapted to this new open ground. The larger brain sizes of fully modern humans subsequently terminated further physiological evolution in favor of behavioral adaptations to environmental change. Humans out-thought environmental challenges rather than physically changing. Adaptation most likely began by migration to places of new opportunity and modification of diet to accommodate a changing food endowment. Adaptation to the climate changes that lie ahead could be one of the next great challenges to human ingenuity.

Adaptation actions and strategies present a complementary approach to those of greenhouse gas mitigation. Efforts that limit or reduce climate-driving forces (i.e., mitigation or reduction of greenhouse gas emissions) tend to reduce the degree and likelihood that significantly adverse conditions will result. Actions that can reduce this likelihood are thus reasonable and prudent, and to a large measure have been the primary focus of public attention and policy efforts on climate change. However, recognition that


the climate system has a great deal of inertia is increasing, and that mitigation efforts alone are insufficient to protect the Earth from some degree of climate change. Even if extreme measures could be taken instantly to curtail global emissions, the momentum of the Earth's climate is such that additional warming would still happen.

**Adaptation as a Policy Priority**

Although mitigation and adaptation measures must both be pursued to effectively address climate change, negotiations under the UNFCCC have tended to focus primarily on efforts to reduce greenhouse gas (GHG) emissions. Sensitivity to the issue of adaptation has grown over the last five years, largely in response to the IPCC's TAR. The TAR confirmed that we are locked into a pattern of change, and some adaptation is inevitable. Mitigation remains a priority for the international community, since the degree of adaptation required is a function of a rise in global temperatures spurred by increased concentrations of GHGs in the Earth's atmosphere and there are limits to the capacity of systems to adapt to change. However, adaptation has finally emerged as a legitimate — and in some cases urgent — policy priority, prompting action within and outside of the climate negotiations.

Within the UNFCCC process, the profile of adaptation noticeably increased at COP-7 with the establishment of the three “Marrakech Funds” — the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF), and the Adaptation Fund (AF). Attention to adaptation was further spurred at COP-8 with the Delhi Declaration, which reaffirmed economic and social development and poverty eradication as the first and overriding priorities of developing countries. Most recently, COP-10 produced the “Buenos Aires Programme of Work on Adaptation and Response Measures.”

---

3Decision 1/CP.10 in FCCC/CP/2004/10/Add.1, builds upon earlier work on adaptation to the adverse impacts of climate change undertaken by the Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technical Advice (SBSTA). It also initiates a process for the development of a new five-year structured work program within SBSTA on adaptation to the adverse effects of climate change that will address issues of importance to all Parties. The decision also includes a separate series of activities to address the economic impacts of “response measures” undertaken by Annex I Parties.
Outside the climate negotiations, there has been a veritable cascade of research and policy activity on adaptation. Apart from on-going academic investigations into the characteristics, indicators and measurability of adaptation, the issue is being noticed by a variety of agencies. Initiatives such as the United Kingdom's Climate Impacts Program, Canada's Climate Change Impacts and Adaptation Program and the Caribbean Community Climate Change Centre have been established to continually increase national and regional understanding of adaptation concerns. Donor agencies have started to realize that their activities can both be affected by climate change impacts and influence capacities to cope with the impacts. The 2003 report of members of the Vulnerability and Adaptation Research Group (VARG), "Poverty and Climate Change", makes the case for integrating climate change concerns into development programming. At the multilateral level, the Convention on Biological Diversity (CBD) is examining the potential impacts of climate change on biodiversity and ecosystems, and identifying opportunities for adapting to climate change while enhancing conservation of biodiversity.

Several environmental, conservation, development and humanitarian institutions have also established work programs on climate change adaptation. Conservation organizations such as The World Conservation Union and the World Wildlife Fund are highlighting the role of ecosystem management and restoration activities in building the adaptive capacity of vulnerable communities. International and local non-governmental development organizations (NGDOs) are similarly emphasizing the contribution of community development activities, such as micro-finance, micro-insurance, income diversification, and education and training programs in reducing vulnerability to climate stress. Humanitarian organizations are using their hard-won expertise in disaster risk reduction and vulnerability and capacity assessments to inform emerging adaptation approaches, such as through the Red Cross/Red Crescent Climate Centre.

Integration of Adaptation into Policy Processes

The global community has recently begun to develop and implement strategies and approaches for adapting to the on-going process of climate change. Assessments of vulnerability to climate change have been completed and priority areas and options for enhancing adaptive capacity have been identified. However, this knowledge has thus far rarely led to the design of policies, programs or projects that bear these findings in mind in either developed or developing countries. For example, current documents that guide development strategies in developing countries, such as national development plans and PRSPs pay negligible attention to climate change. It is increasingly recognized that to effectively support adaptation to climate change and minimize the risks associated with predicted impacts there is a great need to better integrate adaptation considerations into the center of decision-making and policy formation.

Accomplishing this objective requires an understanding of current and future climate risks. This understanding is then used to develop new measures or adjustments to policies, programs and projects so that risks are minimized and adaptive capacity is enhanced. This process can be referred to as ‘climate proofing’: the development of actions to protect infrastructure, systems and processes against climate impacts. Embedding climate change adaptation into sector policies and programs greatly expands the range of opportunities for reducing vulnerability to the impacts of climate change and builds into the system consideration of climate variability today as well as capacity to address changes in an uncertain future. Integration also enables these impacts to be

---

5 European Community, "Adaptation and Sustainable Development," Supporting material for the presentation by Finland on behalf of the European Community and its Member States at the Seminar of Government Experts, Bonn, Germany, 16-17 May 2005.
7 S. A. Rahman Huq, M. Konate, Y. Sokona and H. Reid, "Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDC)," (London: IIED, 2003).
addressed in a more economically efficient manner. "Policy integration is perhaps the greatest contribution that governments can make towards providing climate protection and it is also potentially the least economically costly."  

