

chapter four

The Impact of the Kyoto Protocol on U.S. Business

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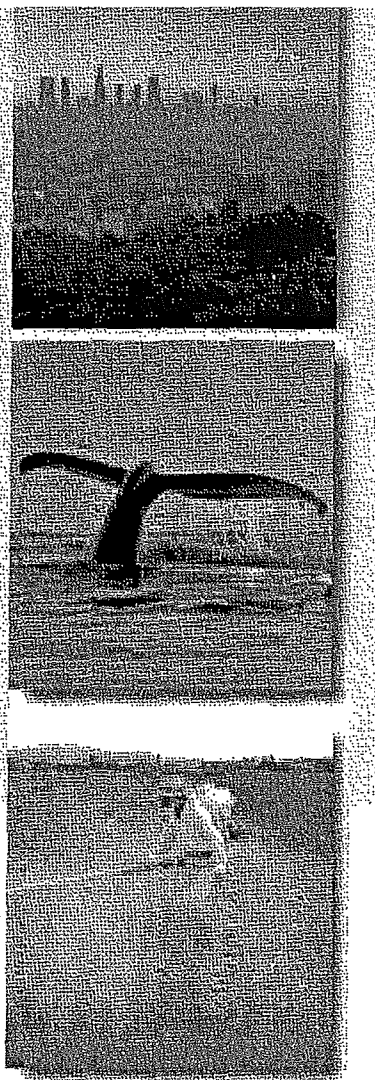
I. Introduction

This chapter assesses the impacts of the Kyoto Protocol to the United Nations Framework on Climate Change (UNFCCC)¹ on U.S. business. Although the United States was very involved in the negotiation of the Kyoto Protocol, and, as a result, the Protocol reflects many U.S. ideas, President Bush decided not to ratify the Protocol.² Even if the President had been in favor of ratification, it is unlikely that the U.S. Congress would have given its consent.³

From the standpoint of international law, the Kyoto Protocol will not affect U.S. business directly, but rather through the implementing laws and regulations that parties to the Protocol adopt. Because most parties have not yet fully drafted these laws and regulations, it is difficult to assess the actual impacts of the Protocol on U.S. business. The most evolved national system of implementation to date is the European Union's (EU) Emissions Trading Scheme, which is discussed in detail below. Two other schemes being developed in Canada and Japan are described in less detail, mainly to provide examples of other approaches. But because the details of these systems remain to be developed, the chapter draws its specific examples from the EU system.

Because the Kyoto Protocol and its implementing laws are not fully formed, an inquiry into its effect on U.S. business is a highly speculative enterprise. We will never

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know what would have happened in the absence of the Kyoto Protocol. Given the scientific consensus that now exists about global warming, however, it is likely that the world would eventually have responded, with or without a Kyoto Protocol.

A second problem is that we know that many businesses have already taken actions that have had, or will have, the effect of lowering their greenhouse gas (GHG) emissions. Some have made their production processes more efficient, saving energy in the process. Others have reduced their carbon emissions by switching fuels and energy sources or invested in emissions offsets through such activities as planting or restoring forests. We cannot always say precisely what motivated these changes. Although many companies have said their actions were a response to climate change,⁴ they may have taken many of the same actions for other reasons, such as reducing fuel costs.

Even more difficult is predicting what businesses will do in the future. Many businesses have already announced actions they intend to take, but they may be responding to state regulations that in many cases are already planned, or to demands from shareholders or consumers. These regulations and demands may themselves be related to the existence of the Kyoto Protocol, but it is difficult to say precisely what the link is, even if we assume one exists.

A third problem is that it is difficult to say what the Kyoto Protocol will look like in the future (or whether there will even be a Kyoto Protocol in the future). In the past few years, several international meetings have been held to discuss future rules of the Kyoto Protocol, particularly those that will apply in the second commitment period, from 2013 to 2017.⁵ During this period other agreements have also been discussed or adopted. Some experts view these as potential alternatives to the Kyoto Protocol.⁶

The point should be clear: we know the climate is changing and we know businesses are taking actions that should result in fewer GHG emissions. As to the cause-and-effect relationship between these two observations, we can only speculate.⁷

The Kyoto Protocol is an experiment. Nothing really similar predates it. From an environmental perspective, it has elements in common with the Montreal Protocol, the international treaty to phase out ozone-depleting substances.⁸ While the Montreal Protocol is widely considered to have been a success, many doubts have been raised about the Kyoto Protocol, which is far more complex. Uncertainty about how Kyoto parties will implement the Protocol, the absence of the United States—the world's largest GHG emitter—from the Protocol regime, the limited role assigned to developing countries, and the provision of excess emissions allowances to Russia and other countries "with economies in transition" all increase uncertainty about how effective it will be, or even what it will look like in the future.

For many questions, the best we can do as lawyers is to provide educated guesses. Economic analysis would be helpful but is beyond the scope of this chapter. Many

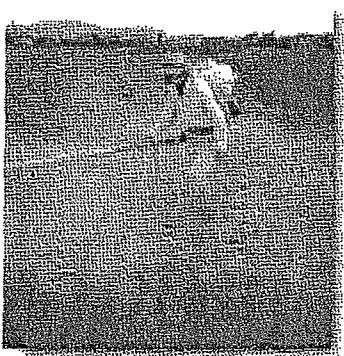
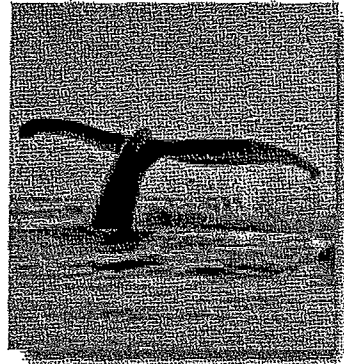
aspects of the Protocol could affect the competitive balance between parties, non-parties, and parties with limited commitments. With so many novel and untested elements in play, even economists would find the predictive capabilities of their tools stretched thin.

Finally, it should be noted that although the present U.S. Administration has decided not to ratify the Protocol, much of its design reflects U.S. ideas and experience. Emissions trading, extended (five-year) commitment periods, and the “basket of gases” approach⁹ were all U.S. ideas. As the United States begins to take climate change more seriously, which is something that has already begun to happen at the state and local levels, these ideas may be integrated into U.S. regulatory systems. On the other hand, thinking in the United States and elsewhere about how best to regulate GHG emissions has evolved, and the international and domestic regimes that finally emerge to solve the problem of climate change may bear little resemblance to the ones we think we know today.

The Bush Administration rejected the Kyoto Protocol on the grounds that it would harm the U.S. economy and would be ineffective in any event because large-emitting developing countries, such as China, India, and Brazil, were also refusing to take on commitments to reduce emissions.¹⁰ A critical, albeit unanswerable, question is whether the United States might ratify the Kyoto Protocol sometime in the future and, if so, whether it would leave the structure largely undisturbed or, more likely, seek to rewrite it to reflect more recent U.S. thinking.

Several sources provide insight into current thinking in the United States about the structure of either a domestic or international emissions control system. (This issue is addressed in Chapter 3 of this book.) The Administration has adopted a voluntary approach for major U.S. emitters based on improving the nation’s GHG intensity, *i.e.*, its emissions per dollar of GDP. The goal—to reduce GHG intensity 18% by 2010—is quite modest (some say it is essentially business-as-usual). The Administration is also investing substantial resources in additional scientific research, development and deployment of new technologies, and bilateral agreements with major developing countries.¹¹

The U.S. Congress has introduced several bills aimed at addressing global warming over the past few years. These include the Climate Stewardship Act introduced in both the Senate and the House and the Keep America Competitive Global Warming Policy Act.¹² None of these approaches is entirely consistent with the Kyoto Protocol. This is important, because any disjuncture between the U.S. approach and that of the parties to the Kyoto Protocol could result in a less efficient and effective global system.



The perceived ineffectiveness of the Administration's voluntary approach and the failure of Congress thus far to adopt anything stronger (although, as noted above, attempts continue to be made) have led a number of states and municipalities to create local, state, and multistate emissions control regimes.¹³ The utility of such regimes is likely to be limited, however, as other states have made it clear they do not intend to self-regulate GHGs, giving rise to significant concerns among regulating states and municipalities about possible negative effects on the competitiveness of their industries.¹⁴ Moreover, a "patchwork" of municipal, state, and regional programs could be difficult to administer and even more difficult to comply with.

This chapter will begin with a discussion of some of the domestic regulatory regimes that are emerging in Kyoto countries. We focus on the EU and its emissions trading system (ETS) because it is the most developed system to date. We then discuss how these regimes are likely to affect U.S. firms and their operations in the EU and in the United States. Next, we discuss some transitional issues, including possible forms that future domestic regulation, adopted partly in response to Kyoto, might take. Finally, we will attempt to draw some conclusions about how U.S. firms might alter their future operations to meet the looming crisis of climate change.

II. Regulatory Regimes Emerging in Kyoto Countries

We now examine the regulatory regimes being developed by three Kyoto Protocol Annex B Parties: the European Union, Japan, and Canada. We focus on the EU and its emissions trading system because it is the most developed system to date. This raises an important caveat: it is quite likely that by the time this treatise is published, some of what we report will have become outdated as a result of new scientific findings, political decisions, new industry and other stakeholder initiatives, new plans, new ideas, new regulations, and new effects. Although our descriptions and opinions will necessarily be incomplete, we hope they will still be helpful.

A. The EU Emissions Trading Scheme

On January 1, 2005, six weeks before the Kyoto Protocol entered into force, the EU Emissions Trading Scheme (EU ETS) became operational, creating the world's largest emissions trading system, with approximately 11,500 industrial emitters. The ETS scheme (also discussed in Chapters 2 and 17 of this book) introduces a new environmental instrument, "the tradable emissions allowance," which is now an important new tradable commodity. Briefly, the ETS limits total EU emissions to a certain agreed level (the "cap"). Allowances equal to the number of tons of emissions allowed under the cap are then distributed to EU governments, which allocate them to their domestic emitters, with each emitter receiving allowances equal to a predetermined quota. Emitters are permitted to trade allowances among themselves, which in theory will allow the market to determine the most efficient allocation of allowances and emissions. The EU ETS was created and is regulated at the EU level by the Emissions Trading Directive.¹⁵

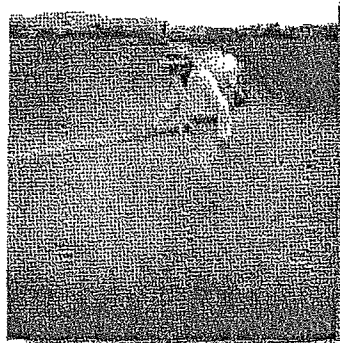
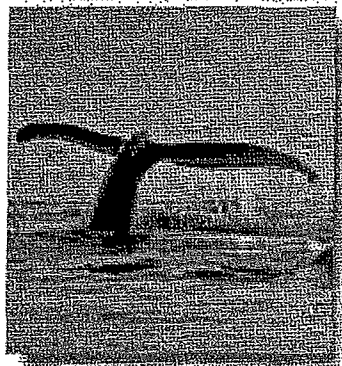
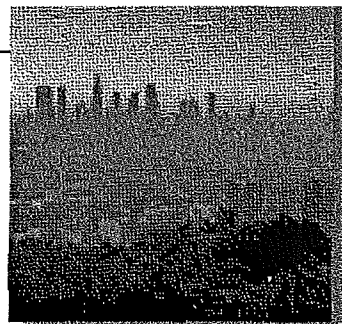
Although other greenhouse gases are covered by the current Emission Trading Directive,¹⁶ carbon dioxide (CO₂) is its primary target, and CO₂ will be the only tradable GHG emission until 2008,¹⁷ at which time other activities and installations may be included. Until 2008, the Directive is limited to certain industries: energy activities,¹⁸ production and processing of ferrous metals,¹⁹ mineral industry (cement, glass and ceramics),²⁰ and pulp and paper industrial plants. In implementing the Directive, EU Member States may choose capacity limits below, but not above, those in the Emission Trading Directive.

