



THE BUSINESS OF GLOBAL WARMING:

Managing the Risks and Opportunities of Climate Change

William F. Stewart, Esquire

200 Four Falls Corporate Center
Suite 400
West Conshohocken, PA 19428
P: 610.832.8356
F: 610.941.0711
wstewart@cozen.com

Peter J. Fontaine, Esquire

457 Haddonfield Road
Suite 300
Cherry Hill, NJ 08002
P: 856.910.5043
F: 856.910.5075
pfontaine@cozen.com





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About the Authors



William F. Stewart joined Cozen O'Connor in May of 1990 and acts as Co-Chair of the firm's Climate Change Practice Area. He serves his clients on a broad range of global warming and insurance-related topics. He has lectured on climate change and insurance at numerous national symposia, including the 2007 PLUS Conference, and has been featured by NBC News, *The Wall Street Journal* and several insurance industry publications on the issue of Global Warming. He is a frequent contributor to *Business Insurance*, *Best's Insurance*, *CPCU Journals*, *Mealey's Bad Faith Reporter* and *Mealey's Mold Litigation Reporter*. Bill is an arbitrator for the U.S. District Court for the Eastern District of Pennsylvania, and for the Philadelphia Court of Common Pleas and the Montgomery Court of Common Pleas. In 2005, he was selected by the Pennsylvania Supreme Court to serve on the state rules committee. He serves frequently as a volunteer attorney for the Montgomery County Children's Advocate Project. Bill earned his law degree at the University of Notre Dame, where he graduated *cum laude*. He is admitted to practice in Pennsylvania and New Jersey and has practiced *pro hac vice* in more than 10 U.S. states and territories.



Peter J. Fontaine joined Cozen O'Connor in 2002 and acts as Co-Chair of the firm's Climate Change Practice Area and Chair of the Energy, Environmental & Public Utility Practice Group. From 1990 to 1994 he was formerly an United States Environmental Protection Agency (EPA) lawyer within the Washington, D.C. Headquarters. He served as an Attorney-Advisor in EPA's Air Enforcement Division, where he helped draft EPA's enforcement regulations under the 1990 Clean Air Act Amendments and focused on enforcement of New Source Performance Standards (NSPS) and New Source Review (NSR) for coal burning power plants and municipal waste incinerators. His practice increasingly focuses on climate change matters. He works with an electric vehicle consortium and a distributed renewable energy equipment manufacturer on climate change matters. He was a founding member of a wind power development company that advanced a wind power project in New England. He is a frequent speaker and writer on climate change issues. In 2003, he received the 40 Under 40 Award from the *Philadelphia Business Journal*. In 2005, he was named a New Jersey "Super Lawyer" by *Law & Politics*. He received his bachelor of arts degree, *cum laude*, from the University of New Hampshire and his law degree from the George Washington University National Law Center. He is admitted to practice in New Jersey, Pennsylvania and Maine.

The opinions stated herein are solely those of the authors.

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INTRODUCTION

“The emission of greenhouse gases...is causing global warming at a rate that began as significant, has become alarming and is simply unsustainable in the long-term. And by long-term I do not mean centuries ahead. I mean within the lifetime of my children certainly; and possibly within my own. And by unsustainable, I do not mean a phenomenon causing problems of adjustment. I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence....”

- *British Prime Minister Tony Blair (2004)*

The majority of scientists believe that we are altering the earth’s “carbon balance,” launching mankind on a harmful collision course with nature. If this view is correct, climate change will be the defining risk management issue of our lifetimes, quite possibly exceeding terrorism, population expansion, and the end of oil as the greatest cause of casualty and human suffering in the 21st century.

Global warming is an insidious problem in two critical respects. First, there is a significant lag between the causative agents and their effects. Thus, by the time the results of climate change are more than a nuisance, much of the die will have already been cast. The inter-generational scale of the dilemma challenges the adaptive abilities of our political and economic institutions. Second, there are major financial disincentives to individual, company, or even national action. As long as burning coal, oil and methane is cheaper than “greener” alternatives, fossil fuels will yield a cost advantage over renewable energy.¹

The objective of this paper is to organize and explain the myriad issues presented by climate change in a concise, non-political manner, and take a “hard look” at this complex and divisive issue. We begin with a discussion of the phenomenon itself (divided into sections on “what we know” and “what we anticipate”), followed by consideration of potential “solutions,” an assessment of the response of government and industry (with particular focus on the insurance sector), a summary of the litigation to date, and an analysis of the broad range of anticipated future disputes. We conclude with strategic recommendations for minimizing risk and for recognizing the business opportunities associated with climate change.

1. For more on the “Problem of Collective Action,” see Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups* (1965)

WHAT WE KNOW ABOUT CLIMATE CHANGE

“[P]redicting future climate change necessarily involves a complex web of economic and physical factors including: our ability to predict future global anthropogenic [human] emissions of [greenhouse gases] and aerosols; the fate of these emissions once they enter the atmosphere (e.g., what percentage are absorbed by vegetation or are taken up by the oceans); the impact of those emissions that remain in the atmosphere on the radiative properties of the atmosphere; changes in critically important climate feedbacks (e.g., changes in cloud cover and ocean circulation); changes in temperature characteristics (e.g., average temperatures, shifts in daytime and evening temperatures); changes in other climatic parameters (e.g., shifts in precipitation, storms); and ultimately the impact of such changes on human health and welfare.”

- *United States Supreme Court Justice John Roberts*²

As summarized by Chief Justice Roberts, there are substantial uncertainties concerning the causes, effects, and consequences of climate change. However, little doubt remains in the scientific community about the basic mechanisms and broad consequences of the phenomenon. It is well established that certain gases — primarily carbon dioxide (CO₂), but also methane, nitrous oxide, chlorofluorocarbons (CFCs), sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons — when emitted into the atmosphere form a barrier which traps heat that would otherwise dissipate into space.³ This phenomenon is called the “greenhouse effect,” because these gases (collectively “the greenhouse gases” or “GHGs”) let solar radiation in, but retain heat like a greenhouse.⁴

The Earth’s atmosphere is composed of multiple levels. The layer we live in is the troposphere, and it is at the top of the troposphere (7-10 miles above the planet’s surface) where GHGs collect.⁵ Some CO₂ at the top of the troposphere is required for the survival of our species. With a thin layer of carbon to retain heat, the average temperature on the planet’s surface is 57°F. Without this naturally occurring greenhouse effect, the average temperature on Earth would be an inhospitable 0°F.⁶ The problem we face is that if we put too much carbon into the air we risk overheating our greenhouse.

The graph on the next page depicts the rise in atmospheric CO₂ over the last 1000 years. Carbon levels were relatively flat for hundreds of years at about 270 parts per million (ppm). As the combustion of fossil fuels slowly grew, carbon levels gradually increased, and in 1950 had reached 320 ppm. By February 2007, carbon levels were approximately 380 ppm — marking the highest level since human beings have walked the Earth.⁷ Ambient CO₂ concentrations continue to increase on average 2 ppm annually. Recent evidence also suggests that the rate of build-up of global CO₂ emissions grows in proportion to population expansion and economic development. So, with a residence time in the atmosphere of 100-200 years, the CO₂ emitted today has impacts far into the future.

2. *Massachusetts v. Environmental Protection Agency*, 127 S. Ct. 1438 (2007), rev’g 415 F.3d 50 (D.C. Cir. 2005) (in dissent, quoting the EPA).

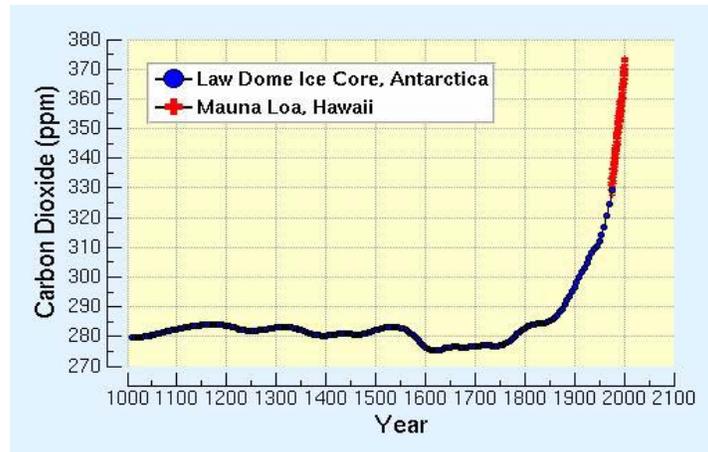
3. The role of water vapor as a greenhouse gas is discussed below.

4. “The National Academies, Understanding and Responding to Climate Change,” Highlights of *National Academies Reports* at 3, fig. 1 (2005).

5. <http://scign.ipl.nasa.gov/learn/glossary.htm>

6. <http://www.ncdc.noaa.gov/oa/climate/globalwarming.html#Q1>

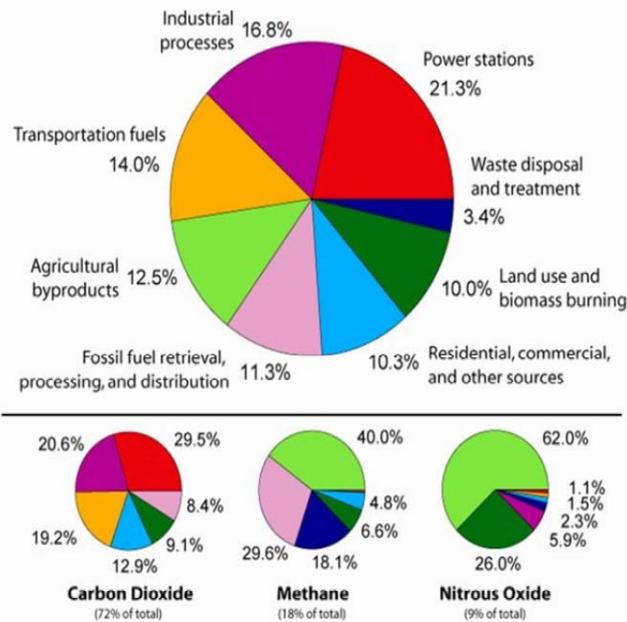
7. See “Working Group I, Intergovernmental Panel on Climate Change (IPCC),” *Climate Change 2007: The Physical Science Basis, Summary for Policymakers 2* (Feb. 5, 2007), available at http://www.ipeec.ch/WG1_SPM_17Apr.07.pdf.



http://www.globalwarmingart.com/wiki/Image:Carbon_History_and_Flux_Rev.png

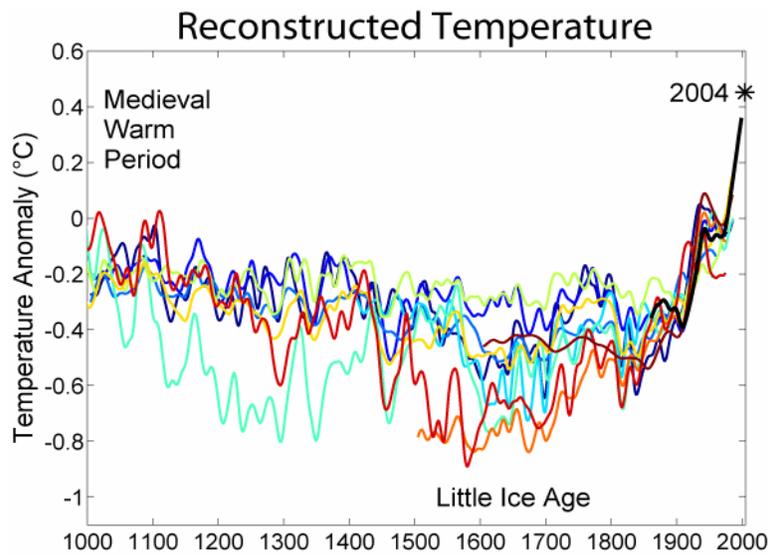
So where are all the GHGs coming from? Mostly from the retrieval, distribution, and use of fossil fuels (oil, coal and methane) in transportation, industry processes, and power generation. The United States and China are each responsible for around 20% of global carbon emissions, the European Union 10%, and Russia, India and Japan each around 5%. As would be expected, the growth rate of carbon emissions in the developing nations far outstrips that of the industrialized nations.

