

POST INDUSTRIAL REVOLUTION HUMAN ACTIVITY AND CLIMATE CHANGE: WHY THE UNITED STATES MUST IMPLEMENT MANDATORY LIMITS ON INDUSTRIAL GREENHOUSE GAS EMMISSIONS

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I. INTRODUCTION

The issue of industry-based emissions of greenhouse gases (GHGs) has become a critically important environmental and political topic over the last decade. While the issue of GHG emissions and its connection to global warming has always been a controversial subject, there is little debate today in the scientific and political arenas that the mean global temperature is increasing. Much of the debate has now shifted to a discussion about the major factors causing this change, the environmental effects of climate change, and the stringency of measures necessary to regulate GHG emissions.

It is important to make the distinction between naturally-occurring GHGs and GHGs that are released from industrial plants and through vehicle emissions. Natural GHGs, such as water vapor, carbon dioxide, and other gases, exist in the atmosphere and act to catch some of the energy that is radiated back into space from the heat of the Earth's surface.¹ This natural "greenhouse effect" is beneficial because it maintains the Earth's average temperature around sixty degrees Fahrenheit, making the planet a hospitable environment.² However, excessive amounts of gases emitted from industrial sources and automobiles have increased the planet's ability to "trap" this energy, causing an increase in the average global temperature. This rise in global climate, and its impact on the Earth's ecosystem, will likely have far-reaching effects.

Certainly, an increase in temperature could have some positive effects: warmer temperatures would allow agricultural cultivation in some areas currently hindered by low temperatures; melting glaciers in the Arctic Ocean would increase accessibility into areas that are currently hard to explore; and warmer winter temperatures would reduce the demand for heating, and likely

1. U.S. Environmental Protection Agency, *Global Warming — Climate*, at <http://yosemite.epa.gov/oar/globalwarming.nsf/content/climate.html> (last modified Jan. 7, 2000) [hereinafter *EPA Climate*].

2. *See id.*

reduce the mortality rates during the cold season.³ On the other hand, if atmospheric carbon dioxide concentrations and global temperatures continue to rise, there is a threat of several catastrophes, including a continued rise in sea level, flooding and droughts, and the spread of deadly diseases.⁴ This is a global problem in which each region's actions affect the rest of the world. Therefore, it is imperative that every country implement the most aggressive regulations on GHG emissions that are economically feasible. It is particularly important that the United States join other industrialized nations in a binding international agreement to regulate GHG emissions. The United States represents around twenty-four percent of the world's carbon emissions, thereby making U.S. participation and cooperation essential for an effective global treaty.⁵

II. GHG INDUSTRY-BASED EMISSIONS — A GROWING PROBLEM

After the Industrial Revolution, productivity and efficiency increased dramatically as production of goods shifted from the home into factories. Unfortunately, along with the technological advances came an enormous increase in the amount of atmospheric concentrations of GHGs. Since the Industrial Revolution, concentrations of carbon dioxide have increased by nearly thirty percent, concentrations of methane have more than doubled, and nitrous oxide concentrations have risen by about fifteen percent.⁶ These gases are released through the burning of fossil fuels such as oil, natural gas, and coal, which are used to operate cars and trucks, heat homes and businesses, and run factories.⁷

The Intergovernmental Panel on Climate Change (IPCC) was created in 1988 by the United Nations Environment Program and the World Meteorological Organization to assess scientific and technical research concerning climate change, and to evaluate potential impacts and possible options for adaptation and mitigation.⁸ The IPCC was created partly as a response to U.S. concerns that there was not enough hard scientific evidence on global warming to warrant mandatory international regulation of

3. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2001: IMPACTS, ADAPTATION, AND VULNERABILITY 83-84 (James J. McCarthy et al. eds., 2001) [hereinafter IMPACTS, ADAPTATION, AND VULNERABILITY].

4. Jasmine Abdel-khalik, *Prescriptive Treaties in Global Warming: Applying the Factors Leading to the Montreal Protocol*, 22 MICH. J. INT'L L. 489, 494 (2001).

5. Anastasia Telesetsky, *The Kyoto Protocol*, 26 ECOLOGY L.Q. 797, 813 (1999).

6. *EPA Climate*, *supra* note 1.

7. *Id.*

8. IPCC, *About IPCC*, at <http://www.ipcc.ch/about/about.htm> (last visited Oct. 5, 2004).

GHG emissions.⁹ In 2001, the IPCC determined that the average global air temperature had increased one Fahrenheit degree over the last century.¹⁰ The IPCC also predicted that the average global temperature would rise by another 2.5 to 10.4 degrees Fahrenheit by the year 2100,¹¹ and concluded that this temperature change has been caused primarily by human activities releasing GHGs into the atmosphere.¹²

III. ARE RISING TEMPERATURES CONNECTED TO GREENHOUSE GAS EMISSIONS OR IS THIS SIMPLY A NATURAL CLIMATE VARIATION?

It is not disputed that the mean global temperature is increasing. Both the IPCC and the U.S. Environmental Protection Agency (EPA) have reported that since the late nineteenth century a warming trend of about one degree Fahrenheit has been recorded, with warming occurring in both the northern and southern hemispheres, and over the oceans.¹³ Many scientists predict that this global warming will have drastic effects on global ecosystems. In fact, climate variations in the distant past appear to have been traumatic for existing life. Research prepared for the United Nations Framework Convention on Climate Change (UNFCCC) noted that the history of the earth is “punctuated by so-called ‘mass extinction events’ during which a large fraction of the world’s species are wiped out.”¹⁴ While there are many potential causes for mass extinctions, research suggests that many occurred coincidentally with relatively sudden changes in climate.¹⁵ Abrupt changes in climate are generally considered significant when they persist for a year or longer, exceed normal climate variability, and affect sub-continental or greater regions.¹⁶

