

COMMENTS

REPUDIATION AND REGRET: IS THE UNITED STATES SITTING OUT THE KYOTO PROTOCOL TO ITS ECONOMIC DETRIMENT?

BY

ERIC SHAFFNER*

The moral and scientific reasoning behind the United States' refusal to become a party to the Kyoto Protocol has been debated, and the potential environmental consequences of that decision cannot be ignored. But what about the effect on the American economy? Do United States business leaders, many of whom pushed hardest against ratification, stand to suffer in the long term? Are there sectors of the economy, particularly those specializing in "green energy" solutions, that will lose ground to overseas competition?

Indications suggest that the Kyoto Protocol's mandates are already proving to be a boon to businesses specializing in renewable energy technologies and that those located in party countries have an edge over their American counterparts. The Protocol also encourages increased energy efficiency, potentially resulting in considerable business savings, and participation in already-lucrative carbon trading markets. The benefits to U.S. businesses, however, are uncertain at best. Finally, the Kyoto Protocol establishes programs such as the Clean Development Mechanism which, though in its early stages, could prove to be quite profitable for corporations willing to invest in developing countries. Participation by American companies, though, entails complications that businesses in party countries are unlikely to face.

* J.D. and Certificate in Environmental and Natural Resources Law 2007, Lewis & Clark Law School; B.A. 1993, Furman University; *Environmental Law*, 2005–2007. The author is grateful to Professor Chris Wold for suggesting the topic and for his excellent editorial advice.

This Comment explores these issues, and others, as it discusses the likely impact of the Bush Administration's opposition to the anti-global warming treaty in light of the government's claim to be acting in the best interests of the American economy.

I. INTRODUCTION	442
II. THE KYOTO PROTOCOL: BACKGROUND AND THE U.S. RESPONSE.....	446
III. RENEWABLE ENERGY TECHNOLOGIES AND ENERGY EFFICIENCY	449
IV. EMISSIONS TRADING.....	453
V. THE CLEAN DEVELOPMENT MECHANISM	458
VI. CONCLUSION	460

I. INTRODUCTION

In early 2001, the Bush Administration withdrew from the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC)¹ by removing the United States' signature from the agreement.² The government's stated rationale was that the global warming treaty would hamstring the American economy by causing an unacceptable loss of jobs and money.³ While that rationale has been challenged,⁴ with the protocol's entry into force in 2005 another possibility is becoming increasingly salient: The United States may actually end up suffering economically and otherwise by having rejected the treaty.

First, the U.S. government's position on the issue of climate change has translated into a lack of incentives for businesses and state and local governments to invest in technologies that improve efficiency and reduce emissions, both for domestic use and export. Second, only Kyoto Protocol Parties may use the new carbon trading markets to offset their emissions of greenhouse gases (GHGs). Consequently, American companies have less incentive than firms in states that have ratified the Kyoto Protocol to engage in what is shaping up to be a potentially profitable system that also

¹ Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998) (entered into force Feb. 15, 2005) [hereinafter Kyoto Protocol].

² Bradford C. Mank, *Standing and Global Warming: Is Injury to All Injury to None?*, 35 *Env'tl. L.* 1, 20 (2005).

³ See, e.g., *Bush Firm Over Kyoto Stance*, CNN, Mar. 29, 2001, <http://archives.cnn.com/2001/US/03/29/schroeder.bush/> (last visited Apr. 15, 2007) (quoting President Bush: "I will not accept a plan that will harm our economy and hurt our workers.").

⁴ See, e.g., Natural Res. Def. Council, *Bush Administration Errs on Kyoto Global Warming Agreement*, <http://www.nrdc.org/globalWarming/akyoqa.asp> [hereinafter NRDC] (last visited Apr. 15, 2007) (rebutting a number of misconceptions and Bush Administration claims and asserting that no economic studies support the administration's dire predictions); Press Release, World Wildlife Fund, *New Report Disproves Bush Claims that Global Warming Treaty Would Hurt U.S. Economy* (July 12, 2001) [hereinafter WWF], available at <http://www.commondreams.org/news2001/0712-06.htm> (arguing that U.S. savings through increased efficiency would outweigh expenditures on cleaner technology by 2010); U.S. DEP'T OF ENERGY, *SCENARIOS FOR A CLEAN ENERGY FUTURE* (2000), available at <http://www.ornl.gov/sci/eere/cef/> (discussing the economic boon the Kyoto Protocol has been to European and Japanese clean technology companies and the money saved by companies investing in increased efficiency).

encourages efficiency, innovation, and competitiveness. Finally, only entities from Parties to the Kyoto Protocol may fully participate in the Clean Development Mechanism (CDM), under which the carbon emissions of entities in developed countries may be offset by investments in emission abatement projects in developing countries. U.S. companies may participate, but they may not use the resulting emissions credits to their gain under the Protocol. The CDM may thus give foreign companies the upper hand in seeking contracts for CDM projects in developing countries.

In September 2004, the largest solar power plant in the world opened in Germany.⁵ Built using technology from Shell Solar, a Dutch company, and Siemens, a German firm, the plant can provide electricity for approximately 1,800 European homes.⁶ In addition, the facility will reduce global annual carbon dioxide emissions by about 3,700 tons.⁷ Two months earlier in China, German Foreign Minister Joschka Fischer inaugurated what is ostensibly the largest solar collector manufacturing facility in the world.⁸ For Fischer, the Sino-German joint venture was proof of the business opportunities available to those with expertise and a willingness to participate in the renewable energy sector.⁹ Meanwhile, 7,000 miles away, AstroPower, the second largest solar cell manufacturer in the United States, closed its doors for the last time, driven into bankruptcy by poor sales and crushing debt.¹⁰ "It's almost embarrassing," said renewable energy consultant Christopher Reed, discussing the situation in the American solar industry.¹¹ "The photovoltaic technology came out of Bell Labs in the U.S. We should be the world leaders."¹²

The successes of the German solar industry are directly related to government policies favoring technologies that enable the country to work towards meeting its Kyoto obligations.¹³ Similarly, early (and gradually tapering) government subsidies led to the installation of 144,000 residential photovoltaic systems in Japan by 2002.¹⁴ But in the United States, production of solar cells dropped fourteen percent in 2003 alone (in part due to the

⁵ *Germany Opens World's Biggest Solar Plant*, DEUTSCHE WELLE, Aug. 9, 2004, <http://www.dw-world.de/dw/article/0,1564,1321857,00.html> (last visited Apr. 15, 2007).

⁶ *Id.*

⁷ *Id.*

⁸ *German Know-How For China's Energy Sector*, DEUTSCHE WELLE, July 16, 2004, <http://www.dw-world.de/dw/article/0,1564,1269079,00.html> (last visited Apr. 14, 2007).

⁹ *Id.*

¹⁰ NAT'L ENVTL. TRUST, *REJECTING THE KYOTO PROTOCOL: LOST BUSINESS, LOST MARKETS, LOST OPPORTUNITIES FOR THE U.S.* 16 (2004) [hereinafter NET REPORT] (on file with author).

¹¹ Stephanie Hemphill, *Report: Kyoto treaty rejection hurts U.S. businesses*, Minn. Pub. Radio, Dec. 15, 2004, http://news.minnesota.publicradio.org/features/2004/12/14_hemphills_energypolicy/ (last visited Apr. 15, 2007).

¹² *Id.*

¹³ GERMAN EMBASSY, *BACKGROUND PAPERS: PROMOTING RENEWABLE ENERGY SOURCES*, <http://www.germany-info.org/relaunch/info/archives/background/renewable.html> (last visited Apr. 15, 2007) (discussing the incentives provided by the German government under the Renewable Energy Sources Act of 2000).

¹⁴ VIVIANA JIMÉNEZ, *EARTH POLICY INST., WORLD SALES OF SOLAR CELLS JUMP 32 PERCENT*, <http://www.earth-policy.org/Indicators/2004/indicator12.htm> (last visited Apr. 15, 2007).

bankruptcy of AstroPower).¹⁵ While subsidies and other incentives in Germany and Japan have encouraged production and lowered the price of renewable energy technologies, allowing companies from those countries to become involved in far-flung projects such as the plant in China, U.S. policy has been “piecemeal and erratic,” discouraging investment.¹⁶ Federal tax credits, for example, are constantly lapsing before eventually being re-approved, if at all.¹⁷

The United States is also losing the opportunity to gain valuable experience in industrial efficiency and emissions credits¹⁸ trading, two ways in which Kyoto Protocol Parties are achieving compliance with their emissions reduction targets. British Petroleum (BP) instituted a company-wide emissions reduction scheme and, in the words of the CEO, “added around \$650 million of shareholder value, because the bulk of the reductions came from the elimination of leaks and waste.”¹⁹ London—not New York—has become home to the burgeoning emissions trading market.²⁰ With individual trades of 100,000 credits not uncommon²¹ and the price of an individual credit (representing one metric ton of carbon dioxide or equivalent GHGs) as high as 31 Euro,²² companies in a position to sell credits—having met their Kyoto Protocol obligations through improved efficiency, for example, and reaping the financial rewards of that as well—stand to make a tidy profit. The activities of Kyoto Protocol Parties have not gone unnoticed in the United States, where a number of business leaders see

¹⁵ *Id.*

¹⁶ Hemphill, *supra* note 12.