Annual Greenhouse Gas Emissions by Sector



www.globalwarming.com

We know that the surface of the planet is heating up. The graph which follows shows the trend in temperatures over the last 1000 years. The hottest 10 years on record (since 1850) follow 1990. Ocean temperatures are rising and the Greenland and Antarctic ice sheets are melting at an accelerated rate. In the latter half of the 20th century, the Atlantic Ocean averaged one Category 5 hurricane every three years; this century, it has averaged more than one per year. According to the Intergovernmental Panel on Climate Change (“IPCC”), a scientific body established by the United Nations: “[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.”⁸



http://en.wikipedia.org/wiki/Temperature_record_of_the_past_1000_years

8. IPCC Summary for Policymakers, draft copy November 16, 2007.

WHAT WE ANTICIPATE AND WHAT IS POSSIBLE

“As abrupt climate change lowers the world’s carrying capacity, aggressive wars are likely to be fought over food, water, and energy. Deaths from war as well as starvation and disease will decrease population size, which over time, will re-balance with carrying capacity.”

- Pentagon — *Commissioned Report on Potential Implications of Abrupt Climate Change*.⁹

The IPCC, which has historically underestimated increases in CO₂ and the effects of climate change, projects that by 2045, temperatures will have increased by 2°F.¹⁰ Such an increase is projected to result in massive flooding due to increased storms and higher sea levels, cause drought and famine impacting billions, increase the range of malaria-carrying mosquitoes, prompt population movements, and likely provoke armed conflict. Much more immediate effects would include eroding coastlines, unprecedented wildfires, more intense hurricanes and tornadoes, and severe hail.

If carbon levels stabilize in the mid-high range of its projections (between 535 and 710 ppm), the IPCC predicts that average global temperatures would rise between 4 and 7°F. Such an increase would exceed the critical temperature threshold for the Greenland Ice Sheet, which alone contains enough water to raise global sea levels by 23 feet.

In October 2003, a Pentagon-commissioned report discussed a climate change scenario which “although not the most likely, is plausible.”¹¹ The report assumes a rise in temperatures on the high-end of the IPCC’s projections, followed by accelerated melting of the Greenland Ice Sheet—and corresponding “freshening of the waters in the North Atlantic.”¹² This report posits a scenario where, around 2010, the lower density of the freshened water will result in a collapse of the Gulf Stream, plunging average temperatures in Europe and North America, while suddenly spiking temperatures near the equator and in the Southern Hemisphere.¹³ In support of their assertion that such an occurrence is plausible, the authors point to similar events 8,000 and 12,000 years ago.¹⁴ According to the report, “[a]s famine, disease and weather-related disasters strike due to abrupt climate change, many countries will exceed their carrying capacity. This will create a sense of desperation, which is likely to lead to offensive aggression in order to reclaim balance.”¹⁵

If the Earth does experience some form of abrupt climate change, it will likely be the result of one or more “positive feedback loops.” Essentially, a positive feedback loop occurs when any change to a system results in additional and enhanced changes to that system as a result of a positive feedback mechanism. Climate change theory is replete with such loops — a few examples are set forth below.

9. Peter Schwartz and Doug Randall, *An Abrupt Climate Change Scenario and Its Implications for United States National Security*, October 2003.

10. *IPCC Summary for Policymakers*, draft copy November 16, 2007.

11. *Id.* at 1.

12. *Id.* at 8.

13. *Id.* at 8-11.

14. *Id.* at 5-6.

15. *Id.* at 15.

- *Ice and snow* both reflect the sun's rays, keeping the Earth cool. As temperatures rise, ice and snow melt, and less solar heat is reflected. As a result, more ice and snow melt, and even less solar energy is reflected, until a runaway heating effect results.
- *Permafrost* – Rising temperatures in the Arctic melt permafrost causing the escape of GHGs into the atmosphere, which results in a further increase in temperatures and the melting of additional permafrost, and the release of more GHGs, etc.
- *Forests* – As temperatures rise, forests become more susceptible to fire, pests and disease, in turn crippling the trees' ability to absorb carbon dioxide, thereby accelerating the greenhouse effect.

An analysis of feedback loops is not complete without some discussion of water vapor. Although it receives less attention than CO₂, water vapor is a significant GHG — responsible for approximately 60% of the greenhouse gas effect. An increase in CO₂, and a corresponding increase in temperature, would result in more atmospheric water vapor (since more water evaporates as temperatures increase). How this increased water vapor will effect temperature is one of the great unknowns of climate change science. On the one hand, increased water vapor (as a GHG) would trap more heat creating a classic positive feedback loop. On the other hand, increased water vapor would produce more clouds, reflecting more sunlight — *i.e.*, a negative feedback loop. How these factors will combine in the real atmosphere remains an open question.¹⁶

16. Elmar Uherek, MPI for Chemistry Mainz/GER (Dec. 31, 2007), at http://www.esper.net/Unitedkingdom/water/uk_watervapour.html

POTENTIAL SOLUTIONS

“Oil is an amazing substance. It stores a tremendous amount of energy per weight and volume. It is easy to transport. It stores easily at regular air temperature in unpressurized metal tanks, and it can sit there indefinitely without degrading. You can pump it through a pipe, you can send it all over the world in ships, you can haul it around in trains, cars, and trucks, you can even fly it in tanker planes and refuel other airplanes in flight. It is flammable but has proven to be safe to handle with a modest amount of care by people with double-digit IQs. It can be refined by straightforward distillation into many grades of fuel – gasoline, diesel, kerosene, aviation fuel, heating oil – and into innumerable useful products – plastics, paints, pharmaceuticals, fabrics, lubricants.”

- James Kunstler¹⁷

Potential solutions to global warming range from the simple (e.g., energy conservation), to the complex (e.g., the underground sequestration of GHGs),¹⁸ to the futuristic (e.g., synthesizing volcanoes to reflect the sun’s heat energy).¹⁹ But whether as part of a global, national, corporate or individual effort, the most plausible approach to reducing atmospheric GHG concentrations is to find alternative energy sources that do not rely upon fossil fuels. As discussed below, however, each of the “renewable” substitutes to fossil fuels lacks one or more of its desirable characteristics.

Alternative Energy Sources

Nuclear power already provides 17% of the world’s electricity. It is sustainable and does not produce GHG emissions. Although no new nuclear reactors have been put into service in the United States since 1996, Japan, China, India, France, Finland, and Romania have actively pursued nuclear programs. In fact, 80% of France’s electricity needs are now met by nuclear reactors.²⁰ Problems associated with nuclear energy include safety, terrorism, waste disposal, high initial investment cost, and unsuitability as a generator of automobile fuel. There are signs that nuclear power is poised to make a comeback in the U.S. as a result of tax incentives and governmentally subsidized loans.

Wind power technology has enjoyed substantial advances in recent years, making it cost-competitive with fossil fuels in several countries. In fact, in some areas of the U.S., wind power is the lowest-cost generation option. Texas surpassed California in 2006 to become the United States leader in wind capacity,²¹ and it is expected to add more than half of all new U.S. installations in 2007. However, the technology is not without challenges. Many of the best wind power locations are remote and constrained by a lack of transmission lines to carry the power to more populated areas. Also, wind power is an intermittent energy source (*i.e.*, electricity is produced only when the wind blows), making it available to the grid only about 35% of the time even in the best locations, as compared to coal plants (72%) and

17. *The Long Emergency: Surviving the End of Oil, Climate Change, and Other Converging Catastrophes of the Twenty-First Century*, 2006, at 31.

18. See EPA, Geologic Sequestration of Carbon Dioxide, at http://www.epa.gov/OGWDW/uic/wells_sequestration.html (last updated Dec. 12, 2007).

19. See Kate Ravillious, “‘Volcano Cure’ For Warming? Not So Fast, Study Says,” *Nat’l Geographic News* (Aug. 17, 2007) at <http://news.nationalgeographic.com/news/2007/08/070817-volcano-warming.html>.

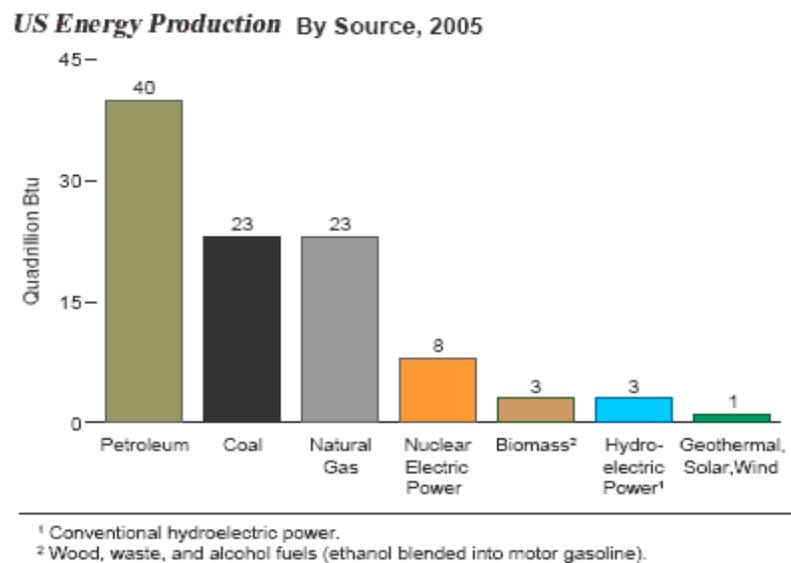
20. Alexandra Fouche, “France’s Nuclear Option,” *BBC News Online* (Oct. 9, 2003), at <http://news.bbc.co.uk/2/hi/europe/3177360>.

21. News Release, Am. Wind Energy Ass’n, Texas Overtakes California as Top Wind Energy State (July 25, 2006), available at http://www.awea.org/newsroom/releases/AWEA_Quarterly_Market_Report_072506.html.

nuclear (90%). Substantial debate continues over whether wind could ever produce more than 25% of the world's electricity needs. Although output has quadrupled in the U.S. over the last six years, wind power still accounts for less than 1% of the nation's electricity.

Solar power generally refers to the conversion of sunlight into electricity. Low oil prices in the 1980s and 1990s discouraged solar research and installations. The recent rise of fossil fuel costs, the availability of government subsidies, and a decline in solar equipment manufacturing costs, have resulted in an annualized growth of solar capacity of 60% per year since 2000.

Geothermal energy is captured by tapping into heat below the ground. It is both cost effective and environmentally sound, but currently accounts for less than 1% of the world's energy. Iceland derives almost 100% of its non-vehicular power from superheated water and streams. The United States is the world's largest producer of geothermal energy, and the largest dry steam field is the Geysers Plant located about 70 miles north of San Francisco. Use of geothermal power on a utility scale is restricted, however, because: (1) it is available only in limited locations; (2) construction of plants can adversely effect land stability; and (3) many locations will eventually cool down (so in that sense, geothermal energy is not truly renewable).²²



www.whatisnuclear.com/articles/nuc_gcc.html

Ethanol burns without emitting any GHG, and as an additive, it is one of the few greener alternatives compatible with existing automobiles. There are, however, two significant challenges associated with corn ethanol. First, it now takes almost as much fossil fuel to grow and distribute the ethanol as the ethanol actually replaces. Second, if all of the corn in the United States were converted to ethanol, the resulting fuel would offset only 12% of gasoline use.

22. Small-scale use of geothermal energy, which involves heating/cooling a building by circulating water through subsurface piping to tap into the Earth's constant temperature of 55°, is growing in popularity.

Brazil produces ethanol from sugar cane which provides about one-third of that nation's automobile fuel. While U.S. corn ethanol yields only about 15-25% more energy than is required to produce it, Brazil's sugar ethanol yields a 270% return.

Hydroelectric power is generated when rivers spin turbines. This is a cost effective and clean source of energy which generates approximately 10% of the electricity utilized in the United States. The problem with this form of energy is also limited capacity. There are relatively few unexploited sites, and capacity is unlikely to ever exceed 15% of total U.S. electricity use.

Hydrogen fuels cells are functional and emit no GHGs. When hydrogen combines with oxygen, heat energy results, and the only byproduct is water. There are currently two practical impediments to using hydrogen as a fuel source on a large-scale basis. First, hydrogen is not available as a free-standing element anywhere in our atmosphere. Based upon present technology, it takes almost as much fossil fuel energy to separate and distribute hydrogen atoms as the hydrogen would replace. Second, hydrogen has extremely low density and tends to leak more than oil or natural gas. As a result, it will take several years to develop a delivery system capable of transporting separated hydrogen to end users.

