

THE KYOTO PROTOCOL

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INTRODUCTION

Since the 1992 Earth Summit in Rio de Janeiro, Brazil, the international community has struggled to understand the ways in which human activity affects climate and to discover possibilities for halting those changes. On May 29, 1992, member nations adopted the United Nations Framework Convention for Climate Change (UNFCCC). Signatories to the UNFCCC agreed to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The UNFCCC, however, lacked any real vision of how signatories would implement their goals; in 1992, nations were simply not sure what it would take to prevent damaging anthropogenic interference. The UNFCCC thus created a Conference of Parties (COP) that would meet at least once a year in an effort to promote the effective implementation of the Convention. The UNFCCC allows for the introduction of protocols to the Convention. The first protocol to the UNFCCC was the Kyoto Protocol, drafted at the third Conference of Parties (COP-3) and signed after an "eleventh hour" diplomatic intervention on December 11, 1997. The Kyoto Protocol assigns binding greenhouse gas emission reduction targets to industrial countries and authorizes the use of market mechanisms such as emissions trading as tools for achieving compliance with the Protocol. Although the Protocol is now nearly two years old, it has yet to go into effect, and some suggest it is already an obsolete document. This Note looks briefly at what the greenhouse effect is, how the Kyoto Protocol proposes to address

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those effects, and the obstacles to the Protocol's implementation.

I

THE GREENHOUSE EFFECT

The greenhouse effect is a natural part of the Earth's global climate system. It is caused by so-called "greenhouse gases"¹ that absorb a high fraction of the Earth's radiative heat emissions, thus acting as an insulation layer between the Earth and space. Naturally occurring water vapor in the atmosphere—upon which humans have little influence²—causes 70% of this insulation effect.³ Humans do, however, have a noticeable impact on the concentrations of other atmospheric greenhouse gases, including carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons.⁴ Human activity can release greenhouse gases, causing what are often referred to as anthropogenic emissions. Of these, carbon dioxide emissions produced by burning fossil fuels and deforestation have the greatest effect. Methane emissions from rice paddies, natural gas drilling, landfills, and coal mines are also significant.⁵ In addition, nitrous oxide emissions have been attributed to deforestation, combustion of fossil fuels, and the introduction of nitrate and ammonia fertilizers into the ecosystem.⁶

The natural and anthropogenic sources of greenhouse gases are countered to some extent by natural "sinks."⁷ For example, methane reacts with the hydroxyl radical and chemicals present in soils at a relatively high rate, so its atmospheric "life"—the average time during which an individual gas molecule contributes to the greenhouse effect—is only eight to twelve years.⁸ On the other hand, the primary sink for carbon dioxide, ocean absorption, operates so slowly that its atmospheric life is over 100 years,⁹ and nitrous oxide, which is destroyed by soil or

1. In reality, the popular label "greenhouse effect" is inaccurate. Greenhouses heat by preventing normal convective processes, not by trapping radiant energy as the so-called greenhouse gases do. See ROBERT C. BALLING, JR., THE HEATED DEBATE 9 (1992).

2. See generally *id.*

3. See *id.* at 17.

4. See *id.*

5. See *id.* at 26.

6. See *id.* at 28.

7. See Ulrich Siegenthaler & Eugenio Sanhueza, *Greenhouse Gases and Other Climate Forcing Agents*, in CLIMATE CHANGE: SCIENCE, IMPACTS AND POLICY 48, 48-51 (J. Jäger & H.L. Ferguson eds., 1991).

8. See *id.* at 50-51.

9. See *id.* at 47.

by photochemical reactions in the atmosphere, persists for roughly 150 years.¹⁰

While testifying before the House of Representatives in 1998, Robert T. Watson, the chair of the Intergovernmental Panel of Climate Change (IPCC), indicated that concentrations of greenhouse gases in the atmosphere are higher now than at any other time during the past 160,000 years.¹¹ The IPCC estimates that since 1750, atmospheric carbon dioxide concentrations have increased by about 30%, methane by about 50%, and nitrous oxide by about 15%—due, at least to some degree, to anthropogenic emissions.¹² Despite efforts to quantify the human effects on the global environment, there is no definitive conclusion on the extent to which the climate is changing due to human activity. Present climate models used by the IPCC, however, predict that global mean surface temperature is likely to increase between 1 and 4.5 degrees Celsius over the next 100 years.¹³

The potential adverse effects of such atmospheric change are numerous: global warming due to the greenhouse effect has already been linked to damaging climatic events including droughts, El Niño, windstorms, and the wildfires that ravaged Yellowstone National Park in 1988.¹⁴ The greenhouse effect may severely impact human health, raising mortality due to infectious diseases such as malaria, dengue fever, and yellow fever.¹⁵ Warmer global temperatures can significantly affect worldwide agricultural production as well. Warmer temperatures may lead to larger crop yields in middle to high latitude regions,¹⁶ but may cause famine in subtropical and tropical areas where crops are often near their maximum temperature tolerance.¹⁷ In some African and Latin American countries, predicted climate changes could cause 30% reductions in agricultural yields.¹⁸ Of additional concern to many nations are changes in sea level that

10. See *id.* at 51.

11. See *Kyoto Protocol: Hearing Before the House Committee on Small Business*, 105th Cong. (1998) [hereinafter *Hearing on Small Business*] (statement of Robert T. Watson, Chair of the Intergovernmental Panel on Climate Change), available in 1998 WL 12762787.