Additionally, the Directive regulates the emissions allocation procedure. It stipulates that at least 95 percent of the allowances will be allocated free of charge for the first three-year period (2005-2008) and 90 percent for the second five-year period (2008-2012).²¹ Each Member State must draw up a national plan in accordance with Annex III of the Directive, indicating the number of allowances the Member State intends to allocate and which facilities will receive allocations. This method of distribution, sometimes called "grandfathering," is intended to reduce the cost incurred by industry in adapting to the EU ETS. Grandfathering represents a strong incentive for the acceptance of the scheme by many industry sectors.²²

The Directive also speaks to penalties for noncompliance, although each Member State has determined its own sanctions. If operators fail to surrender the quantity of allowances equal to the emissions from their installations during the previous year, they will be required to pay an excess emissions penalty of €100 for each ton of CO₂ equivalent.²³ Payment of the penalty does not release the operator from the obligation to surrender an amount of allowances equal to the excess emissions.

Since the scheme is regulated by Directive, EU law requires that, in furtherance of the general obligation framed in the Directive, each Member State must transpose and implement the ETS scheme as described above. However, the Directive leaves many decisions, including the number of allowances to be allocated to each regulated facility, up to the individual Member State. Many commentators have stated that the economic and environmental effectiveness of the scheme will depend on how these allocations are made and, in particular, how uniform the allocations will be. Many analyses of the ETS system have already been performed, and more are currently under way.

In addition to the ETS, the EU has committed itself to continue international efforts to move the Kyoto process forward in a way that includes broader participation by all major emitters, including developing countries like China and India. The



EU's broader climate change strategy includes developing new policy areas; promoting, developing, and deploying low-emission technologies; using flexible market-based instruments; and creating adaptation policies.²⁴ Simultaneously, the EU plans to continually monitor the success of the ETS, and may revise the system before 2008 by adding new sectors and additional GHGs to the scheme. In addition, a legislative proposal on aviation emissions is under preparation following a recommendation by the Commission.²⁵

B. The Canadian Plan

To comply with the Kyoto Protocol, Canada has committed to reduce its GHG emissions to 6% below 1990 levels during the first commitment period, 2008 to 2012. Canada's Climate Change Plan, released in April 2005, aims to reduce emissions by approximately 240 megatons of CO₂ equivalent annually during this period.²⁶ In order to reach this overall target, Canadian private-sector entities will use a domestic emissions trading system.

The four most significant components of Canada's domestic emissions trading system are the Large Final Emitters System, the Offset System, the Climate Fund, and the Partnership Fund.²⁷ The Large Final Emitters System, which has yet to be translated into regulations, covers approximately 700 companies in the oil, gas, thermal electricity, mining, and manufacturing sectors. Companies in these sectors may utilize a number of approaches to meet their obligations, including upgrading facilities to achieve in-house reductions, purchasing emissions reductions from other large final emitters (LFEs), investing in domestic offset credits, and purchasing international Kyoto units (provided that these represent emission reductions that have been verified in accordance with Kyoto mechanisms). Taken together, these options will allow the more than 700 LFEs in Canada to achieve reductions of approximately 36 megatons of CO₂ equivalent.

The Offset System for GHG emissions aims to establish a market incentive to identify and develop projects that reduce emissions or enhance removals not covered by the proposed framework establishing targets for emissions reductions for LFEs. Such reductions or enhancements result in credits that can be used for compliance with the Large Final Emitters System and for other purposes, such as the increased cost savings from allowing entities with potential GHG reductions or removals not covered by the proposed framework to participate in the trading program by supplying offset credits.²⁸ In addition, Canada envisions that the government would be prepared to exchange Kyoto compliance units for offset credits as appropriate so that they could be sold internationally.

The Climate Fund, with an initial capitalization of \$1 billion Canadian, is a permanent institution to purchase, on behalf of the government of Canada, GHG emissions reduction and removal credits generated in Canada and abroad.

The Partnership Fund aims to execute new agreements and improve existing ones with provinces and territories, to find strategic investments on the basis of mutual

priorities, and to finance, on a cost-sharing basis, major technology and infrastructure investments identified in collaboration with provinces and territories. Investments could include, for example, clean coal, phasing out coal-fired power plants, CO₂ capture and storage pipelines, and extension of the East-West electricity power grid.

The design of the Canadian Program is still in a fairly early stage, and U.S. industry should pay close attention to further developments within the largest U.S. trading partner.²⁹ Furthermore, some climate change decisions previously made by the Canadian government may be revisited by the new, more conservative government.³⁰

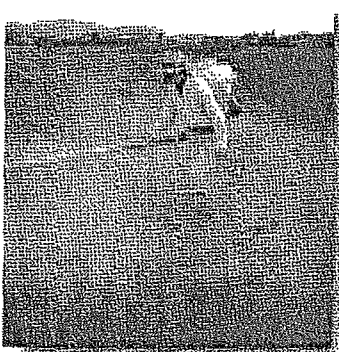
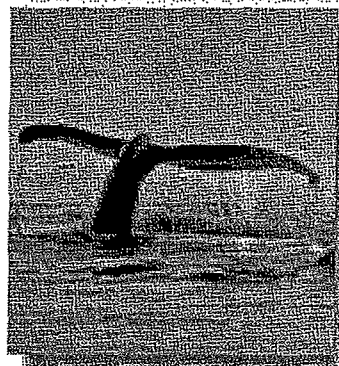
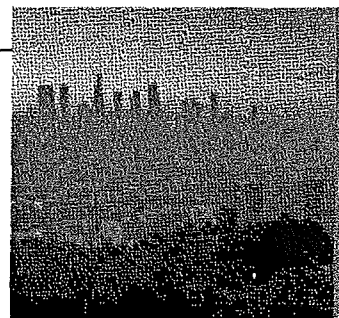
C. The Japanese System

In 2005 the Japanese Ministry of the Environment selected 34 companies and corporate groups to participate in the country's new Voluntary Emissions Trading Scheme.³¹ Under this scheme, the Japanese Government will subsidize the installation cost of CO₂ emissions reduction equipment for participating companies.³² In exchange for the subsidies, the participants must commit to a certain level of CO₂ emissions reductions,³³ which can also be achieved through CO₂ emission allowance trading. If the stipulated reduction targets are not met, participating companies must reimburse the government for the subsidy expenditure.³⁴

The main objective of the Japanese scheme is to achieve a cost-effective and substantial reduction in GHG emissions levels and to accumulate knowledge and experience relating to emissions trading at the national level.³⁵ Although the system is presently just a voluntary pilot scheme, Japan is committed to the Kyoto Protocol and will create a mandatory emissions trading scheme in the future. Japan's intention to utilize emissions trading in order to fully implement its Kyoto commitments should be taken seriously by potential investors, especially in the medium and long term. With respect to near-term prospective business opportunities, U.S. businesses should also consider the possibility of participating in the Voluntary Emissions Trading Scheme to gain access to short-term subsidies available from the Japanese government.

III. The Effects of Regulatory Regimes in Kyoto Countries on U.S. Businesses

This section discusses the types of effects that domestic implementing regulations in Kyoto countries could have on U.S. business. For the most part, we limit our discussion to regimes in Annex B countries. Annex B countries are the Kyoto parties that have



committed to limiting or reducing their emissions under Annex B of the Protocol. For specific examples of the effects of domestic regulation, we discuss the EU ETS, as this is the only system detailed enough to make meaningful analysis possible.³⁶

The types of direct impacts we discuss include compliance with domestic GHG control regulations, the ability of U.S. companies to compete in overseas (and in some cases domestic) markets for GHG control technologies and other green goods and services, and the ability to use and profit from the emissions trading mechanisms set up under both the Protocol itself and national systems developed by Annex B countries to implement the Protocol.

We also look at some indirect impacts: the ability of U.S. businesses to plan in an uncertain regulatory environment, their lack of political influence in shaping emerging international and domestic regulatory regimes, and consumer and investor attitudes toward the U.S. corporate response to climate change (or the perceived lack thereof).

Although economic analysis is beyond the scope of this chapter, it is well known that the U.S. Administration rejected the Kyoto Protocol at least partly on economic grounds.³⁷ A closer look reveals that non-participation in the Kyoto regime (the Protocol and its domestic and international implementing rules) may also create disadvantages, in some cases increasing costs or causing companies to forgo formidable opportunities related to the trading of emissions and other investment opportunities brought about by the Kyoto Protocol.

The Kyoto Protocol only regulates behavior of states parties (i.e., governments, not firms). Each Annex B government can decide for itself how to regulate entities operating within its borders, and national regulations to implement Kyoto may differ considerably from one Annex B country to another. Because each Annex B Party may decide for itself how to implement its Kyoto obligations, U.S. companies with multiple overseas facilities may be subject to a plethora of different Kyoto-related requirements. Of course, prior to Kyoto, they already were faced with different regulatory regimes in different countries, but Kyoto compliance adds a new level of complexity for companies operating or transacting in multiple overseas markets.

Some of the analysis that follows may raise issues concerning the interplay between international and domestic regulation and international trade and investment law. The connection between the Kyoto Protocol and WTO Agreements is discussed in Chapter 8 and, hence, is not discussed at length here. To a large extent, however, the regulation of climate change and the relationship between climate change and international trade rules cannot be made entirely clear, as measures being adopted by Kyoto parties are a work in progress. A comprehensive analysis of WTO consistency will have to await their completion and then must be determined on a case-by-case basis.

A. Direct Impacts on U.S. Businesses Operating in Annex B Countries

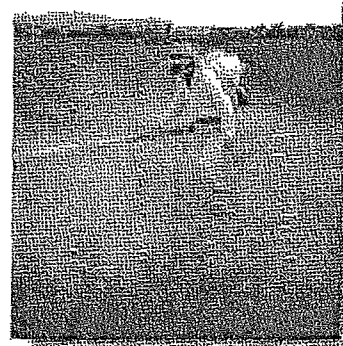
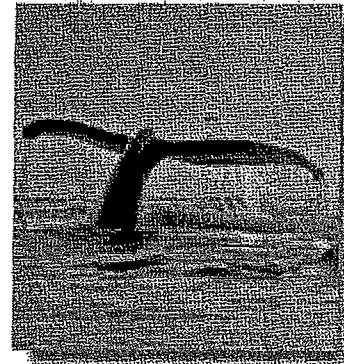
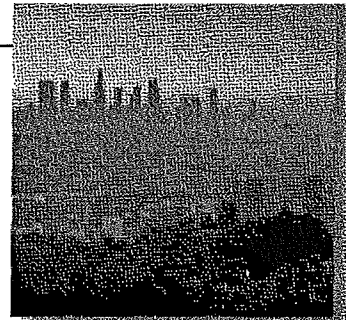
1. Compliance with Annex B GHG Control Regulations

There is little doubt that U.S. firms with operations in Annex B countries will have to comply in substance with domestic rules for implementation of the Kyoto Protocol. The EU ETS provisions, for example, make no distinction between domestic facilities and foreign-owned facilities. This is largely due to the fact that Kyoto Protocol emissions-accounting rules are geographically based. Emissions are attributed to the country in which they occur, regardless of who owns the emitting facility or purchases goods or services from the facility.