As has been expressed by many academics, policy makers and stakeholders, it has been widely recognized that leadership plays a vital role in tackling climate change internationally. If we would at all realize "stabilization of greenhouse gases at a level that would prevent dangerous anthropogenic interference with the climate system" strong leadership would be indispensable that would guide and direct the rest of the world towards materializing such a goal. In a situation of multilateral negotiation, the more universal the character of the issue is, and the greater the number of the participating states is, the more necessary the effective leadership is in order to making the negotiation to move forward toward an agreement. The presence of leadership is a "necessary condition" for success in reaching agreement. In other words, as Lindberg and Scheingold argued, "leadership is the very essence of a capacity for collective action" in multilateral negotiation. Talking about general situation at the multilateral negotiation, Underdal argues that "the more complex the negotiation setting (that is, the larger the number of the actors and the number and "intricacy" of issues), the more likely that some actors will emerge as leaders and others as followers, and the more critical leadership becomes as a determinant of success." Currently, however, no distinctive and sustainable international leadership has yet been emerged that would provide a

---

9Organization for Economic Co-operation and Development, "Conclusions of the Chair...," op.cit.
breakthrough to the political stalemate. The goal is set and has reached a consensus in the form of the Art.2 of UNFCCC, but the interpretation as well as the ways how to achieve the goal varies from country to country. Accordingly, the situation where one actor "guides or directs the behavior of others" has not yet emerged in this issue area.\textsuperscript{16} The U.S. has performed rather "a process breaker" than leader in the climate negotiation process from the outset\textsuperscript{17}, and now the Bush administration in the U.S. has decided not to ratify the Kyoto Protocol and have officially given up providing leadership role in moving the existing global agreement forward. The EU and its member states, arguably the most ambitious party among Annex I countries which have primary responsibility to climate change, have shown many unilateral policy initiatives in the framework of the Kyoto Protocol. But, these initiatives, often internal to EU, have not become solid external leadership that would lead most, if not all of the responsible countries (including the US) towards the goal set up by the UNFCCC. Japan, which is situated between the US and the EU in many political terms and which has a good record of improving energy efficiency, has been rather a follower than a leader in multilateral negotiation settings, as in many other diplomatic issue areas. Leadership is necessary to save the earth, but currently there is no strong leadership to be discerned.

\textbf{Shifting Strategies of the United States}

The United States as was compared to the EU from the outset of climate negotiations, far more skeptical towards taking on binding commitments, a skepticism that culminated in its withdrawal from the Kyoto Protocol in 2001.\textsuperscript{18} The economic aspects, more specifically the cost-effectiveness of climate policy, have been vital for both the choice of policy instrument and the degree of involvement in the international climate regime for the United States.\textsuperscript{19} For example, throughout the Kyoto Protocol negotiations, the United

\textsuperscript{16}A Underdal, "Leadership Theory.....," \textit{op. cit.}
States put much weight on the importance of flexibility and broad participation for keeping costs down. The Clinton administration's support for Kyoto was based strictly on the assumption that international agreement could be achieved on some of the most disputed and contentious issues in the Protocol: full emissions trading, joint implementation, and participation by developing countries.\(^{20}\)

In the Kyoto protocol negotiations, the United States together with other members in the Umbrella group pushed for maximum flexibility. It opposed the EU on important positions, such as exempting the developing countries from binding commitments and imposing a ceiling for the use of Kyoto mechanisms to ensure that substantial action was taken domestically. The US also opposed the G77/China, insisting that developing countries must take on commitments in the first Kyoto period (2008-2012).

Economists predicted that the costs for the United States would be relatively higher if emissions reductions in keeping with Kyoto were to be achieved in the short term. Furthermore, they calculated that the United States would bear the lion's share of global costs in a Kyoto-like regime.\(^{21}\) With a rapidly growing population combined with high rates of economic growth, U.S. emissions have been increasing steadily over the past couple of decades. In Kyoto, the United States committed to cut emissions by 7 percent from 1990-levels, but during the 1990s its GHG emissions has increased by 18 percent. Reversing this development would entail large costs.\(^{22}\) As a consequence of potentially

---


high costs for the United States, the United States Congress, with the support of influential stakeholder groups, consistently opposed the 'targets and timetables' approach that has been at the center of the Kyoto Protocol negotiation process.\(^{23}\) U.S. politicians have favored a longer term trajectory towards stabilizing concentrations of GHGs in the atmosphere, arguing that it would in a more benign way secure continuous economic growth at the same time as it would mitigate climate changes.

The policy instruments that have been applied in US climate policy have focused on tax incentives and energy efficiency as cost-effective solutions for achieving reductions for companies, and on the needs for intensified research to reduce scientific uncertainty.\(^{24}\) During the 1990s US firms in general were hostile to the idea of accepting policy regulations involving mitigation of GHG emissions. They adopted a confrontational strategy to avoid mandatory regulations, involving strong political pressure and outreach campaigns to influence the public opinion.\(^{25}\) The Global Climate Coalition and Exxon were major driving forces behind that strategy. Over the last few years, there has been a more visible split between US firms continuing to pursue a confrontational strategy, and others who have decided to accept voluntary action to reduce their emissions, including participating in emissions trading markets.\(^{26}\) For example, Environmental Defense has facilitated the Partnership for Climate Action, where US-based companies have announced a goal of reducing their aggregate emissions by 15 percent from 1990 levels by 2010 using market-based mechanisms.\(^{27}\) These firms show an interest in taking part in the growing markets applying Kyoto mechanisms and flexible policy solutions, such as


\(^{25}\)Guri Bang, "Emissions trading in Europe....," op. cit.


\(^{27}\)Atle Christen Christiansen, and Jørgen Wetterstad, "The EU as a Frontrunner on Greenhouse Gas Emissions Trading: How Did it Happen and Will the EU Succeed?" Climate Policy, 3 (1) 2003, pp. 3-18.
emissions trading, joint implementation projects, and the World Bank’s Prototype Carbon
Fund.

The NGO community has been divided over several issues, most notably the
contributions of sinks – that is land use, land-use change and forestry – and the Kyoto
mechanisms to the reduction of GHG emissions.\textsuperscript{28} This is largely due to different
philosophies regarding the role of the market in global environmental governance.
Environmental Defense has promoted market-based mechanisms and sinks as means to
curb human-induced emissions. The World Wildlife Fund (WWF) and a few expert
NGOs, in particular Center for International Environmental Law (CIEL) and the
Foundation for International Environmental Law and Development (FIELD), also had
influence in the United Stated in the design of an effective and novel Kyoto compliance
system. These organizations seem to have had some success with the insider strategy,
framing issues in a creative and constructive way and providing expert advice to
negotiators, particularly in the early phases of negotiations on new topics.\textsuperscript{29}

Considering the complexity of the climate issue, it is perhaps not surprising that a non­
confrontational insider strategy seems to have been more successful than traditional
activism in influencing the international climate negotiations and domestic policy. In the
US, however, this was before the election of George W. Bush to the US Presidency
immediately following the suspension of COP-6 at The Hague. As a result of the change
of the US administration and the statement by President Bush that the US would not
become a party to the Kyoto Protocol, environmental NGOs have almost given up on
promoting the treaty in the US. Although European NGOs have been able to influence
both international and domestic climate policy, US-based NGOs have focused on
international talks, business and consumers to compensate for lack of access to their
home government.\textsuperscript{30}