¹⁷ *Id.*

¹⁸ The terms “credit” and “allowance” are sometimes used interchangeably, but they are technically different. A credit is awarded to an entity for exceeding its mandated emissions cuts and can then be traded in an emissions trading market. An allowance is what is doled out to entities at the start of the emissions reduction regime. Allowances may then be bought from, sold to, or traded with other entities directly, depending on how well the entities are faring in relation to their emissions limits. Int’l Emissions Trading Ass’n, Difference Between an Allowance and Credit, <http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=369> (last visited Apr. 15, 2007). For further explanations of this distinction and others, most of which are beyond the scope of this Comment, see RICHARD ROSENZWEIG ET AL., PEW CTR. ON GLOBAL CLIMATE CHANGE, THE EMERGING INTERNATIONAL GREENHOUSE GAS MARKET (2002), *available at* http://www.pewclimate.org/global-warming-indepth/all_reports/international_greenhouse_gas/index.cfm.

¹⁹ John Browne, *Beyond Kyoto*, 83 FOREIGN AFF. 20, 26 (2004), *available at* <http://www.foreignaffairs.org/20040701faessay83404-p0/john-browne/beyond-kyoto.html>.

²⁰ Angus McCrone, *Special Report: London Leads in Carbon Market*, SUNDAY TIMES (U.K.), Aug. 7, 2005, *available at* 2005 WLNR 12541808.

²¹ Andrew Cave, *City Life*, DAILY TELEGRAPH UK, Oct. 10, 2005, <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2005/10/10/cccity10.xml> (last visited Apr. 15, 2007).

²² Mathew Carr, *Emission Prices Drop to 13-Month Low After Sweden Shows Surplus*, BLOOMBERG, May 2, 2006, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=amqPIxw2WKDg> (last visited Apr. 15, 2007). However, as of this writing the price is €0.75. Point Carbon, <http://www.pointcarbon.com> (last visited Apr. 15, 2007). The culprit of the price drop was apparently an over-allocation of credits, and further price volatility is expected. *Does Canada Need a Carbon Tax?*, GLOBE-NET, Jan. 4, 2006, <http://www.globe-net.ca/search/display.cfm?NID=2524&CID=2> (last visited Apr. 15, 2007).

the imposition of emissions restrictions—if not outright accession²³ by the United States to the Protocol itself—as an eventual reality in this country, and worry that they are losing ground to overseas competitors.²⁴

Finally, the United States may come to regret its rejection of the Kyoto Protocol for another reason: American companies could find themselves cut out of the bidding processes for CDM projects. The CDM allows the transfer of emissions credits to developed countries or their companies in exchange for participation in GHG-reducing projects in developing countries. Examples of current and proposed projects include an Anglo-Japanese landfill gas management project in Brazil and a Dutch windfarm in China.²⁵ Almost half the turbines for the windfarm project will come from GE's Wind Energy division, underscoring the opportunities renewable energy companies could expect from full U.S. participation in the CDM.²⁶ Sweetening the deal for Kyoto Protocol Parties is the World Bank which, through a number of “carbon funds,” is providing low-priced emissions credits (by purchasing those credits and then pooling them for sale to groups of buyers) and brokerage assistance to companies and states that engage in CDM projects.²⁷ But without American ratification of the Protocol,

²³ Accession is a process through which a state can become a party to a treaty after the treaty has been negotiated and signed by other states and has entered into force, as is the case with the Kyoto Protocol. UNITED NATIONS, TREATY REFERENCE GUIDE 6 (1999), *available at* <http://untreaty.un.org/English/guide.pdf>. Further, accession has the same legal effect as ratification. *Id.* Ratification involves submitting the treaty to a country's domestic political process, which then generally enacts enforcing legislation; in the United States this involves authorization by the Senate, followed by final ratification by the President. UNITED STATES SENATE, ENACTMENT OF A LAW ch. 23, http://www.senate.gov/legislative/common/briefing/Enactment_law.htm (last visited Apr. 15, 2007). Generally, once all the negotiating parties have ratified a treaty, it enters into force. NET REPORT, *supra* at note 10, at 7.

²⁴ See, e.g., Katherine Stapp, *U.S. Companies See Practical Benefits in Carbon Emissions Market*, TIERRAMÉRICA, *available at* <http://www.tierramerica.net/2004/1204/iarticulo.shtml> (last visited Apr. 15, 2007) (discussing the opinions among business leaders in the United States on the potential for emissions regulation and the attitudes toward the carbon market). Tom Jacob, DuPont's senior adviser for global affairs stated: “I believe it's only a matter of time before we'll face (U.S. federal) regulatory mandates to reduce our emissions.” *Id.*; see also Steve Lohr, *The Cost of an Overheated Planet*, N.Y. TIMES, Dec. 12, 2006, at C1, *available at* 2006 WLNR 21397744. James E. Rogers, chief executive of Duke Energy stated: “Climate change is real, and we clearly believe we are on a route to mandatory controls on carbon dioxide. And we need to start now because the longer we wait, the more difficult and expensive this is going to be.” *Id.*

²⁵ UNFCCC, CDM: Brazil NovaGerar Landfill Gas to Energy Project, <http://cdm.unfccc.int/Projects/DB/DNV-CUK1095236970.6/view.html> (last visited Apr. 15, 2007); UNFCCC, CDM: Huitengxile Windfarm Project, <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1113481234.64/view.html> (last visited Apr. 15, 2007).

²⁶ UNFCCC, HUITENGXILE WINDFARM PROJECT DESIGN DOCUMENT 6 (2004), *available at* http://cdm.unfccc.int/UserManagement/FileStorage/FS_920755771. GE can keep the emissions credits or sell them, but it will otherwise be unable to use them until the United States ratifies the Kyoto Protocol or implements its own GHG reduction program. See discussion *infra* Part V (describing the Clean Development Mechanism).

²⁷ World Bank Carbon Finance Unit, Carbon Finance at the World Bank, <http://carbonfinance.org/> (last visited Apr. 15, 2007). The goal of the World Bank in this endeavor is to encourage and enable entities to become involved in carbon reduction projects that benefit developing countries while reducing GHGs. It plans to utilize its formidable resources and expertise to help launch CDM projects that might not otherwise get off the

U.S. companies could either be shut out of such project negotiations entirely or, at the very least, find themselves competing with companies for whom offsetting emissions, not financial gain, is paramount.

This Comment discusses American non-participation in the Kyoto Protocol and its economic implications for U.S. companies and the economy in general. Part II introduces the Kyoto Protocol and describes the United States' response to it under the Bush Administration. Part III examines the lack of a consistent focus on renewable energy by the U.S. government as contrasted with the policies of Kyoto Protocol Parties, both in terms of the domestic market and overseas opportunities, and the increase in industrial efficiency expertise in countries that have ratified the Kyoto Protocol. Part IV considers the growing emissions trading market in view of the possibility that American companies may soon find themselves at a competitive disadvantage in that area. Part V indicates the nascent CDM system is likely to handicap U.S. companies that could otherwise be top bidders for projects in developing countries. As to the overall question of whether the U.S. economy will suffer as a result of the Bush Administration's stance on the Kyoto Protocol, Part VI concludes that it most likely will and that the administration may have reason to regret its decision even before it leaves office.

II. THE KYOTO PROTOCOL: BACKGROUND AND THE U.S. RESPONSE

Before examining the impact of the U.S. withdrawal from the Kyoto Protocol, it is important to understand how the Protocol works and why the Bush Administration objects to it. In 1992, the United Nations Framework Convention on Climate Change²⁸ was signed in Rio de Janeiro. Although it lacked any binding targets or fixed timetables, it laid the foundation for later agreements by committing the parties to the convention to beginning the process of formulating national climate change mitigation policies.²⁹ It also established 1990 as the baseline year for the parties to use in developing their GHG-reduction targets.³⁰

The Kyoto Protocol,³¹ an addition to the UNFCCC, was adopted in 1997 and came into force in February 2005 after Russia added itself to the list of 141 ratifying countries.³² The stated aim of the parties to the UNFCCC was to stabilize "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate

ground. World Bank Carbon Finance Unit, Carbon Finance at the World Bank: About Us, <http://carbonfinance.org/Router.cfm?Page=About&ItemID=24668> (last visited Apr. 15, 2007).