This fact in itself does not seem to raise any particular issues beyond those of complying with more than one regulatory system, something that is routine for multinationals. Climate change and the Kyoto Protocol, however, may make the situation more complicated because of the inherent and designed-in characteristics of emissions trading systems. In particular, emissions trading schemes are often designed to comprise a multiplicity of relationships between regulatory entities and companies, and, in the particular case of EU ETS, among Member States and the Commission. As a result, U.S.-owned firms may find they have fewer options and less flexibility in meeting those rules than do their domestic Annex B counterparts.

Parent companies located in Annex B countries may be able to comply with existing GHG emissions regulations more easily and cheaply than their U.S. counterparts if they have subsidiaries in different sectors or if their processes of production are vertically integrated. Annex B companies (and to a lesser extent, U.S. firms) that have some old plants and some modern plants or that are in the process of modernizing also may have options that are not available to companies that do not intend to modernize their Annex B facilities. Current EU ETS rules, which do not permit companies to utilize allowances from countries that are not Kyoto parties, create a clear advantage for companies concentrated in Europe or other Annex B countries and that do not have their production dispersed between Annex B countries and the United States. For example, Annex B companies may have more opportunities for internal (intra-firm) trading of emissions allowances than U.S. firms with few facilities operating in Annex B countries (or none at all). This may present a particular disadvantage for U.S.-owned facilities, as reductions achieved in the United States cannot be used to comply with the Kyoto Protocol.

U.S. companies located in Annex B countries might seek to avoid or minimize the impact of GHG control regulations by, for example, conducting high-emitting activi-



The Kyoto Protocol creates incentives for the development of new markets for what are called "green goods"... products that are the result of cleaner, more efficient production methods or that operate in a way that allows better environmental outcomes.

ties (such as manufacturing) at home but locating low-emitting ones (such as assembly) in an Annex B country. EU rules, as they currently stand, would not prevent this,

but future rules could be envisioned to discourage such behavior. For example, an Annex B country might treat such a split production process as though the emissions associated with the entire process occurred within its borders, thus requiring companies to hold allowances for all their emissions, whether the emissions occur domestically or in the United States. This might entail imputing emissions to imported components and requiring the U.S. assembly or sales facility to obtain allowances to cover those emissions. This type of emission accounting could be analogized to a GHG-related tax or other measure imposed at the border, which may be permitted by the rules of the WTO, provided the importing country has in place a domestic measure of equal or greater stringency.³⁸

As time goes on, and the Kyoto Protocol controls become more stringent, Annex B countries will be forced to tighten their domestic regulation accordingly. Incremental tightening of the domestic regime can already be observed in EU states. Despite difficulties already apparent in the first phase of the EU emissions control regime (2005-2007),³⁹ a second, Kyoto-compliant phase is scheduled to begin in 2008, and proposals to add more regulated sectors are being discussed. For example, on July 4, 2006, the European Parliament, on the recommendation of the EU Commission and the Council of Ministers, supported a proposal by the Parliament's Environmental Committee to extend the EU ETS scheme to include civil aviation.⁴⁰ Although clear rules have not been adopted in respect of the geographical scope of the measures under consideration, it appears likely that all airlines will be required to comply with any adopted provisions within the geographical area of application of the system, regardless of nationality.⁴¹

2. Competing in Markets for GHG Control Technologies and Green Goods

The Kyoto Protocol creates incentives for the development of new markets for what are called "green goods." Green goods are products that are the result of cleaner, more efficient production methods or that operate in a way that allows better environmental outcomes. Green goods include the control technology necessary to achieve certain levels of emissions-reduction or efficiency standards that allow for lower energy consumption. These could include such things as renewable energy technologies (wind turbines, solar panels, geothermal technologies, etc.), more efficient energy-consuming products (electric motors, boilers, and appliances), and products that help conserve energy passively (including thermal-pane windows, insulation, and other green building products).

If the market for green goods and services is stronger in Europe and other Annex B countries than it is in the United States, or if Annex B countries prohibit the sale of some non-green products altogether, U.S. companies may be at a disadvantage, especially if their major market is the United States. If U.S. firms decide to serve their less environmentally demanding domestic market exclusively and forgo more costly opportunities in Annex B countries, they could find themselves "behind the curve" when green technologies are widely accepted, as they almost surely will be. Their foreign competitors will gradually become more efficient and innovative and eventually may be able to lock in their access to cleaner technologies markets, much as Asian and other countries have done with certain consumer electronics and are now doing with cars.⁴² If U.S. firms decide, in the future, to get "back into the game," they could find it is expensive to enter the race long after it has started.

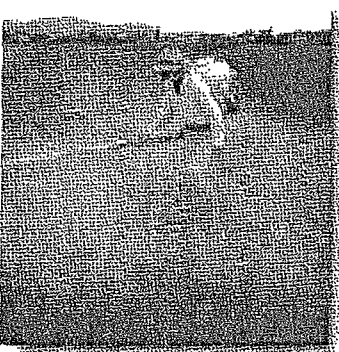
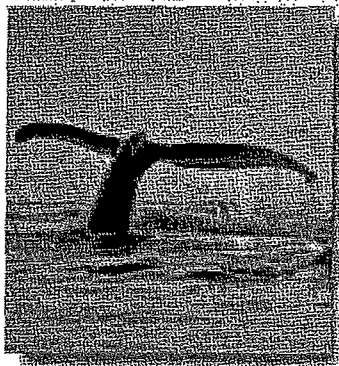
U.S. companies face another risk. To prevent their own companies from facing excessive start-up costs as they make the transition to greener products and services, it is not unlikely that Annex B Kyoto parties will provide subsidies. This may already be happening, as EU states provide free emissions allowances to their regulated industries, as discussed below.

3. Ability to Use and Profit from Emissions Trading and Other Market Mechanisms

Emissions trading and other "market mechanisms" can increase economic efficiency, saving firms money by reducing the cost of complying with GHG emissions reduction requirements. In addition, firms that can reduce their emissions cheaply can make money by selling these reductions to companies with higher reduction costs. Such reductions could become quite valuable as controls on emissions become more stringent.

First, as discussed in the previous section, firms that have most or all of their operations located in Annex B countries will have more opportunities for internal (intra-firm) trading. Thus, it is likely that they will have strategic opportunities to reduce the overall costs of meeting their emissions obligations that will not be available to companies that have only a small part of their operations based in Annex B countries and must buy needed allowances from other companies.

Second, U.S.-owned facilities that seek to meet Annex B emissions obligations by obtaining low-cost emissions reduction units (ERUs) through joint implementation (JI)⁴³ or certified emissions reductions (CERs) through the clean development mechanism⁴⁴ (CDM) may also face hurdles. These companies will need to obtain the approval of the Annex B country "involved," as well as the approval of the non-Annex I Kyoto host country, to participate in a CDM project.⁴⁵ While arbitrary withholding of such ap-



proval may raise WTO questions, restricted or conditional approval could withstand WTO scrutiny if the environmental rationale is clear. Strict reliance on WTO rules to overcome such governmental resistance could prove misplaced, especially since the Protocol is unequivocal about the need for government approval but virtually silent on the criteria by which governments may provide or withhold their approval.⁴⁶

Third, U.S.-owned facilities in Annex B countries would face an even larger problem if Annex B governments refuse to provide them with accounts in their Kyoto registries. The Kyoto Protocol requires all Annex B countries to create national registries to account for their national emissions and to enable trading with other Annex B countries.⁴⁷ Firms that wish to engage in trading must establish accounts within those national registries. Under the rules of the Kyoto Protocol, however, the establishment of such private accounts is entirely at the discretion of the government.⁴⁸ The WTO and other international trade rules notwithstanding, the Kyoto Protocol does not obligate Annex B countries to treat all emitters the same with respect to national registries. Thus, in theory at least, U.S.-owned emitters in Annex B countries could be prevented from participating in Kyoto trading altogether.

B. Direct Impacts on U.S. Businesses Operating in the United States

1. Compliance with Annex B GHG Control Regulations

U.S. firms seeking to sell their goods or services into Annex B markets may be affected by, if not required to fully comply with, Annex B greenhouse gas control regulations. No doubt, their products will have to meet the same efficiency and other performance standards as products manufactured in Annex B countries. In addition, as noted above, unless prohibited by the WTO, some Annex B countries may restrict or regulate imports based on “embodied” GHGs (*i.e.*, GHGs emitted during the production process). Furthermore, green subsidies (including freely allocated allowances) that may be available to companies in Annex B countries may not be available to U.S. firms.⁴⁹ This also could depend on WTO rules and rulings.

2. Competing in Markets for GHG Control Technologies and Green Goods

It seems unlikely that Annex B countries would attempt to prohibit the importation or sale of GHG control technologies or green goods produced by U.S. companies simply because they are manufactured partly or entirely in the United States. Furthermore, such restrictions would almost certainly raise difficulties with respect to WTO rules. Nevertheless, there are several reasons why U.S. companies may have difficulty marketing GHG control technologies and other green products in Annex B countries. Some reasons are discussed below in this section, while others are discussed below in the section on indirect impacts.

One problem facing U.S. companies is that, until the United States adopts stringent emissions control regulations, U.S. companies presumably will not find a similar (or equal) demand for such products in their home market. Thus, they may be forced to

simultaneously meet demand for inexpensive "brown" goods at home and more expensive "green" goods in Annex B countries. This may discourage U.S. companies from being leaders in the development of such goods and technologies, leaving them ill-equipped to serve the carbon-constrained markets of the future.

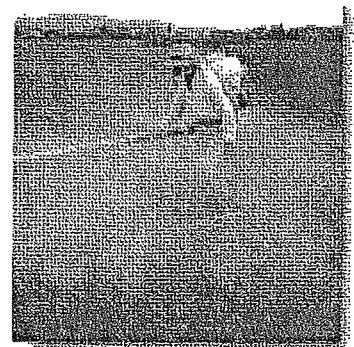
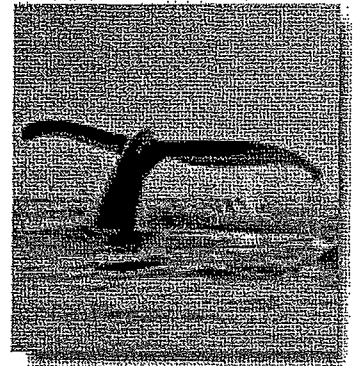
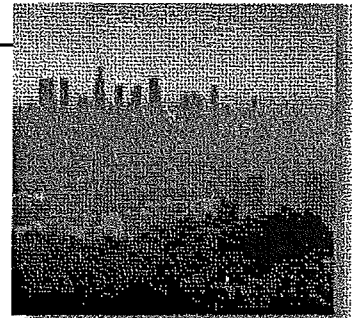
U.S. firms also may face future difficulties in meeting eco-labeling requirements and government procurement specifications. While this does not seem to be a problem at the present time, future Annex B governments may adopt eco-labeling requirements or specifications for goods and services purchased by the government itself or by its contractors. These requirements could be a powerful tool to promote U.S. ratification or compliance with the Kyoto Protocol and are unlikely to run afoul of WTO rules.⁵⁰

An additional problem, similar to the one noted above, and which may not be unique to U.S. firms, is the difficulty of serving many different Annex B markets. Although EU Member States are somewhat restricted by their Trading Directive, they still possess a lot of latitude in choosing their implementing regulations. Thus, different Annex B countries may have different specifications, requiring different types of green goods and technologies. In subsequent phases, however, the European Union is likely to seek more consistency among its Member States. In principle, adjusting to a range of different and possibly conflicting regulatory restrictions is standard operating procedure for companies with many overseas operations, though the problem may be more extreme in the Kyoto context, since implementing regulations will be new and untested in the early phases of the Protocol, with little opportunity for harmonization.