Natural variability in the climate has historically been the cause of extreme weather consequences. The modern problem is determining what extent the human enhancement of the natural greenhouse effect has on the planet. Since accurate records of temperature measurements do not exist before the mid-1800s, scientists must reconstruct temperature records using various

9. DONALD A. BROWN, *AMERICAN HEAT* 87 (2002).

10. IPCC, *CLIMATE CHANGE 2001: SYNTHESIS REPORT 5* (2001), at <http://www.ipcc.ch/pub/SYRspm.pdf> (Sept. 24-29, 2001) (last visited Oct. 5, 2004).

11. *Id.* at 8.

12. *Id.* at 4.

13. EPA, *Global Warming — Climate Uncertainties*, at <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ClimateUncertainties.html> (last modified Jan. 7, 2000).

14. UNFCCC, *Climate Change Information Kit* (2002), <http://unfccc.int/resource/iuckit/infokit2001.html> (last visited Oct. 5, 2004) [hereinafter *Information Kit*].

15. *Id.*

16. NATIONAL RESEARCH COUNCIL, *ABRUPT CLIMATE CHANGE* 14 (2002).

indicators such as changes in coral reefs, volcanism, and sunspot activity.¹⁷ A comprehensive study was completed in 1999 using 115 different indicators to track the Earth's average global temperature for the last one thousand years.¹⁸ The study's climatologists concluded that the overall pattern actually demonstrated a steady decrease in temperature over the first 900 years, followed by a dramatic increase in the twentieth century.¹⁹ The findings suggest that 1990 through the year 2000 was the warmest decade of the *whole millennium*, indicating that the temperature increase over the last century is not typical of normal climate variability.²⁰ The researchers also correlated their findings with factors known to affect climate and determined that solar variability and volcanism were the main influences during the first 900 years, but that human activity contributed to much of the variation in the twentieth century.²¹ In general, most of the scientific community agrees with the findings of this study, and the viewpoint of the IPCC, that there is a connection between the increasing amounts of GHGs emitted into the atmosphere and the increasing global temperature.²²

IV. EFFECTS OF INCREASED GLOBAL TEMPERATURES

While the threat of devastating impacts of global warming may seem alarmist, such concerns are not limited to radical environmental groups, but are supported by highly regarded scientific entities such as the EPA, the National Academy of Sciences, and the panel of experts comprising the IPCC.

A. *Rise in Sea Level*

Over the past century, an increase in temperature of only one degree contributed to a rise in sea level of four to eight

17. Richard Wolfson & Stephen H. Schneider, *Understanding Climate Science*, in CLIMATE CHANGE POLICY 3, 5 (Stephen H. Schneider et al. eds., 2002).

18. *Id.* at 5-6.

19. *Id.* at 5.

20. *Id.*

21. *Id.* at 6.

22. There are some skeptics of this theory in the scientific community. See Richard S. Lindzen, *Global Warming: The Origin and Nature of the Alleged Scientific Consensus*, Regulation: The Cato Review of Business Government, at <http://www.cato.org/pubs/regulation/reg15n2g.html> (last visited Oct. 5, 2004) (arguing there is no substantive basis for predictions of sizeable global warming due to increases in greenhouse gases); see also John Carlisle, *Sun to Blame for Global Warming*, 203 NATIONAL POLICY ANALYSIS (June 1998), at <http://www.nationalcenter.org/NPA203.html> ("scientific evidence conclusively shows that the sun plays a far more important role in causing global warming and global cooling than any other factor, natural or man-made").

inches.²³ Based on current warming trends, the EPA has estimated an increase in sea level between two to five feet will occur within the next century.²⁴ UNFCCC research also predicts a rise in sea level over the next hundred years, but conservatively calculates the increase to be between four to thirty-five inches.²⁵ The UNFCCC believes the rise will be mainly due to the thermal expansion of the top layers of the ocean as they warm, along with some level increase from melting glaciers.²⁶ One obvious potential effect from rising sea levels is widespread coastal flooding. For island nations barely above sea level, such as the Maldives, these increases in ocean levels will be disastrous.²⁷ Residents living in coastal areas of the United States are particularly vulnerable because sea level is rising more rapidly along the U.S. coast than anywhere else worldwide.²⁸ A rise in sea level along the Atlantic and Gulf coasts has been estimated by the EPA to occur by 2050, and could possibly occur as early as 2025.²⁹ The EPA believes that coasts will be affected directly by flooding and the loss of barrier islands that help protect the mainland from storm surges.³⁰

Another serious impact of rising sea levels is saltwater intrusion into the coastal estuaries. The EPA has determined that even a one foot rise in sea level will have major impacts on saltwater intrusion — which means that U.S. estuaries and aquifers are in jeopardy of salinity by the year 2100.³¹ This contamination will result in a water supply too salty for drinking purposes, and the salinity of the water will damage existing pipes and equipment at a costly expense.³² Encroachment of saltwater into the coastal estuaries could also destroy the wildlife habitats that these wetlands provide.³³

23. ALBERT K. BATES, *CLIMATE IN CRISIS* 45 (Albert W. Bates et al. eds., 1990).

24. EPA, *Global Warming — Coastal Residents*, at http://yosemite.epa.gov/oar/global_warming.nsf/content/VisitorCenterCoastalResidents.html (last modified Jan. 7, 2000) [hereinafter *EPA Coastal Residents*]. See this website for a fascinating illustration of sea level rise through pictures taken of the North Beach, MD coastline in 1920 and 1996.