²⁸ United Nations Framework Convention on Climate Change, May 9, 1992, S. TREATY DOC. No. 102-38 (1992) [hereinafter UNFCCC].

²⁹ UNFCCC, The United Nations Framework Convention on Climate Change, http://unfccc.int/essential_background/convention/items/2627.php (last visited Apr. 15, 2007).

³⁰ UNFCCC, *supra* note 28, art. 4.2(b).

³¹ Kyoto Protocol, *supra* note 1.

³² For a full timeline of the climate change agreements leading up to and following the Kyoto Protocol, see Mapleleafweb.com, History of the Kyoto Protocol, <http://www.mapleleafweb.com/features/environment/kyoto/05.html> (last visited Apr. 15, 2007).

system.”³³ Those gases include: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.³⁴ The Kyoto Protocol’s plan to achieve that goal involves specific emissions reduction targets within a specific timeframe for most of the developed countries among its parties.³⁵ For example, if the United States became a Party it would be required to reduce its GHG emissions seven percent below the amount of its 1990 emissions³⁶ between 2008 and 2012.³⁷ Iceland, by contrast, is allowed to *increase* its emissions by ten percent.³⁸ Such a surplus of emissions capacity is known as “hot air.” Russia is probably the biggest winner in terms of hot air. Its target under the Kyoto Protocol is zero percent (i.e., it needs to be at or below its 1990 levels by 2012),³⁹ but the collapse of its economy after the 1990 benchmark left it with a thirty-percent emissions surplus.⁴⁰

Emissions credits⁴¹ are issued to countries by the CDM Executive Board based on their original emissions targets and those countries are then expected to implement national policies geared towards meeting their targets.⁴² Developed countries are further required to assist developing countries in reducing their emissions through knowledge transfers⁴³ and

³³ UNFCCC, *supra* note 28, art. 2.

³⁴ Kyoto Protocol, *supra* note 31, annex A.

³⁵ UNFCCC, Kyoto Protocol, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Apr. 15, 2007). Developing countries are exempt from the emissions reductions targets, including those with fast-growing (and heavily polluting) economies such as China and India. Kyoto Protocol, *supra* note 1, annex B. Also, some countries “undergoing the process of transition to a market economy” in eastern Europe may use benchmark years other than 1990. Kyoto Protocol, *supra* note 1, art 3.5.

³⁶ To be precise, 1990 is the benchmark year for carbon dioxide, while parties may use 1995’s levels as the targets for hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. Kyoto Protocol, *supra* note 1, art. 3.8.

³⁷ *Id.* art. 3, annex B.

³⁸ *Id.* annex B.

³⁹ *Id.*

⁴⁰ Takamitsu Sawa, *A Way Past Kyoto’s ‘Hot Air,’* JAPAN TIMES, Jan. 30, 2006, *available at* <http://www.japantimes.co.jp/cgi-bin/ea20060130ts.html>. One of the criticisms of the Kyoto Protocol is that, thanks to the issue of hot air, countries unwilling or unable to reduce their emissions can simply buy Russia’s excess allowances, for example, resulting in no net decrease in global emissions and serving only to enrich Putin’s government. *See, e.g.,* Ronald Bailey, *Bonn Voyage: Last month’s international greenhouse gas reduction plan—negotiated without U.S. participation—is full of hot air*, REASON MAG., Aug. 8, 2001, <http://www.reason.com/rb/rb080801.shtml> (last visited Apr. 15, 2007) (noting, for instance, that Russia alone may have enough hot air to satisfy all of Europe’s Kyoto Protocol obligations).

⁴¹ Emissions credits go by different names depending on the Kyoto Protocol mechanism involved (the discussion of these mechanisms begins *infra* notes 42–44 and accompanying text). Under Joint Implementation, they are called emission reduction units (ERUs); under the CDM, certified emission reductions (CERs); and for emissions trading, assigned amount units (AAUs). UNFCCC, Kyoto Protocol, http://unfccc.int/kyoto_protocol/background/items/3145.php (last visited Apr. 15, 2007).

⁴² Kyoto Protocol, *supra* note 1, art. 2. Only certain industrial sectors are expected to contribute to the emissions reductions because they are considered to be the principle sources of the Kyoto Protocol-listed GHGs. *Id.* annex A.

⁴³ *Id.* art. 10(c).

funding.⁴⁴ Countries that fail to reach their goals are subject to stringent penalties.⁴⁵

However, the Protocol established three mechanisms designed to give the Parties sufficient flexibility to attain their targets. These mechanisms—emissions trading,⁴⁶ the CDM,⁴⁷ and Joint Implementation (JI),⁴⁸ which allows developed countries or those with economies in transition to engage in emissions reductions projects in each other's countries—were vigorously promoted by the U.S. delegation in Kyoto,⁴⁹ and emissions trading was something of an American brainchild, having been used to reduce acid rain in New England.⁵⁰

Although Vice President Al Gore signed the Kyoto Protocol on behalf of the United States in 1997 after considerable modifications were made to accommodate U.S. demands,⁵¹ the Bush Administration has since removed the U.S. signature,⁵² citing studies predicting economic hardship if the United States accedes to it.⁵³ As mentioned above, the accuracy of the

⁴⁴ *Id.* art. 11.2.

⁴⁵ UNFCCC, An Introduction to the Kyoto Protocol Compliance Mechanism, http://unfccc.int/kyoto_protocol/compliance/introduction/items/3024.php (last visited Apr. 15, 2007).

⁴⁶ Kyoto Protocol, *supra* note 1, art. 17; *see also* UNFCCC, Emissions Trading, http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php (last visited Apr. 15, 2007) (describing the emissions trading process). Emissions trading is discussed further *infra* Part IV.

⁴⁷ Kyoto Protocol, *supra* note 1, art. 12; *see also* UNFCCC, Clean Development Mechanism (CDM), http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php (last visited Apr. 15, 2007). The CDM is discussed further *infra* Part V.

⁴⁸ Kyoto Protocol, *supra* note 1, art. 6; *see also* UNFCCC, Joint Implementation, http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php (last visited Apr. 15, 2007).

⁴⁹ *See, e.g.,* Linda Baker, *Adventures in Smog Trading*, SALON, June 4, 2003, available at <http://gspp.berkeley.edu/alumni/AlumniNews/trexler.pdf>. According to David Doniger, former Clinton Administration Kyoto Protocol negotiator, "Cap-and-trade was invented in America and sold in Kyoto over the great objections of the Europeans and Japanese." *Id.*

⁵⁰ Acid Rain Program, 40 C.F.R. § 72 (2006). The emissions trading system is called the Sulfur Dioxide Allowance System. *Id.* § 73; *see also* Michael Hopkin, *Emissions Trading: The Carbon Game*, 432 NATURE 268, 270, Nov. 18, 2004, available at http://www.nature.com/news/2004/041115/pf/432268a_pf.html (describing the Acid Rain Program).

⁵¹ *See, e.g.,* *Negotiators Discuss 'Differentiated' Emissions Cuts*, CNN, Dec. 2, 1997, <http://www.cnn.com/EARTH/9712/01/global.warming/> (discussing last-minute proposals by the U.S. delegation such as less ambitious emissions cuts and pushing the target date for those cuts from 2005 to 2012—failing their adoption, the United States was "prepared to walk away" from a bad treaty").

⁵² Affixing a signature to a treaty is largely a formality. The signatory country is not bound to the treaty's terms and is only obligated to refrain "from acts that would defeat the object and the purpose of the treaty." UNITED NATIONS, *supra* note 23, at 9. Vice President Gore's signature, however, was more purely symbolic than most—the Clinton Administration never had any intention of submitting the Kyoto Protocol to the Senate for approval, as it was guaranteed to have been rejected by the Republican-controlled body. *See, e.g.,* Senate Historical Office, Albert A. Gore, Jr., 45th Vice President (1993–2001), http://www.senate.gov/artandhistory/history/common/generic/VP_Albert_Gore.htm (last visited Apr. 15, 2007).

⁵³ *See, e.g.,* Press Release, The White House, President Bush Discusses Global Climate Change (June 11, 2001), <http://www.whitehouse.gov/news/releases/2001/06/20010611-2.html>

studies and the motivations of those involved with their development and release have been questioned.⁵⁴ One criticism of the Administration's stance is that it is based on calculations that ignored the potential benefits to U.S. businesses from participation in the Kyoto Protocol's flexibility mechanisms⁵⁵ and from the increased energy efficiency that would have almost certainly resulted from American accession to the treaty.⁵⁶

But with no indication that the Administration is considering reversing its position, the debate over the rationale for withdrawal is not likely to be resolved anytime soon. However, evidence that President Bush's stance may end up hurting U.S. businesses is more readily available, and it is to that possibility that this Comment now turns.