3. Ability to Benefit from Emissions Trading and Other Market Mechanisms

Companies in Annex B countries that can reduce their emissions relatively cheaply will be able to sell their excess allowances to other Annex B companies or countries. It is unlikely, however, that U.S. firms that have or are able to create cheap opportunities for reducing their emissions will be able to market those reductions to firms or governments in Annex B countries, as reductions generated in the United States could not be used to meet commitments under the Kyoto Protocol. U.S. businesses will face an additional disadvantage if Annex B countries choose to "grandfather" allowances, as the EU has.

Of course, as domestic emissions trading markets spring up in the United States, as is already happening in some states and regions, U.S. firms located in those states



and regions will be able to sell reductions within their own markets. However, potential sellers will have a smaller market in which to sell reductions, and hence may not be able to demand as high a price as they could get if the United States were a Kyoto party.

A potentially more significant problem, mentioned above, is that Annex B governments presumably could refuse to provide U.S. firms with accounts in their Kyoto registries. Thus, in theory at least, U.S. companies could be prevented from participating in Kyoto trading altogether. At present, the EU ETS specifically authorizes trading only with other Annex B countries, although it is not completely clear that this prohibits trading with the United States. The same problem could arise with respect to JI. Because JI projects also reduce the emissions that must be reported by the Annex B country hosting the project, the transfer of ERUs must be accompanied by a parallel transfer of AAUs.⁵¹

Annex B governments, arguably, could create other barriers to participation by U.S. firms in JI projects by imposing taxes or implementing unfavorable legislation. While such barriers might violate WTO rules or internationally agreed rules on investment, it is difficult to predict the outcome until the specific domestic rules have been adopted and adjudicated in the appropriate international forum.⁵² It is not obvious, however, that the WTO or other international investment rules would prevail over rules established to further the goals of the Kyoto Protocol.

The CDM, somewhat like JI, provides the opportunity for governments and private firms to finance projects that reduce greenhouse gas emissions in developing countries that are Kyoto parties and receive certified emissions reductions (CERs) in return.⁵³ CERs, once created, must be transferred directly into the account of the firm or government that is designated by the project agreement to receive them. This could create an accounting problem similar to one identified above. Such accounts must be housed within an Annex B country's registry. Since the Kyoto rules leave the decision about which entities may have accounts within their registries entirely to the discretion of each Annex B party,⁵⁴ it is possible that U.S. firms that finance CDM projects would not have accounts to receive the resulting CERs.

While U.S. firms might be able to circumvent such limitations by making deals with firms that do have such accounts, the cost attached to such deal-making will be borne by U.S. firms but not by Annex B firms. U.S. firms with Annex B facilities may not encounter this problem, as their Annex B facility may have the same right as domestic firms to establish an account in the registry of the country in which it is located. On the other hand, Annex B countries may view the establishment of such accounts as a privilege to be accorded only to firms belonging to countries that have accepted all the strictures of the Kyoto Protocol.

If ownership and resale of CERs, as well as AAUs, ERUs, and RMUs, pose special difficulties for U.S. firms, then investing in such projects may not be worthwhile. Even if these difficulties may be circumvented, for example, by striking deals with firms or governments that have Annex B accounts, the extra effort and expense this would

entail would place the U.S. firm at a disadvantage relative to its Annex B competitor. As Kyoto emissions targets become more ambitious, and the value of CERs increases, this disadvantage may become significant enough to make participation in CDM projects prohibitively expensive for U.S. firms. Such costs may also limit the ability of U.S. firms to market goods or services to CDM projects if, for example, Annex B firms are able to receive CERs or equity positions in the projects themselves as partial or full payment for providing such goods and services, while U.S. firms may not.

C. Indirect Impacts on U.S. Business

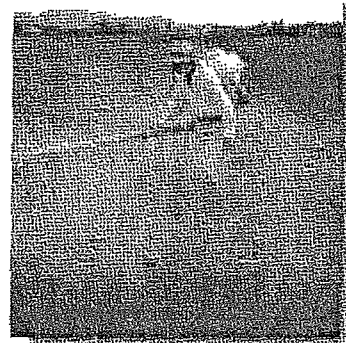
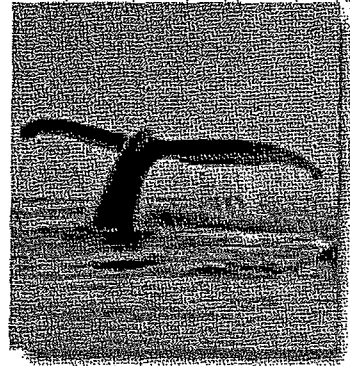
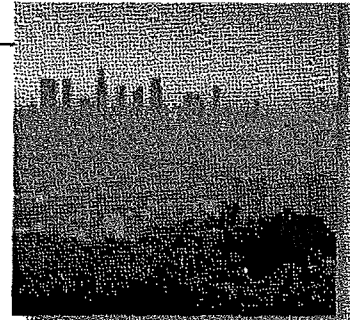
It is often assumed that, all other things being equal, companies in Annex B countries that are saddled with the cost of implementing Kyoto will be at a disadvantage vis-à-vis their competitors in the United States. As the discussion above shows, however, U.S. facilities operating both in the United States and in Annex B countries will not necessarily enjoy a competitive advantage, and in fact may even find themselves at a disadvantage.

This section discusses other problems that U.S. firms may face, no matter where they are situated, as a result of the decision by the United States not to participate in Kyoto. These may be thought of as the "indirect effects" of the Kyoto Protocol.⁵⁵ These include abilities of U.S. businesses to plan in an uncertain regulatory environment, lack of political influence in shaping emerging international and domestic regulatory regimes, and consumer and investor attitudes toward the U.S. corporate response to climate change (or the perceived lack thereof).

1. Regulatory Uncertainty

To a much greater extent than their Kyoto competitors, U.S. firms face an uncertain regulatory future. This includes uncertainty regarding the nature, scope, and timing of potential federal regulations, and the multiple and sometimes contradictory legislative approaches emerging at the state and municipal levels. As a result, business decisions for U.S. firms may be more costly and risky than similar decisions faced by Annex B firms, especially where long-term strategic planning and foreign investment are concerned.⁵⁶

On the one hand, firms may not be adequately preparing for the possibility of regulation and compliance in the most cost-effective manner. On the other, firms may incur unnecessary costs if they guess wrong in trying to anticipate and prepare for a future regulatory scenario and the instruments that it will adopt. Geography amplifies



this uncertainty, as many companies make the difficult choice of either pursuing different policies in different places, which is likely to be inefficient and expensive, or bearing the costs of making Kyoto-equivalent improvements in the United States.⁵⁷

2. Lack of Political Influence

A similar problem that could also create a significant potential disadvantage for U.S. firms is that they will likely have less influence than their Annex B competitors on the process of developing Kyoto rules, both at the international and domestic levels. The United States cannot participate directly in Kyoto Protocol negotiations, where Kyoto rules are made. Similarly, U.S. firms may have less say than their domestic counterparts in shaping domestic regulations for implementing Kyoto rules. For industries that rely on overseas sales, the inability to have their concerns considered on par with their competitors might be a substantial impediment.

As has already been noted, each Annex B government can decide for itself how to regulate entities operating within its borders, and national regulations to implement Kyoto may differ considerably from one Annex B country to another. Because each Annex B Party may decide for itself how to implement its Kyoto obligations, U.S. companies, particularly those with multiple overseas facilities, may be subject to a plethora of different Kyoto-related requirements. Having limited influence in the development of these rules could only exacerbate this problem.

3. Consumer and Investor Attitudes

Consumer preference, especially in Annex B countries, could give Annex B companies an additional competitive advantage. As consumers become more aware of the dangers of global warming, they may grow increasingly reluctant to purchase goods from countries that do not have stringent GHG emissions controls. Moreover, performance specifications of goods manufactured and sold by U.S. companies for the U.S. market may not meet the more rigorous needs of consumers in Annex B countries. Energy-efficiency standards for appliances and other goods are likely to become more stringent over time in Kyoto countries, possibly forcing U.S. firms to redesign their overseas products to meet Kyoto-based specifications, while continuing to market cheaper, less efficient products at home.

Compliance with standards equivalent to those required by the Kyoto Protocol could help a firm improve its reputation and enhance its brand value, not to mention its shareholder value. It is even possible that, as the problem of global warming grows more severe and Kyoto-compliant countries strengthen their efforts to respond, citizens of Kyoto countries might boycott products from non-Kyoto or non-Annex B countries, as has already happened in the area of genetically modified organisms.⁵⁸ Investors, too, are finding green companies and products more attractive. Sustainability indexes and stock markets providing information on environmental internal policies and associated risks are now a reality, as discussed in Chapter 17.

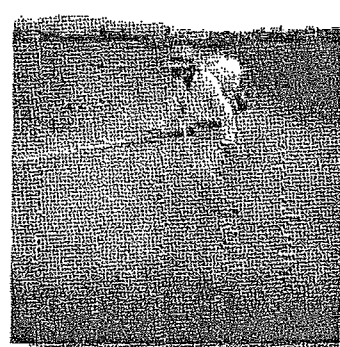
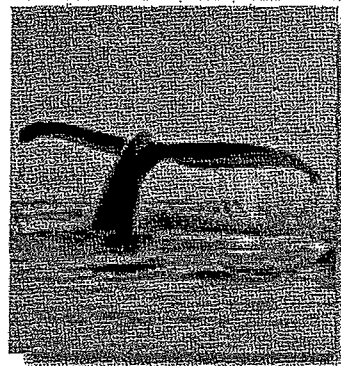
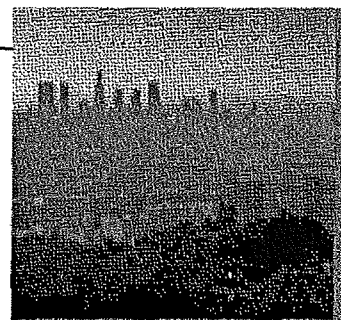
IV. Transitional Issues

In this section we consider how the approach of the United States to regulating GHG emissions might change in the future, how different options available to U.S. policymakers could interact with the regulatory regimes of Kyoto Protocol parties, and the effects on U.S. businesses that might result. The types of options we consider for U.S. regulation fall into three categories: domestic regulation at the state and regional levels, domestic regulation at the federal level, and regulation pursuant to international agreements. We should note that, while the Constitution prohibits states from entering into agreements with other countries,⁵⁹ certain elements of state systems could be linked to non-U.S. systems, for example, in the area of emissions trading.

At the federal level, each of the options we consider could be implemented independently by the United States, or it could be tied to systems in other countries through international agreements. In other words, any permutation of these two categories is possible. We analyze the effects on U.S. businesses of regulatory changes at the state, regional, federal and international levels utilizing the same set of issues as in part 5: direct impacts, including compliance with Annex B regulations, markets for green goods and services, and emissions trading; and indirect impacts, including regulatory uncertainty, political clout, and public attitudes.

A. State/Regional Regulations

As a threshold matter, it should be noted that principles of federalism do not permit state laws controlling GHG gas emissions to conflict with federal laws. They may, however, expand on federal laws—for example, by adding to the number of covered sectors—unless it is clear that Congress intended to preempt the entire field of GHG regulation.⁶⁰ Currently, federal law does not regulate GHG emissions, though, as noted above, the U.S. Administration has put in place voluntary programs. Thus, within some limits that are beyond the scope of this chapter, states presumably are free to regulate emissions as they see fit. Many approaches to GHG regulation have been considered at both the state and federal level, and several of these are discussed below in the section on federal regulation. In this section, we consider only one type of state regulation: mandatory emissions limits and trading (cap-and-trade) along the lines of the Northeast Regional Greenhouse Gas Initiative.⁶¹ Chapter 10 of this book describes the kinds of actions that states have taken, and Chapter 11 provides a 50-state survey.