25. *Information Kit*, *supra* note 14.

26. *Id.*

27. See ANDREW REVKIN, *GLOBAL WARMING: UNDERSTANDING THE FORECAST* 128-30 (Susan Costello ed., 1992).

28. *EPA Coastal Residents*, *supra* note 24.

29. *Id.*

30. *Id.*

31. See EPA & THE DELAWARE RIVER BASIN COMMISSION, *GREENHOUSE EFFECT, SEA LEVEL RISE, AND SALINITY IN THE DELAWARE ESTUARY* 8 (C. H. J. Hall & James G. Titus eds., 1986).

32. *Id.* at 18.

33. *Id.* at 19.

B. Flooding and Droughts

As discussed above, a rise in sea level will become a significant problem for residents living in coastal areas. The danger of widespread flooding, however, is not limited only to regions along the coast. Additional flooding will likely occur inland since small changes in the ocean's temperatures can have enormous effects on a region's precipitation patterns.³⁴ General circulation models indicate that an increase in temperature will produce an increase in rainfall, causing lakes and rivers to swell and flood inland areas.³⁵ Even areas that do not experience an increase in rainfall could be affected by mountain snow that melts earlier and intensifies spring flooding.³⁶ Residents living in low-lying areas will be vulnerable to an early thaw. California will be particularly susceptible because more than seventy-five percent of its residents currently live in floodplains.³⁷

It is not known exactly how the warming trend will affect weather patterns, but the connection between changes in the oceans and the weather is well accepted. For example, every couple of years an area of warming of the Pacific Ocean near the Equator, called El Niño, causes increased rainfall across the United States and in Peru. This shift in temperature has caused destructive flooding and drought in the West Pacific, and has even been associated with devastating brush fires in Australia.³⁸ Even if the climate change in the next hundred years is limited to conservative scientific estimates — an increase of about two degrees — the change will still have an impact on precipitation patterns. In fact, in 1212, a decrease in the average temperature by only one degree coincided with mass flooding in the Netherlands that drowned 300,000 people.³⁹ The effects of massive flooding have historically been devastating, particularly in developing countries which have poorly built housing and do not have the economic resources to respond to this type of catastrophe.

34. See EPA, *Global Warming — Impacts*, at <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ImpactsWaterResourcesFloodControl.html> (last modified Jan. 7, 2000).

35. *Id.*

36. *Id.*

37. Eleanor G. Turman, *Regional Impact Assessments: A Case Study of California*, in CLIMATE CHANGE POLICY, *supra* note 17, at 89, 93.

38. National Oceanic and Atmospheric Administration, *El Niño Page*, at <http://www.pmel.noaa.gov/tao/el-nino/el-nino-story.html> (last visited Apr. 8, 2005).

39. Der Spiegel, *The Calamitous Cost of a Hotter World*, in GLOBAL WARMING: OPPOSING VIEWPOINTS 76, 78 (Tamara L. Rolef ed., 1997).

While precipitation increases have been measured every decade during the twentieth century in the Northern Hemisphere continents and tropical areas, there have actually been declines in precipitation in subtropical land areas.⁴⁰ The frequency and intensity of droughts have also worsened in parts of Africa and Asia.⁴¹ Droughts can be demonstrated by rainfall shortages, low groundwater levels, moisture deficits in the soil, or low reservoir levels.⁴² During the 1991-1992 Zimbabwe drought, the temperature was two degrees Celsius above the seasonal average.⁴³ An inspection of Zimbabwe's main water storage facility during the drought revealed an evaporation rate higher than thirty percent above normal, peaking at just below a ninety percent rate.⁴⁴ Due to the lack of stored water, the use of hydroelectric power was limited and Zimbabwe suffered over \$100 million in economic losses.⁴⁵

C. Spread of Deadly Disease

Changes in global temperatures can permit disease-carrying vectors, such as mosquitoes, to thrive in new areas. Public health scientists in the Netherlands have predicted that a three-degree increase in global warming could be accompanied by 80 million new cases of malaria each year.⁴⁶ In addition to mosquitoes, warmer and wetter temperatures will provide prime breeding grounds for ticks, mites, rodents, and the diseases that these vectors carry — plague, typhoid fever, encephalitis, hantavirus, and yellow fever.⁴⁷ The effect of these types of outbreaks will depend upon the public health policy and the economic status of the area affected.⁴⁸ Major factors that influence the probability and magnitude of an outbreak are population density, types of housing, sewage and waste management systems, and efficiency of vector control.⁴⁹

In addition to infectious diseases spread by vectors, the flooded areas themselves are likely to result in public health problems. The relocation of people from flooded areas into crowded refugee sites, especially in areas with limited

40. *Information Kit*, *supra* note 14.

41. *Id.*

42. *IMPACTS, ADAPTATION, AND VULNERABILITY*, *supra* note 3, at 206.

43. *Id.* at 499.