III. RENEWABLE ENERGY TECHNOLOGIES AND ENERGY EFFICIENCY

Probably the most obvious sector of the economy to discuss when analyzing the impact of the U.S. withdrawal from the Kyoto Protocol is that of renewable energy technologies. In the United States, clean technologies occupy a tiny niche (two percent) in the energy sector.⁵⁷ The oil, natural gas, and coal industries got off the ground thanks in large part to federal subsidies in the form of tax breaks and exploration rights on public lands, many of which continue today.⁵⁸ The renewable energy sector, on the other hand, has long complained of a lack of government incentives or, when such incentives do exist, their unpredictable and unreliable nature.⁵⁹ The most

(last visited Apr. 15, 2007) [hereinafter Bush Kyoto Speech] (transcript of President Bush's speech); THE WHITE HOUSE, CABINET-LEVEL CLIMATE CHANGE WORKING GROUP, CLIMATE CHANGE REVIEW—INITIAL REPORT 13–14 (2001), available at <http://www.whitehouse.gov/news/releases/2001/06/climatechange.pdf> (outlining many of the arguments in President Bush's speech); CHARLI E. COON, THE HERITAGE FOUND., WHY PRESIDENT BUSH IS RIGHT TO ABANDON THE KYOTO PROTOCOL (2001), <http://www.heritage.org/Research/EnergyandEnvironment/BG1437.cfm> (predicting, for example, anywhere between \$100 billion to more than \$400 billion in lost productivity and 2.4 million lost jobs). The Bush Administration and others also see it as unfair that countries such as China and India are exempt from the Kyoto Protocol's emissions reduction targets, as discussed *supra* note 35, and this was one of the stated rationales for withdrawing from the treaty. Bush Kyoto Speech, *supra*.

⁵⁴ See *supra* note 4. Also, some opponents of the Administration's climate change policy say little proof of the primacy of policy over science in the Bush White House is needed beyond the revelation that a former oil industry lobbyist watered down reports by government scientists on climate change and mankind's role in it. *Bush Aide 'Edited Climate Papers,'* BBC NEWS, June 9, 2005, <http://news.bbc.co.uk/1/hi/world/americas/4075986.stm> (last visited Apr. 15, 2007).

⁵⁵ See, e.g., NRDC, *supra* note 4.

⁵⁶ See, e.g., WWF, *supra* note 4.

⁵⁷ *Voluntary Green Power Purchasing up 1000 Percent in 5 Years; Large Corporate Purchasers Driving Growth*, ENVT. NEWS NETWORK, Oct. 27, 2005, <http://enn.com/biz.html?id=1193> (last visited Apr. 15, 2007) [hereinafter *Voluntary Green Power*].

⁵⁸ See, e.g., Taxpayers for Common Sense, An Overview of Senate Energy Bill Subsidies to the Fossil Fuel Industry (2003), <http://www.taxpayer.net/greencissors/LearnMore/senate/fossilfuelsubsidies.htm> (last visited Apr. 15, 2007) (summarizing the history of federal assistance to the energy sector and decrying its continuation in an era of record oil company profits).

⁵⁹ Kurt C. Hofgard, *Is This Land Really Our Land?: Impacts of Free Trade Agreements on U.S. Environmental Protection*, 23 ENVTL. L. 635, 646 (1993); *Energy: Maximizing Resources, Meeting Our Needs, Retaining Jobs: Hearing Before the Subcommittee on Energy Policy,*

prominent federal incentive program, a corporate production tax credit passed as part of the Energy Policy Act in 1992,⁶⁰ has to be renewed after it lapses every few years, leading to frustration among industry leaders who view a consistent, long-term renewable energy policy as vital to the success of their sector.⁶¹ Similarly, the federal Million Solar Roofs Initiative,⁶² launched in 1997, lacks a dedicated funding source and has achieved less than half of its goal.⁶³

Some states have taken the reins, and it is in those states that the clean energy sector has fared best. State-level programs in Pennsylvania, for example, have enabled financing for renewable energy projects and have convinced the world's second largest wind technology manufacturer to open its American headquarters and a large wind turbine plant in the state.⁶⁴ California recently launched its own million solar roofs plan with long-term initiatives based on the highly successful Japanese program⁶⁵ and expressly aimed at fostering a sense of market certainty.⁶⁶

Government incentives are vital to the long-term viability of the clean energy sector because prices for renewable energy technology are still prohibitively high in many cases. But Japan, in particular, has proven that government support does not have to be perpetual. The solar panel installation subsidy there, discussed in Part I,⁶⁷ was reduced from fifty percent of the cost to ten percent in a few years as increased demand drove down the price of solar photovoltaic cells.⁶⁸ The government-supported increase in domestic research and production of renewable energy technologies has allowed countries like Japan and Germany to export the fruits of those efforts abroad and to become world leaders in the sector.

Natural Resources and Regulatory Affairs of the H. Government Reform Comm., 107th Congress 120-121 (2002) (statement of George Sterzinger, Executive Director, Renewable Energy Policy Project).

⁶⁰ Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (codified in scattered sections of 11, 15, 16, 25, 26, 30 & 42 U.S.C.). The credit "applies to commercial and industrial sectors only, and provides a tax credit of 1.8 cents/KWh for electricity produced from wind, solar, geothermal, and closed-loop biomass; and half that rate, or 0.9 cents/KWh for open-loop biomass, small irrigation power, and municipal solid waste." NET REPORT, *supra* note 10, at 10.

⁶¹ NET REPORT, *supra* note 10, at 10.

⁶² See U.S. Dep't of Energy, Solar Energy Technologies Program, <http://www1.eere.energy.gov/solar/deployment.html#million> (last visited Apr. 15, 2007) (explaining the Department of Energy's initiative to install solar energy systems on one million homes by 2010).

⁶³ *Id.* (touting 350,000 installed systems as of the end of 2002); NET REPORT, *supra* note 10, at 16 (providing a considerably smaller number than the government's figure, at only 229,000 solar roofs by the end of 2003). It is unclear what the current figure is, but attaining the goal of one million installed systems by 2010 seems to be a tall order.

⁶⁴ NET REPORT, *supra* note 10, at 11. The company, based in Spain, is Gamesa Corporación Tecnológica, S.A. *Id.*

⁶⁵ See JIMÉNEZ, *supra* note 14 (describing the variety of Japan's government incentive programs and identifying the nation as the "world leader in both production and installation of solar cells"); Env't Cal., Million Solar Roofs, <http://www.environmentcalifornia.org/energy/million-solar-roofs/fact-sheet> (last visited Apr. 15, 2007).

⁶⁶ Cal. Pub. Util. Comm'n, The California Solar Initiative, <http://www.cpuc.ca.gov/static/energy/solar/> (last visited Apr. 15, 2007).

⁶⁷ JIMÉNEZ, *supra* note 14 and accompanying text.

⁶⁸ *Id.*

Japanese firms produce half the global supply of photovoltaic cells,⁶⁹ and Germany is the world's largest producer of wind energy, with more than twice the installed capacity of the United States.⁷⁰ As discussed in Part I, this predominance has enabled firms in these countries to land lucrative contracts in China and elsewhere and to eclipse the United States in a global renewable energy technology market worth well over 25 billion dollars annually.⁷¹

The Global Energy Innovation Index, which tracks the fifty biggest "pure play"⁷² publicly-traded renewable and low-carbon energy technology companies in the world, paints a striking picture. In the first quarter of 2005, those companies in countries that are party to the Kyoto Protocol did very well, with shares rising an average of nearly twenty-two percent⁷³ and those of companies based in Frankfurt soaring almost fifty-three percent.⁷⁴ By contrast, the shares of the U.S.-based companies on the index dropped by an average of just under fourteen percent.⁷⁵ While there may be no single explanation for this divergence, these are well-established companies, and for their stock prices to race in opposite directions almost as soon as Russia ratified the Kyoto Protocol could forecast prosperity for renewable energy technology companies fortunate enough to be located in Party countries.

It is fair to say that accession to the Kyoto Protocol would likely propel the American government to implement renewable energy incentives as a strategy for meeting its emissions reduction obligations. As discussed previously, it is mainly the "boom and bust" cycle of government assistance, or the complete lack of assistance, that hinders progress in the U.S. renewable energy sector. There is no lack of desire,⁷⁶ however, and it has been noted that the archetypal entrepreneurial American spirit contributes to the fact that more energy technology startups are created in the United States than in Europe.⁷⁷ Presumably, all that is needed is some indication

⁶⁹ Solarbuzz, Fast Solar Energy Industry Facts, <http://www.solarbuzz.com/FastFactsIndustry.htm> (last visited Apr. 15, 2007).