Carbon Sinks and Sequestration – Reducing the GHGs Absorbed Into The Atmosphere

When CO₂ is emitted from a factory or an automobile, only 40% makes it to the top of the troposphere. The remainder is captured by one of the earth's carbon sinks, namely oceans and plants. Approximately 30% of the Earth's CO₂ emissions are absorbed by the oceans, and 30% is absorbed by plants (mostly by trees in rain forests). Thus, ongoing deforestation in Brazil, Indonesia, and elsewhere will directly increase atmospheric CO₂ both by addition (carbon is released through slash and burn practices) and subtraction (plants are no longer available to consume carbon).

To date, there is no international agreement in place to conserve tropical forests. Although the Kyoto Protocol (discussed below) provides credits for growing new forests, it does not offer any incentives for preserving existing forests. There is growing tension between the world's developing and industrialized nations about whether the industrialized nations should subsidize the protection of rain forests in less developed areas. On December 3, 2007, on the eve of the international Bali Climate Conference, Indonesia requested \$6 billion from the U.S. as compensation for preservation of its increasingly depleted forest resources.

Carbon sequestration involves capturing CO₂ collected from large localized carbon emitters such as fossil fuel powered energy plants and storing it beneath the earth's crust and oceans. The most common locations targeted for storage are underground geological formations (including subterranean areas where fossil fuels have been removed) and deep beneath the ocean. According to the U.S. Department of Energy, carbon sequestration "will likely be essential if the world is to stabilize atmospheric concentrations of greenhouse gases at acceptable levels."²³ Carbon sequestration projects are currently operational in limited locations, with the oldest being the 1996 Sleipner site (see photo on next page) in the North Sea near Norway. Determining the costs of carbon capture and sequestration is complex, but

23. U.S. Department of Energy at www.energy.gov/sciencetech/sequestration

based upon today's technology and energy prices, adding these processes would result in an estimated 70-100% increase in the price of electricity.



The Sleipner Sequestration Site in the North Sea

THE RESPONSE OF GOVERNMENTS

The Kyoto Protocol

In 1992 most countries in the world joined an international treaty, the United Nations Framework Convention on Climate Change (UNFCCC), which established a framework for intergovernmental efforts to address climate change. The Convention, which built upon the highly successful Montreal Protocol,²⁴ acknowledged that the climate system is a shared resource, the stability of which is affected by emissions of CO₂ and other GHGs. Under the Convention, governments gather and share information on GHG emissions, national policies and best practices, and implement national strategies for addressing GHG emissions.

By the mid-1990's, however, it was evident that climate change was becoming more pronounced and GHG emission levels continued to rise largely unabated. The parties to the Convention decided that only firm and binding commitments by developed countries to reduce emissions could effectively address climate change. Negotiations began on a new Protocol under the existing Convention. After several years of intense negotiations, on December 11, 1997, the Kyoto Protocol was adopted in Kyoto, Japan. The Kyoto Protocol represented the first concerted international attempt to reduce GHG emissions. Participating "industrialized" nations were required to reduce their GHG emissions by 5.2% compared to 1990 levels. Developing nations, such as China and India, had no numerical limitation, but agreed they shared a "common responsibility to combat climate change."

Kyoto went into effect on February 16, 2005, and has been ratified by 175 nations. Australia, one of the few nations which initially rejected the Protocol, ratified it on December 3, 2007. On July 25, 1997, before the Kyoto Protocol was finalized, the United States Senate passed a resolution, by a vote of 95 to 0, indicating that it would not support an agreement which did not include binding targets and timetables on both industrialized and developing nations.

The Kyoto Protocol is a "cap and trade" system, which means that countries that do not achieve their designated cuts must purchase "credits" from those nations which emit less GHG than their assigned "cap." Further detail on cap and trade is provided in the International Carbon Markets section beginning on page 31.

24. The Montreal Protocol (MP) is widely regarded as a successful multinational environmental treaty and a template for how to address GHGs. In the 20 years following its entry in 1986, the MP phased out 95% of global production of stratospheric ozone depleting CFCs. These substances destroy the ozone layer in the upper atmosphere which forms a protective barrier against harmful ultraviolet radiation. Because CFCs are powerful GHGs, a collateral benefit of the MP is the substantial reduction in GHG emissions. By preventing the release of CFCs some experts believe the MP has prevented the onset of climate change for 12 years or more. Durwood Zaelke and Scott Stone, "The Montreal Protocol: Lessons for Climate Change," U.N. Climate Conference (December 5, 2007). http://www.southcentre.org/Events/2007Dec_Climate%20_Change_Side_Event_Presentation1.ppt#2

KYOTO PROTOCOL - February 16, 2005



Participation in the Kyoto Protocol, where dark green indicates countries that have signed and ratified the treaty, yellow is signed, but not yet ratified, grey is not yet decided and red is no intention of ratifying.

http://en.wikipedia.org/wiki/kyoto_protocol

Regional Initiatives

Over the past few years, several regional initiatives have been developed to pool efforts in combating climate change. In general, the localized initiatives set goals for the reduction of GHG emissions from power plants within their area and create systems for tracking emissions and emission credits.

Northeast Mid-Atlantic States Regional Greenhouse Gas Initiative

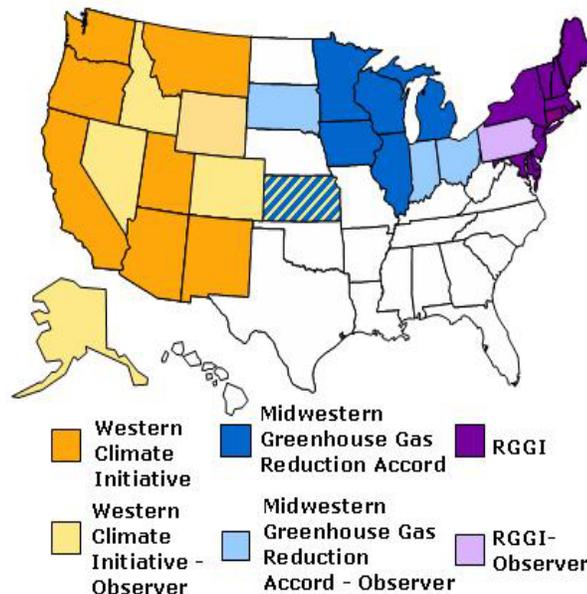
Perhaps the most far-reaching climate change development in the U.S. to date is the Regional Greenhouse Gas Initiative or “RGGI” (pronounced “Reggie”), a mandatory CO₂ cap and trade program being developed by the Northeastern and Mid-Atlantic states.²⁵ Starting in 2009, RGGI will cap CO₂ emissions from some 758 fossil fuel-fired electrical generation units having a nameplate capacity of 25 megawatts or larger within the ten-state region. These plants are required to reduce CO₂ emission by 10% by 2019. Collective CO₂ from the RGGI states, comprised of New Jersey, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire, Vermont, Maine, Maryland and Delaware, are substantial in the global context. These states have combined emissions of about 577 million metric tons of CO₂ equivalents (MMTCE), nearly the same emissions level of the United Kingdom. Collectively, the ten states would constitute the fifth highest CO₂ emitter in the world. The RGGI Model Rule, which will be adopted by each RGGI state through legislation, provides for the issuance of CO₂ offset allowances.²⁶

It also is possible that states located outside the Northeast and Mid-Atlantic regions will join the RGGI effort. As discussed immediately below, in addition to most of the RGGI states, California and Oregon have adopted mandatory CO₂ reduction legislation. Linking emissions trading systems on the West and East Coasts is probable considering that nearly all of the RGGI states have adopted California’s tough

25. See Peter Fontaine, “Greenhouse Gas Emissions: A New World Order,” *Public Utilities Fortnightly* (Cover Article) (February 2005).

26. Modeled on EPA’s NOx cap and trade program, RGGI authorizes the creation of CO₂ allowances (one allowance equals one metric ton of CO₂) from CO₂ emission offset projects, including projects that reduce/capture methane emissions from landfills, agricultural manure management operations and energy conservation measures/energy efficiency measures (ECM/EEM) that reduce CO₂ emissions. ECM/EEM projects reduce or avoid CO₂ emissions from natural gas, oil, or propane end-use combustion generally through physical changes to facility equipment or modifications to a building. Thus, for example, a residential conversion from distillate fuel to natural gas may be eligible for CO₂ emission offsets because gas-fired boilers emit 27% less CO₂ than oil-fired boilers.

new CO₂ tailpipe standards for cars and light duty trucks. RGGI offers the prospect for other states and nations to join in a larger cap and trade program.



Pew Center on Global Climate Change, Regional Initiatives

http://www.pewclimate.org/what_s_being_done/in_the_states/regional_initiatives.cfm
(last updated November 2007).

Western Climate Initiative

The Western Climate Initiative (“WCI”) began in 2007 and involves Arizona, California, New Mexico, Oregon, Utah and Washington, as well as the Canadian provinces of Manitoba and British Columbia. WCI was formed with the intention of identifying ways in which the emission of GHGs could collectively be reduced and implementing plans to accomplish these reductions. WCI members have committed to a goal of reducing their GHG emissions by an aggregate of 15% below 2005 levels by 2020.²⁷ WCI anticipates that it will publish final design recommendations for a regional cap and trade program by August, 2008.

Midwestern Regional Greenhouse Gas Reduction Accord

In November 2007, the governors of nine midwestern U.S. states and the Canadian province of Manitoba established the Midwestern Regional Greenhouse Gas Reduction Accord (“Accord”).²⁸ The member states are Wisconsin, Minnesota, Indiana, Illinois, Iowa, Michigan, Kansas, Ohio and South Dakota. As

27. This goal is for the region as a whole; each state sets its own emission reductions goals, which are set forth in a recently adopted statement of the WCI. See Western Climate Initiative, Statement of Regional Goal (Aug. 22, 2007), at <http://www.westernclimateinitiative.org/ewebeditpro/items/O104F13006.pdf>.

28. See Pew Center on Global Climate Change, Regional Initiatives, at http://www.pewclimate.org/what_s_being_done/in_the_states/regional_initiatives.cfm (last updated Nov. 2007).

Regional Greenhouse Gas Initiative enacted its own Global Warming Response Act in July, 2007.³³ The act commits the state to reducing CO₂ emissions to 1990 levels by 2020 and to 80% below 2006 levels by 2050.

California, in addition to being a member of the Western Climate Initiative, is part of the International Carbon Action Partnership (ICAP), a multilateral group intended to provide authorities with an opportunity to share experiences on the formation and management of cap and trade allowance programs. California also enacted its Global Warming Solutions Act of 2006, which aims to cap the state's GHG emissions at 1990 levels by 2020. The legislation requires the California Air Resources Board to formulate a state-wide program for the reporting of emissions and a market-based system including cap and trade allowances as part of the enforcement mechanism.³⁴

Mayors' Agreement

On February 16, 2005, the date that the Kyoto Protocol became operative in the 141 countries where it had been ratified, Seattle Mayor Greg Nichols began the Mayors' Climate Protection Agreement, with the aim to have at least 141 mayors of U.S. cities agree to advance the goals of Kyoto. By November, 2007, 740 mayors had signed the agreement.

Participating cities agree to strive to meet or exceed the targets set forth in the Kyoto Protocol for reducing global warming in several ways, including the promotion of alternative transportation options and increasing the use of green energy.³⁵ Cities also agree to urge federal and state governments to enact global warming reduction programs. The agreement urges the U.S. Congress to enact GHG emission reduction legislation including clear timetables and plans for allowing the trading of allowances among industries.³⁶

Proposed Federal Legislation

One-hundred sixty five different bills dealing with some aspect of climate change were introduced in the 110th Congress now in session. America's Climate Security Act (S. 2191) ("CSA"), a bill sponsored by Independent Sen. Joseph Lieberman and Republican Sen. John Warner, has the chance of becoming law, having just been approved by the Senate Environmental and Public Works Committee.³⁷ The bill would create a national CO₂ cap and trade program applicable to specified "covered facilities" responsible collectively for more than 80% of U.S. GHG emissions. The stated purpose of the CSA is to create the

33. A. 3301, 212th Legis. (N.J., adopted June 14, 2007), available at http://www.njleg.state.nj.us/2006/Bills/A3500/3301_R2.HTM; Press Release, State of New Jersey, Governor Signs Global Warming Response Act (July 6, 2007), available at <http://nj.gov/governor/news/news/20070706.html>.