\textsuperscript{28}A. Tjemshaugen, "United States Participation in Future Climate Agreements: An Assessment," CICERO
Policy Note no. 1, (Oslo: CICERO, 2005).
\textsuperscript{29}Lars H. Gulbrandsen, and Steinar Andresen, "NGO Influence in the Implementation of the Kyoto
54-75.
\textsuperscript{30}Ibid.
Domestically in the United States, a much stronger public demand and pressure on policy outcome has come from parts of the industry lobby. Representatives of powerful corporations that stand to be adversely affected by mitigation policies, in particular large energy corporations in the oil, gas, and coal industries have continued to exercise substantial clout and effectively work against any kind of commitments. Multinational oil companies have different strategies for approaching climate change, but common grounds may be found in the link between international institutions and major multinational companies at either side of the Atlantic. The Kyoto Protocol represents a potent political force that has affected, and will most likely continue to affect, US multinationals with significant activities in Europe. While the Kyoto Protocol restricts access to participation in the Kyoto mechanisms to members of the Protocol, US multinationals operating in Europe and Japan will have to be in the same markets as companies that are operating on the inside of new ‘carbon markets’. How the positive and negative consequences add up for US multinationals remains to be seen. But many companies have had experience reducing emissions and have proved that such reductions can be achieved without negative economic consequences or increased loss of jobs. It is becoming clear that the reduction of greenhouse gas emissions is a problem that is not impossible to solve, and that the policy solutions are within reach. It is however, also clear that the business sector cannot be the main driving force behind a proactive development. Fair and credible governmental incentives are required to continue a process of innovation and change that can be a potent response to climate change.

In the absence of strong domestic political pressure within the United States in favor of a more proactive climate policy from the general public the Bush administration is unlikely to take steps towards a mandatory policy or indeed any policy to seriously limit greenhouse gas emissions. In US politics the Kyoto Protocol has become synonymous with a burdensome solution to the climate change problem, and has no chance of gaining

33 John Browne, "Beyond Kyoto", Foreign Affairs 83 (4) July/August 2004
34 Ibid.
support. However, the United States might become more open to reengaging in other forms of international climate policy cooperation.

Concerns about the stringency and costs of emissions caps, including risks of unexpectedly high costs, will certainly constrain the range of targets that may be adopted by the United States for the foreseeable future. Technology focus — and more specifically interest in development of fossil-based no- or low-emissions technologies — is likely to be a resilient trait in the U.S. approach to climate policy even regardless of electoral outcomes.\(^{35}\) The Bush administration sees fossil fuels as pivotal to America’s future energy supply, even in a future where control of carbon emissions is deemed necessary. Commitment to the continued use of coal is not limited to the current administration. Since the oil shocks of the seventies, Americans have worried about their dependence on ‘foreign oil’. Environmental concerns apart, domestic coal constitutes a cheap and reliable alternative. Coal interests also have considerable political clout, as illustrated by the leading role Senator Robert Byrd of coal-rich West Virginia has played in opposing the Kyoto Protocol.

The increased salience of energy security concerns in the post-September 11 political climate and the political realities stemming from the importance of coal in ‘swing states’ that tend to decide presidential elections and Congressional majorities have led moderate environmentalists, such as the Natural Resources Defense Council and leading Democrats, to embrace R&D spending for development of carbon sequestration and coal-derived hydrogen fuels.\(^{36}\) These observations suggest that research and development activities regarding fossil-based technologies are likely to remain an area of intense interest for U.S. authorities — also with respect to possible international cooperation. As a result of these domestic policy traits, the United States changed its negotiating strategy since COP-8 from insisting on developing country commitments to warning against it.\(^{37}\) The turnaround seems to be a result of outspoken opposition to the Kyoto Protocol, since

\(^{35}\)Guri Bang, “Emissions trading in Europe...,” \textit{op. cit.}

\(^{36}\)Nedra Pickler Lieberman, “End Foreign-Oil Dependence. More Efficient Cars, Coal Figure in his Plan,” \textit{The Seattle Times}, 8 May 2003.

it would affect the US economy negatively if emissions cuts are performed the way the Protocol determines. By supporting developing countries in not accepting commitments under such an international regime, and at the same time presenting new and alternative ways to reduce emissions that at the same time secure continued economic development, e.g. intensity targets or emissions relative to GDP, the US takes a stronger unilateral control over how it intends to handle the climate change issue. New coalitions are being built with both industrialized and developing countries, for instance with Australia, Italy, India, China, South Korea, and others, through bilateral agreements that focus on technology R&D, and carbon storage solutions rather than on short-term emissions reductions. In other words, the United States is engaging in new forms of multi- or bilateral cooperation, hence engaging in a new strategy for facing the challenges posed in the international climate change negotiations.

The U.S. Strategy

The United States is the world's largest oil junkie – consuming more than a quarter of the world's production. Its use of oil is forecast to rise by more than a third by 2020, adding 2.5 billion barrels to global annual demand. The US is the third largest oil producer in the world, but the days when it could meet its own demand have long gone. US net oil imports more than doubled between 1985 and 2000 as its production fell and consumption rose. More than half the oil used in the US is now imported. By 2020, this dependence could rise to two-thirds, if current policies are continued, as domestic production falls further and consumption continues to increase.

US President, George 'W' Bush and his deputy, Dick Cheney are both ex-oil men. Less than two weeks after gaining power, George Bush told Cheney to review US energy

---

41 Ibid. pp. 1-13
42 Ibid. p p. 1-13

135
policy. His report, published in May 2001, concluded that “energy security must be a priority of US trade and foreign policy.”

The US strategy rests on two key objectives – opening up oil suppliers to US investment and diversifying supply. Promoting investment by American energy firms in oil exporting countries, “will be a core element” in US “engagement with major foreign oil producers”. The Report recommends that the US supports action by Algeria, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates and Yemen to open their oil industries to foreign investment. No doubt, Iraq (which was America’s sixth biggest supplier in 2000) will also be subject to the same encouragement. But, US support for open access for its energy companies goes beyond the Middle East. The Report also recommends that America’s participation in the Asia-Pacific Economic Cooperation (APEC) forum, the Organization for Economic Cooperation and Development (OECD), the World Trade Organization (WTO) and the Free Trade Area of the Americas (FTAA) be directed to leveling the playing field for US companies overseas, and reducing barriers to trade and investment.

But it is the diversification of supply that features most strongly in the new US policy. Dick Cheney’s report says “US policies in each of these high-priority regions will focus on improving the investment climate and facilitating the flow of investment.” It contains detailed recommendations for each, major oil producing region.

The United States already enjoys a diversity of oil supply. Only one-fifth of its imports come from the Persian Gulf (mostly from Saudi Arabia and Iraq) and only two-fifths from OPEC countries. Besides Saudi Arabia and Iraq, its biggest suppliers are Mexico, Canada, Venezuela and Nigeria, but imports from the UK, Angola, Colombia, Norway and Gabon combined are almost as significant as any one of these.