⁷⁰ AM. WIND ENERGY ASS'N, GLOBAL WIND ENERGY MARKET REPORT 2 (2004), *available at* <http://www.awea.org/pubs/documents/globalmarket2004.pdf>.

⁷¹ Christopher Flavin & Janet Sawin, *Kyoto As an Opportunity*, WORLDWATCH INST., Feb. 15, 2005, <http://www.worldwatch.org/node/1804> (last visited Apr. 15, 2007).

⁷² "A company devoted to only one line of business, or a company whose stock price is highly correlated with the fortunes of a specific investing theme or niche." InvestorWords.com, http://www.investorwords.com/3967/pure_play.html (last visited Apr. 14, 2007).

⁷³ Press Release, New Energy Fin. Ltd., "Kyoto Effect" Boosts European Renewable Energy Company Stocks (Apr. 5, 2005), *available at* <http://www.newenergyfinance.com/NEF/HTML/Press/KyotoEffect.pdf>.

⁷⁴ Kevin Allison & Stephen Schurr, *Winds of Change Point to Green Energy's Day in the Sun*, FIN. TIMES, May 18, 2005, at 44, *available at* 2005 WLNR 7804782.

⁷⁵ *Id.*

⁷⁶ See, e.g., *Voluntary Green Power*, *supra* note 57 (noting a 1,000% increase in the purchases of "green power" over five years, predominantly by large corporations such as Johnson & Johnson, which now derives 18% of its electricity from renewables).

⁷⁷ New Energy Fin. Ltd., *supra* note 68. When that spirit is combined with government investment, the results can be astounding. Boeing-Spectrolab recently announced the development of a solar cell with 40% efficiency, more than double the efficiency of current photovoltaics, made possible in part by funding from the Department of Energy. Thomas

that the national government is willing to support the clean energy sector in the twenty-first century with even a fraction of the resources devoted to the mineral extraction industries in the twentieth.⁷⁸ In addition to arguments in favor of consistent federal assistance to the clean energy sector, part of the criticism of the Bush Administration's economic analysis of the Kyoto Protocol is that it disregards savings from increased energy efficiency and the potential for job creation, which are aspects of clean energy technology that are also pertinent to the discussion, particularly in light of global competition. The 650 million dollars BP saved through increased efficiency prompted by its internal trading system is only one example.⁷⁹ The German chemical company BASF cut its annual costs by 500 million dollars through improved efficiency at just one of its manufacturing sites, and in the United States Dow Chemicals saved itself four billion dollars over an eleven-year period through increased energy efficiency and reduced carbon dioxide emissions by thirty-two percent.⁸⁰ Money saved through efficiency is money that can be spent elsewhere in an increasingly competitive global marketplace, which is why Lord Browne of BP referred to his company's savings as "shareholder value."⁸¹

In terms of employment, a number of studies have forecast significant job creation if the U.S. government starts investing more seriously in renewable energy.⁸² Experiences in other countries bear this out. Germany,

Claburn, *Major Solar Cell Breakthrough Announced*, INFO. WK., Dec. 6, 2006, available at <http://www.informationweek.com/story/showArticle.jhtml?articleID=196602062>.

⁷⁸ See, e.g., Taxpayers for Common Sense, *supra* note 58; NAVIN NAYAK, ILL. PIRG EDUC. FUND, REDIRECTING ILLINOIS'S ENERGY: THE ECONOMIC AND CONSUMER BENEFITS OF CLEAN ENERGY POLICIES 9 (2005), available at <http://www.house.gov/schakowsky/RedirectingIllinoisEnergy.pdf> (citing MGMT. INFO. SERV., FEDERAL INCENTIVES FOR THE ENERGY INDUSTRIES (1998)). "Since the early 20th century, the federal government has offered special tax breaks for the production of oil and gas. In fact, the oil and gas industry has always been the biggest beneficiary of federal energy subsidies." *Id.* See also Roger H. Bezdek & Robert M. Wendling, *Support for R&D*, ENERGY (BCC RESEARCH), Winter 2006, at 46 (on file with author) (calculating the federal government's support for the oil industry alone in the second half of the twentieth century, including research and development, tax breaks, and direct subsidies, at \$302 billion, or over 46% of the total spent on energy development incentives. By contrast, the solar and geothermal sectors combined received just over \$38 billion, or 6% of the total.).

⁷⁹ Browne, *supra* note 19 and accompanying text; see also Michael Northrop & David Sassoon, *The Mythology of Economic Peril*, ENVTL. FIN., June 2005, available at http://www.rbf.org/pdf/ef_mythology.pdf (quoting Karl Ulrich of the Wharton School of the University of Pennsylvania: "[W]e know from a technical analysis that we could, for example, reduce carbon dioxide . . . emissions by 500 million metric tons a year by improving energy efficiency in appliances and in residential and commercial buildings, and—here's the kicker—we would save money doing it").

⁸⁰ CLIMATE GROUP, CARBON DOWN PROFITS UP 7 (2006), available at http://theclimategroup.org/assets/resources/cdpu_newedition.pdf.

⁸¹ See Browne, *supra* note 19 and accompanying text (referring to the internal BP emissions reduction program that saved the company \$650 million).

⁸² See, e.g., UNION OF CONCERNED SCIENTISTS, RENEWING AMERICA'S ECONOMY 2 (2007), available at http://www.ucsusa.org/assets/documents/clean_energy/Renewing-Americas-Economy-2005.pdf (estimating 91,220 new jobs if Congress requires all large electric utilities to increase their use of renewable sources to 10% by 2020); GEORGE STERZINGER & MATT SVRCEK, RENEWABLE ENERGY POL'Y PROJECT, WIND TURBINE DEVELOPMENT: LOCATION OF MANUFACTURING

for example, currently generates approximately six percent of its electricity from wind, and its wind technology industry employs more than 45,000 people.⁸³ One study suggests that a more substantial level of investment in United States. renewables, on the order of 300 billion dollars, could create over three million new jobs.⁸⁴ A comprehensive study also found that the renewable energy sector creates more jobs per unit of energy delivered than does the fossil fuel-based sector, and that investment in renewables would benefit the economic sectors and geographical areas of the United States that have suffered the highest levels of unemployment.⁸⁵ In short, renewables could help rescue the beleaguered United States manufacturing sector and ameliorate the overall unemployment situation in the country.

IV. EMISSIONS TRADING

American non-participation in the Kyoto Protocol also affects the extent to which American companies will participate in the Protocol's flexibility mechanisms, which in turn could have a bearing on those companies' business prospects. Analysis of this issue starts with a discussion of the emissions trading mechanism. Once a party to the UNFCCC ratifies the Kyoto Protocol and implements a national program involving policies and measures aimed at reducing GHG emissions, monitoring emissions levels,⁸⁶ and reporting progress to the convention,⁸⁷ that nation's appropriate government agency specifies emissions limits for companies in certain industries⁸⁸ and issues emissions credits in amounts commensurate with those limits. Those companies are then legally bound either to reduce their emissions below the government-imposed ceiling or to acquire additional credits from companies whose emissions already are less than the maximum allowed.⁸⁹ The same is true of the parties themselves: If the United Kingdom, for example, continues to have difficulty meeting its obligations under the Kyoto Protocol,⁹⁰ it could buy some of Russia's hot air.

Thus, from the standpoint of regulated businesses, entities whose emissions exceed the limit set by the country's permitting authority are not required to invest in smokestack scrubbers or to start purchasing wind-

ACTIVITY 4 (2004), *available at* <http://www.repp.org/articles/static/1/binaries/WindLocator.pdf> (estimating that "every 1000 MW of wind power developed created a potential for 3000 jobs in manufacturing, 700 jobs in installation, and 600 in operations and maintenance").

⁸³ AM. WIND ENERGY ASS'N, *supra* note 70, at 3.

⁸⁴ APOLLO ALLIANCE, NEW ENERGY FOR AMERICA 7 (2004), *available at* <http://www.apolloalliance.org/docUploads/ApolloReport.pdf>.

⁸⁵ DANIEL M. KAMMEN, KAMAL KAPADIA & MATTHIAS FRIPP, PUTTING RENEWABLES TO WORK: HOW MANY JOBS CAN THE CLEAN ENERGY INDUSTRY GENERATE? 2, 12 (2d ed. 2006), *available at* <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf>.

⁸⁶ Kyoto Protocol, *supra* note 1, art. 5.