34. A.B. 32, available at http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf. See also Pew Center on Global Climate Change, California Global Warming Solutions Act of 2006, at http://www.pewclimate.org/what_s_being_done/in_the_states/ab32/ (last visited Dec. 10, 2007).

35. The U.S. Mayors Climate Protection Agreement, available at <http://www.usmayors.org/climateprotection/documents/mcpAgreement.pdf> (last visited Dec. 10, 2007).

36. Mayors Climate Protection Center, U.S. Conference of Mayors Climate Protection Agreement, at <http://www.usmayors.org/climateprotection/agreement.htm> (last visited Dec. 10, 2007).

37. See http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:s2191is.txt.pdf On December 2, 2007, the CSA was approved by the Senate Environmental and Public Works Committee. Chairwoman Boxer has indicated that the bill will reach the full Senate for debate in February 2008.

“core of a federal program that will reduce U.S. GHG emissions substantially enough between 2007 and 2050 to avert the catastrophic impacts of global climate change, while preserving economic growth.”

The bill places a declining cap on U.S. emissions of five primary GHGs (CO₂, methane, nitrous oxide, sulfur hexafluoride and perfluorocarbons, designated as Group I greenhouse gases) and on U.S. emissions of the sixth primary GHG (hydrofluorocarbons, designated as the Group II greenhouse gas).³⁸ A separate declining cap is imposed on U.S. emissions of hydrofluorocarbons from all other industrial activities that emit that gas. For all six gases, the bill uses a common unit of measurement, called a “CO₂ equivalent.” A CO₂ equivalent is the quantity of a GHG that the EPA determines makes the same contribution to global warming as one metric ton of CO₂.³⁹

The proposed bill contains extensive provisions designed to reduce costs. It creates a program for trading of CO₂ allowances and a robust emissions offset program that encourages non-covered facilities to generate allowances from GHG emissions reductions. Designated covered facilities⁴⁰ can satisfy up to 15% of their annual CO₂ cap obligation by purchasing offset allowances. Anyone can buy, hold, sell, and retire emission allowances. Owners and operators of covered facilities can hold allowances for as long as they wish and borrow 15% of their allowances against future years at a 10% annual interest rate. The bill would also create a program for the sequestration of CO₂.⁴¹

Importantly, the bill would link emissions trading with international emissions trading programs. An owner or operator of a covered facility can import international allowances to satisfy up to 15% of its compliance obligation.⁴² The proposed bill would also reward owners and operators of covered facilities who have made early reductions in GHG emissions since January 1, 1994. The bill also directs the president to intensify efforts to convince other nations to start reducing their GHG emissions. If the president finds that a nation has not undertaken comparable action eight years after enactment of the CSA, the president can require importers of products from such nations to submit emissions credits to cover the emissions of GHGs associated with such products. Interestingly, this provision is analogous to a border tax adjustment for carbon, which may give rise to trade disputes subject to resolution before the World Trade Organization.⁴³

Finally, like most federal environmental laws in the U.S., the proposed bill would preserve the right of individual states to implement their own GHG control programs, so long as they are no less stringent than the federal program. Thus, regional programs like the Regional Greenhouse Gas Initiative in the

38. A separate declining cap is imposed on U.S. emissions of hydrofluorocarbons from all other industrial activities that emit that gas.

39. Thus, for example, the EPA has found that one ton of methane has the same GHG potential as 21 tons of CO₂. See <http://www.epa.gov/otaq/climate/420f05002.htm> All things being equal, a one ton reduction in methane therefore has greater benefit than a one ton reduction in CO₂.

40. “Covered facilities” include those that use more than 5,000 tons of coal in a year, import natural gas (including liquefied natural gas), produce or import fossil fuels, and emit hydrochlorofluorocarbons as a byproduct of production, among others.

41. The EPA would be required to promulgate regulations for permitting geological sequestration projects under the Safe Drinking Water Act Underground Injection Control Program. Offsets for geological sequestration are not yet available. Sequestration offsets are available for biological sequestration projects, such as changes in agricultural and rangeland practices, reforestation and afforestation projects, and manure management and disposal project, such as waste aeration and methane capture and combustion. The federal government would study the feasibility of constructing CO₂ pipelines for the purposes of geological sequestration and enhanced oil recovery. The federal government also would study the feasibility of assuming liability for closed geological sequestration sites.

42. International allowances are those generated under a foreign greenhouse gas emissions trading market that the EPA certifies as having comparable integrity to the U.S. market, and that exists by virtue of national emissions caps that the EPA finds to be of comparable stringency to the caps established by the CSA.

43. See Peter Fontaine, “Greenhouse Gas Emissions: A New World Order,” *Public Utilities Fortnightly* (Cover Article) (February 2005).

Northeast and Mid-Atlantic states and the Western Climate Initiative in the far Western states would be preserved.

EPA's Voluntary Climate Leaders Program

In 2002, EPA announced the formation of an industry-government partnership called "Climate Leaders," pursuant to which companies develop comprehensive climate change strategies to reduce their GHG emissions. The voluntary program requires participants to complete a corporate-wide inventory of their GHG emissions based on a quality management system, set GHG reduction goals, and annually report progress to EPA.

To date, 153 companies and organizations have joined the program, ranging from large Fortune 100 manufacturers in the cement, forest products, pharmaceutical, utility and information technology sectors, to small businesses and organizations. EPA issued GHG inventory guidance to assist members to quantify their GHG emissions. The guidance builds upon the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) GHG inventory protocol. EPA also has developed a series of guidelines for qualifying, measuring and monitoring GHG offset projects. Offset protocols exist for landfill gas, manure management, afforestation, transportation, and boiler replacement projects.

While good publicity is an obvious and oft-stated benefit of participation in the EPA Climate Leaders program an even greater benefit is the unspoken presumption that a company who takes stock in its GHG emissions using EPA's inventory guidance and makes GHG emissions reductions in accordance with the EPA's guidance is better positioned to receive credit for these "early reductions" under future Federal and state legislation, such as the Lieberman-Warner bill and RGGI. All credible cap and trade legislative proposals to date have allocated a certain portion of the allowances to early movers who reduced their GHG emissions prior to the onset of any mandates. Moreover, because the EPA is likely to be the federal implementing agency of any national climate change cap and trade program, presumably, it will make sure that participants in its voluntary Climate Leaders program are duly rewarded.

THE RESPONSE OF THE INSURANCE INDUSTRY

“Throughout their history, insurance companies have done more than collect premiums and pay claims. They’ve made the world a safer place— by promoting fire prevention, lobbying for building codes, testing the crash-worthiness of cars and rating vehicles for safety. Now some insurers are worried by the threat to their business posed by climate change. And they are starting to see what, if anything, they can do about it.”

- M. Gunther, *CNNMoney.com*, August 24, 2006

Whether as part of an individual or collective effort, human beings respond to climate change by mitigation and/or adaptation. Mitigation involves the reduction of GHG emissions through conservation, alternative energy uses, underground carbon storage (i.e., sequestration), and perhaps blocking sunlight by ejecting sulfur dust at high altitudes.⁴⁴ Adaptation is a much more sobering concept. It is the response of individuals, businesses and communities to the consequences of climate change. In other words, adaptation is our response to what we have failed to mitigate. Forms of adaptation include population exodus from coastal areas, constructing better levies, adopting stronger building codes, and seeding clouds to control the rain.⁴⁵

The insurance industry is uniquely situated to assume a leadership role in the advancement of mitigation and adaptation efforts.⁴⁶ First, the industry wields tremendous financial clout on an international level. Insurance is the second largest industry in the world and its revenues exceed the Gross National Product of every country except the United States and Japan. Second, the industry’s expertise lies in risk identification, evaluation, and management. As discussed below, the insurance industry has, in fact, adopted a prominent role in addressing climate change.

Mitigation Efforts

While the responses of individual insurance companies runs the gamut, the insurance industry as a whole has been pro-active in global climate change mitigation. Mitigation efforts by insurers include developing new products, promoting awareness by example and investing in renewable energy. On October 18, 2007, the CERES Organization (a network of environmental groups and individuals), issued a report identifying 422 new products and services addressing global warming.⁴⁷

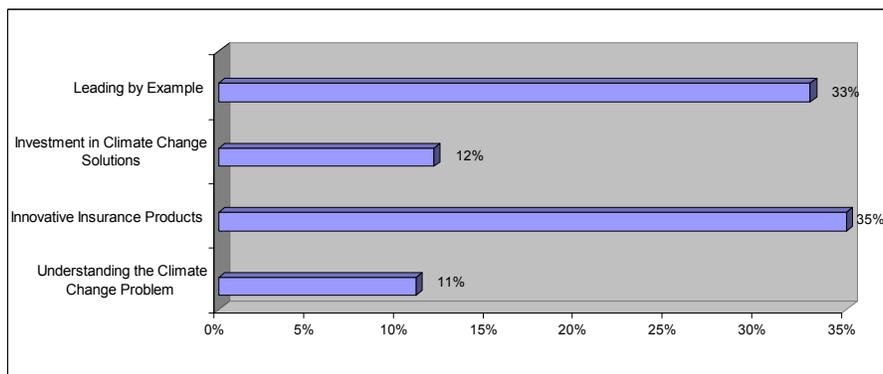
44. See Kate Ravilious, “‘Volcano Cure’ For Warming? Not So Fast, Study Says,” *Nat’l Geographic News* (Aug. 17, 2007) at <http://news.nationalgeographic.com/news/2007/08/070817-volcano-warming.html>.

45. See William F. Stewart, “What Every Insurance Professional Should Know About Climate Change,” CPCU Society, Agent & Broker Solutions (December 2007).

46. See Peter Fontaine, “Shifting the Energy Paradigm,” *Risk & Insurance* (December 2002).

47. Evan Mills, Ph.D., “From Risk to Opportunity: 2007; Insurer Responses to Climate Change,” October 18, 2007, at 2.

Climate Change Mitigation By Insurers



Information derived from CERES Report

Innovative new products include “pay as you go” automobile premiums to encourage conservation, and discounts for operators of hybrid vehicles. The Fireman’s Fund and Lexington insurance companies now sell policies which permit repair or replacement of insured property with more expensive “green” products. In October 2007, a large group of insurers formed “ClimateWise,” an organization committed to supporting climate awareness among customers, incorporating climate change into their investment strategies, and reducing the environmental impact of their businesses.⁴⁸

AIG, Allianz, Munich Re and Swiss Re are among the members of the “Climate Group” which “works to accelerate international action on global warming with a new, strong focus on practical solutions.” Munich Re and AIG are a part of the Combat Climate Change organization which supports adoption of a cap and trade system for CO₂ emissions.

AIG, Allianz, AXA, Royal SunAlliance, and Swiss Re were among 150 corporate signatories of the November 30, 2007, Bali Communiqué delivered to world leaders at the December 2007 Bali Climate Conference, which petitions governments to:

- provide a comprehensive, legally binding United Nations framework to tackle climate change;
- issue emission reduction targets to be guided primarily by science; and
- recognize that those countries that have already industrialized need to make the greatest effort.

Swiss Re has been a global leader on climate change for over a decade, planning to be GHG neutral by 2013, promoting awareness, and reimbursing employees for certain qualified investments. Allianz mitigates against climate change by selling CO₂ reduction certificates to its insureds and then investing

48. The “associate companies” comprising ClimateWise are: Allianz; AIG; ABI; Aviva; AXA; Benfield; Cooperative Insurance; F&C Investments; Friends Provident; HBOS plc; Lloyd’s; Lloyds TSB Group; Munich Re Group; RBS Insurance; Royal & SunAlliance; Swiss Re; and Zurich. Twenty-one additional insurance organizations are also full signatories to ClimateWise: ACE; Amlin; ARK; Beazley; BIBA; Catlin; Chaucer; Diagonal Underwriting; Equity Group; Hardy’s Underwriting; Hiscox; Legal & General; Marketform; Navigators; NFU Mutual; Prudential; QBE European Operations; RJ Kiln; RMS; Standard Life; UNUM; and XL.

the money in projects which protect the climate. And Aviva, the world's fifth largest insurance group, has been carbon neutral (as a result of carbon offset investments) since 2006.