1. Compliance with Annex B Emissions Regulations

Companies in states that adopt mandatory GHG cap-and-trade programs might benefit somewhat in marketing green goods and services in Kyoto countries as a result of experience gained in meeting their own state's requirements.

The adoption by a state or group of states of a mandatory cap-and-trade program could lessen the impact of Annex B emissions regulations on emissions-intensive U.S. products if Annex B countries decide to distinguish between products imported from states with cap-and-trade (or other equally effective) programs from products produced in states lacking such programs. The basis for the distinction would be the amount of GHGs presumed to have been emitted in manufacturing the product. Such a distinction poses a host of questions, however, that would make implementation difficult. Does the state program entail equally stringent reduction, compliance and enforcement measures? Can it be determined that the product in question is entirely from a regulated state, or does it include parts or labor from unregulated states? Does the WTO permit its members to distinguish between products from cap-and-trade states and "like" products from states that choose not to regulate GHG emissions? The difficulties countries would face in trying to answer these questions make it unlikely that products from states with cap-and-trade programs would receive more favorable treatment in Annex B countries than products from states that fail to regulate emissions.

2. Markets for Green Goods and Services

Companies in states that adopt mandatory GHG cap-and-trade programs might benefit somewhat in marketing green goods and services in Kyoto countries as a result of experience gained in meeting their own state's requirements. For example, new power plant designs developed to meet emissions reduction requirements in the electric power sector might be more marketable in Annex B countries or developing countries hosting CDM projects than older, conventional designs. On the other hand, this benefit would be available to any company, regardless of its location, that has redesigned its products to meet requirements in regulated states. It is unlikely that the importing country could confer some special benefit that would be unavailable to companies in states that fail to regulate emissions without running afoul of WTO rules.⁶²

3. Emissions Trading and Other Market Mechanisms

Although states may not enter into agreements with foreign countries, it would be possible for a state to explicitly link certain aspects of its trading program to similar trading programs in other countries. For example, state regulations could recognize allowances or credits purchased from other countries, regardless of whether those countries are parties to the Kyoto Protocol. This likely would require those countries to have monitoring and compliance systems that are as stringent as state systems, but this should not be a problem for Annex B countries, since Kyoto monitoring and compli-

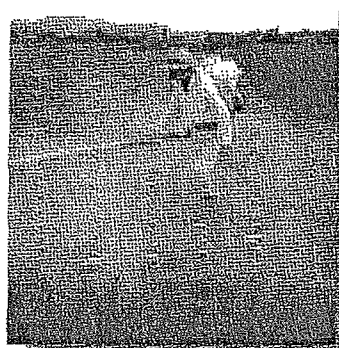
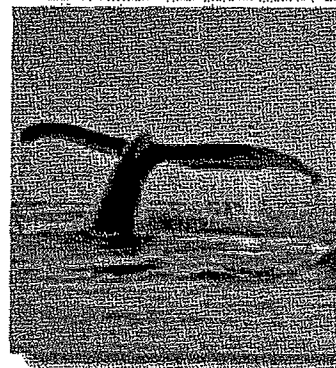
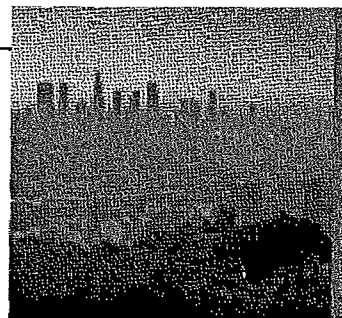
ance systems are relatively stringent, and some parties, such as the EU, have even stricter requirements than those mandated by Kyoto.

In addition to having the ability to purchase allowances and credits from other countries, some companies will want to be able to resell those units. Sales to other U.S. companies should be straightforward and will be governed by state or federal law only. If the intent is eventually to use those units for purposes of compliance with the Protocol, however, the transaction may be more complicated.

The simplest way to purchase a unit out of another country's system would be to pay a company in that country, or the government itself, to cancel or retire a unit. This would also ensure that the unit is not counted twice, once in the purchasing state and again in the selling country. Once a specific Kyoto unit is cancelled or retired, however, it cannot be reactivated; that is, it can no longer be used for purposes of Kyoto compliance. Thus, a U.S. company using cancellation or retirement to purchase a Kyoto unit will not be able to resell that unit to any entity that intends to use it to meet its obligations under the Protocol.

A different approach that would permit such resale would be for the purchasing entity to establish an account in the national registry of a Kyoto party and have the purchased unit transferred into that account. Kyoto units retain their character as such (i.e., can be used for compliance with the Protocol) as long as they do not leave the Kyoto system. This means they must always be located in an account in the registry of a Kyoto party. Such accounts are discretionary; a party can withhold permission to establish an account within its registry. It is reasonable to suppose that parties will be more willing to accord this privilege to companies in states with mandatory emissions reduction programs. This may be especially important for carbon brokers, such as the Chicago Climate Exchange (CCX).⁶³

As we have already noted, Kyoto parties probably will not purchase allowances or credits generated in the United States, as those units could not be used to meet Kyoto commitments. On the other hand, some countries might provide limited or full recognition of allowances or credits generated in states with mandatory reduction programs (for purposes of domestic compliance only) to induce U.S. states to begin to regulate their emissions. Several EU ETS participants have already expressed interest in such linkage with state or regional trading programs.⁶⁴ The Protocol would have to be amended, however, for these Annex B countries to use such allowances or credits to meet their Kyoto commitments.



B. Federal Regulations

In part 3 we analyzed some of the possible effects of the Kyoto Protocol on U.S. business if the United States remains opposed to mandatory federal controls on its greenhouse gas emissions. The effects of the Protocol on U.S. business could be quite different, however, if the United States were to adopt mandatory federal emissions regulations some time in the future, even if it remains outside the Protocol. There have been many different proposals for mandatory U.S. regulations. In this section we discuss several of these proposals—cap-and-trade with allowances allocated for free, cap-and-trade with auctioned allowances, and cap-and-trade with a “safety valve.”⁶⁵ We also briefly consider a relatively new proposed approach called action targets.⁶⁶

We focus on cap-and-trade because it is included to varying degrees in most of the proposals for federal regulation. It is also the approach taken by the Kyoto Protocol for regulating emissions from industrialized (Annex B) countries.⁶⁷ Although many Annex B countries are still formulating their programs to implement the Protocol, it appears likely that all will utilize some form of domestic trading. The most developed of these national programs, as well as the largest, is the EU ETS, which in many respects mirrors the Kyoto Protocol.

To put any of these approaches into action, many questions would have to be addressed: What sectors would it cover? Could other sectors opt-in? Would regulation occur upstream or downstream? Would all regulated sectors receive equal treatment or would some be regulated more stringently than others? Would all gases be included? How would removals of carbon from the atmosphere (e.g., through growing forests) be handled?, and many more. It is beyond the scope of this paper to consider all of these variations. Unless we specify otherwise, assume that all scenarios discussed below are economy-wide, all sectors are regulated equally, and all activities and gases are included.

It should also be pointed out that all these approaches have an important feature in common: they are all “market mechanisms,” meaning they all utilize market principles to minimize the aggregate cost of reducing emissions. This is important, because the decision was made early in the negotiation of the UN Framework Convention on Climate Change that a market approach would be utilized to reduce compliance costs. Not only would a domestic market-based approach reduce compliance costs in the United States, but, to the extent the U.S. approach can be linked to the Kyoto Protocol, it can also save Kyoto parties money, while providing additional savings in the United States. Generally speaking, the more gases, sectors, geographic area, and regulated entities a market system covers, the more efficient and cost-effective it will be.

1. Cap-and-Trade with Allowances Allocated for Free

This approach has the most in common with the EU ETS, which requires Member States to freely allocate 90% of their allowances to regulated entities during the commitment period. It is also similar to the Protocol itself, in that the Protocol allocates

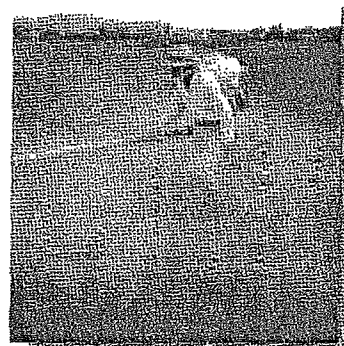
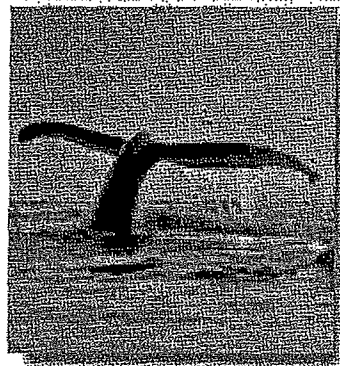
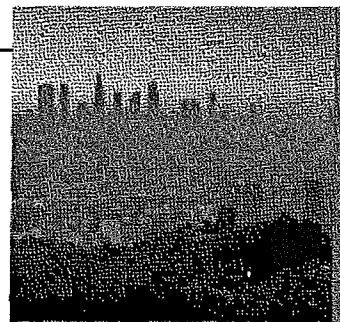
assigned amounts to the parties at no cost. The most common method of allocation is "grandfathering," that is, allocating allowances on the basis of historical emissions. This is the approach currently taken by the Kyoto Protocol and the EU ETS, though for both systems proposals have been made to allocate allowances based on other considerations, such as "benchmark" performance standards at the national level and population at the international level.

a. Compliance with Annex B Emissions Regulations

Because free allocation of allowances is essentially the approach taken in the EU ETS and the Kyoto Protocol itself, effects on U.S. business likely would result more from domestic regulation than from Annex B rules aimed at leveling the playing field or coercing the United States to join the Protocol. Of course, the sectors covered, the stringency of the cuts, and other details of the U.S. regulatory program ultimately would determine the similarity and compatibility of the U.S. system with the EU ETS and other Annex B approaches. If the systems diverge significantly in these details, impacts on U.S. business from Annex B regulation could still be significant.

For example, U.S. products in sectors not subject to U.S. emissions controls might be taxed at the border when they are imported into Annex B countries. On the other hand, if the overall U.S. system achieved a level of abatement that was in line with the efforts of Annex B parties, there would be little justification for targeting unregulated U.S. products in this manner. The EU might argue that it adjusts its border taxes to match the cost of allowances required to manufacture domestic "like products," but this argument would raise several problems. First, most of the allowances required by EU products in regulated sectors are allocated for free, so EU manufacturers are not required to pay the full costs of allowances. This fact could give rise to a WTO challenge based on the WTO requirement that taxes imposed at the border may not exceed the tax imposed on domestic like products.⁶⁸

A second problem is that it would be unnecessarily provocative, from a trade standpoint. If the United States failed to regulate certain products that are regulated in some Annex B countries, it would have to regulate other products more stringently than similar products in those countries to achieve comparable levels of abatement. The United States likely would react by imposing similar trade measures on products produced in Annex B countries. In fact, it was decided early in the negotiation of the Framework Convention that each party could pick its own measures for implementing its emissions commitments. There would be little reason to violate that principle merely



because the United States has decided to implement Kyoto-type emissions cuts without actually joining the Protocol.

b. Markets for Green Goods and Services

Were the United States to adopt emissions controls comparable in stringency to controls in Annex B countries, there is little reason to expect that green U.S. goods and services would receive differential treatment in Annex B countries. Of course, sectors that are not regulated in the United States may not stimulate the same level of innovation as would occur in comparable sectors in Annex B countries that choose to regulate them, but this would cut both ways, giving a potential advantage to U.S. products designed to meet the needs of sectors that are regulated in the United States but not in some other Annex B countries. Less direct effects, like consumer preference, likely would not be significant.

c. Emissions Trading and Other Market Mechanisms

With respect to emissions trading and other market mechanisms, the closer the U.S. approach is to approaches in Annex B countries, the more compatible the systems are likely to be, and the less reason for restricting trading between the systems. Nevertheless, Annex B countries would still be prohibited by the rules of the Protocol from utilizing U.S.-generated allowances or credits to meet their commitments under the Protocol. Changing this restriction would require an amendment of the Protocol, but accomplishing such an amendment may be relatively straightforward, especially if it is done in conjunction with negotiation and adoption of the second commitment period, which requires an amendment in any event.