⁸⁷ *Id.* art. 7.

⁸⁸ *Id.* annex A.

⁸⁹ *Id.* art. 17.

⁹⁰ See, e.g., Richard Black, *UK Could 'Miss Kyoto Gas Target,'* BBC NEWS, Apr. 1, 2005, <http://news.bbc.co.uk/1/hi/sci/tech/4399323.stm> (last visited Apr. 15, 2007) (citing statistics showing that Britain is not on track to meet its GHG reduction goals).

generated electricity. Instead, they can find willing sellers in any developed country (that is, any country listed in Annex I of the UNFCCC)⁹¹, companies whose emissions are below the mandated limit, and buy their credits in a forum very similar to the bond market. This system was patterned after the sulphur dioxide (which contributes to acid rain) emissions trading system—a component of the U.S. Acid Rain Program—in the United States in the 1990s.⁹² That program, after much initial criticism, was widely seen as having successfully used market forces to cut sulphur dioxide in the air over the United States by more than thirty percent.⁹³

The idea behind emissions trading of any kind is to internalize externalities by assigning a monetary value to pollution, thus ensuring that it gets factored into business decisions. The key element, as demonstrated by the U.S. Acid Rain Program and voluntary efforts like the Chicago Climate Exchange (CCX),⁹⁴ is an emissions limit, or cap (hence the phrase “cap-and-trade”), either government- or self-imposed. Individual companies or industry sectors then determine how best to meet that requirement. They decide for themselves whether it makes more financial sense for them to cut emissions outright or to buy someone else’s surplus credits. Also, they can decide whether to seek out willing sellers on their own or, for convenience and speedier results than those available with a negotiated contract, buy credits through an emissions trading market.⁹⁵ Thus, on paper, and to a large degree in practice as well, emissions trading satisfies both the free market proponents, who prefer the carrot to the stick when regulation is unavoidable, and the environmentalists, whose focus is on reducing the overall level of GHGs in the atmosphere.

The GHG emissions trading mechanism under the Kyoto Protocol got off to a slow start. The United Kingdom established a trading market in 2001 and Denmark followed with one of its own, but trades of emissions credits were small and of a mainly experimental nature for the next few years.⁹⁶ In early 2005 the CCX established a subsidiary in London and Amsterdam, the European Climate Exchange (ECX),⁹⁷ but credits were stagnating at around

⁹¹ For the full list, see the UNFCCC’s website: http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php (last visited Apr. 15, 2007).

⁹² See *supra* note 50 and accompanying text.

⁹³ Hopkin, *supra* note 50, at 270.

⁹⁴ A group of companies, states, and cities, principally in North America, have volunteered to work together to reduce GHGs by a certain percentage through an emissions trading mechanism. For more information, see the website of the Chicago Climate Exchange, <http://www.chicagoclimatex.com> (last visited Apr. 15, 2007).

⁹⁵ See, e.g., FRANCK LECOCQ & KARAN CAPOOR, INT’L EMISSIONS TRADING ASS’N/WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET 2005, at 17 (2005), available at <http://carbonfinance.org/docs/CarbonMarketStudy2005.pdf> (discussing the use of both brokers and trading platforms in an emissions trading market).

⁹⁶ UNITED KINGDOM DEPARTMENT FOR ENVIRONMENT, FOOD, AND RURAL AFFAIRS, APPRAISAL OF YEARS 1-4 OF THE UK EMISSIONS TRADING SCHEME 6-15 (2006), available at www.defra.gov.uk/environment/climatechange/trading/uk/pdf/ukets1-4yr-appraisal.pdf (last visiting Apr. 15, 2007).

⁹⁷ Press Release, Chicago Climate Exchange, Launch Date Set For First EU ETS Futures Contracts (Mar. 21, 2005), available at http://www.chicagoclimatex.com/news/press/release_20050321_ECX.html.

five Euro each. Since Russian ratification and entry into force of the Kyoto Protocol, however, the market has taken off, with the price of a credit rising to more than thirty-one Euro⁹⁸ and hundreds of thousands of credits being traded daily. The ECX hit a new record on January 19, 2006, with credits worth 5.2 million metric tons of carbon dioxide trading hands, including a single 3.3 million ton-equivalent transaction.⁹⁹ One side of that deal managed to rake in more than €85 million in profit.

The ECX and rival markets, such as Nord Pool¹⁰⁰ in Norway and the European Energy Exchange (EEX)¹⁰¹ in Germany, are used by European companies to comply with the emissions caps administered by their national governments under the EU's Emissions Trading Scheme (EU ETS),¹⁰² a legally-binding cap-and-trade system for all twenty-five member states. Accompanying the establishment of emissions markets has been the establishment of emissions brokerage houses and consulting firms,¹⁰³ and even large European banks want a piece of the action.¹⁰⁴ London, in particular, is becoming a hub for the new trading systems.¹⁰⁵

More importantly, however, it is the European countries and their business leaders who are designing what will likely turn out to be the model, if not the foundation, of a future global emissions trading system.¹⁰⁶

⁹⁸ See *supra* note 22 (discussing the current price and its recent volatility).

⁹⁹ NETL CARBON SEQUESTRIAN NEWSL.: ANNUAL INDEX (Pittsburgh, Penn.), Sept. 2005–Aug. 2006, at 88, available at http://www.netl.doe.gov/publications/carbon_seq/2006index.pdf. One of the parties was ABN AMRO, one of the largest banks in the world. *Id.* The other party has not been publicly identified, as is normally the case with these market exchanges. See, e.g., INT'L EMISSIONS TRADING ASS'N, EMISSION ALLOWANCES: SINGLE TRADE AGREEMENT FOR THE EU SCHEME 12 (2006), available at <http://www.ieta.org/ieta/www/pages/getfile.php?docID=1739> (laying out the confidentiality requirements of a typical emissions trading contract, in which public disclosure of the contract's details is prohibited absent an explicit agreement otherwise); LECOCQ & CAPOOR, *supra* note 95, at 9 (noting that "most of the transactions on the carbon market are over the counter and confidential, with few details, if any, made public").

¹⁰⁰ Nord Pool, <http://www.nordpool.com/> (last visited Apr. 15, 2007).

¹⁰¹ European Energy Exchange, <http://www.eex.de/> (last visited Apr. 15, 2007).

¹⁰² See, e.g., Press Release, European Comm'n, Questions & Answers on Emissions Trading and National Allocation Plans (Mar. 8, 2005), <http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/05/84> (last visited Apr. 15, 2007) (providing general information on the EU ETS). See generally Joseph A. Kruger & William A. Pizer, *Greenhouse Gas Trading in Europe: The New Grand Policy Experiment*, ENV'T, Oct. 2004, at 8, available at <http://www.rff.org/rff/News/Features/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=16480> (providing an excellent overview of the EU ETS and the issues it faces).

¹⁰³ Examples include: Point Carbon, <http://www.pointcarbon.com/> (last visited Apr. 15, 2007), CO2e.com, <http://www.co2e.com/> (last visited Apr. 15, 2007), and Natsource, <http://www.natsource.com/> (last visited Apr. 15, 2007).

¹⁰⁴ McCrone, *supra* note 20 (noting, for instance, the involvement of the British bank Barclays).

¹⁰⁵ *Id.* According to James Cameron at Climate Change Capital, a London based investment banking firm focused on climate change, "Europe will be the centre of the global market as a result of it taking the lead. It will provide the benchmark. London is the leading centre and will remain so for years to come. The preparation has taken place here, and other financial centres are not so advanced, although there is also a concentration of expertise in the Netherlands." *Id.*

¹⁰⁶ Otto Pohl, *U.S. Left Out of Emissions Trading*, N.Y. TIMES, Apr. 10, 2003, at W1, available at 2003 WLNR 5234900. As Steve Drummond of CO2e.com put it, "Now that the Americans are out, Europe can dominate the emissions trading market. It entitles the Europeans to write the

American companies may be able to join and execute trades in the overseas markets, depending on the membership rules, and they can buy or sell credits “over the counter” (bypassing any centralized trading system and dealing directly with another company). But if people like DuPont’s Tom Jacob are correct in assuming that U.S. mandatory emissions caps are inevitable,¹⁰⁷ American companies could one day find themselves competing in—among other possibilities—a European-designed market system with European companies that are highly skilled in emissions trading and, due to their efforts to comply with emissions restrictions, in a position to be sellers rather than buyers. Furthermore, if the price of a credit rises, the American companies will find themselves paying considerably more than the early bird Europeans did to offset their emissions.¹⁰⁸

U.S. multinational corporations may also find themselves in a particularly complicated situation with regard to emissions trading. Their overseas operations could be subject to regulation by Kyoto Protocol Parties in which they do business.¹⁰⁹ If so, they will be required to adhere to the emissions limitations set by their host countries, whether through actual reductions or by acquiring allowances or credits from other entities.¹¹⁰ In addition, multinationals with efficient, low-emission facilities within the United States will be unable to benefit from those facilities under the overseas trading schemes, while companies based in Kyoto Protocol Parties will be able to leverage the totality of their worldwide operations and gain the maximum benefit from the emissions markets.¹¹¹ Indeed, the inability of foreign multinationals to benefit from emissions reductions at their U.S.-based facilities could make them think twice about maintaining those operations (or establishing new ones) and could even convince them to

rules for global trading.” *Id.*

¹⁰⁷ Stapp, *supra* note 24.