Adaptation Efforts

Insurance companies participate in adaptation by doing what they do best — underwriting. Increased premiums, higher deductibles and retentions, requiring minimum building standards, and in some cases exiting from markets, all force individuals and businesses to reassess locating or expanding in coastal areas. When a state insurance commissioner mandates coverage in these areas or when a state funded insurer (as in Florida) becomes involved: (1) non-coastal homeowners and businesses must subsidize their coastal counterparts; and (2) the difficult, but necessary, process of adaptation is impeded.

Another example of insurer participation in the adaptation process occurs when insurers offer drought insurance in Africa or India. Coverage is linked to historical data on rainfall or temperature with payouts triggered by weather during the growing season. These types of programs assist local farmers in adapting to changing weather patterns, and unlocking the potential agricultural value of the land.

THE LITIGATION TO DATE

“First it was tobacco and asbestos. Then it was the turn of the food sector. Now litigators have yet another target in their sights: those responsible for climate change.”

- *The Financial Times*, July 14, 2003

So far, climate-related cases and complaints can be categorized in the following manner: cases arising under the federal Clean Air Act, cases alleging that state attempts to regulate GHG emissions are preempted by federal authority, cases involving the National Environmental Policy Act or state versions of this statute, and cases which allege that contributions to global warming constitute a public nuisance under tort law. The lines between these categories often blur as different jurisdictions and governmental authorities grapple with the issues raised by climate change, as well as the basic questions of who has the authority and the responsibility to deal with it.

It cannot be assumed that all future litigation will fit neatly into these categories. If the effects of climate change intensify as the majority of scientists predict, a wide variety of lawsuits will be brought in the future. This broad range of potential lawsuits will be discussed in the “Future Litigation” section which begins on page 28.

Litigation under the Clean Air Act: *Massachusetts v. Environmental Protection Agency*

On April 2, 2007, in the much-anticipated decision of *Massachusetts v. Environmental Protection Agency*,⁴⁹ the U.S. Supreme Court ruled that the Clean Air Act authorizes the EPA to regulate GHG emissions from new motor vehicles and that the EPA does not have the discretion to refuse to issue such regulations, unless it could provide a scientific basis for that refusal. The Supreme Court’s decision is considered by many to be one of the most important environmental decisions the Court has ever issued, and a possible turning point in the climate change debate.

The Story Behind Massachusetts v. EPA

The case began in 1999, when several non-profit organizations, trade associations and businesses filed a petition asking the EPA to promulgate regulations under Section 202 of the Clean Air Act⁵⁰ aimed at the emission of GHGs by motor vehicles. The EPA concluded that the Clean Air Act did not authorize the agency to regulate greenhouse emissions from new motor vehicles, and that, even if it did, the agency would not exercise such authority.⁵¹

In 2005, a federal appeals court dismissed a petition to review the EPA’s decision, but it was a sharply divided decision, with each judge of the three-judge panel issuing a separate opinion. Essentially, this

49. 127 S. Ct. 1438 (2007), *rev’g* 415 F.3d 50 (D.C. Cir. 2005).

50. 42 U.S.C. § 7521(a)(1). That provision states that the EPA “shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.”

51. Environmental Protection Agency, *Control of Emissions from New Highway Vehicles and Engines*, 68 Fed. Reg. 52922 (Sept. 8, 2003), available at <http://a257.g.akamaitech.net/7/257/2422/14mar20010800/edocket.access.gpo.gov/2003/pdf/03-22764.pdf>.

case posed three major questions: (1) whether any of the petitioners had standing, or the legal right, to bring this suit; (2) whether the Clean Air Act authorized the EPA to make the requested regulations; and (3) if it did have the authority, whether the EPA properly decided to stay out of the fight by abstaining from using that authority.

The Supreme Court Opinion

On April 2, 2007, the Supreme Court decided that the EPA had erred in refusing to issue regulations of GHG emissions from new motor vehicles. With a 5-4 vote, it was as close a decision as possible.⁵² Justice Stevens began his opinion on behalf of the Court by asserting that “[a] well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related.”⁵³

Justice Stevens found that Massachusetts, as a sovereign commonwealth and the owner of a considerable amount of territory allegedly at risk because of global warming, had standing to sue. The Court found that Massachusetts was in danger of suffering actual and imminent harm because of the effects of global warming, including rising sea levels, changes in ecosystems, reduction of water storage in winter snowpack, and the risk of damage from hurricanes. Specifically, the petitioners’ affidavits stated that global sea levels had already risen between 10 and 20 centimeters in the 20th century because of global warming. Because Massachusetts owned a substantial portion of its coastal land, the Court found that it had alleged a particularized injury.⁵⁴

In addressing the merits of the petition, the Court found that the Clean Air Act expressly authorized the EPA to regulate GHG emissions from new motor vehicles if it concludes that such emissions contribute to climate change. The Court further held that emissions constituted an air pollutant, within the meaning of the act.

Finally, the Court held that the EPA had erred in relying upon either the uncertainty of science or policy reasons in deciding not to regulate emissions. The statute requires the EPA to determine whether the emissions, either as air pollutants themselves or as contributing to air pollution, may reasonably be expected to endanger public welfare. To avoid taking further action, the Court ruled that the EPA must find that GHGs do not contribute to climate change or otherwise ground its decision not to act in the language of the statute.⁵⁵

The Dissents

Four justices (Chief Justice Roberts, and Justices Scalia, Thomas, and Alito) dissented, filing two opinions which all four justices signed. Chief Justice Roberts’s opinion focused on the question of whether the petitioners had standing to bring the lawsuit in the first place, a question he would have answered in the negative on all elements of that analysis. He pointed out that it was a stretch to hold the loss of coastal land to be an imminent harm, when even the affidavits submitted by the petitioners spoke

52. Justices Kennedy, Souter, Ginsburg and Breyer joined in Justice Stevens’ opinion for the Court. Chief Justice Roberts and Justice Scalia both filed dissenting opinions, in which they were joined by Justices Thomas and Alito.

53. *Massachusetts v. EPA*, 127 S. Ct. 1438, 1446 (2007).

54. *Id.* at 1457.

55. *Id.* at 1462.

of expected sea level rise by the year 2100—it is hard to say something is “imminent” when it is supposed to take about 100 years to occur.⁵⁶ He also argued that it does not necessarily follow that the EPA’s failure to take the requested action is to blame for Massachusetts’s supposedly imminent danger. The Chief Justice Robert’s analysis here demonstrates the kind of difficulty any plaintiff suing over global warming will have in establishing a causal link between the injury complained of and the emission of GHGs.

Justice Scalia’s opinion focused more on the merits of the case itself.⁵⁷ Justice Scalia would have held that the EPA properly considered policy concerns in exercising its discretion to abstain from rulemaking in this area.⁵⁸ He also disagreed with the Court’s conclusion that GHG emissions fall within the definition of “air pollutant” under the Clean Air Act, analyzing the definition of that term in depth and relying upon the explanation provided by the EPA in the underlying decision not to regulate.

Preemption Litigation & the Effect of *Massachusetts v. EPA* on State Climate Change Efforts

The Supreme Court’s decision is expected to have far-reaching effects. In response, the EPA announced that it intends to promulgate emissions standards for new motor vehicles and for fuels by the end of 2008.⁵⁹ Reports indicate that the EPA is coordinating its emission regulation efforts with the National Highway Transportation and Safety Administration, which issues fuel economy standards.⁶⁰

The decision may also affect individual state efforts to regulate GHG emissions — efforts which are already underway and the subject of litigation. Specifically, if the EPA does decide to issue emission standards under the Clean Air Act, states will be preempted from issuing their own regulations.⁶¹ The preemption section of the act, however, contains an exception for the State of California, allowing that state to seek a waiver of preemption, if it can show that it needs stricter state standards because of “compelling and extraordinary conditions.”⁶² The California waiver provision of the Clean Air Act was intended to allow California to enact stricter emission controls to allow California’s cities to reduce their excessive soot and smog problems and to meet federal clean air standards.⁶³

California is already seeking to use this exception to adopt its own more stringent standards for automobile GHG emissions, and is seeking a waiver of preemption from the EPA. California’s request was first submitted in 2005. In November 2007, California sued the EPA for failing to act on the waiver request. Fourteen other states, which have indicated they would adopt California’s standards if California does obtain the necessary waiver, have joined California in the suit. On December 19, 2007, the EPA

56. *Id.* at 1468 (Roberts, C.J., dissenting).

57. Justice Scalia also joined in Chief Justice Roberts’ dissent and would have held that the petitioners did not have standing. *Id.* at 1471 (Scalia, J., dissenting).

58. *Id.* at 1473-74 (Scalia, J., dissenting).

59. See Office of the Press Secretary, “Briefing by Conference Call on the President’s Announcement on CAFE and Alternative Fuel Standards,” May 14, 2007, available at <http://www.whitehouse.gov/news/releases/2007/05/20070514-6.html>. See also Charles Q. Choi & Charles Choi, “Warming to Law,” *Scientific American.com* (June 17, 2007), available at <http://www.sciam.com/article.cfm?articleID=26E045F2-E7F2-99DF-320C630B0B6B2D1E>.

60. See Jonathan S. Martel, “Climate Change Law and Litigation in the Aftermath of *Massachusetts v. EPA*,” *Daily Env’t Rep* (BNA), Vol. 07, No. 214 (Nov. 6, 2007), at 3.

61. 42 U.S.C. § 7543(b).

62. 42 U.S.C. § 7543(b)(1)(B).

63. Jonathan H. Adler, “Can California Catch a Waiver?” *Nat’l Review.com* (May 24, 2007), at <http://article.nationalreview.com/?q=YWVIOGEzZjk3NWE5MmI2Yzk1MWZjZmUyNjNkYmJkZjA=>.

denied California's waiver request, the first such denial in the thirty-seven year history of the Clean Air Act. On the same day, Governor Schwarzenegger announced that California would appeal the decision and "pursue every legal opportunity to obtain the waiver."⁶⁴

California's authority to regulate tailpipe CO₂ standards was upheld recently in *Central Valley Chrysler-Jeep v. Witherspoon*.⁶⁵ In this case, motor vehicle dealers and manufacturers had claimed that California's regulation of CO₂ from automobiles was preempted by the Clean Air Act and by NHTSA⁶⁶ regulations under the Energy Policy and Conservation Act, which sets fuel economy standards for automobiles and light duty trucks.⁶⁷

Automobile manufacturers and dealers were also rebuffed in *Green Mountain Chrysler v. Crombie*.⁶⁸ Here, they challenged Vermont's adoption of the same California GHG tailpipe emissions standards at issue in *Central Valley Chrysler-Jeep v. Witherspoon*. Once California adopts a tailpipe standard under its special authority in section 209 of the Clean Air Act, other states can adopt the standard if they choose. Vermont adopted the California GHG tailpipe standards in 2005.⁶⁹ The plaintiff automakers contended that the standards were preempted under the Clean Air Act and also by the NHTSA's CAFE standards under the Energy Policy and Conservation Act. In an over 200-page opinion, the federal district court in Vermont expressly found that California's standards were not preempted by either federal statute. The automakers have appealed the decision. The entire issue is now uncertain following EPA's denial of California's requested waiver.⁷⁰

Litigation Under the National Environmental Policy Act

The National Environmental Policy Act ("NEPA")⁷¹ requires the federal government to evaluate the expected environmental consequences of its actions and to disclose those consequences to the public.⁷² Some states have enacted "little NEPAs," which essentially hold agencies of that state responsible for the same kind of environmental evaluation. There have been some lawsuits in which it has been argued that

64. See, State of California, "Governor Schwarzenegger Issues Statement after U.S. EPA Rejects California's Tailpipe Emissions Waiver Request"; <http://gov.ca.gov/press-release/8353/>

65. CV F 04-6663 (E.D. Cal. December 11, 2007).

66. 49 U.S.C. §§32901-32919. This is the statute under which the NHTSA establishes the fuel efficiency standards known as "CAFE standards" (corporate average fuel efficiency).