44. *Id.*

45. *Id.*

46. Der Spiegel, *supra* note 39, at 79.

47. Turman, *supra* note 37, at 104.

48. *Id.*

49. *IMPACTS, ADAPTATION, AND VULNERABILITY*, *supra* note 3, at 462.

resources, will increase the risk of infection and disease. The United States is certainly better equipped to handle public health emergencies than developing nations, but it is not immune from contamination outbreaks. Heavy rainfall events in the United States and Great Britain have caused outbreaks of cryptosporidiosis, giardia, and other infections from microbiological agents polluting drinking water supplies.⁵⁰

For regions affected by drought, lack of access to safe drinking water may require the use of rivers and lakes as alternative sources of freshwater. The risk of disease-contaminated drinking water is particularly high in nations facing poor socio-economic situations because often the lakes and rivers are also used for bathing and washing laundry.⁵¹ A restriction on water use will also decrease available water for hygiene and sewage systems, leading to an increase in pathogenic organisms.⁵² The World Health Organization estimates that four million people die each year due to poor sanitation and a lack of access to safe drinking water.⁵³

V. INTERNATIONAL ATTEMPTS TO REGULATE GREENHOUSE GAS EMISSIONS

Leaders from 106 countries met at the Earth Summit in Rio de Janeiro in June of 1992 to begin collaboration on the UNFCCC, which was entered into force in 1994.⁵⁴ The treaty divided the countries into three groups with "Annex I" being comprised of forty-one industrialized countries in economic transition, "Annex II" being comprised of the twenty-four members of the Organization of Economic Cooperation and Development, and the remaining countries being designated as "non-Annex I" countries.⁵⁵ The UNFCCC was actually disappointing to many environmentalists because its language did not legally bind the member countries to any specific emissions target, but simply required the developed countries to report detailed objectives and their anticipated emissions "with the aim of returning individually or jointly to their 1990

50. *Id.* at 471.

51. *Id.*

52. *Id.*

53. *Id.*

54. Richard A. Rinkema, *Environmental Agreements, Non-State Actors, and the Kyoto Protocol: A 'Third Way' for International Climate Action?*, 24 U. PA. J. INT'L ECON. L. 729, 735 (2003).

55. *Id.* at 736.

levels.”⁵⁶ Nonetheless, it was at least a step towards global efforts to control industrial GHG emissions.

The long-term goal of the UNFCCC to stabilize “greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system,”⁵⁷ is supported by all developed nations, including the United States. However, the United States was concerned because the protocol required only the thirty-eight developed nations to reduce GHG emissions, while allowing developing nations to simply set voluntary limits.⁵⁸ This reservation to the protocol became abundantly clear after the U.S. Senate voted 95-0 to adopt the Byrd-Hagel Resolution, which stated that the United States should not be a party to any treaty regarding the Climate Convention that would create emission limitation commitments for developed countries, unless it also mandated limits for developing countries.⁵⁹ Around the same time, an alliance of oil companies, automobile manufacturers, farm groups, and electric companies, launched a multi-million dollar advertising campaign to create public opposition to the Kyoto Protocol (Kyoto).⁶⁰ The campaign alleged that if developing nations were exempted, the protocol would have devastating impacts on the U.S. economy.⁶¹

The Kyoto Conference took place December 1-11, 1997, and was attended by 6,000 delegates from more than 160 nations.⁶² Among industry representatives at the conference was the “Climate Change Coalition,” which was partially comprised of representatives from Exxon, Mobil, Shell Oil, U.S. automobile manufacturers, and chemical producers.⁶³ In the words of one reporter, “[t]he petroleum lobbyists outnumbered the ecofreaks by a wide margin.”⁶⁴ There was also a large congressional delegation in attendance headed by Republican Chuck Hagel, the senator who had introduced the Byrd-Hagel Resolution.⁶⁵ Amid intimidation by the industry

56. UNFCCC, May 29, 1992, art. 4(2)(b), 31 I.L.M. 849, 856 (entered into force Mar. 21, 1994).

57. *Id.* at art. 2.

58. See Kyoto Protocol to the UNFCCC (adopted Dec. 10, 1997), 37 I.L.M. 22, available at <http://unfccc.int/resource/docs/convkp/kpeng.pdf> (last visited Oct. 5, 2004).

59. S. Res. 98, 105th Cong., 143 CONG. REC. S8138-39 (1997) (enacted).

60. BROWN, *supra* note 9, at 33.

61. *Id.*

62. *Id.*

63. *Id.*

64. ROBERT HUNTER, THERMAGEDDON 112 (2003).

65. BROWN, *supra* note 9, at 33.

representatives and a lack of flexibility by the U.S. delegation, it appeared that negotiations were going to fail.⁶⁶ Nevertheless, a compromise was eventually reached between the parties. A year later in Buenos Aires, Vice-President Al Gore signed Kyoto on December 11, 1998, indicating the intent of the United States to seek ratification.⁶⁷

Many developing countries, supported by the European Union (E.U.), were asking the United States to commit to a fifteen percent reduction in 1990 levels, whereas the United States was firmly resolved to simply reducing down to 1990 levels.⁶⁸ Ultimately, the United States committed to a seven percent reduction below 1990 emission levels in exchange for an agreement to its “flexibility mechanisms.” These flexibility mechanisms would allow the United States to meet half of its reduction target, not through reducing its actual emissions, but by financing emissions reductions in other countries.⁶⁹ The United States also negotiated flexibility regarding which gas reductions could be credited toward targets,⁷⁰ and a deadline ranging from 2008 to 2012.⁷¹

The United States committed to the UNFCCC’s objective of reducing GHGs below 1990 levels, but President Bill Clinton did not send Kyoto to the U.S. Senate for consent — probably due to the unanimous vote on the Byrd-Hagel Resolution noted above — and the protocol was never ratified by the United States. The postponement of ratification led to congressional hearings focusing not on science, economics, or

66. It is important to note that other countries were also impeding the negotiations. India and China were bargaining for a compromise over the emissions trading and did not want to defer rule making and guidelines. HUNTER, *supra* note 64, at 126-29. Russia, Ukraine, and New Zealand refused to reduce below their respective 1990 levels. *Id.* at 131. Norway, Australia, and Iceland were adamant in being allowed to increase from their 1990 levels, citing “special needs and problems.” *Id.*

67. UNFCCC, *Kyoto Protocol Status of Ratification*, at <http://unfccc.int/resource/kpstats.pdf> (last modified Jan. 27, 2005) [hereinafter *Status of Ratification*].