¹⁰⁸ See, e.g., Latham & Watkins Online, Overview of the Process for Obtaining Carbon Credits Under The Clean Development Mechanism, <http://www.lw.com/resource/Publications/ClientAlerts/clientAlert.asp?pid=1221> (last visited Apr. 15, 2007) [hereinafter Latham & Watkins] (“[T]he cheapest CDM projects will likely be taken first by Kyoto signatories and their companies, leaving US companies at a competitive disadvantage if they later become interested in using CDMs as an emissions hedge.”).

¹⁰⁹ Whether or not a U.S. multinational’s overseas operations are subject to emissions caps depends on whether the government of that country decides to include that particular industry sector and that company in its emissions reduction scheme. See, e.g., DANIEL BODANSKY, PEW CTR. ON GLOBAL CLIMATE CHANGE, IMPLICATIONS FOR U.S. COMPANIES OF KYOTO’S ENTRY INTO FORCE WITHOUT THE UNITED STATES 3–6 (2002), available at <http://www.pewclimate.org/docUploads/Kyoto-USBusiness.pdf>.

¹¹⁰ Kyle W. Danish, *The Effect of the Kyoto Protocol on U.S. Companies*, TRENDS, Mar.–Apr. 2005, at 8–9 available at <http://www.vnf.com/content/articles/trends0405.pdf> (describing the “direct effects” of the Kyoto Protocol on U.S. multinationals). Failure to meet emissions targets can result in hefty fines. In the first phase of the EU ETS, for example, which will run from 2005 to 2008 and deal with the energy, iron and steel, minerals, and pulp and paper industries, companies will be fined €40 for each ton of carbon dioxide-equivalent emitted beyond their allowances. In the second phase, which covers the period from 2008 to 2012 and adds other industries, the penalty will jump to €100 per ton. *Id.*

¹¹¹ *Id.*

relocate their facilities to countries where their GHG curtailment efforts would count toward their Kyoto Protocol obligations.

Finally, American multinationals will be subject to, in the words of Goldman Sachs, “a confusing regulatory environment”—the Clean Air Act and state and regional GHG reduction schemes for their U.S.-based operations and the Kyoto Protocol for their overseas facilities.¹¹² Such a scenario adds administrative costs and sows confusion.¹¹³ U.S. auto manufacturers are already facing this quandary as they find themselves compelled to choose between complying with two separate car emissions standards—the federal Clean Air Act on one hand and the more stringent California Air Resources Board (CARB) regulations¹¹⁴ on the other—or adopting the California standards for its entire domestic market.¹¹⁵ Similarly, U.S. multinationals with operations subject to the Kyoto Protocol may find that it makes more sense to reduce emissions at all their facilities rather than dealing with the complications of multiple regulatory schemes.

American companies may enjoy a competitive advantage during the initial months or years following the Kyoto Protocol’s entry into force as many of their counterparts in Europe will be compelled either to cut emissions by upgrading their facilities or to purchase credits on the market. The German chemical giant BASF, for example, will either have to reduce its annual emissions by 85,000 tons or spend up to 700,000 dollars per year on additional credits.¹¹⁶ Meanwhile, U.S. corporations will be able to continue

¹¹² GOLDMAN SACHS GLOBAL INVESTMENT RES., PORTFOLIO STRATEGY—THE GROWING INTEREST IN ENVIRONMENTAL ISSUES IS IMPORTANT TO BOTH SOCIALLY RESPONSIBLE AND FUNDAMENTAL INVESTORS 6 (2005), *available at* <http://www.gs.com/insight/research/reports/docs/enviro-interest.pdf>. For more information on the most prominent schemes, see Regional Greenhouse Gas Initiative, <http://www.rggi.org/> (last visited Apr. 15, 2007) (under which seven northeastern states have agreed to mandatory cuts in GHG emissions); California Clean Cars Campaign, <http://www.calcleancars.org/> (last visited Apr. 15, 2007) (describing California’s first-in-the-world restrictions on GHG vehicle emissions, which have been adopted by New York and three other New England states and which are likely to compel auto manufacturers to comply with the California standards rather than balkanizing their design and marketing efforts); Mark Martin, *State’s War on Warming*, S.F. CHRON., Sept. 28, 2006, at A1, *available at* <http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2006/09/28/MNG89LEBTN1.DTL> (describing a new law to reduce CO₂ and other GHGs in California by 25% by 2020).

¹¹³ *Id.*

¹¹⁴ Development and Adoption of Regulations Achieving Reduction of Greenhouse Gas Emissions from Motor Vehicles by January 1, 2005, CAL. HEALTH & SAFETY CODE § 43018.5 (West Supp. 2006).

¹¹⁵ In fact, this is the position of at least one major industry trade association: “The only compliance approach that makes economic sense is for the manufacturers to modify production facilities for the entire U.S. fleet to comply with California criteria, thereby making the CARB standard a de facto Federal standard.” Press Release, Ass’n of Int’l Automobile Mfrs., AIAM Comments on CARB Greenhouse Gas Draft Staff Report (July 7, 2004), *available at* http://www.aiam.org/public/aiam/media/agency_comments.aspx?PRID=81.

¹¹⁶ Mark Landler, *Mixed Feelings As Kyoto Pact Takes Effect*, N.Y. TIMES, Feb. 16, 2005, at C1, *available at* 2005 WLNR 2175085. The fact that the United States and China, in particular, get a pass on their emissions rankles some in Europe. As Jürgen Strube, chairman of BASF’s supervisory board, explained, “We have already done so much in the past that we feel others should not get a free ride. We could reach a situation where the leader is a lonely rider going into the sunset, and everyone else sits back and says, O.K., let’s wait and see when he will

to ignore emissions in their record-keeping. But in the long run, it seems more likely than not that companies in Kyoto Protocol Parties will gain valuable experience in operational efficiency and emissions reduction, leading to opportunities for the acquisition of profit and useful skills in the emissions markets, and that American firms that fail to move beyond a business-as-usual mentality will find themselves outflanked by leaner, greener overseas competitors.

V. THE CLEAN DEVELOPMENT MECHANISM

While two aspects of the Kyoto Protocol discussed thus far—increased use of clean energy technology and emissions trading—pertain mainly to developed countries, the Clean Development Mechanism (CDM) is where developing countries will play their biggest role under the Protocol, at least initially. It is also this flexibility mechanism in which the impact of U.S. non-participation in the Kyoto Protocol is probably the least clear.

Under the CDM, companies, governments, and organizations such as the World Bank attempting to offset GHG emissions may invest in, or even carry out, emissions reduction projects in developing countries. For example, one of the first approved CDM projects involved the sale in October 2005 of nearly 50,000 credits by the Indian government to SenterNovem, the Dutch government's energy and climate agency.¹¹⁷ The project involves generating electricity from mustard crop residues.¹¹⁸ The CDM is premised on the notion that it is easier to slow down emissions *growth* in developing countries than to *reduce* emissions in wealthy nations and on the idea that, since GHGs are a global problem, the geographical location of the reductions is irrelevant.¹¹⁹ So far, the major buyers of such credits, besides the Dutch government, include the Japanese government and the World Bank, which administers a number of funds to buy credits awarded to developing countries' projects by the UNFCCC and then either acts as a broker by locating individual buyers or pools the credits for groups of buyers to offset their emissions.¹²⁰ Recently, private companies are becoming more involved in the CDM as well.¹²¹

The CDM is quite controversial, however, and is potentially deeply flawed. For example, the rules defining a valid emissions reduction project

return." *Id.*

¹¹⁷ UNFCCC, CDM: Biomass in Rajasthan—Electricity Generation from Mustard Crop Residues, <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1112801052.32/view.html> (last visited Apr. 15, 2007).

¹¹⁸ *Id.*

¹¹⁹ BARBARA HAYA, PATRICK MCCULLY & BEN PEARSON, INT'L RIVERS NETWORK/CDM WATCH, DAMMING THE CDM: WHY BIG HYDRO IS RUINING THE CLEAN DEVELOPMENT MECHANISM 1 (2002), available at <http://www.irn.org/programs/greenhouse/pdf/021025.dammingthecdm.pdf>.