67. Specifically, the *Witherspoon* court held that:

both EPA and California, through the waiver process of section 209, are equally empowered through the Clean Air Act to promulgate regulations that limit the emission of greenhouse gases, principally carbon dioxide, from motor vehicles. The court further concludes that the promulgation of such regulations does not interfere or conflict with NHTSA's duty to set maximum feasible average mileage standards under EPCA. The court finds EPCA's preemption of state laws that regulate vehicle fuel efficiency does not expressly preempt California's effort to reduce greenhouse gas emissions through AB 1493. Because Congress intended there should be no conflict between EPA's duty to protect public health and welfare and NHTSA's duty to set fuel efficiency standards through EPCA, the doctrine of conflict preemption does not apply. To the extent the enforcement of California's AB 1493 Regulations may be inconsistent with existing CAFE standards, EPCA provides that NHTSA has authority to reformulate CAFE standards to harmonize with the AB 1493 Regulations if, and when, such standards are granted waiver of preemption by EPA.

Id. slip. op. at 55 (E.D. Cal. December 11, 2007).

68. No. 2:05-CV302 (D. Vt. Sept. 12, 2007).

69. *Id.* slip op at 8 (citing 42 U.S.C. § 7507).

70. No. 2:05-CV302, slip op. at 104.

71. 42 U.S.C. §§ 4321-4335.

72. 42 U.S.C. § 4332(2)(C).

the government has violated the NEPA by failing to evaluate or disclose the potential effect of its actions upon the climate.

In one recent case *Center for Biological Diversity v. National Highway Traffic Safety Administration*, involving the same CAFE standards indirectly at issue in the challenges to California's GHG tailpipe standards (*Green Mountain Chrysler v. Crombie and Central Valley Chrysler-Jeep v. Witherspoon*), the Ninth Circuit struck down the new light truck fuel efficiency standards of the NHTSA.⁷³ The court found that the NHTSA had failed to "monetize the benefit of reducing carbon dioxide emissions" in its cost-benefit analysis and to consider under NEPA the cumulative impacts of light duty truck emissions on climate change.⁷⁴

Similarly, in *Friends of the Earth v. Mosbacher*, environmental groups and cities sued two federal government agencies—the Export Import Bank and the Overseas Private Investment Corporation—arguing that they violated NEPA by financing international fossil fuel projects without evaluating the impact of such projects upon the climate.⁷⁵ This matter awaits trial. Another case under the NEPA is *Border Power Plant Working Group v. Department of Energy*,⁷⁶ which was the first case in which a court held that an environmental analysis under the NEPA would include considerations of potential impact on climate change.

Greenhouse Gas Emissions as a Nuisance?

Global warming also comes to court in nuisance actions. In these suits, the plaintiffs include states, municipalities and environmental groups, and they seek damages from GHG emitters for property damage allegedly resulting from climate change. The claims are based on the theory of public nuisance and draw analogies to a line of cases in which pollution was held to constitute a nuisance causing harm beyond the boundaries of one state.

A 2003 article proposing the use of tort law to allocate the cost of harm caused by climate change concluded that public nuisance theory would be the most appropriate and promising theory for this kind of litigation.⁷⁷ A defendant is liable for a public nuisance if it carries on, or participates to a substantial

73. No. 06-71891 (9th Cir. Nov. 15, 2007).

74. Importantly, in reaching its decision, the court acknowledged the objective monetary value of reducing carbon emissions: NHTSA assigned no value to the most significant benefit of more stringent CAFE standards: reduction in carbon emissions. Petitioners strongly urged NHTSA to include this value in its analysis, and they cited peer-reviewed scientific literature in support. NRDC cited figures for the benefit of carbon emissions reduction ranging from \$8 to \$26.50 per ton CO₂, based on values assigned by the California Public Utilities Commission, the Idaho Power Company, and the European Union (EU) carbon trading program. NRDC also cited a study published by the National Commission on Energy Policy, which "found that measures mitigating climate change emissions have estimated benefits of \$ 3-19 per ton of carbon dioxide equivalent.

Id. slip. op. at 14872.

75. *Friends of the Earth v. Watson*, No. C 02-4106 (N.D. Cal. San Francisco Div.), Complaint for Declaratory and Injunctive Relief (Second Amended) at page 36.

76. 260 F.Supp. 2d 997 (S.D. Cal. 2003). This case involved a challenge to a decision by the Department of Energy allowing new power plants in Mexico to connect to U.S. power grids. The plaintiffs argued that the Department should have prepared an environmental impact statement analyzing its decision, and, specifically, should have considered the impact of the expected carbon dioxide emissions of the new power plants.

77. David A. Grossman, "Warming Up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation," 28 *Colum. J. Envtl. L.* 1, 60 (2003). The author also considered the viability of products liability suits, noting that a design defect claim filed against automobile manufacturers did have potential, in light of the defendants' failure to implement available technologies for more fuel-efficient vehicles. *Id.* at 44-46, 51-52. However, he concluded that the framework of products liability litigation was not the most likely to succeed. *Id.* at 60.

extent in carrying on, an activity that creates “an unreasonable interference with a right common to the general public.”⁷⁸ Defendants’ conduct “unreasonably interferes” with public rights, if it (1) “significantly interferes with public safety, health, peace, comfort, or convenience; (2) it is continuing conduct, or has produced a permanent or long-lasting effect, and defendants know or have reason to know that it has a significant effect upon the public right; or (3) defendants’ conduct is unlawful.”⁷⁹ The author argues that the emission of GHG would fit within at least one of these criteria. As one example of the way in which climate change was affecting public rights, the author discussed the significant damage resulting from the serious thawing of the Alaskan permafrost.⁸⁰

In *Connecticut v. American Electric Power Co., Inc.*,⁸¹ several power companies were sued under both the federal and state common law of nuisance. The U.S. District Court for the Southern District of New York dismissed the case, holding that it presented political questions best left to the executive and legislative branches of the government. An appeal is currently pending in the Second Circuit Court of Appeals.

The plaintiffs claimed that the defendant power companies, which collectively emit approximately 650 million tons of carbon dioxide each year, were the five largest emitters of carbon dioxide in the country.⁸² Carbon dioxide emissions are a primary cause of global warming, which is expected to cause “irreparable harm to property in New York State and New York City and...it threatens the health, safety, and well-being of New York’s citizens, residents, and environment.”⁸³ The plaintiffs sought an order holding the defendants jointly and severally liable for contributing to global warming as a public nuisance, and requiring the defendants to cap, and then reduce their emissions by a specified percentage each year. The plaintiffs argued that reducing emissions would reduce the risk of global warming to their citizens.⁸⁴

The plaintiffs argued that this was a simple nuisance claim. The District Court disagreed, noting that resolving the issues presented by this case would require the identification and balancing of complex economic, environmental, foreign policy and national security interests. Therefore, the district court held the matter presented political questions, more properly decided by a legislature rather than a court. The plaintiffs appealed this decision to the U.S. Court of Appeals for the Second Circuit, where it awaits decision.

On September 17, 2007, the U.S. District Court for the Northern District of California dismissed *California v. General Motors Corp.*,⁸⁵ in which the state of California sought damages from six automobile manufacturers under public nuisance doctrines of both federal and California common law. The state alleged that the defendants’ motor vehicles release over 289 million metric tons of carbon dioxide each year in the United States, comprising thirty percent of the emissions made in California, and that the resulting global warming is injuring the coastline and water supplies and causing the state to

78. *Id.* at 53 (quoting *Restatement (Second) of Torts* §§ 821B(1), 834 (1979)).

79. *Id.* at 54 (citing *Restatement (Second) of Torts* § 821B(2) (1979)).

80. *Id.* at 53-54.

81. 406 F. Supp. 2d 265 (S.D.N.Y. 2005). This case is currently pending on appeal in the Second Circuit under No. 05-5104-CV.

82. 406 F. Supp. 2d at 268.

83. *Id.*

84. *Id.* at 270.

85. No. C06-05755 MJJ, slip op. (N.D. Cal. Sept. 17, 2007), available at

[http://www.cand.uscourts.gov/cand/judges.nsf/59881109e1fdb45688256d480060b737/61c396eab91211868825735900798cf7/\\$FILE/5755or_derdism.pdf](http://www.cand.uscourts.gov/cand/judges.nsf/59881109e1fdb45688256d480060b737/61c396eab91211868825735900798cf7/$FILE/5755or_derdism.pdf)

suffer damages. The state sought monetary compensation and also a declaration that the defendants are liable for all future damages caused by their motor vehicles' emissions. The Court dismissed the complaint because the issues presented were political rather than legal questions.

In *Comer v. Murphy Oil Co.*,⁸⁶ a case arising out of damage caused by Hurricane Katrina in 2005, Louisiana property owners filed a class action suit against their insurer for failing to pay property damage claims. The complaint also included several oil and oil refining companies as defendants in the suit and alleged that the property damage sustained as a result of Hurricane Katrina resulted at least in part from the GHG emissions from the oil and refining companies. This case was dismissed on standing and jurisdictional grounds. The court held that, even assuming that the defendants' activities contributed to climate change, the argument that their activities caused global warming, which in turn caused Hurricane Katrina and then the plaintiffs' damages was too remote to support standing. The court also held that the standards to which companies should be held on the issue of GHG emissions is a political question better left for other branches of government to decide.

The U. S. Supreme Court's recent decision in *Massachusetts v. EPA* may have an important effect on the future validity of these nuisance cases. If federal environmental statutes such as the Clean Air Act apply to the emission of GHG, it is arguable that both the state and federal common law of nuisance are preempted.

86. No. 1:05CV436 (S.D. Miss. Aug. 30, 2007).

FUTURE LITIGATION

“We now need to take [climate] science to the courts so that greenhouse gas emissions cannot continue with impunity.”

- *Roda Verheyen, Co-Director of the Climate Justice Programme*

“I say, ‘Bring it on.’ If we ever get into a court of law, the holes in the arguments about disastrous climate change will be self-evident.”

- *Patrick J. Michaels, Environmental Sciences Professor, University of Virginia*⁸⁷

Change creates both conflict and opportunity. Global warming threatens to fundamentally impact the commercial, regulatory, social, economic and political fabric of our society. It is impossible to predict precisely how, when, and to what extent conflicts and opportunities will manifest themselves, but there are general observations which can be made with a high level of confidence.

Professional Liability Litigation

While the litigation to date has centered upon high publicity nuisance and “regulatory inaction” claims, those suits are relatively few in number. The first sustainable wave of viable lawsuits is likely to involve professional liability claims. Engineers, brokers, architects, consultants and other professionals who fail to factor climate change into their work product will be sued when that change manifests itself in a manner which damages their clients. Now that the IPCC, the U.S. Supreme Court, the EPA, and the majority of scientists have acknowledged the phenomenon of global warming, professionals who fail to take climate change into account do so at their own peril. Specific examples of potential professional liability exposure include an architect or engineer who fails to account for increased storm surge on a coastal development project, a broker who is unfamiliar with new climate change insurance products, or a lawyer or consultant advising an energy company who is unaware of the likely impacts of cap and trade legislation.

Directors and Officers Liability

Directors, officers, and other fiduciaries face potential liability if: (1) the organization sustains financial harm as a result of a breach of care; or (2) the director, officer, or fiduciary fails to disclose substantial risks. While directors receive some protection from the “business judgment” rule, that protection typically applies only where a decision can be characterized as reasonably informed. Directors, especially those in the energy and risk management industries, may face exposure where they fail to carefully account for the impact of climate change, including the costs of potential new laws and regulations, competitive harm to their business and the higher costs of fossil fuels, among others. Similarly, ignoring climate change, or misrepresenting its likely impact, in the context of risk disclosures, may give rise to future shareholder

87. Quotes taken from *The Nation* by Marc Morano, Senior Staff Writer, CNSNews.com (July 18, 2003).

suits.⁸⁸ Because global warming, and legislation associated with climate change, will undoubtedly produce corporate winners and losers, it is inevitable that the shareholders of the latter group will look to their fiduciaries for accountability.