---

43 Ibid. pp. xv and 8-4
44 Ibid. pp. 8-5
45 Ibid. pp.8-6
46 Ibid. pp. 8-7
Future diversification will be accelerated using new technology – enabling deep water exploration in the Atlantic Ocean ("stretching from off-shore Canada to the Caribbean, Brazil and West Africa") and Caspian Sea, and "heavy oil" reserves in Canada and Venezuela. Canada and Mexico, as its nearest neighbors, are obviously extremely important to US energy policy. The continued development of Canada's "heavy oil" could be a "pillar of sustained North American energy and economic security", the report says, while Mexico's oil reserves (25 per cent larger that those of the US) make it "a likely source of increased production over the next decade." But the US oil strategy goes well beyond its near neighbors. Venezuela is already extremely important to the US, but it now wants to agree a bi-lateral investment treaty to "provide investors from both the United States and Venezuela with incentives for increased investment." Brazil is also mentioned as a source of off-shore supply and the report recommends that the Summit of the Americas be used to "foster reliable supply sources of all fuels within the region." Africa, meanwhile, is "expected to be one of the fastest-growing sources of oil and gas for the American market." Nigeria is expected to more than double production over the next decade and Angola "is thought to have the potential to double its exports" over the same period. Other significant exports mentioned include Gabon and Congo-Brazzaville while US firms are already investing in a pipeline to carry 250,000 barrels of oil per day from inland Chad to the Cameroon coast. Again, the report recommends the Americans use their influence to "promote a more receptive environment for US oil and gas trade, investment and operations." The other region identified as having a high potential for growth is the Caspian Basin. Proven oil reserves in Azerbaijan and Kazakhstan are only slightly less than those in the

49 National Energy Policy Development Group, op cit., p. 8-7
50 Ibid. pp. 8-8 and 8-9
51 Ibid. pp. 8-10
52 Ibid. pp. 8-11
53 Ibid. pp. 8-7
54 Ibid. pp.8-10
55 Ibid. pp. 8-11
56 Ibid. pp. 8-11
US itself, and further discoveries are expected.\(^{57}\) Exports are expected to double by 2005 “as the United States works closely with private companies and countries in the region to development commercially viable export routes, such as the Baku-Tbilisi-Ceyhan (BTC) and Caspian Pipeline Consortium oil pipelines” and could “grow even more substantially in subsequent years.”\(^{58}\) Meanwhile, the US is lobbying to support its oil companies’ investments in Russia, which is the second largest oil exporter in the world.\(^{59}\)

**Oil: Power Game**

US energy policy is not only concerned with the supply of oil to Americans. “In a global energy marketplace, US energy and economic security are directly linked” to the energy supplies of its trading partners.\(^{60}\) Yet, the US forecasts worldwide consumption will rise by two per cent a year for the next two decades - with demand in developing countries rising particularly fast.\(^{61}\) It says this will “exert increasing pressure on oil availability.”\(^{62}\)

Significantly, the US strategy will minimize its dependence on Middle Eastern oil and provide infrastructure to link non-OPEC suppliers like Russia, Azerbaijan and Kazakhstan to European markets. Meanwhile developing countries in Asia “are expected to remain heavily dependent on Middle East imports.”\(^{63}\) Diversity of supply is clearly not for everyone.

**Oil and war**

Control of oil has long been seen as a key factor in global conflicts\(^{64}\). Increasing evidence is mounting that oil is also a source of conflict in its own right- particularly in developing countries. The Global Policy Forum in New York says:

“'Black gold’ may produce great wealth for some, but it often brings hardship and misery to the societies where it is found. Petroleum-dependent countries are plagued by corrupt..."
and authoritarian governments, lopsided and unsustainable economic development and violent conflict. Disaffected rebels challenge governments and both use oil and gas revenues to purchase arms. Environmental damage by oil extraction can give rise to protest movements, which are frequently met by violent repression. Trans-boundary disputes between states over oil reserves represent yet another link between oil and violence.65

Unsurprisingly, many of the countries listed by Dick Cheney's report as growing sources of US oil are listed by the Global Policy Forum as suffering from conflicts over oil, and already, evidence is mounting that oil issues are influencing US policy towards boundary disputes.

Oil and Climate Change

As if the conflict and corruption caused by oil exploration and development are not enough, the expansion of the industry also undermines attempts to combat climate change. The UN scientific body set up by the world's governments to advise it on climate change says that global average temperatures could rise by almost six degrees by the end of the century and sea levels by up to a meter, if emissions are not cut severely.66 Millions of people could lose their lives or their livelihoods as a result of flooding and more severe storms and droughts brought about by the temperature change.67 The poorest people in the poorest countries are likely to suffer most, because they are most dependent on agriculture and because their governments cannot protect them.68 Climate change may of itself cause conflict. Climate scientists predict changes in rainfall patterns will lead to increased water stress and reduced crop yields for millions of people. This could create millions of refugees and provoke conflict over water supplies.69

65http://www.globalpolicy.org/security/natres/oilindex.htm
68Ibid. p. 8
69http://www.mod.uk/issues/strategic_context/physical.htm
Modeling suggests emissions must fall by 80 per cent from 1990 levels by 2050 in order to keep average global temperature increases below two degrees Celsius—the level regarded as the maximum that could be experienced without intolerable economic and ecological damage. But for the most vulnerable communities, even the modest warming witnessed so far is putting lives at risk. Yet the US is assuming that world oil consumption grows by 2.1 per cent per year till 2020—an increase of 50 per cent over twenty years. The United States, which has ratified the United Nations Framework Convention on Climate Change, is committed to taking “precautionary measures to anticipate prevent or minimize the causes of climate change.” Yet, in 2001, George Bush rejected the Kyoto protocol, the only international treaty that would have cut the emissions causing the problem.

Major European and American oil companies have apparently chosen significantly different climate policy strategies. The European Company Shell supports the Kyoto Protocol; it has set an ambitious goal to reduce its own greenhouse gas (GHG) emissions and has invested in renewable energy. Conversely, the big American oil company Exxon Mobil opposes the Kyoto Protocol; it has not set any reduction targets for its own GHG emissions, nor does it have any immediate plans to invest in renewable energy. Exxon Mobil’s main message to Shell is: Good luck! Exxon Mobil has no faith in investments in renewable energy as a good business strategy in either the short or the long term.

---

70CAN International (Climate Action Network), “A Global Framework for Preventing Dangerous Climate Change,” Discussion Paper, (Milan: Italy, December 2003), p.11, CAN believes that the climate change regime needs three parallel, interlinked tracks operating on the same or a very similar timetable: the Kyoto track, a Greening (de-carbonization) track and an Adaptation track.