Kyoto Parties may, on the other hand, be reluctant to adopt such an amendment for several reasons. First, they probably would insist that the U.S. reduction commitment equal their own in its level of stringency. Second, they would be concerned that the U.S. approach to monitoring, compliance and enforcement is as effective as their own. Third, a great deal of time and effort was spent devising the Kyoto system for registering and tracking trades, and presumably the United States would not be a part of that system. Fourth, and most important, they probably would be concerned about setting a precedent for the Kyoto Protocol by, in effect, allowing the United States to be a partial party to the Protocol, picking and choosing which elements of the Protocol it will comply with and which elements it rejects.

2. Cap-and-Trade with Allowances Auctioned

This approach differs from the one just discussed only in that allowances, rather than being allocated to emitters for free on the basis of historical emissions, technology benchmarks, or other criteria, would be auctioned periodically to the highest bidder. An advantage of this approach is that it allows new companies to enter into the market on equal footing with established companies. Allocations based on historical emissions are disadvantageous to new firms, as they have no historical emissions on which

to base an allocation. On the other hand, allocations based on technology benchmarks could give new companies an advantage, as they would have the opportunity to utilize cleaner, more efficient technology from the start, whereas existing companies with older, less efficient technology would be forced to purchase additional allowances or invest in expensive retrofits.

Auctioning would also provide a revenue stream to the government that could be used to offset other types of taxes, such as taxes on income and capital formation. Many economists have observed that shifting the tax burden in this fashion would be good for the economy. Such a revenue stream could be used for many other purposes: to assist in the transition to a low-carbon or zero-carbon economy, for example, by retraining coal miners and by providing assistance to low-income families saddled with higher energy costs. Some have even proposed lump-sum annual transfer of auction proceeds to U.S. citizens.⁶⁹

a. Compliance with Annex B Emissions Regulations

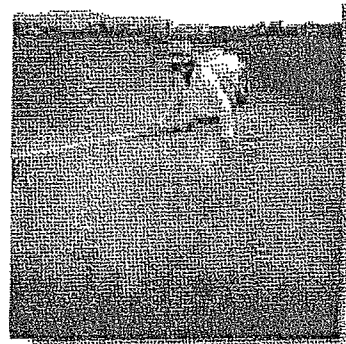
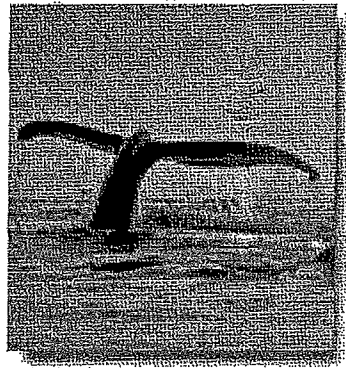
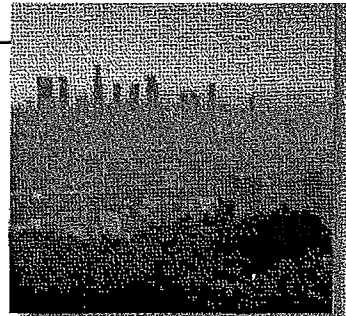
From the perspective of an Annex B country, whether the United States chooses to allocate or auction allowances probably would make little difference. Auctioning, however, could place U.S. companies at a competitive disadvantage, vis-à-vis companies in Annex B countries that choose to allocate. One of the stated reasons for allocating allowances in the EU ETS is to relieve companies of some or all of the costs of compliance.⁷⁰ Thus it seems unlikely that U.S. companies would agree to a cap-and-trade system in which most or all allowances are auctioned.

b. Markets for Green Goods and Services

It is unlikely that the decision to auction rather than allocate allowances would have any effect on marketing of green U.S. goods and services in Kyoto countries.

c. Emissions Trading and Other Market Mechanisms

Kyoto parties that allocate most of their allowances, such as the European Union and its members, should have little reason to care whether the United States disseminates allowances by means of auctions, allocations, or some combination of the two. If anything, they should prefer that the United States auction allowances, since that gives companies in countries that allocate an advantage over their U.S. competitors, as noted above. Thus, they may be more willing to allow full trading with U.S. companies.



3. Cap-and-Trade with a "Safety Valve"

As described above, a safety valve is a predetermined price at which the government will sell as many allowances as an emitter desires to buy. Thus the market price of allowances can never exceed the safety valve price. In fact, once the price of allowances reaches the safety valve level, the system effectively converts to a GHG tax, unless and until the price for allowances subsequently drops below the safety valve price.

a. Compliance with Annex B Emissions Regulations

Annex B countries' response to a U.S. cap-and-trade program, and their efforts to devise regulations that would have the effect of reducing U.S. emissions or at least

... how much U.S. companies are able to benefit from emissions trading could be linked directly to the level at which the safety valve price is set.

leveling the playing field, probably would be determined, in large measure, by the price at which the safety valve was set. A high price might be viewed as little more than insurance for the United States that compliance costs would not be excessive, in which case, if the U.S. cap itself was sufficiently stringent, Annex B countries might respond much as they would to a conventional U.S. cap-and-trade program, that is, one that had no safety valve. But if the safety valve price were perceived as being too low, Annex B countries might view the U.S. effort as in-

sufficient, and take the types of measures discussed in part 3 to induce stronger action by the United States.

b. Markets for Green Goods and Services

The extent to which Annex B countries would treat green U.S. goods and services more favorably than in the scenario discussed in part 3 might depend on the safety valve price; a high price would provide less incentive for Annex B countries to attempt to restrict sales within their borders. A low price, on the other hand, would provide little incentive for Annex B countries to behave differently toward U.S. goods and services than they would in the no-regulation scenario discussed in part 3. A low safety valve price also would provide less motivation for development in the United States of emissions reduction strategies and technologies, leaving U.S. companies behind the curve compared to the Annex B competitors, as also discussed in part 3.

c. Emissions Trading and Other Market Mechanisms

Similar to the issues discussed above, how much U.S. companies are able to benefit from emissions trading could be linked directly to the level at which the safety valve price is set. Some commentators believe that the European Union will not engage in full-scale trading with the United States or seek the necessary rules changes in the Kyoto Protocol if the U.S. system includes a safety valve, out of concern that their own systems would be weakened if allowance prices hit safety valve levels. The fear would be that if Annex B companies could buy U.S. allowances for compliance purposes, then

their own systems could be “infected” by the safety valve. If the price of allowances in their own markets rose above the safety valve price, their companies would simply turn to the United States as a limitless source of allowances at the safety valve price. On the other hand, if the safety valve price was set at a sufficiently high level, other Annex B countries may choose to disregard it or even adopt their own safety valve to afford their own companies the same financial protection as that given to their U.S. competitors.

4. Action Targets

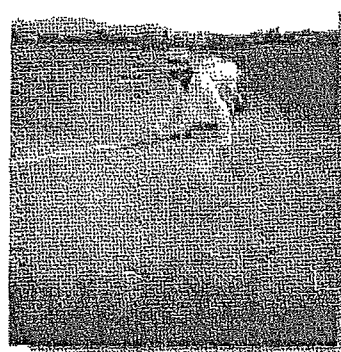
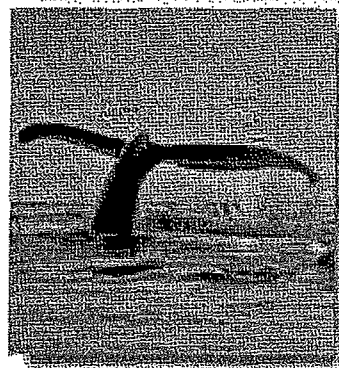
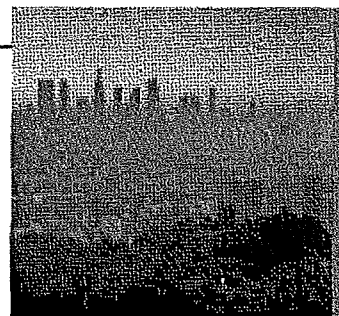
Action targets are a new form of market mechanism. They are similar to the cap-and-trade mechanisms discussed above in that they allow trading, but differ in that they utilize emission reductions, or cuts, rather than caps. (For this reason, the designers of this system sometime refer to it as “cut-and-trade.”)

The system works as follows: Rather than setting an emissions target, or cap, for a given period, a country adopting action targets would set a target for the number of reductions it will achieve during that period. While it is beyond the scope of this paper to discuss the pros and cons of action targets, its two major advantages, according to its designers, are that it would: (1) make the level of effort a country would have to exert to achieve its target more predictable,⁷¹ and (2) have a smaller impact on consumer prices for a given level of reductions.⁷²

a. Compliance with Annex B Emissions Regulations

Action targets are sufficiently different from cap-and-trade that it is difficult to assess how they would be treated by the EU and other Annex B parties that adopt cap-and-trade schemes. Action targets are designed to be compatible with cap-and-trade, and there is no inherent characteristic of action targets that would inhibit integration with other market mechanisms. The EU, however, has tended to be wary of reduction-based systems, such as the clean development mechanism, and may be reluctant to accept credits resulting from U.S. action targets. Furthermore, the use of such credits for Kyoto compliance would require amendment of the Protocol. On the other hand, the EU and other parties recognize the need to incorporate reduction-based credits into their domestic systems in order to gain the participation of developing countries, and such systems are already integrated into the Kyoto Protocol through Articles 6 and 12.

Given the importance of the United States to solving the problem of climate change, most Annex B countries likely would welcome a U.S. approach based on action targets if both the target and the system for counting and verifying reductions are sufficiently stringent. The ultimate measure of success of action targets or any other system will be



emissions trends. If U.S. emission reductions meet expectations, there is little reason for other parties to throw up barriers, and if they did, international trade rules might be used to remove those barriers.

b. Market for Green Goods and Services

Like all market mechanisms, action targets are designed to provide regulatory incentives to companies to reduce their emissions. Under action targets, U.S. firms will have the same need for renewable energy and energy-efficient products as they would under cap-and-trade. In other words, if the scheme succeeds as its designers predict, action targets will push U.S. firms to be as competitive in the market for green goods and services as their Annex B counterparts.

c. Emissions Trading and Other Market Mechanisms

As noted above, some countries, notably those of the EU, have expressed reservations about utilizing reduction-based credits, but this reluctance is likely to melt away if such systems prove effective in bending emissions trajectories downward. Indeed, its designers believe action targets will remove some of the political barriers to adopting the steep reductions needed to solve the problem of climate change, so the scheme may, in the long run, prove to be more effective than cap-and-trade and other conventional schemes for reducing emissions. If this proves to be the case—and emissions inventories will tell the tale—action targets should integrate fully with cap-and-trade and other market mechanisms, as its designers intend.