For example, it was reported recently⁸⁹ that an Alabama nuclear plant was forced to shut-down during portions of the hot, dry summer of 2007 because the river supplying the reactor with cooling water was too warm (in excess of 90 degrees) and had insufficient volume. Several pulp and paper mills also had to shut-down for extended periods to avoid violating wastewater discharge permit limits. Also, thawing permafrost along Alaska's 800-mile Trans-Alaska Pipeline is destabilizing the pipeline due to risk of heaving and collapse. Support structures costing \$2 million per mile were recently installed to protect the pipeline against heaving or collapse. Seventeen percent of the U.S. oil production is supplied by the pipeline. It goes without saying that losses such as these could materially impact on share prices. The failure to adequately assess and disclose such climate change risks invites litigation by shareholders.⁹⁰

Despite these liability exposures it appears that a significant portion of the U.S. business community is not adequately assessing and disclosing risks posed by climate change. A January 2007 survey of the Standard & Poor's 500 found that climate risk disclosure practices among the 500 largest companies in the U.S. are severely lacking as less than half of the S&P 500 analyze and disclose their climate change risks. Given the tremendous wealth of new information emerging practically daily about the physical, economic, and social impacts of climate change — and the compelling need for governments and businesses to address the problem — the time has long-since passed for publicly-traded companies to implement programs to systematically assess, manage, and disclose their climate change risks. With little difficulty one can conceive of the following scenario: (1) a company fails to adequately assess and disclose its climate change risks, (2) an investor purchases the company's stock at an inflated price because the market was unaware of the risk, (3) a loss tied to climate change occurs, and (4) the stock price falls as a result.

Pending the SEC's issuance of climate change disclosure guidance,⁹¹ companies looking for help on what to disclose can look to the *Global Framework for Climate Risk Disclosure* published by CERES in October 2006. The framework identifies principal climate change risks to companies, namely operational risk, market risk, liabilities risk, policy risk, regulatory risk, and reputational risk. It recommends that companies disclose: (1) emissions, (2) corporate statement addressing commitment and competitive risks, (3) analysis of physical risks and (4) analysis of regulatory risk. A more detailed discussion of steps a company can pursue under the *Global Framework for Climate Risk Disclosure* is provided later in the section on Minimizing Risk and Capitalizing on Opportunities beginning on page 34.

88. See Richard Bortnick & Kevin LaCroix, "Supreme Court Gives Wake-Up Call to Buyers on Global Warming Risks," *National Underwriter Property & Casualty* (June 25, 2007) (cover article) (reciting SEC Regulations S-K regarding risk disclosures).

89. Statement by Mindy S. Lubber, President, CERES, & Director, Investor Network On Climate Risk, Before the Subcommittee on Securities, Insurance, and Investment, Senate Committee on Banking, Housing and Urban Affairs, Regarding Climate Disclosure: Measuring Financial Risks and Opportunities, October 31, 2007.

90. Securities fraud suits usually are based on SEC Rule 10b-5 and generally require a showing that a company or its officials made a material misstatement or omitted stating some important information with the intent to defraud. Shareholders must have relied reasonably on the statement and must have suffered some economic loss. Finally, the misstatement or omission must have "caused" the plaintiff shareholders loss. See *Dura Pharmaceuticals, Inc. v. Broudo*, 544 U.S. 336 (2005).

91. A group of institutional investors and state pension funds petitioned the SEC to issue guidance on corporate disclosure of climate change risks. See *New York Times*, "Effort to Get Companies to Disclose Climate Risk" (September 2007).

Insurance Coverage Disputes

As directors, officers, architects, lawyers, consultants, builders, brokers, municipalities and a vast array of other defendants become targets of climate change lawsuits, they will seek insurance coverage. Those suits may present issues of “expected or intended,” “trigger of coverage,” and the potential application of the “pollution exclusion.” Additionally, affected property owners will bring first party claims against their insurers. Indeed, it has been argued that global warming was a contributing factor in the California wildfire and/or Katrina hurricane losses.⁹² Since “climate change” per se is not an excluded peril under property policies,⁹³ there has been no reason to litigate the impact of climate change on these events. This is likely to change, however, as insurers develop and implement new endorsements, exclusions and products specifically addressing the global warming phenomenon.

Cap and Trade Disputes

There is an expectation in both political and business circles that the United States will pass legislation imposing some form of GHG emission restriction by the end of this decade. There is still some disagreement, however, concerning whether the restriction will take the form of a carbon tax or a cap and trade system. Both approaches provide strong incentives for companies to reduce fossil fuel usage and both would spur investment into renewable energy programs. The carbon tax would be much easier to administer, giving it the dual advantages of cost and simplicity. The key advantage to the cap and trade approach is that it not only rewards companies for meeting their obligations, it also creates incentives for them to earn credits by exceeding legislative requirements. Moreover, it is more compatible with the regulatory approach adopted by the EU and by the emerging Northeast and West Coast regional cap and trade programs. Finally, the majority of U.S. climate change legislative proposals to date rely on cap and trade rather than a carbon tax. The adoption of either regulatory approach will likely produce litigation over the establishment of a particular company’s appropriate obligations, the measurement of its emissions, and director, officer, and professional liability disputes. A cap and trade system would likely also give rise to a broad range of litigation over credits, offsets, and other market-related disputes.

92. See e.g., *Comer v. Murphy Oil Co.*, discussed above.

93. Many standard property policies do, however, contain a “changes in temperature” exclusion.

UNDERSTANDING THE INTERNATIONAL CARBON MARKETS

“Carbon emissions trading will probably double to at least \$60 billion this year...as investors and polluters seek to profit from reducing greenhouse gas emissions.”⁹⁴

-Annika Breidhardt, World Carbon Market Seen Doubling This Year: IETA⁹⁵

Despite the United States’ rejection of the Kyoto Protocol, we are witnessing the emergence of a nascent global CO₂ emissions trading system that links CO₂ cap and trade programs in different regions of the U.S. and across the globe. As previously discussed, because the impact of CO₂ emissions and similar pollutants are global in scope, the location of emissions reduction is immaterial. Cap and trade programs — provided they share common rules and metrics — can be linked together to expand the number of opportunities for efficient emissions reductions and thereby to reduce cost.

Kyoto Market

In 1997, the United States signed the Kyoto Protocol, a global treaty in which the developed nations — the so-called Annex I Parties — agreed to limit their GHG emissions relative to the levels emitted in 1990. The U.S. preliminarily committed to reduce emissions from 1990 levels by 7% during the first compliance period from 2008 to 2012. However, under its terms, the protocol could only enter into force when ratified by at least 55 countries and Annex I Parties accounting for at least 55% of the total 1990 CO₂ emissions. In June 1997 the U.S. Senate — which has sole authority to ratify international treaties on behalf of the U.S. — voted 95-0 to reject the protocol unless China and India were likewise subject to binding emissions reductions.⁹⁶ In 2001, during negotiations over the rules to implement the Kyoto Protocol, the U.S. announced that it would not ratify the protocol without emission reduction commitments from India and China.

By 2004, without the U.S., only countries accounting for 44% of CO₂ emissions had ratified. Thus, without ratification by one or more Annex I countries representing an additional 11% of CO₂ emissions, the Protocol was dead. However, in November 2004, Russia defied conventional wisdom by ratifying the Kyoto Protocol, thereby clearing the way for the treaty’s entry into force on February 16, 2005.⁹⁷

The centerpiece of the Kyoto Protocol is international CO₂ emissions trading which, like the EPA’s NO_x and Acid Rain trading programs, is designed to secure the most cost-efficient opportunities for CO₂ reductions among and between the nations ratifying the Protocol. The Kyoto Protocol incorporated three mechanisms to assist Annex I countries (*i.e.*, developed nations) to achieve their emission reduction targets. First, the Protocol allows for using tradable CO₂ allowances generated by Joint Implementation (“JI”) projects, pursuant to which two Annex I countries jointly sponsor an emissions reduction project.

94. Quoting industry source.

95. <http://www.reuters.com/article/environmentNews/idUSSP20658520071106?sp=true>

96. Remarkably, conventional wisdom at the time of the Senate Resolution predicted that the greenhouse gas emissions of China would surpass those of the United States no earlier than 2015. In fact, this was too optimistic. The greenhouse gas emissions of China surpassed those of the U.S. in 2007. *See* 101st Congress, Senate Resolution 98 (June 12, 1997).

97. Peter Fontaine, “Global Warming: The Gathering Storm,” *Public Utilities Fortnightly* (August 2004).

Second, the Protocol allows for using tradable CO₂ allowances generated by Clean Development Mechanism (“CDM”) projects (referred to as “Certified Emissions Reductions” or “CERs”), pursuant to which an Annex I country sponsors an emissions reduction project located in a Annex II country (i.e. developing nations). Because the impact of CO₂ emissions — like ozone depleting substances — are global in scope, the location of emission reductions is immaterial. In other words, a ton of CO₂ avoided in Bombay is just as valuable as a ton avoided in Scranton. Third, the protocol allows for emissions trading of CO₂ allowances pursuant to which regulated sources in Annex I countries trade CO₂ allowances to meet their emissions reduction targets.

European Union Market

Linkage of regional cap and trade programs can be seen in the European Union, which is meeting its Kyoto Protocol emission reduction commitments on a collective basis through its own Emissions Trading Scheme (“ETS”). In 2003, even though Kyoto had not yet entered into force, the EU moved forward with its own mandatory GHG control program three years ahead of Kyoto’s schedule. The 15 nations who were EU members in 1990 redistributed their targets among themselves pursuant to a “bubble” approach.

The EU ETS is patterned on the U.S.’s Acid Rain Program under Title IV of the Clean Air Act, the world’s first market-based pollution trading program. The Acid Rain Program substantially reduced sulfur dioxide (SO₂) emissions from coal-burning power plants through a cap and trade system.⁹⁸ The EU ETS program relies on the same market-based approach under which EU members have each developed National Allocation Plans under which limits are imposed on individual sources of GHG emissions by allocating emissions allowances.

The ETS program applies to some 12,000 installations, namely producers of energy, steel, cement, glass, ceramic, brick, pulp and paper. The first phase of the EU ETS ran from 2005 to 2007. The second phase runs from 2008 to 2012. Under the ETS, each covered facility is required to hold a sufficient number of allowances representing its authorized level of CO₂ emissions cap. Each EU member allocated allowances to its covered facilities pursuant to each country’s National Action Plan. Before April 30th of each year, subject facilities are required to surrender a sufficient number of allowances covering their actual emissions for the year. To meet their emission caps, facilities can either reduce their CO₂ emissions down to their specified level or purchase allowances from the emissions allowance market.

The EU allowance market is supplied by excess allowances generated by facilities that reduce their emissions below their caps. While allowances are generated primarily by facilities within the EU, allowances also are supplied by other non-EU CO₂ trading systems, pursuant to the EU’s “Linking Directive.” The Directive allows EU ETS installations to purchase allowances from outside the EU to satisfy their emissions caps, including allowances generated pursuant to the Kyoto Protocol’s JI and CDM programs. Thus, an installation within the EU needing to reduce its CO₂ emissions can obtain the needed allowances through the lowest-cost option available. In lieu of undertaking expensive pollution reductions

98. Under the cap and trade approach, SO₂ sources are allocated allowances (the cap) which they can then buy and sell among themselves (trade) to achieve net reductions in SO₂ emissions. The Acid Rain Program surpassed expectations by reducing annual SO₂ emissions in Phase I by almost 40% at a cost well far below even the most optimistic predictions.

itself, this might involve funding an emissions project outside the EU in a nation that has adopted Kyoto, either in a non-EU industrialized country like Russia or Canada (through the JI mechanism) or in a non-EU developing country like Argentina or Chile (through the CDM mechanism). In this way, the most economically efficient option for emission reduction can be pursued.

Global Linkage

The EU's Linking Directive will impact on the U.S. as it provides for linkage with any mandatory CO₂ cap and trade programs in the world, including RGGI. Heretofore, because the U.S. is not party to the Kyoto Protocol, companies in America that reduce CO₂ emissions voluntarily — which otherwise would qualify for CO₂ allowances — were unable to participate in the EU ETS. Thus, American corporations with installations in the EU could not take advantage of low-cost emission reductions at their U.S. facilities to meet their ETS emission caps. Nor could EU companies generate allowances from investments in emissions reduction projects here in the U.S. However, with CO₂ allowances soon to be generated by RGGI, the EU's Linking Directive will enable covered facilities to purchase CO₂ allowances generated under the RGGI program. Similarly, under certain conditions, the RGGI program authorizes covered facilities to purchase CO₂ allowances generated by mandatory CO₂ cap and trade programs outside the region, including by the EU ETS and the United Nations programs.