71National Energy Policy Development Group, op cit., 8-16

72United Nations “Framework Convention on Climate Change” Article 3(3), the parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptations, and compromise all economic sectors. Effects to address climate change may be carried out cooperatively by interested parties.

Together with BP Amoco, Exxon Mobil and Shell represent the three biggest private owned oil companies in the world and are now often referred to as “the three sisters.”

The oil industry earns its livelihood from oil, natural gas and coal—the main sources of emissions of greenhouse gases—and will be severely affected by regulatory measures to curb GHG emissions. With its multinational companies linked in worldwide operations, the oil industry constitutes a global industry operating in a global market. The business opportunities and challenges offered by the problem of climate change would thus apparently be the same for large oil companies. This would imply, however, that the climate strategy of each individual oil company also would be the same. The striking differences in the climate strategies of the large oil companies thus represent a puzzle.

**Comparison of the Climate Strategies of Exxon Mobil and the Shell Group**

Of the two companies, Exxon Mobil is the most reluctant in its acknowledgement of the problem of a prospective human-induced climate change. While Exxon Mobil acknowledges climate change as a “legitimate concern,” it does not accept that the problem is sufficiently scientifically substantiated to legitimize costly policy regulation. Exxon Mobil is also explicitly opposed to the Kyoto Protocol. Thus, Exxon Mobil does not have any targets for GHG emission control or reduction. On the contrary, its position is that if there indeed is a climate problem, it is a long-term problem for which there is plenty of time to develop appropriate responses. Exxon Mobil does not anticipate governmental regulation of its activities in this area. Its response to climate change is thus currently dominated by research activities on energy efficiency and de-carbonization of fuels. Currently, Exxon Mobil does not systematically report its GHG emissions. For the time being, therefore, Exxon Mobil responds to the climate problem on an “as needed”-basis, and its strategy can be characterized as reactive.

---


76 Ibid.
The Shell Group, on the other hand, acknowledges the climate problem as a real problem requiring concerted action by governments. In 1997, Group Managing Director Phil Watts maintained that the oil industry has “the privilege of being part of the solution” to this problem.77 Accordingly, Shell explicitly supports the Kyoto Protocol and has adopted an aim to reduce its GHG emissions by 10% from their 1990 levels by 2002. Shell also has approached the problem by improved energy efficiency and de-carbonization of fuels. In contrast to Exxon Mobil, however, Shell’s de-carbonization strategy has had implications for its business orientation: In 1997, Shell announced that the Group’s coal assets were under strategic review with the aim of divestment,78 and the sale was completed in July 2000. Moreover, in October 1997, the Shell Group established a fifth core business—Shell International Renewable—with an investment plan of US$ 0.5 billion over the next five-year period.79 Shell also has assigned a cost to CO2 emissions in its investment decisions for new major projects.80

In January 2000, Shell launched an internal GHG emissions trading system called the Shell Tradable Emission Permit System (STEPS). Businesses representing 30 percent of the GHG emissions from the Shell Group’s operations are now using tradable emission permits to help meet their self-imposed emissions targets.81 In this system, participants are rewarded for reducing their emissions wherever the cost is lower than the price of a

79I.H. Rowlands, “Beauty and the Beast? BP’s and Exxon’s….” op. cit., as noted by him, it is difficult to assess the cause-effect relationship between a proactive strategy to climate change and a strategy of de-carbonization of fuels and renewable—it is not at all obvious which is cause and which is effect. In this context, however, Shell itself has presented its divestment in coal as an integral part of its climate strategy. Also see, The Guardian, 19 November 1997. Available at http://www.globalpolicy.org/nance/alternat/carbon/ct11_19.htm; Shell, “Shell Annual Report 1997,” Available at http://www.shell.com/. With regard to its investment in renewable energy sources, Shell emphasizes the business opportunities in this area as its main motivation. Sustainable Solutions Support Sustainable Business. Speech, issued 26 May 1999. Available at http://shell.com/library/speech/0,1525,3893,00.html. While these events all took place in 1997, Shell’s shift in climate strategy was announced before its decision to divest its coal assets and invest in renewables.
GHG emission permit. In this way it provides incentives for environmental performance by direct reward.

Exxon Mobil does not have any reward system comparable to STEPS in the climate area. In contrast to Exxon Mobil, it may be argued that Shell's approach to climate change may have much more significant long-term implications for its organizational structure and business orientation and reflects a higher level of commitment. This brief comparison of the two companies indicates that there are significant differences in their approaches to the climate problem.

An Energy Future for Climate and the Economy

Today, carbon dioxide from fossil fuel combustion constitutes about half of the greenhouse gases being released into the atmosphere. It follows that a successful climate strategy must involve more than curtailing CO₂ releases from the burning of coal, oil, and natural gas. But it also follows that addressing CO₂ emissions from fossil fuels must be the bedrock of such a strategy.

Among the most widely accepted projections of future fossil fuel use are those provided by the International Energy Agency (IEA). Its report "World Energy Outlook 2004" provides perspective on what will happen in the absence of far-reaching new measures to move to a climate-friendly energy strategy. Its "reference scenario," a business-as-usual projection, has total world energy use climbing by 60 percent between 2002 and 2030. Reliance on coal increases by 51 percent, oil by 57 percent, natural gas by 89 percent. Carbon dioxide emissions thus climb by 62 percent by 2030. In such a business-as-usual future, achieving climate goals is not possible. Globally, CO₂ emissions can climb somewhat for the next two decades and still hold CO₂ concentration below 450 parts per million, but the emissions growth forecast in the IEA reference scenario is many times too high. The U.S. Energy Information Administration has developed a similar business-as-usual scenario for the United States, looking ahead to 2025. It has both coal use and

---

CO₂ emissions increasing in the United States by about 42 percent between 2002 and 2025. 83

Of course, we should be reducing our emissions during this period, not increasing them. Is the technology available to break sharply with this business-as-usual, carbon intensive future? Stephen Pacala and Robert Socolow addressed that issue in an important and insightful paper published in August 2004 in *Science.* 84 In their analysis, they note that fossil fuel use can continue at about its current (and already high) level between now and 2050 while still staying below 500 ppm CO₂ in the atmosphere. Assuming such a continuation of fossil fuel use at roughly current levels, they then identify fifteen currently available technologies that, in a variety of combinations, can eliminate the further buildup of atmospheric CO₂ that would occur in the business-as-usual approach. In other words, their answer to the question whether technology is available is an emphatic yes. Technologies are available to prevent increases in fossil fuel use and emissions.