68. HUNTER, *supra* note 64, at 118.

69. BROWN, *supra* note 9, at 34. Canada, representing only .5% of the world’s population yet responsible for 2% of the world’s carbon dioxide emissions, teamed up with the United States in support of these “emissions-trading mechanisms” that would allow both countries to meet 50% of their reductions targets. HUNTER, *supra* note 64, at 115-17.

70. BROWN, *supra* note 9, at 35. “National target reductions could be achieved through reductions in six greenhouse gases (carbon dioxide, methane, nitrous oxide, and three synthetic substitutes for ozone-depleting chlorinated fluorocarbons) . . . rather than the three proposed by the European Union.” *Id.* This would allow countries to reduce only the GHGs which they find the easiest to reduce, while allowing the others to remain at high levels. *Id.*

71. *Id.* at 36. Not only was this deadline later than the E.U.’s proposed target date of 2010, but the United States also negotiated that the emissions target need only be averaged over that five-year period, as opposed to the target being achieved in each individual year. *Id.*

political responses to climate change, but a partisan face-off between the Clinton administration and those opposed to the treaty.⁷² By not sending the treaty to the Senate, it was obvious that Clinton did not intend to have Kyoto defeated during his tenure as president.

In the first few months of his presidency in early 2001, George W. Bush made a clear statement to the international community regarding the current U.S. stance on Kyoto by stating that the United States would not consent to its limitations.⁷³ Bush observed that the United States would suffer huge economic impacts under Kyoto and stated that he would not accept a plan that would hurt American workers.⁷⁴ In a nod to the perceived unfairness to the United States in the treaty, Bush noted that India and China are responsible for a majority of the world's GHG emissions. However, he failed to recognize that together India and China, having 2.3 billion people, produce *fewer* carbon emissions than the United States does with only 280 million people.⁷⁵ The United States has never been comfortable with regulation, and historically has been particularly uncomfortable with regulation by an international coalition. Thus, it is important to note that failure to ratify Kyoto was not directly a result of the George W. Bush Administration. The Bush Administration was simply less subtle regarding U.S. unilateralism and more direct about rejecting any mandatory limits on emissions.

The U.S. rejection of the treaty caused an international outcry, as the agreement can only enter into force if it is ratified by at least fifty-five nations that together account for at least fifty-five percent of the total carbon dioxide emissions for 1990.⁷⁶ In 1996, the United States led the world in per capita carbon dioxide emissions at 19.7 metric tons, with the Czech Republic at the next highest level with 12.3 metric tons.⁷⁷ Because the United States is such a significant contributor of industrialized emissions, U.S. participation in any treaty targeting emission reduction is vital. Because

72. Kai S. Anderson, *The Climate Policy Debate in the U.S. Congress*, in *CLIMATE CHANGE POLICY*, *supra* note 17, at 235, 240.

73. Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281, 289 (2003).

74. Armin Rosencranz, *U.S. Climate Change Policy*, in *CLIMATE CHANGE POLICY*, *supra* note 17, at 221, 227-29.

75. *Id.* at 229.

76. UNFCCC, *The Convention and Kyoto Protocol*, at <http://unfccc.int/resource/docs/convkp/conveng.pdf> (last visited Oct. 5, 2004).

77. *Information Kit*, *supra* note 14.

negotiations had been ongoing for almost a decade, the U.S. decision not to ratify was greatly disappointing to all parties involved.⁷⁸ The United States was criticized by the international community for unilateralism and abandonment for failing to align itself with the global agreement.

VI. WHERE DO WE GO FROM HERE?

While most political and environmental authorities accept that GHG emissions will have some type of significant environmental impact, there is major disagreement on how to proceed from here. The U.S. failure to ratify Kyoto led many to believe that the treaty would never have binding legal effect. However, on November 18, 2004, the Russian Federation made a surprising move by ratifying Kyoto.⁷⁹ Russia's ratification began a ninety-day countdown for Kyoto to enter into force, making the treaty effective on February 16, 2005.⁸⁰

For the United States to be a party to any global implementation to reduce emissions, economic considerations must be addressed. An aggressive treaty like Kyoto is not likely to be ratified by the United States because industry lobbyists are too powerful. The United States would probably be more receptive to a plan to develop innovative technologies that produce lower emissions, rather than a plan requiring industry to meet emissions targets. Some analysts have argued that U.S. resistance to Kyoto could be due to its "cap-and-trade" system because it provides ambitious targets, but does not limit compliance costs.⁸¹

A. Current U.S. Federal Government Policy

i. Climate VISION

After rejecting Kyoto, the Bush Administration created the "Voluntary Innovative Sector Initiatives: Opportunities Now," also known as "Climate VISION." The voluntary, public-private partnership was created to reduce the U.S.

78. *Id.*

79. *Status of Ratification*, *supra* note 67. Russia's ratification was surprising because it had previously announced that it would not ratify the treaty in its current form for the same reason that the United States rejected the treaty — finding the agreement an obstacle to economic growth.