Moreover, until recently, U.S. companies specializing in carbon offset projects were unable to participate readily in CDM projects because Article 12 of the Kyoto Protocol requires each proposed CDM project to be authorized by the Designated National Authority for each of the sponsoring and host countries. Because the U.S. is not a party to the Kyoto Protocol, it can not sponsor a CDM project, thereby making it difficult for U.S. offset project developers to obtain sponsorship, as parties to the Protocol naturally tend to favor their own domestic companies. CDM opportunities for U.S. offset developers, however, were boosted recently through a policy directive issued by the United Kingdom's Department for Environment, Food and Rural Affairs ("DEFRA"), which offers to sponsor CDM projects proposed by companies from non-Kyoto countries, such as the U.S. This enables U.S. companies with carbon mitigation technology and knowledge to participate in the CDM offset market by completing projects in developing countries that generate CERs. In turn, the U.K. creates additional sources of CO₂ offsets that can be used to satisfy its Kyoto Protocol emissions target under the umbrella of the EU.

In sum, a nascent global CO₂ emissions trading system is emerging that is linked together by various CO₂ state-level cap and trade programs across the U.S. and across the globe.

MINIMIZING RISK AND CAPITALIZING ON OPPORTUNITIES

“In the middle of difficulty lies opportunity.”

- Albert Einstein

Cozen O’Connor’s Climate Change Practice brings together an unmatched combination of expertise in environmental law and policy, insurance and risk, complex litigation, and energy regulation to assist clients dealing with a multitude of climate change issues. Energy developers depend on us to help them finance and site their projects. Energy companies count on us to handle rate and other proceedings before state and federal utility regulatory commissions concerned about climate change. Publicly traded corporations consult us on climate risk disclosure obligations under SEC Rule S-K.⁹⁹ Corporate officers and directors, and all types of professionals, rely on us to defend them in litigation. Technology companies seek our help to protect and position their CO₂ mitigation technology in the emerging climate change carbon trading regime. And, of course, insurers rely upon us in drafting, investment, coverage analysis, and litigation-related matters.

Developing a Strategy

An oft-repeated refrain at climate change seminars is “If you are not at the table, then you will be on the menu.” And indeed, with new legislation, litigation, increased risk of property damage and enhanced public awareness, it has become imperative for organizations to develop a comprehensive climate change strategy. Consider for a moment the following questions:

- Would the implementation of a carbon tax or the adoption of a “cap and trade” system be better for your business?
- Do you stand to gain or lose clients or business partners based upon your climate change strategy?
- How, if at all, will substantially increased costs of buying and selling non-renewable energy affect your ability to compete for business?

If the answers to these questions are not immediately clear, you may not be optimizing opportunity and minimizing risk. We are ready to assist you in either developing a climate change strategy, or analyzing and supplementing your current strategy.

Disclosure Issues

Presumably, companies that follow the recommendations of the CERES *Global Framework for Climate Risk Disclosure* will help insulate themselves against shareholder litigation, as follows:

99 SEC Regulation S-K, 17 C.F.R. Part 229.10 *et seq.* (2007).

Assess and Disclose Emissions

A company should assess its total historical, current, and projected GHG emissions. A company can use a widely-accepted emissions inventory protocol developed by the World Resources Institute, *Corporate Accounting and Reporting Standard* (revised edition) of the Greenhouse Gas Protocol. This is a protocol to measure a company's direct GHG emissions, emissions associated with the company's consumption generation of electricity, heating/cooling, or steam, and includes indirect emissions, such as travel. It is the same protocol used by EPA's Climate Leaders Program.

Develop Climate Change Statement

A company should develop a clear, straightforward statement about its current position on climate change, its corporate governance for climate change matters, its commitment to address climate change, and its engagement with governments and advocacy organizations to affect climate change policy. The statement should also describe how climate change could affect the company's competitiveness and how the company plans to meet any strategic challenges posed by climate risk. This would include an explanation of its actions to minimize its climate risk, including emissions reductions, emissions trading, and renewable energy/clean technology investments, as well as any new opportunities such as development and design of new products.

Analyze Physical Risks

A company should analyze and disclose how climate and weather impact its business and operations, including its supply chain. This could include impacts of changed weather patterns (e.g. storm intensity, sea-level rise, water scarcity, etc.). This analysis should also explain how it will adapt to the physical risks of climate change and associated costs.

Analyze Regulatory Risks

A company should analyze and disclose known regulatory trends, events, demands, commitments and uncertainties stemming from climate change that are reasonably likely to have a material effect on financial condition or operating performance. Secondary effects of regulation, such as increased energy and transportation costs, shifts in consumer demand and other impacts should be examined. The analysis should contain a list of all GHG regulations enacted in those countries where the company operates and the financial impact of those rules. The analysis also should cover the anticipated future cost of either: (1) emissions reductions of 5%, 10%, and 20% below 2000 levels by 2015; or (2) a limited number of plausible GHG regulatory scenarios, mainly those under discussion by governments in countries where they operate.

Insurance and Risk

The impacts of climate change, both real and perceived, are having a profound effect on the insurance sector. Historical underwriting models are becoming obsolete, new products are being introduced, new "carbon credit" investment opportunities are available, and governments are interacting with the

insurance marketplace in new ways. In the coming years, insurers who are able to project and respond to the likely effects (or lack thereof) of global warming will be at a significant competitive advantage. Cozen and O'Connor's unique and extensive insurance practice places us in a position to assist insurers in connection with general climate change consultation, product development, litigation, coverage analysis and carbon offset investment strategy.

Participating in Clean Air Markets

Environmental regulation is evolving toward market-based approaches to pollution control. By monetizing air pollution emissions, these innovative approaches harness the power of capitalism to reduce emissions to their lowest-cost. Since the early 1990s, our lawyers have been at the forefront of the clean air market paradigm, starting with the EPA's NOx budget trading program under the 1990 Clean Air Act amendments. Cozen O'Connor has worked with energy efficiency and renewable energy ("EE/RE") project developers to secure EE/RE set-aside NOx allowances, reflecting the quantity of NOx emissions from baseload electric generation displaced by EE/RE measures, such as high-efficiency lighting.

Our expertise with clean air markets, such as the NOx budget program, enables Cozen O'Connor to help clients manage the next wave of market-based regulation — one that is vastly more complex — CO₂ cap & trade. In the United States, the regulation of CO₂ emissions first will impact on the Northeast and Mid-Atlantic regions, where ten states are implementing the RGGI. Starting in 2009, RGGI will cap CO₂ emissions from some 758 fossil fuel-fired electrical generation units having a nameplate capacity of 25 megawatts or larger within the ten-state region. Modeled on the EPA's NOx cap and trade program, RGGI authorizes the creation of CO₂ allowances from CO₂ emission offset projects, including EE/RE and projects that reduce/capture methane emissions from landfills, agricultural manure management operations, and natural gas transmission and distribution equipment, among others. Cozen O'Connor has closely monitored RGGI since its inception three years ago and is working with several clients to accredit CO₂ offset projects that will generate CO₂ allowances for banking and eventual sale.

Acquiring Information

Cozen O'Connor actively monitors federal climate change legislative proposals, including the Lieberman-Warner Climate Security Act, which would create a national CO₂ cap and trade program. Cozen O'Connor also closely follows climate change regulatory developments on the international front in connection with the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the European Union's Emissions Trading Scheme. Together, these programs created a burgeoning international CO₂ allowance trading market which, like the EPA's NOx trading program, is designed to secure the most cost-efficient opportunities for CO₂ reductions among and between the nations ratifying the Protocol. At your request, we will be glad to provide you with our firm's client alerts.

Energy and Renewable Opportunities

The introduction of competition into electricity markets in New Jersey, Pennsylvania and many other Northeastern states has elevated the importance of both environmental and energy-related legal services. Many electrical generation units (“EGUs”) now operate in a competitive energy market in which the costs of environmental compliance and other capital improvements are no longer recoverable from customers through regulated rates. Environmental costs are increasingly important drivers for utilities and independent power producers alike. In tandem with electric competition, many states have enacted renewable portfolio standards (“RPSs”) requiring retail electric suppliers to derive increasing annual percentages of their power from renewable sources, such as wind power, solar, and biomass.¹⁰⁰

Cozen O’Connor has assisted electric public utilities in divesting generation capacity and to spinning-off generation assets. We have also represented private equity buyers of electrical generation units, helping them to analyze the risk and compliance costs associated with impending climate change regulation under RGGI. Cozen O’Connor has assisted a resource recovery facility owner in resolving a dispute concerning ownership of RECs under a long-term Public Utility Regulatory Policy Act (PURPA) power purchase agreement and qualifying for the issuance of New Jersey Class II RECs. This work generated hundreds of thousands of dollars in new revenue annually for the client. We assisted a major electric utility in constructing a thin-film solar energy facility on an industrial landfill to provide electricity for a groundwater pumping and treatment system. We also assisted in developing an auction sale of an electric power plant. We represent an unregulated energy services company in the negotiation of agreements for the sale of thermal energy and for the construction of thermal energy plants across the country.

Cozen O’Connor has assisted an unregulated merchant power company analyzing a multitude of due diligence issues in connection with the acquisition of a large New Jersey coal burning power plant. This matter required us to analyze the plant’s sulfur dioxide and NOx allowance compliance status and the potential impact of RGGI and the Clean Air Interstate Rule (“CAIR”). One of our lawyers co-founded a small wind power development firm that analyzed the feasibility of a mountain-ridge wind farm site in the Northeastern U.S., requiring in-depth analyses of the Massachusetts REC market, grid interconnection issues, and various permitting requirements, including U.S. Fish & Wildlife Service Migratory Bird Treaty Act requirements.

Cozen O’Connor is one of a small handful of firms in the country with experience in electricity auctions. In New Jersey, for example, the electricity market is competitive as electricity is procured through a unique reverse auction process. Customers may buy power directly from either non-utility or utility suppliers. Utility suppliers, in turn, buy their power from the lowest bidder or bidders at an auction. Cozen O’Connor represents major electric suppliers in these auction proceedings, enabling the firm to develop expertise in yet another emerging area of the law. As other states follow the auction model for

100. Electric suppliers must demonstrate to their state public utility commissions that they have achieved their renewable portfolio requirement either by purchasing their electricity from renewable sources or by purchasing renewable energy credits (“RECs”). RECs are similar to NOx and CO₂ allowances, as they are a commodity that can be bought and sold to satisfy the RPS obligation. Large energy companies that own coal-burning plants are diversifying their energy portfolios by building renewable energy facilities (e.g. wind power, solar energy, biomass) to satisfy their renewable portfolio obligations. Construction of these facilities requires sophisticated environmental and energy law services to secure revenue streams from air pollution emission offset credits and RECs.

electricity markets, Cozen O'Connor is ready to assist electricity suppliers in navigating in this emerging competitive energy field.

Technology Development

Climate mitigation technology is a key driver in the emerging climate change market. Cozen O'Connor represents a number of technology companies, helping them to position their businesses and to protect their technologies in this new marketplace. We represent a wind technology company that has developed a compelling new micro-wind turbine that is roof-top mounted and is specifically adapted for use in the urban, "built" environment by taking advantage of the wind-acceleration effects of buildings. We represent an ocean-power technology company that has developed a scalable electricity generation device that produces power through the subsurface action of waves. We represent a technology company that has developed a device to "fast-charge" industrial truck batteries in a fraction of the time needed by conventional charging, enabling warehouse operations to eliminate redundant forklift battery packs and helping electric vehicle ("EV") manufacturers to extend the range of EVs to the point of commercial viability. We represent an EV consortium seeking to promote EV fleet vehicle projects to demonstrate the commercial viability of EVs, which have the potential to substantially reduce CO₂ emissions from the transportation sector, one of the largest sources of climate change gases. We represent a smart grid technology manufacturer that has developed an information technology and digital communications capability that is overlaid on the electric distribution network to enable utilities for the first time to have real-time visibility into their end-to-end electric distribution networks. The technology turns every point in the existing network—including every meter and transformer—into a potential information source, enabling instant feed-back of performance data and reinforcement of grid reliability.

CONCLUSION

The realities and perceptions of climate change have already begun to present pitfalls and opportunities. Organizations which proactively evaluate, anticipate, and respond to these changes will secure a substantial competitive advantage over those that do not. This paper was intended to assist our friends in navigating this turbulent environment. If we can be of any further assistance or if you have questions or comments, please do not hesitate to contact us.