¹²⁰ The World Bank, Carbon Finance Unit, <http://carbonfinance.org/Router.cfm?Page=About&ItemID=24668> (last visited Apr. 15, 2007).

¹²¹ LECOCQ & CAPOOR, *supra* note 95, at 3 (calculating that private companies in Europe, for example, have purchased 60% of the CDM and JI project-related emissions credits there).

under the CDM are extremely complicated.¹²² Part of the issue involves the complexity of the “additionality” requirement, which seeks to ensure that any new emissions abatement projects are undertaken in addition to any already-planned projects.¹²³ If a power plant was going to be upgraded anyway for business reasons, for example, that upgrade could not be counted as a CDM project.

More fundamental concerns, however, involve the motivations and methodologies of the entities engaging in CDM projects. As has been demonstrated by the majority of the projects submitted to the CDM Executive Board for consideration, companies and governments so far have been targeting the “low-hanging fruit” GHGs like methane and potent hydrofluorocarbons like HFC-23, which are considered much more damaging than carbon dioxide but which comprise a tiny percentage of the GHGs in the atmosphere contributing to global warming.¹²⁴ So if a company can invest in a methane-capture project at a landfill in Latin America, that company will meet its emissions reduction target much more quickly and cheaply—while doing nothing to reduce the level of carbon dioxide in the atmosphere—than if it had been compelled to make direct cuts in its own emissions. Critics charge that, for these reasons, the CDM will do little, if anything, to provide a real environmental benefit to the host country or to change industrial behavior in the developed countries, which is what is required ultimately if the levels of GHGs in the atmosphere can be expected to stabilize.¹²⁵

From a business perspective, however, the CDM offers a potentially profitable opportunity. Companies subject to the Kyoto Protocol can use their need for emissions credits to barter their way into projects in developing countries. Once their reputations and business footholds are established, they can bid for other, for-profit endeavors. This ability to

¹²² Baker, *supra* note 49. The article quotes Dr. Mark Trexler, who heads a climate risk management firm in Portland, Oregon, and describes the rules as “massively confusing and contentious.” *Id.*

¹²³ *Id.*

¹²⁴ Jeffrey Ball, *Kyoto Treaty Creates Market in Gas-Emission Credits; CO₂ Projects Fall Short*, WALL ST. J., Aug. 11, 2005, at A1, available at <http://www.siliconinvestor.com/readmsg.aspx?msgid=21594625>.

¹²⁵ María Amparo Lasso, *Is Latin America Really a Carbon Market Pioneer?*, TIERRAMÉRICA, Nov. 20, 2004, available at <http://tierramerica.net/2004/1120/iarticulo.shtml>; see also Ball, *supra* note 124 (discussing a Dutch methane capture project in Brazil and the admission by a Dutch government official that the Netherlands would have been unable to meet their emissions reduction obligations without looking to “cheaper deals” in the developing countries); Keith Bradsher, *Big Profits, and Questions, in Effort to Cut Emissions*, N.Y. TIMES, Dec. 21, 2006, at A1, available at 2006 WLNR 22300233 (noting that 80% of the payments under the CDM are going to China, India, Brazil, and South Korea and to none of the countries in sub-Saharan Africa, and that 66% of those payments is tied up in projects intended to eliminate the “low-hanging fruit” gas HFC-23, resulting in an enormous waste of money for the purchasing businesses, which could have spent a fraction as much to build and operate incinerators to destroy the gas if they did not have to work through the CDM). Another criticism of the CDM is that it may end up subsidizing, or at least condoning, large-scale, environmentally unfriendly, non-sustainably developed projects such as hydroelectric dams. For a full discussion of this issue, see HAYA ET AL., *supra* note 119.

forego all or most of the remuneration they would ordinarily receive from a development project because they need emissions credits to help them balance their books is a considerable advantage over competitors not similarly situated. American companies, of course, figure among those competitors.

This is not to say that U.S. firms will be unable to participate in the CDM. Under the 2001 Marrakesh Accords to the Kyoto Protocol, private entities from non-parties may participate in unilateral CDM projects (that is, projects planned and negotiated solely by a developing country's government, rather than those also involving one of the countries listed in Annex B of the Kyoto Protocol).¹²⁶ American multinationals with operations in Kyoto Protocol Parties can engage, and have been engaging, in emissions abatement projects in developing countries, possibly in hopes of one day being able to use the resulting credits to offset their emissions under a U.S.-mandated cap-and-trade system or, as discussed above, with the goal of enhancing their business prospects in the host country. For instance, Coca-Cola is considering investing in a methane capture project in Brazil,¹²⁷ and ChevronTexaco is preparing an emissions reduction project through one of its subsidiaries in Indonesia.¹²⁸ Some experts are advising American companies with subsidiaries or parents in Kyoto Protocol Parties to invest in CDM projects with an eye towards selling the resulting credits, using them to offset emissions, or saving them for use under a future climate change mitigation scheme in the United States.¹²⁹

But while American companies can participate in the CDM, most likely the only companies that would be able to outbid their competitors in Party countries would be those whose international operations are large enough to absorb taking a financial hit on a project that would pay primarily in emissions credits. Small- to mid-size companies, especially those *not* heavily subsidized by the U.S. government such as renewable energy companies, might find it difficult to win CDM contracts over rivals for whom those emissions credits are a crucial element of their business strategy. Such a scenario would reduce further the ability of American companies to serve the growing energy needs of many developing countries.

VI. CONCLUSION

The impact of the U.S. rejection of the Kyoto Protocol is complicated to predict, but a few possibilities are reasonably likely to become reality. First, and most certain, is the likelihood that the Protocol will lead party

¹²⁶ BODANSKY, *supra* note 109, at 6; *see also* UNFCCC, Conference of the Parties 7, Annex F(33), Nov. 10, 2001, *available at* <http://unfccc.int/resource/docs/cop7/13a02.pdf>.

¹²⁷ Ball, *supra* note 124.

¹²⁸ Danish, *supra* note 110, at 1.

¹²⁹ *See, e.g.*, Latham & Watkins, *supra* note 108. The firm also said that "US investors should evaluate whether they can structure projects in developing countries to include a CDM component, as they may find that the additional revenue that can be derived from CDM projects can contribute significantly to the economic viability of their projects." *Id.*

governments to provide support to the clean energy sectors in their countries, enabling them to become world leaders in renewable energy technology and allowing those companies to emerge as profitable enterprises in their own right, no longer needing subsidies and tax breaks and providing jobs and boosting their local and national economies.¹³⁰ Also, by forcing their industries to comply with emissions caps, those governments will ensure that many companies become highly efficient and competitive players in the world's markets.¹³¹ American companies, on the other hand, may continue to languish in the "boom and bust" cycle of a fossil fuel-centric national energy policy.

Second, the experience gained by companies in party states through the establishment and growth of emissions trading schemes will probably prove invaluable, particularly as more countries accede to the Kyoto Protocol, and could end up being the highly profitable icing on the cake of their increased industrial efficiency.¹³² Meanwhile, U.S. companies stand to lose out on the chances for profit in the short term and, in the long term, to be forced to play catch-up if the United States imposes an independent domestic cap-and-trade scheme or one linked to the Kyoto Protocol.¹³³

Finally, less predictably but potentially even more damaging, U.S. companies may find it difficult to participate in energy generation and emissions abatement projects in China, India, and elsewhere. Competition from foreign governments, private firms, and behemoths such as the World Bank may make offers from American companies, particularly those that lack the resources or the long-term vision to accept an initial loss of income, less attractive under the CDM than those of their competitors in party countries.¹³⁴

The evidence is far from conclusive, but after having been a key player in the Kyoto Protocol negotiations, shaping the eventual structure of the agreement before ultimately walking out ostensibly for fear of hurting its business sector, the United States may one day find itself asking to be let back in. And it may be those same businesses that provide the impetus for such a request.

¹³⁰ See *supra* notes 53–73 and accompanying text (explaining the relationship between government incentives and clean energy business viability).

¹³¹ See *supra* notes 74–80 and accompanying text (analyzing particular instances where companies have become more efficient and examining the potential for job creation in the renewable energy sector).

¹³² See *supra* notes 81–99 and accompanying text (detailing how emissions trading mechanisms work).

¹³³ See *supra* notes 100–10 and accompanying text (explaining the potential negative consequences for American companies forced to compete at a later date in emission trading programs with highly skilled European companies).

¹³⁴ See *supra* notes 100–23 and accompanying text (discussing American companies in emission trading programs and their role in the Clean Development Mechanism).