Their fifteen technologies reflect six basic strategies:

- Energy efficiency and conservation through doubling the fuel efficiency of vehicles, reduced use of vehicles, high-efficiency building construction, and more efficient coal-fired power plants;
- Substituting natural gas for coal through substituting gas power plants for coal ones;
- Carbon dioxide capture and storage by capturing CO₂ at power plants, hydrogen plants, and synfuel plants and sequestering the CO₂ in subsurface geologic reservoirs;
- Nuclear fission with a new generation of safer nuclear power plants and far reaching international security arrangements governing uranium enrichment and plutonium recycling;
- Renewable electricity and fuels through the substitution of wind power, photovoltaic power, and biomass fuel for fossil energy; and

---

• Sequestration of carbon in forests and soils by reducing deforestation and increasing afforestation and conservation tillage.

Pacala and Socolow urge an intelligent mix of many of these approaches rather than excessive reliance on only a few.

One place to look for answers to these questions is the remarkable plan developed by the government of Prime Minister Tony Blair in the United Kingdom. As reflected in the government’s Energy White Paper, Our Energy Future—Creating a Low Carbon Economy, the Blair government is committed to a 60 percent reduction in U.K. carbon dioxide emissions by around 2050, has developed a plan of action to back it up, and estimates that the costs would be “very small—equivalent in 2050 to just a small fraction (0.5 to 2 percent) of the nation’s wealth, as measured by GDP, which by then will have tripled as compared to now.” The plan avoids setting quantitative targets for various energy sources but stresses renewable energy, natural gas, and energy efficiency gains. As for coal, it “will either play a smaller part than today in the energy mix or be linked to CO2 capture and storage.” The plan defers the question of nuclear power to a later decision “if needed to help meet the UK’s carbon aims.” Regarding renewables, the Energy White Paper notes that “by 2050, we are likely to need renewables .... to be contributing at least 30 percent to 40 percent of our electricity generation.”

In terms of policy instruments, the Energy White Paper places heavy reliance on the carbon emissions cap-and-trade scheme developed by the European Union; a national carbon tax; efficiency standards for new construction, appliances, and boilers; energy research and development; and various funding and incentive programs.

State and Local Action

States can lead efforts to mitigate global climate change through their authority over land use, transportation, utilities, taxation, and other policy areas affecting the environment.

Many states have successfully reduced GHG emissions without threatening their economy, and are providing solutions to climate change that offer a wide array of benefits.

States are taking a range of approaches, from comprehensive, cross-cutting programs to those focused more narrowly on energy, air pollution, agriculture, transportation, natural resources, education, or other areas. Some state programs are expressly designed to confront the challenge of global warming, while others are designed to achieve other policy goals, but have the additional effect of reducing GHG emissions. Some states are enacting new state laws and rules, while others are utilizing existing legal authorities and programs. Some tackle climate change through their environmental agencies; others are working through other agencies, such as agriculture and energy.

With the path forward blocked in Washington, states and localities across the country have moved in a remarkable way to fill the breach. The Pew Center on Global Climate Change reported in 2004 that twenty-eight states have developed or are developing action plans to reduce GHG emissions. Many of these, such as the programs in Massachusetts and Oregon, focus on reducing GHG emissions from power plants. Other states, such as Connecticut and New Jersey, have more ambitious legislation that seeks to reduce overall emissions in the state. For example, the plan in Connecticut aims to reduce GHG emissions to a level 10 percent below that of 1990 by 2020. Connecticut’s initiative is linked to a Regional Greenhouse Gas Initiative in the Northeast that will establish a ten-state cap-and-trade program for regulating carbon dioxide emissions from power plants. Numerous states have regulatory, building code, and financial incentive programs to encourage energy efficiency, but compared with state efforts to promote green energy, efficiency programs are lagging at the state level and need more attention.

http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm
The renewable energy efforts at the state level are indeed impressive. Seventeen states have mandated “renewable energy portfolio standards” requiring electric utilities to incorporate renewable energy. New York aims to have 25 percent of its power from renewables by 2013; California is planning on being 20 percent renewable by 2010. In June 2004, thirteen governors of western states agreed to have the equivalent of twenty large power plants (20,000 megawatts) from renewables by 2020.

California has taken the lead in regulating GHGs from vehicles. In September 2004, it announced plans to reduce GHG emissions from cars and light trucks by 34 percent by 2016; the target for large trucks and sport utility vehicles (SUVs) is 25 percent. Since seven states in the East typically follow California on these issues, the California plan could potentially affect about 30 percent of the national market for vehicles.

Although these initiatives create considerable indirect pressure on Washington to act, several states are also pressing for Environmental Protection Agency action directly. In 2004 twelve states filed suit in federal court to force the Bush administration to regulate GHGs as pollutants under the Clean Air Act. At the local level, the International Council for Local Environmental Initiatives reports that 151 U.S. cities were participating in its Cities for Climate Protection campaign in 2004. Minneapolis is a city leader, having reduced its GHG emissions by 15 percent between 1994 and 2004.

The United States government is currently pursuing a broad range of strategies to reduce emissions of greenhouse gases in the major greenhouse gas emitting sectors

**Electricity Sector**

Federal programs promote greenhouse gas reductions through the development of cleaner, more efficient technologies for electricity generation and transmission. For example, the Environmental Protection Agency/Department of Energy Combined Heat and Power Challenge program has the goal of doubling U.S. combined heat and power capacity by 2010 by providing technical assistance and addressing regulatory issues where possible.
The Federal government is also supporting renewable resources such as solar energy, wind power, geothermal energy, hydropower, bio-energy, and hydrogen. For example, the Department of Energy supports the development of a wide range of solar and renewable energy technology, seeking to improve their reliability, expand their applicability, and reduce their costs. These activities have been very successful in bringing down technology costs. The cost of producing photo-voltaic modules has decreased 50 percent since 1991, and the cost of wind power has decreased 85 percent since 1980. Commercial success has been achieved for both of these areas in certain applications.

**Transportation Sector**

Transportation accounts for about one-third of U.S. CO₂ emissions. Therefore, state transportation policies provide another opportunity to mitigate climate change. Many states have committed to state fleet purchases of alternative-fuel vehicles. In May 2002, the California Senate passed a bill to regulate CO₂ emissions from automobile exhaust. If signed into law, emissions standards would be adopted by 2006 and affect model years 2009 and later. California’s Zero Emission Vehicle (ZEV) Program provides grants of up to $9,000 per vehicle toward the purchase or lease of new zero emission vehicles. California placed 2,500 ZEVs in service during the program’s first year, avoiding approximately 3,700 metric tons of CO₂ emissions. Indiana encourages the building of alternative fueling sites through its Alternative Fuel Vehicle Infrastructure Grant Program, which provides grants of up to $30,000 on a competitive basis. New York’s Clean Fuel Bus Program has provided $25 million to purchase 523 clean-fuel buses. Each year, the buses eliminate nearly 4 million gallons of diesel fuel use and over 19,000 tons of CO₂. Kansas provides income tax credits for the purchase of alternative-fuel vehicles. Maryland provides a reduction in the state titling tax for new cars and light trucks of up to $2000 for electric vehicles and up to $1500 for hybrid-electric vehicles. Minnesota and Nebraska have implemented state vehicle fleet efficiency standards. Washington’s Commute Trip Reduction law requires employers to participate in a program to change

---

87 Ibid.
commuters’ travel choices and reduce single-occupant vehicle use. The Clean Air Campaign is a Georgia non-profit organization that works with state agencies to reduce traffic congestion and improve air quality. Through carpool programs, Washington Commute Trip Reduction employer commuting programs, and public education, the Campaign estimates that its projects will reduce automobile travel by 1.44 million light duty miles per day by summer 2003, avoiding approximately 240,000 tons of CO₂ emissions per year.