80. UNFCCC, *Kyoto Protocol*, at http://unfccc.int/essential_background/kyoto_protocol/items/2830.php (last visited Jan. 28, 2005).

81. Rosencranz, *supra* note 74, at 230.

“greenhouse gas intensity — the ratio of emissions to economic output — by 18 percent during the next decade, and challenged American businesses and industries to undertake broader efforts to help meet that goal.”⁸² However, the biggest shortcoming of Climate VISION is that it has as its goal a reduction in the *ratio* of emissions to total gross domestic product, as opposed to the UNFCCC’s *absolute target* to reduce overall emissions. The plan was implemented with economic protection as the priority because by allowing the permissible level of emissions to increase or decrease based on economic output, the economic impact of GHG emission regulation on industry is reduced. A regulatory policy based on such a ratio will, at the most, result in a negligible reduction in overall emissions. In reality, even though GHG intensity has fallen over the last two decades, there has actually been a continued total increase in overall emissions.⁸³ This is largely a result of advanced technology increasing energy efficiency and a shift from heavy industry towards service-oriented industries that require less energy.⁸⁴

Another shortcoming of the Climate VISION is that it is a *voluntary* reporting program that will expand upon the existing Department of Energy (DOE) reporting program.⁸⁵ Under the current DOE “Voluntary Reporting of Greenhouse Gases Program,” companies voluntarily submit information on their efforts to lessen GHG emissions.⁸⁶ Further, the organizations are given wide discretion in how they calculate their reductions, and the information submitted need only be self-certified by the company — no outside verification is required.⁸⁷ The only oversight DOE provides on the submissions is to verify the mathematic accuracy and the clarity of the information.⁸⁸ While a few socially-conscious companies have made significant reductions in their emissions, the program as a whole has not reduced the cumulative growth in U.S. emissions.⁸⁹ Essentially, companies are given a choice of whether to submit reports on

82. EPA, *Bush Administration Launches “Climate VISION,”* at http://www.epa.gov/newsroom/headline_021203a.htm (last modified Nov. 30, 2004).

83. Vicki Arroyo, *Climate Change: A Primer*, ALI-ABA 1, 19 (2003).

84. *Id.*

85. Climate VISION, *Program Mission*, at <http://www.climatevision.gov/mission.html> (last visited Oct. 5, 2004).

86. Arroyo, *supra* note 83, at 20.

87. *Id.*

88. *Id.*

89. *Id.*

their efforts to reduce emissions, and even if they choose to do so, the information is given practically no oversight and is readily susceptible to fraud and abuse. The DOE system has shown to be minimally effective. Compiled data shows that in 2000, the number of reported direct emission reductions represented only 2.7 percent of the total GHG emissions by the United States in that year.⁹⁰

ii. Legislative Action

Fortunately, there does appear to be some effort in Congress to impose more rigorous limits on GHG emissions. In February 2003, Senator James Jeffords (I-VT) introduced the Clean Power Act to amend the Clean Air Act to achieve specified reductions in emissions of sulfur dioxide, nitrogen oxide, carbon dioxide, and mercury from power plants.⁹¹ Public statements by such conglomerates as British Petroleum, Shell, Boeing, 3M, American Electric Power, and Toyota, acknowledging potential consequences from increased global temperatures, have also fostered some bipartisan efforts in Congress to regulate emissions.⁹² Joseph Lieberman (D-CT) introduced the Climate Stewardship Act in January 2003, which was co-sponsored by Republican Senators Olympia Snowe and John McCain.⁹³ The bill was introduced to provide for a program of scientific research on abrupt climate change, accelerate the reduction of GHG emissions in the United States by creating a market-driven system of GHG allowances, and to reduce dependence upon foreign oil.⁹⁴ It remains to be seen whether these bills will ultimately be enacted by Congress.⁹⁵

The federal government has also responded to the promising new area of hybrid electric vehicles by creating a tax incentive for consumers who purchase these "clean vehicles." Current qualifying vehicles are the Toyota Prius, the Honda Insight, and the Honda Civic Hybrid. The statute allows for a deduction against taxable income that is

90. *Id.*

91. S. 366, 108th Cong. (2003).

92. Anderson, *supra* note 72, at 241.

93. S. 139, 108th Cong. (2003).

94. *Id.*

95. The Climate Stewardship Act was considered by the Senate on October 29-30, 2003. Due to a strong backing of 43 votes, Senators Lieberman and McCain have pledged to bring the bill back to the floor for another vote as soon as possible. Senator Joseph Lieberman's website, *Issues and Legislation*, at <http://lieberman.senate.gov/issues/environment.html#warming> (last visited Oct. 5, 2004).

calculated depending on when the vehicle is first put into use.⁹⁶ For example, a maximum deduction of \$4,000 is allowed for vehicles first put into use in 2003, however for new vehicles first put into use in 2004, the statute provides for a maximum deduction of only \$2,000.⁹⁷ The current language of the statute provides that the benefit will decrease each successive year until it is completely phased by the end of 2006.⁹⁸