V. Conclusion

Under international law, the Kyoto Protocol will not affect U.S. business directly, but rather through the implementing laws and regulations that parties to the Protocol adopt. Because most parties have not yet fully drafted these laws and regulations, any assessment of impacts of the Protocol on U.S. business is necessarily speculative. At present, the only national system that is sufficiently developed to provide a concrete basis for analysis is the EU ETS. The schemes being developed in Canada and Japan are still too much in flux to provide useful guidance.

While many businesses have taken actions that have had, or will have, the effect of lowering their GHG emissions, it is difficult to know what motivated those actions. Although many companies have claimed they acted in response to climate change, they may have taken the same or similar actions for other reasons, such as reducing fuel costs. It is even more difficult to predict what businesses will do in the future.

A third problem is that it is difficult to envision the Kyoto Protocol of the future. The Protocol is an experiment, and many doubts have been raised about its chances for success. Businesses in the United States and elsewhere will be reluctant to respond to the Kyoto regime, given the uncertainty of its future prospects. The abstention of the United States and the limited and unpredictable role of developing countries and countries with economies in transition contribute to this air of uncertainty, making predic-

... for the present the Kyoto Protocol is the sole international vehicle for building a mandatory regime for controlling GHGs, and U.S. businesses that ignore it do so at their peril.

tions about business impacts little more than educated guesses.

Although the United States ultimately decided not to ratify the Protocol, much of its design reflects U.S. ideas and experience. Emissions trading, extended commitment periods, and the "basket of gases" approach were all U.S. ideas. Thinking in the United States about how best to regulate GHG emissions has evolved, however, and it may select a different path for the future. Other countries may choose to follow the U.S. lead.

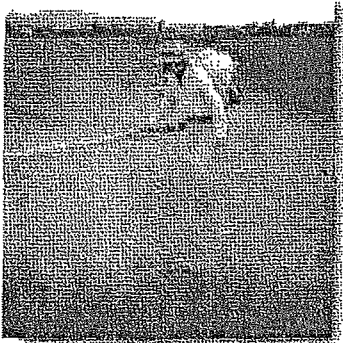
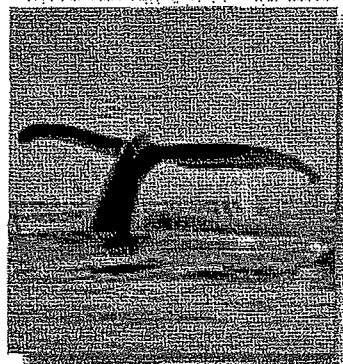
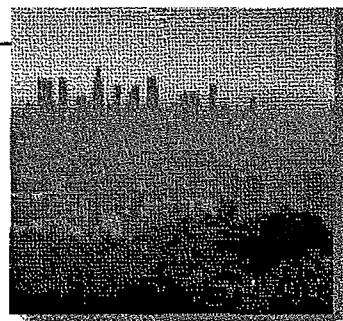
Nevertheless, for the present the Kyoto Protocol is the sole international vehicle for building a mandatory regime for controlling GHGs, and U.S. businesses that ignore it do so at their

peril. Any approach that might succeed Kyoto likely would be evolutionary rather than revolutionary, and undoubtedly would retain many of Kyoto's characteristics. In any event, U.S.-owned facilities located in Annex B countries will be required to comply with domestic regulations, whether or not they were adopted to implement Kyoto, and for a number of reasons may find compliance is made more difficult by the U.S. government's decision to remain outside

the Protocol. In particular, they may not be able to take full advantage of the Protocol's trading rules, as reductions generated in the United States cannot be counted for purposes of Kyoto compliance. They may also find that their parent companies are "out of synch" with markets in Kyoto countries, making it increasingly more difficult for U.S. foreign subsidiaries to compete with their domestic counterparts, for example, in markets for green goods and services.

Other problems may confront U.S. companies as the Kyoto regime develops and markets in Annex B countries and elsewhere evolve in response to the changing regulatory environment. U.S. companies are likely to find that their own decision-making will become increasingly more difficult if uncertainty about U.S. emissions controls continues. Their competitors, through their national legislatures, will shape the future regulatory environment in ways that they cannot. Perhaps the greatest risk to U.S. firms is that consumers in foreign countries, and possibly even in the United States, will turn away from companies that are perceived not to be good stewards of the climate.

Eventually, the United States must develop domestic emissions controls, and it will need to be mindful of the existing international regime, whether that regime is Kyoto or something new. The United States may have opportunities to improve upon current approaches, but whatever emerges must be compatible with Kyoto or its successor, as



well as with the domestic regimes that implement the international one. Despite Kyoto's possible flaws, its underlying fundamental logic remains sound: climate change is a global problem, and solving it will require a market-based regime that is internationally coherent, if not uniform.

Endnotes

1. See Kyoto Protocol to the United Nations Framework on Climate Change, Dec. 11, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol].
2. See Letter to Members of the Senate on the Kyoto Protocol on Climate Change, 1 PUB. PAPERS 235, 235 (Mar. 13, 2001).
3. Although U.S. treaties are ratified by the President, ratification requires consent of two-thirds of the Senate. Practically speaking, it also requires acceptance by the House, which must consent to any implementing legislation.
4. Beginning in the late 1990s, many businesses began to take action to reduce greenhouse-gas emissions. See John Carey, *Global Warming*, Bus. Wk., Aug. 16, 2004, available at http://www.businessweek.com/magazine/content/04_33/b3896001_mz001.htm.
5. In May 2006, several UN-sponsored conferences were held in Bonn, Germany, to discuss climate negotiations for the period following the end of the first commitment period of the Kyoto Protocol. For further news, articles and press releases, visit the United Nations Framework Convention on Climate Change's Web site, <http://unfccc.int/press/items/2794.php> (last visited Oct. 19, 2006). See also Chapter 2 of this book.
6. See, e.g., the Asia-Pacific Partnership on Clean Development and Climate, Inaugural Ministerial Meeting, January 2006, <http://www.dfat.gov.au/environment/climate/ap6/> (last visited Oct. 19, 2006).
7. For a comprehensive overview of potential implications of the Kyoto Protocol on U.S. businesses, see DANIEL BODANSKY, PEW CENTER ON GLOBAL CLIMATE CHANGE, IMPLICATIONS FOR U.S. COMPANIES OF KYOTO'S ENTRY INTO FORCE WITHOUT THE UNITED STATES 1-8 (2002).
8. The Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541 (1987).
9. The Kyoto Protocol regulates six gases listed in Annex A of the Kyoto Protocol and include: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). At the urging of the United States, the Protocol permits each party to decide on the amount of each gas it will reduce. The Protocol targets determine the total amount of reduction of the six gases based on their "GHG potential," which involves a complex scientific determination of their potency and residency time in the atmosphere. See *supra* note 2, Annex A; see also Chapter 2 of this book.
10. Letter, *supra* note 3, at 235.
11. See, e.g., *Climate Change Review from the President's Council on Environmental Quality*, <http://www.whitehouse.gov/news/releases/2001/06/climatechange.pdf> (last visited Oct. 19, 2006).
12. See, e.g., Climate Stewardship Act, S. 139, 108th Cong. (2003); Keep America Competitive Global Warming Policy Act, H.R. 5049, 109th Cong. (2006).
13. See, e.g., the U.S. Mayors Climate Protection Agreement, the Regional Greenhouse Gas Initiative (RGGI), the Western Governors' Association: Clean and Diversified Energy Initiative, the West Coast Governors' (WGA) Global Warming Initiative: Powering the Plains, the New England Governors: Climate Change Action Plan conducted in conjunction with the Eastern Canadian Premiers (NEG-ECP), and the South-

west Climate Change Initiative. See *infra*, Part 4, Section A.3, of this chapter and Chapter 9 for more discussion of regional initiatives.

14. See, e.g., RANDY L. LOFTIS, AM. SOC'Y OF LANDSCAPE ARCHITECTS, TEXAS COOL TO CONFRONT GLOBAL WARMING (2006), http://www.texasasla.org/index.php?option=com_content&task=view&id=94&Itemid=113.

15. See Council Directive 2003/87, 2003 O.J. (L 275) 32 (EC) (establishing a scheme for emission allowance trading within the Community and amending the original Emissions Trading Directive, Council Directive 96/61, 1996 O.J. (L 257) 26 (EC); see also Council Directive 2004/101, 2004 O.J. (L 338) 18 (EC) (establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms and amending Council Directive 2003/87, 2003 O.J. (L 275) 32 (EC). Other relevant instruments include Council Directive 2004/8, 2004 O.J. (L 52) 50 (EC), on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Council Directive 92/42, 1992 O.J. (L 167) 17 (EC).

16. Kyoto Protocol, *supra* note 2.

17. Under Article 24 of the Emissions Trading Directive, this is further dependent on the discretion of the individual Member States and on approval by the European Commission.

18. This includes combustion installations with a rated thermal input exceeding 20 MW, mineral oil refineries and coke ovens in accordance with the Emissions Trading Directive. See also Commission Communication on Further Guidance on Allocation Plans for the 2008 to 2012 Period of the European Union Emission Trading Scheme, at 20, COM (2005) 703 final (Dec. 22, 2005), available at http://europa.eu.int/comm/environment/climat/pdf/nap_2_guidance_en.pdf. (defining "combustion installation" to include all combustion processes, i.e., oxidation of fuels, and comprises a stationary technical unit that burns fuel for the production of an energy product, which could be electricity, heat or mechanical power):

19. Metal ore roasting or sintering installations and those for the production of pig iron or steel with a capacity exceeding 2.5 tons per hour. *Id.* at 36.

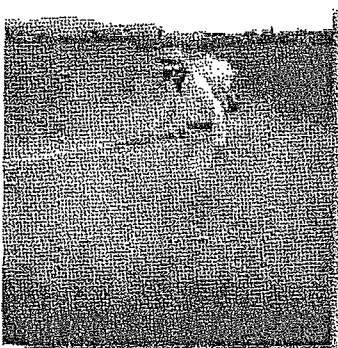
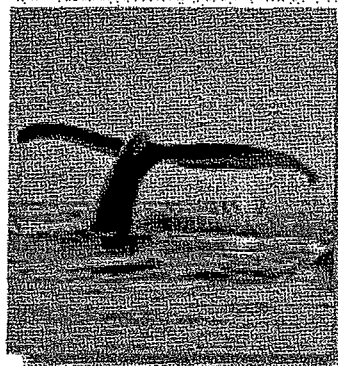
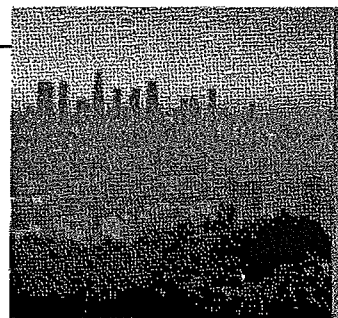
20. Of a certain capacity. *Id.* at 27.

21. See Emissions Trading Directive, Council Directive 96/61, 1996 O.J. (L 257) 26 (EC).

22. The effects of this method of allocation have been analyzed by different scholars in comparison to auctioning. For the discussion of advantages, disadvantages and pernicious effects, see, e.g., Svante Mandell, *The Choice of Multiple or Single Auctions in Emissions Trading*, 5:1 CLIMATE POL'Y 97, 102 (2005); Boemare & Quirion, *Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Literature and International Experiences*, 43 ECOLOGICAL ECONOMICS 213, 222 (2002); Bent Mortensen, *The EU Emissions Trading Directive*, EUR. ENVTL. L. REV. 275, 281 (2004).

23. See Emissions Trading Directive, *supra* note 21, at 37 (art. 16).

24. See Commission Communication on Winning the Battle Against Global Climate Change, at 8, 9, COM (2005) 35 final (Feb. 2, 2005), available at http://eur-lex.europa.eu/LexUriServ/site/en/com/2005/com2005_0035en01.pdf.