The U.S. is currently promoting the development of fuel-efficient motor vehicles and trucks, researching options for producing cleaner fuels, and implementing programs to reduce the number of vehicle miles traveled. For example, through the Partnership for a New Generation of Vehicles (PNGV) program, the research has directly led to the commercial introduction of new hybrid vehicles and soon hydrogen as well. Commercialization of such vehicles could cut fuel use and carbon emissions for individual vehicles significantly and could lay the foundation for large, long-term fuel and carbon benefits. If 10 percent of the on-road vehicle fleet utilized PNGV technologies, the aggregate emission reductions could be approximately 20 million metric tons of carbon equivalents per year. The program is being extended to sport utility vehicles and other light trucks which, because of their lower baseline fuel economies, have the potential for even greater overall fuel and carbon savings per vehicle.

Industry Sector
The U.S. government is implementing many partnership programs with industry to reduce emissions of CO₂ and other greenhouse gases, to promote source reduction and recycling, and to increase the use of combined heat and power. For example, current voluntary partnerships directed toward eliminating market barriers to the profitable collection and use of methane that otherwise would be released to the atmosphere are expected to hold methane emissions at or below 1990 levels through 2010. Since the launch of EPA’s Voluntary Aluminum Industrial Partnership in 1995, the program’s membership has grown to include 22 of the nation’s 23 aluminum smelters, representing 94 percent of U.S. production capacity. As of 2000, program partners cumulatively
achieved a 45 percent reduction in per-fluorocarbon (a high global warming potential gas) emissions from 1990 levels.\textsuperscript{88}

**Commercial and Residential Buildings Sector**

Partnership programs promote energy efficiency in the nation's commercial, residential, and government buildings (including schools) by offering technical assistance as well as the labeling of efficient products, efficient new homes, and efficient office buildings. As one example, the --EPA/DOE Energy Star program collaborates with a wide range of building owners and users retailers, real estate investors, small businesses, governments and schools. Each partner commits to improve the energy performance of its facilities and the most efficient buildings are awarded the Energy Star label. More than 16 percent of the U.S. commercial, public, and industrial building market is enrolled in Energy Star. Nationwide, Energy Star has eliminated the need for over 10,000 megawatts of peak generating capacity – equivalent to 20 large (50 MW) power plants.\textsuperscript{89}

**Agriculture and Forestry Sector**

The Federal government is conducting research into methods to reduce emissions of methane and nitrous oxide from agriculture, and is implementing conservation programs that have the benefit of sequestering carbon in soils and forests. For example, USDA's Conservation Reserve Program (CRP) has taken over 36 million acres of environmentally sensitive crop land out of production. CRP provides long-term environmental benefits, including the offset of up to 12 MMTCE each year.\textsuperscript{90}

**Waste Recycling and Management Sector**

Several states have developed programs that reduce, reuse, and recycle municipal waste. This reduces GHG emissions from the production of new materials and waste handling. New Jersey has a mandatory statewide recycling program through which the state

\textsuperscript{89} Ibid.
avoided 8.7 million tons of GHG emissions from 1990 through 1995. In 2000, Arkansas' Solid Waste Management and Recycling Grants Program distributed $2.5 million to community recycling programs across the state. In Washington, electric generating facilities powered by landfill gas and other renewable resources are eligible for exemption from state sales and use taxes.

Alabama’s waste management and recycling program promotes composting, waste reduction, and reuse. Indiana’s Recycling Market Development Program provides technical and financial assistance to manufacturers and businesses to help them reduce their waste and increase reuse and recycling. When the 38 projects that are part of the program are fully implemented, they will divert more than 1.45 million tons of recyclables from disposal and create 745 new jobs. The Missouri Department of Natural Resources Energy Loan Program provides financing for the Patton Ville High School Landfill Gas recovery project. This project captures methane from a 70-acre sanitary landfill and burns it to fuel the school’s boilers, significantly reducing methane emissions to the atmosphere, eliminating the need to burn natural gas, and avoiding over 2,000 tons of CO2 annually.91

Business Activity
A growing number of major companies based or operating in the United States are undertaking significant efforts to address climate change. These efforts include: setting GHG reduction targets; improving energy efficiency; increasing the use and production of renewable energy; improving waste management; investing in carbon sequestration; participating in emissions trading; and developing energy-saving products. Some companies also are speaking out about climate change and encouraging stronger government efforts to reduce emissions throughout the economy.

91 Climate Protection Partnerships Division, “The Power of Partnerships...,” op. cit.
Companies are acting in the absence of mandatory requirements for a number of reasons. A recent Pew Center report, “Corporate Greenhouse Gas Reduction Targets,” cited several motivations for adopting a voluntary target: Companies believe that over the long term, the world will have to deal with climate change, so their climate-friendly investments will pay off. They believe that by taking the initiative, they can help government craft climate change policies that work well for business. And they believe that emissions reduction efforts can drive innovation and improve their bottom line.

Through their efforts, these companies are demonstrating that GHG emissions can be reduced significantly and cost-effectively—with substantial ancillary benefits, including improved competitive positioning. The diversity of approaches they are taking also underscores the need for flexible policies that allow companies to find the most cost-effective path to emissions reductions.

Greenhouse Gas Reduction Targets
Companies have adopted several kinds of targets leading to GHG emissions reductions. Some targets focus directly on GHGs while others focus on energy use, purchases, or products. Some serve as absolute limits, while others are pegged to indicators such as production levels or revenues. The type of target a company chooses depends on its products and production methods, policy environment, and business models. Four general considerations influence a company’s choice of target type: the target’s effect on emissions reductions; the existence of uncontrollable factors relating to emissions or energy use; the opportunity for cost-effective emissions or energy reductions; and the potential impact on company growth.