B. Initiatives Taken by the States

Lack of significant federal action currently in place has prompted many state and local governments to implement their own policies. In fact, more than half of the states have either created programs to reduce emissions, or are in the process of doing so.⁹⁹

i. Legislative Action

Several states have created legislation similar to the federal statute that encourages their citizens to purchase hybrid-electric and alternative fuel vehicles by allowing credits towards state taxes. For instance, Oregon enacted a statute that allows its business owners and residents who buy new electric-gasoline hybrid vehicles to credit up to \$1,500 against state income taxes owed.¹⁰⁰ The state accepts the same three qualifying hybrid-electric vehicles required for the federal credit, and recently expanded its list to include the 2005 Ford Escape Hybrid.¹⁰¹ Oregon also allows its residents a \$750 tax credit for new vehicles fueled by electricity, natural gas, gasohol, methanol, propane, hythane, ethanol, or hydrogen.¹⁰²

Colorado has a statute similar to the Oregon statute that provides its citizens and business owners a credit applied to state income tax for the purchase of a hybrid or alternative fuel vehicle, or for the conversion of an existing gasoline

96. IRS, *Clean Fuel Tax Deduction For Hybrid Vehicles*, at <http://www.irs.gov/newsroom/article/0,,id=107766,00.html> (last visited Mar. 25, 2004).

97. 26 U.S.C. § 30(b) (2002).

98. *Id.* § 30(e).

99. J. Kevin Healy & Jeffrey M. Tapick, *Climate Change: It's Not Just a Policy Issue for Corporate Counsel—It's a Legal Problem*, 29 COLUM. J. ENVTL. L. 89, 98 (2004).

100. OREGON DEPT. OF ENERGY, *Hybrid Electric and Dual-Fuel Vehicles*, at <http://oregon.gov/ENERGY/TRANS/hybridcr.shtml> (last updated Sept. 11, 2004).

101. *Id.*

102. *Id.*

vehicle into a vehicle that uses an alternative energy source.¹⁰³ The credit cannot actually exceed the taxpayer's tax liability in any given year so, if necessary, the excess credit will be carried over to each of the next five income tax years.¹⁰⁴

In an important shift from simply promoting these types of vehicles through tax credits, California has focused on actually implementing limits on vehicle emissions. Approximately 82 percent of GHG emissions in the United States are produced from the burning of fossil fuels to generate energy and power vehicles.¹⁰⁵ On July 22, 2002, California became the first state to create standards for vehicle emissions through a law enacted by former governor Gray Davis.¹⁰⁶ The enacted law mandates that, by January 1, 2005, the California Air Resources Board (CARB) "shall develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles."¹⁰⁷ The regulations adopted by CARB will be applied to vehicle models manufactured in the year 2009, and every year thereafter.¹⁰⁸

CARB has extensive freedom to establish regulations, but is not permitted to impose fees or taxes on any motor vehicle or fuel, ban the sale of any type of vehicle category, or limit the speed limit on any street or highway in the state.¹⁰⁹ Under the federal Clean Air Act, the states are prohibited from adopting regulations to control emissions from new motor vehicles, but a waiver can be granted if the state adopted such standards prior to March 30, 1966.¹¹⁰ Since California was the only state to enact standards prior to this date, it is the only state that can be exempted from this provision.¹¹¹ The new emissions standards developed by CARB will have a large impact nationwide. California consumers make up ten percent of the national automobile market, so manufacturers often update all of their cars in order to meet California's

103. COLO. REV. STAT. § 39-22-516 (2004).

104. *Id.* § 39-22-516(3).

105. EPA, *Global Warming—Individual Emissions*, at <http://yosemite.epa.gov/oar/globalwarming.nsf/content/emissionsindividual.html> (last modified Jan. 7, 2000).

106. Rachel L. Chanin, *California's Authority to Regulate Mobile Source Greenhouse Gas Emissions*, 58 N.Y.U. ANN. SURV. AM. LAW 699, 699 (2003).

107. Cal. Health & Safety Code § 43018.5(a) (West 2004).

108. *Id.* § 43018.5(b)(1).

109. *Id.* §§ 43018.5(d)(1)-(4).

110. 42 U.S.C. § 7543(b)(1) (2004).

111. Chanin, *supra* note 106 at 712-13 n.79. The legality of Assembly Bill 1493 is beyond the scope of this paper, but for a detailed analysis, see Carlson, *supra* note 73, at 292-319.

requirements.¹¹² California's initiative to regulate a major source of GHG emissions is encouraging and will hopefully influence other states to enact the most aggressive legislation they can within the confines of the Clean Air Act.¹¹³

ii. Litigation

Many states have challenged the federal government's refusal to implement and mandate measures to reduce GHG emissions. On October 23, 2003, Attorney Generals from several states,¹¹⁴ and representatives from New York City, Baltimore, and American Samoa, met to compel the Bush Administration to confront the growing problem of global warming.¹¹⁵ The group filed challenges in the United States Court of Appeals for the District of Columbia Circuit in response to the EPA's ruling a couple of months prior that the agency had no legal authority to regulate GHG pollutants.¹¹⁶ As stated by Connecticut Attorney General Richard Blumenthal:

The EPA is ignoring the clear and growing evidence of real harm done by global warming.... [T]he Administration's own studies show how greenhouse gas pollution causes disease, extreme weather, destruction of shoreline and loss of critical wetlands and estuaries. Connecticut will not allow the Bush Administration to cast aside scientific fact as a concession to its friends and campaign contributors in the energy industry.¹¹⁷

Nine northeastern states¹¹⁸ have also joined together to organize the Regional Greenhouse Gas Initiative to create a cap-and-trade program to reduce carbon emissions from power

112. Tim Molloy, *Stricter Exhaust Rules Approved in California*, TALLAHASSEE DEMOCRAT, Sept. 25, 2004, at 7A.

113. Ironically, as discussed above, the so-called "Clean Air Act" actually restricts states in the extent of legislation they are legally able to pass in order to combat air pollution.