25. See Commission Communication on Reducing the Climate Change Impact of Aviation, at 4, COM (2005) 459 final (Sep. 27, 2005), *available at* http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/com/2005/com2005_0459en01.pdf (defining plans to reduce the greenhouse gas emissions of the aviation sector). Additional initiatives for 2006 include the presentation of an Energy Efficiency Plan to assist in reducing energy dependency, promote growth and fight climate change, Commission Communication: Green Paper on Energy or Doing More with Less, at 17, COM (2005) 265 final (June 22, 2005), *available at* http://europa.eu.int/comm/energy/efficiency/doc/2005_06_green_paper_text_en.pdf; the publication of Communications on Clean Coal Technologies, to stimulate technological development, Commission Communication: 2005 Environmental Policy Review, COM (2006) 70 final (Feb. 16, 2006), *available at* http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0070en01.pdf, and a strategy proposing policies beyond 2010, Commission Communication: An EU Strategy for Biofuels, at 16, COM (2006) at 34 final (Feb. 2, 2006), *available at* http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0034en01.pdf. The Second Phase of the European Climate Change Program (ECCP) will start defining policy in the household, industrial, commercial and transport sectors as well as adaptation policies. Press Release, European Comm'n, Climate Change: Start of the Second European Climate Change Programme (Oct. 21, 2005), *available at* <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/155&format=HTML&aged=1&language=EN&guiLanguage=en>.
26. The Plan provides for Government of Canada investments in the order of \$10 billion between now and 2012 to fully realize the anticipated reductions of about 240 megatons of CO₂ equivalent. It also commits the Government of Canada to annual assessments of climate change initiatives and investments. First, there are investments to date that will address one-third of the total reduction (80 Mt). Second, the Plan defines a strategy for a further 100 Mt reduction. And finally, it outlines a number of current and potential actions that should enable Canada to address the remaining 60 Mt reduction.
27. CANADIAN GOV'T, PROJECT GREEN, MOVING FORWARD ON CLIMATE CHANGE. A PLAN FOR HONORING OUR KYOTO COMMITMENT (2005), *available at* http://www.climatechangeconnection.org/pdfs_ccc/report_e.pdf.
28. An offset is a "credit" awarded for net GHG reductions or removals achieved by a registered offset project during 2008-2012, as verified through the offset review process.
29. See Canada-U.S. Trade Relationship, <http://www.buyusa.gov/canada/en/traderelationsusacanada.html> (last visited Oct. 20, 2006).
30. CANADIAN GOV'T, *supra* note 27.
31. See TOMONORI SUDO, INST. FOR GLOBAL ENV'T'L STRATEGIES, JAPANESE VOLUNTARY EMISSIONS TRADING SCHEME (VETS): OVERVIEW AND ANALYSIS 5 (2006), *available at* <http://www.epa.gov/ies/documents/Workshops/Sudo.pdf>. The participants were chosen among applicants who responded to an open invitation by the Japanese government and were screened based on their cost-effectiveness for the program.
32. The government's budget for the subsidy is 2,596,340,000 yen or about \$23.6 million. *Id.* at 11.
33. The total of emissions promised by the schemes' participants for the fiscal year of 2006 is 276,380 tons, which represents 21% of their average annual CO₂ emissions in the base years 2002-2004. *Id.*
34. *Id.* at 12.
35. *Id.* at 2-3.
36. The analysis of EU law is necessarily incomplete. As previously mentioned, the Directive establishing the EU ETS provides only for general principles and obliga-

tions, its implementation being dependent on Member States' actions. Hence, our analysis is necessarily general because it cannot describe the 25 Member States' legislation, especially taking into consideration that the measures adopted have in many cases not been fully harmonized. Therefore, in fact, the effects on U.S. industry will depend not only on the design of the second phase of the scheme, which is claimed and hoped to be more harmonized, but also on the legislation put in force by each Member State.

37. Letter, *supra* note 2, at 235.

38. See General Agreement on Tariffs and Trade, Art. III, available at http://www.wto.org/english/docs_e/legal_e/gatt47_01_e.htm.

39. See, e.g., *Terminating Greenhouse Gases*, THE ECONOMIST, Oct. 19, 2006; *Slow collapse seen for EU allowance prices*, CARBON FINANCE, May 2006.

40. See Commission Communication on Reducing the Climate Change Impact of Aviation, at 4, COM (2005) 459 final (Sept. 27, 2005), available at http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/com/2005/com2005_0459en01.pdf.

41. *Id.*

42. Kyle W. Danish, *The Effect of the Kyoto Protocol on U.S. Companies*, 36:4 TRENDS (2005), available at <http://www.vnf.com/content/articles/trends0405.pdf>.

43. Kyoto Protocol, *supra* note 2, art. 6.

44. *Id.* at art. 12.

45. *Id.* at art. 12, ¶ 5(a).

46. *Id.*

47. *Id.* at art. 7.4.

48. See FCCC/CP/2001/13/Add.2, Decision 19/CP.7, Annex II.A., ¶ 21(b).

49. While, at first glance, allocating allowances for free may appear to do no more than help offset compliance costs, economists have shown that such "grandfathering" can result in a windfall to firms receiving free allowances.

50. Government Procurement Agreement art. V, Apr. 15, 1994. Unlike most WTO agreements, the Agreement on Government Procurement does not require every WTO member to participate, and only a handful of developing countries do so at the moment. Furthermore, it only applies to goods and services that a Member Country chooses to "list" when it joins the agreement.

51. Decision 11/CMP.1, U.N. Doc. FCCC/KP/CMP/2005/8/Add.2 (March 30, 2005).

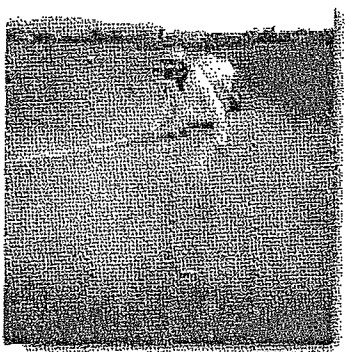
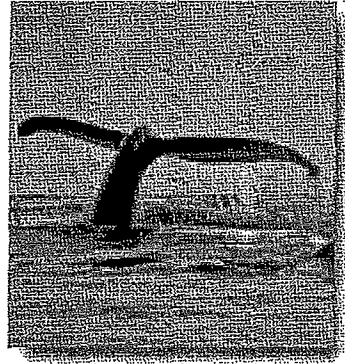
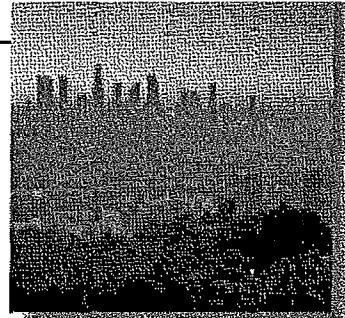
52. At this stage, it is not even clear where such conflicts might be adjudicated. Questions pertaining to conflicts that may arise between the Kyoto Protocol and other treaties, and how those conflicts could be resolved, are addressed elsewhere in this book.

53. Kyoto Protocol, *supra* note 2, art. 12.

54. Dec. 3/CMP.1, Appendix D, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (March 30, 2005).

55. Danish, *supra* note 42.

56. According to Robert W. Fri, *Resources for the Future, Business Planning in a Post-Kyoto World: For U.S. Firms, Which End Is Up?*, 159 RESOURCES 16, 16 (2005), available at <http://www.rff.org/rff/News/Features/loader.cfm?url=/commonspot/security/>



getfile.cfm&PageID=18458, different designs of a control strategy make a huge difference in future costs—by a factor of five or more.

57. According to Stuart Eizenstat and Rubén Kraiem, *In Green Company*, FOREIGN POLICY, September/October 2005, U.S. corporations have nearly USD \$1 trillion in direct investments in the EU and the U.S. industrial presence in Canada is estimated at USD \$200 billion. Moreover, Canada is still the largest single U.S. trading partner.

58. This has important trade implications. On this see the pending *EC—Measures Affecting the Approval and Marketing of Biotech Products* Case, WT/DS291/INTERIM, WT/DS292/INTERIM and WT/DS293/INTERIM. For a good summary on the controversy and consumer issues surrounding the facts of this case, see Nicholas Perdakis, *EU-US Trade in Genetically Modified Goods: a Trade Dispute in the Making*, in *THE WTO AND THE REGULATION OF INTERNATIONAL TRADE—RECENT TRADE DISPUTES BETWEEN THE EUROPEAN UNION AND THE UNITED STATES* 215 (Nicholas Perdakis & Robert Read eds. 2005), and Mark Pollack & Gregory Schaffer, *The Challenge of Reconciling Regulatory Differences: Food Safety and GMOs in the Transatlantic Relationship*, in *TRANS-ATLANTIC GOVERNANCE IN THE GLOBAL ECONOMY* 153 (Mark Pollack & Gregory Schaffer eds., 2001). For a comprehensive work on the differences between EU and U.S. environmental policies, see *GREEN GIANTS? ENVIRONMENTAL POLICIES IN THE US AND THE EU* (Norman J. Vig & Michael G. Faure eds., 2004).

59. See U.S. CONST. art. I, § 10 (“No state shall enter into any treaty, alliance, or confederation . . .”).

60. See, e.g., *Barnett Bank of Marion County, N.A. v. Nelson*, 517 U.S. 25, 30 (1994) (in determining whether a federal statute preempts a state statute, the critical question to be asked is whether Congress intended such preemption); see also U.S. CONST. art. VI, cl. 2.

61. See Regional Greenhouse Gas Initiative (RGGI), discussed in chs. 9, 18 *infra*.

62. This may fall under the GATT principle of most favored nation, which prevents WTO Members from distinguishing between products based solely on their place of origin, unless there is a sufficient justification to trigger the environmental exceptions contained in Art. XX.

63. See <http://www.chicagoclimatex.com/> (last visited Oct. 25, 2006). The CCX is North America’s only GHG emissions registry, reduction and trading system for all six GHGs identified in the Kyoto Protocol.

64. See VIVIAN E. THOMSON, *EARLY OBSERVATIONS ON THE EUROPEAN UNION’S GREENHOUSE GAS EMISSION TRADING SCHEME: INSIGHTS FOR UNITED STATES POLICYMAKERS* 18 (2006), available at http://www.earthscape.org/r1/ES17152/PCGCC_European_Trading_0406.pdf.

65. A safety valve is a predetermined price beyond which abatement costs would not be permitted to rise. To prevent the cost of allowances from exceeding that level, the government would make additional allowances available to regulated entities at a predetermined price, in effect converting the program from a cap-and-trade approach to a carbon tax.

66. Kevin A. Baumert & Donald M. Goldberg, *Action Targets: A New Approach to International Greenhouse Gas Controls*, 5 CLIMATE POL’Y 567, 567-580 (2006).

67. Developing countries may utilize a voluntary, credit-based system called the clean development mechanism (CDM) to reduce their emissions quantitatively under Kyoto Protocol. The CDM is similar, in many respects, to action targets.

68. General Agreement on Tariffs and Trade, art. III, ¶ 1, Oct. 30, 1947.

69. See, e.g., PETER BARNES, *WHO OWNS THE SKY?: OUR COMMON ASSETS AND THE FUTURE OF CAPITALISM* (2001).

70. See THOMSON, *supra* note 64, at 18.

71. See Baumert, *supra* note 66, 567-80.

72. Donald M. Goldberg, Danielle Rosengarten & Taylor Ferrell, *Cut and Trade: A Better Model for Addressing Climate Change* (2006) (on file with author).