Climate Policy under George W. Bush
The Global Climate Change Initiatives announced by President George W. Bush on February 14, 2002, commits the United States to “reduce the greenhouse gas intensity of the U.S. economy by 18 percent over the next ten years.”92 Critics have noted that this target amounts to little more than extending the trend in greenhouse gas intensity (emissions per dollar of GDP) reduction from the previous decade, and that it means

---

92a Analysis of President Bush's February 14th Climate Change Plan,” (February 2002), www.pewclimate.org/policy/response_bushpolicy.cfm

152
allowing actual emissions to rise substantially over the coming years. The implementation of the target depends on voluntary measures. In February 2002, the President challenged businesses to “make specific commitments to improving the greenhouse gas intensity of their operations and to reduce emissions.” This initiative has been followed up by a series of agreements and declarations from business associations representing major, energy-intensive industrial sectors, which promises to seek to reduce the emissions intensity of their operations. The quantified targets of most of these voluntary commitments are, however, even more modest than the overall national goal defined by the administration. This is hardly surprising. In the absence of a credible threat of mandatory controls in case of non-compliance, there are weak incentives for industry to effectively implement “voluntary” emissions reductions. The one area of climate policy where the Bush administration has introduced substantial new policies and funding is energy technology research, development and demonstration. The Bush administration has increased funding for research, development and demonstration of hydrogen as well as carbon capture and storage technologies. It has announced long-term projects and public-private partnerships including the Future Gen plant, which is expected to produce electricity and hydrogen from coal without CO2 emissions, the Freedom CAR project to develop hydrogen-powered cars, and the parallel Hydrogen Fuel Initiative.

During 2003 and 2004, three new multilateral agreements on climate technology cooperation saw the light of day: the Carbon Sequestration Leadership Forum (CSLF), the International Partnership for the Hydrogen Economy (IPHE), and the recently launched Methane to Markets Partnership (MMP) that will promote the collection of methane from landfills, coal mines and petroleum activity to use it as an energy source.

All three collaborations seem initially to have been U.S. initiatives. The U.S. Department of Energy hosts the secretariats of CSLF and IPHE. In the most recent initiative, MMP, the U.S. Environmental Protection Agency plays a leading role. All three agreements are nonbinding and do not impose financial or other commitments on the signatories. Objectives include the identification and facilitation of collaborative efforts.

In Congress, there is considerable support for legislation that would regulate U.S. greenhouse gas emissions, but no majority. The most prominent initiative is the Lieberman- McCain Climate Stewardship Act, which was introduced in the Senate and rejected by a 55-43 majority in October 2003. While most of the supporters were Democrats, a number of Democrats also defected and voted against the proposal, while some Republicans voted in favor, including co-sponsor John McCain. Senators from major coal-producing states were much more likely to have voted against the bill. This was the first time the Senate voted on legislation that would place binding constraints on greenhouse gas emissions.

The proposal would have capped total 2010 emissions at the 2000 level for the sectors covered by the legislation, and would have allowed trading of permits and credits. The sectors covered represent some 85 percent of total US GHG emissions. Similar legislation has been introduced in the House of Representatives, but commands considerably less support there. Both houses of Congress have to agree in order to pass a bill into law.

99 http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm
Meanwhile, the most important developments in U.S. climate policy are taking place at the state and regional levels. Several states have already passed legislation to control greenhouse emissions. For instance, Massachusetts and New Hampshire have introduced CO$_2$ limits for power plants. More and more states are also introducing renewable portfolio standard laws, which require electric utilities to sell a certain share of renewable energy. Most recently, such a law won the support of Colorado's voters in a ballot initiative on November 2, 2004. The important Regional Greenhouse Gas Initiative was first proposed by New York Governor George E. Pataki in 2003. Nine Northeastern states are currently working on a regional cap-and-trade system for power plants. They plan to present a program design proposal by April 2005. In parallel, the governors of the New England states are working with their counterparts, the premiers of the Eastern Canadian provinces, under a 2001 agreement that aims to reduce regional emissions to the 1990 level by 2010. Cooperation on emission registries and policies could potentially evolve into a cross-border trading system. Finally, California is introducing regulation that requires producers of cars and trucks to sell vehicles that meet far more stringent emissions standards. In September 2004, the California Air Resources Board approved rules which will require the companies to sell low missions vehicles from 2009. Compared to today, the rules are expected to reduce the average greenhouse gas emissions per kilometer from new vehicles by about 22 percent in 2012 and about 30 percent in 2016. The states of New York, Massachusetts, New Jersey, Vermont, Connecticut, Rhode Island and Maine, as well as the nation of Canada, are expected to consider adopting similar regulations. The rule is virtually certain to be challenged in the courts, and the outcome will most likely decide its fate. A key issue is whether these rules, which in practice will require reduced fuel consumption, are really fuel efficiency standards (which are a federal prerogative) or if they are properly in the realm of air pollution where California is allowed to make its own standards.

---

In the private sector, two important developments are the fragmentation of the earlier united business opposition against greenhouse gas regulations, and the emergence of voluntary targets and trading systems. The dismantling of the powerful anti-regulation lobby group Global Climate Coalition came about not only because of its success in achieving its goals under the Bush administration, but also because of changes in the positions of some companies. Several major companies in emissions-intensive sectors have partnered with the Pew Center on Global Climate Change and adopted voluntary emissions targets. The private Chicago Climate Exchange even offers trading in emissions reduction credits. These developments will not amount to a solution, but may help the proponents of regulation.

Climate change looms as one of the dominant social and economic policy issues of the next century. The forecast that global climate will occupy the political spotlight for such a long time is not hyperbole. The time scale over which human activity perturbs the climate is measured in centuries. Climate change has ramifications extending beyond purely environmental concerns, including deep questions of economic growth, sustainability, intergenerational equity, and national security. The Framework Convention on Climate Change (FCCC) drawn up in Rio de Janeiro in 1992 was the first step in formulating a global response to the climate problem, the Third Conference of the Parties which took place in Kyoto in December 1997 marks another milestone in the effort of the world’s nations to coordinate their policies.

A great deal of controversy surrounds the issue of climate change. Some participants in the debate say that climate change is one of the greatest threats facing humankind, one that calls for immediate and strong controls on greenhouse gases (GHGs), particularly carbon dioxide emissions from fossil fuel burning and releases of other gases such as methane. Others say that the risks are weakly documented scientifically, that adaptation to a changing climate will substantially reduce human vulnerability, and that consequently little action is warranted other than further study and development of future technological options. The same kinds of divides arise in discussing policy options to
reduce greenhouse gas emissions, with some predicting net benefits to the economy and others fearing the loss of several percentage points of national income.

These disagreements surface in the ongoing efforts of the international community to negotiate goals and actions under the 1992 United Nations Framework Convention on Climate Change (UNFCCC). They reflect both different interpretations of the evidence and different interests.