114. Massachusetts, Connecticut, Illinois, Maine, New Jersey, New Mexico, New York, Rhode Island, Vermont, and California.

115. Press Release, Office of New York Attorney General Eliot Spitzer, *States, Cities, Environmental Groups Sue Bush Administration on Global Warming, Challenges EPA's Refusal to Reduce Greenhouse Gas Pollution* (Oct. 23, 2003), at http://www.oag.state.ny.us/press/2003/oct/oct23a_03.html [hereinafter Spitzer Press Release].

116. *Id.*

117. *Id.*

118. Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

plants through integration of public participation and stockholder input.¹¹⁹

iii. State Programs

A few states have even created programs to target businesses and industry. New Jersey created its own target to reduce GHGs by setting voluntary corporate and state plans.¹²⁰ The voluntary program has the same shortcomings that the federal voluntary plan does, but it at least demonstrates willingness towards self-regulation. New Jersey also provided guidance to help the state school system reduce its GHG emissions by creating a manual that offered tips for lowering emissions and directing that teachers actively involve students in the “Doing Our Share” campaign.¹²¹ The New Jersey Department of Environmental Protection developed its own goal to reduce New Jersey's GHG emissions by at least 3.5 percent below their 1990 levels by 2005 — which amounts to a total decrease of fifteen percent due to increased GHG emissions since 1990.¹²² The state of Massachusetts also showed self-regulatory initiative when, in 2001, it placed a limit on GHG emissions from state power plants, requiring a fifty to seventy percent reduction in sulfur dioxide and nitrogen oxide, ten percent reduction in carbon dioxide, and a reduction in mercury releases.¹²³

The state of Florida has responded, not through limits on emissions, but through education. The Pollution Prevention Act was created to promote the reduction of hazardous pollutants, including emissions, by educating businesses and local government offices that they can control the expenses associated with air emissions by eliminating the processes and raw materials that create them.¹²⁴ In the absence of federal or state mandated regulations, the effect that such an educational initiative will have on the quantity of GHGs emitted is not known.

119. Spitzer Press Release, *supra* note 115.

120. Chanin, *supra* note 106, at 701.

121. NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (2001), *Doing Our Share: Greenhouse Gas Reductions Manual for Schools*, at <http://www.state.nj.us/dep/dsr/gcc/doingourshare.pdf>.

122. *Id.* at 1.

123. Chanin, *supra* note 106, at 701-02.

124. FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, *Pollution Prevention (P2)*, at <http://www.dep.state.fl.us/air/programs/p2.htm> (last modified Apr. 27, 2004).

VII. CONCLUSION

The planet's increasing average temperature is a phenomenon that is no longer disputed by any credible scientific agency. Advances in technology during the Industrial Revolution and the burning of fossil fuels have caused an excessive amount of GHGs to be released into the atmosphere. By enhancing the natural greenhouse effect, the planet is getting warmer and the damaging effects of human activity could be seen within the next twenty-five years. The major effects of a warmer planet will be higher sea levels, increased flooding and droughts, and an increase in infectious diseases. Many countries will be severely affected by these consequences, but countries with low socio-economic statuses will suffer the greatest detriment. Unfortunately, despite evidence of environmental disruption that coincides with abrupt climate change, economic concerns persuade many politicians to dismiss the obvious dangers.

An international treaty, such as Kyoto, is an ideal starting point to reverse some of the damage that human activity has already caused. Unfortunately, it is now obvious that the United States will likely never agree to mandatory regulations imposed by an international coalition. U.S. participation in some type of an international protocol to reduce emissions is important for both accountability purposes and a demonstration of flexibility that would encourage other countries that are hesitant to sign on.

Many states have shown initiatives that are promising, but a federally-mandated program that sets limits on industry emissions is absolutely necessary. The federal government must be responsible and implement a national plan to address industrial emissions because:

Piecemeal approaches ignore important sources of the problem and thus neglect important opportunities to solve it. Moreover, they tend to be self-defeating because efforts to solve one aspect of a problem intensify other, neglected aspects. The history of pollution control in the United States offers an example. Our federal environmental statutes have focused on one medium at a time: separate laws for air, water, and land. Restrictions on one medium have induced disposal into other media. Like squeezing one end of a balloon, this approach

shifts the problems elsewhere and delays attainment of the primary goal: a cleaner environment. An integrated approach would control pollution more comprehensively and effectively.¹²⁵

State legislatures should be commended for attempting to regulate GHG emissions in the absence of any effective federal regulations, but it is inefficient, overly burdensome, and unrealistic to expect each state to implement and manage its own emissions policies. The federal government must devise a comprehensive national system that takes economic effects into consideration, but has emissions reduction as its primary goal. Climate VISION is a virtually worthless initiative because it is voluntary and does not aim to reduce actual emissions. In order for Climate VISION to be successful, corporations would have to voluntarily choose to reduce their emissions simply out of an ethical obligation — a virtue that is greatly lacking in many corporate entities today. The reality is that reducing emissions and creating cleaner energy technology will be expensive. However, if the federal government continues to apply a cost-benefit analysis to whether mandatory emissions control programs should be implemented, such programs will never be created. A mandatory reduction in emissions will initially be expensive, but if the United States neglects to implement mandatory limits on its emissions, the planet will eventually have to pay the ultimate cost.

125. Jonathan Baert Wiener, *Designing Global Climate Regulation*, in CLIMATE CHANGE POLICY, *supra* note 17, at 150, 154.