12. See *id.*

13. See *id.*

14. See *id.*

15. See UNITED NATIONS ENVIRONMENT PROGRAMME AND WORLD METEOROLOGICAL ORGANIZATION, COMMON QUESTIONS ABOUT CLIMATE CHANGE 22 (1997).

16. See *Hearing on Small Business*, *supra* note 11.

17. See *id.*

18. See *id.*

may result from warmer global surface temperatures. The Second World Climate Conference projected that the global mean sea level may rise as much as one meter over the next century, affecting the coastal zones of about 180 nations.¹⁹ In response to concerns about these and other climatic effects, the UNFCCC and the Kyoto Protocol attempt to curb the anthropogenic sources of greenhouse gases in the atmosphere.

II

THE KYOTO PROTOCOL

Climate change entered the forefront of the international political arena with the adoption of the UNFCCC in 1992 at the Earth Summit in Rio de Janeiro, Brazil.²⁰ The objective of the UNFCCC and "any related legal instruments that the Conference of Parties may adopt" is to stabilize the production of greenhouse gases by anthropogenic sources.²¹ Parties to the UNFCCC conference adopted the Kyoto Protocol on December 11, 1997, in Japan's ancient imperial capital.²² The Protocol is a unique document in international environmental law because it includes binding commitments requiring countries to reduce their emissions of greenhouse gases through the use of flexible market-based mechanisms.

A. Nationally Binding Commitments

Article 3 of the Kyoto Protocol requires "Annex B" countries to make differentiated reductions in a "basket" of six gases within the commitment period between the years 2008 and 2012.²³ Annex B countries include all countries listed in Annex I of the UNFCCC except for Turkey and Belarus.²⁴ Annex I countries are those which committed themselves under the UNFCCC to adopt and effectuate national policies that limit

19. See El-Mohamady Eid & Cornelis H. Hulsbergen, *Sea Level Rise and Coastal Zone Management*, in CLIMATE CHANGE: SCIENCE, IMPACTS AND POLICY 301, 301, 305 (J. Jäger & H.L. Ferguson eds., 1991).

20. See United Nations Conference on Environment and Development: Framework Convention on Climate Change, May 29, 1992, 31 I.L.M. 849 (entered into force Mar. 16, 1998) [hereinafter FCCC].

21. *Id.* art. 2.

22. See Conference of the Parties to the Framework Convention on Climate Change: Kyoto Protocol, Dec. 10, 1997, 37 I.L.M. 22 (1997) (opened for signature Mar. 16, 1998) [hereinafter Protocol].

23. See *id.* art. 3; Hermann E. Ott, *The Kyoto Protocol: Unfinished Business*, ENV'T, July/Aug. 1998, at 16.

24. Compare FCCC, *supra* note 20, Annex I, with Protocol, *supra* note 22, Annex B.

anthropogenic emissions of greenhouse gases to 1990 levels by 2000.²⁵ Annex I commitments are voluntary while Annex B commitments are legally binding.

1. Commitment Period

The five year "commitment period" in Article 3 was a concession to the United States, which was concerned that a single year target might prove impossible to meet due to unusual weather or economic conditions.²⁶ The commitment period does provide flexibility by assessing a party's compliance based on its annual emissions averaged over the five-year period.²⁷ The European Union, however, viewed the proposed dates of 2008-2012 as a dilatory tactic by the United States and proposed an earlier commitment period of 2003-2007.²⁸ This accelerated commitment period was rejected by other industrialized nations.²⁹

2. Basket of Gases

The second significant concession secured by the United States at Kyoto concerned the six gas "basket" of greenhouse gases. As currently implemented, the Protocol contains no targets for reducing emissions of *individual* gases but rather demands reductions in the basket *as a whole*. Other countries—such as Germany—had originally proposed reducing individual gases,³⁰ and Japan was willing to compromise on a three-gas approach including carbon dioxide, methane, and nitrous oxide.

Ultimately, however, the United States prevailed, and the final gas basket included three naturally occurring gases—carbon dioxide, methane, and nitrous oxide—and three synthetic compounds—hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride.³¹ Chlorofluorocarbons (CFCs), used in aerosol cans, refrigerants, foam blowing agents, and solvents, are not included in the Kyoto Protocol's basket of gases because CFC production has been frozen under the Montreal Protocol, and CFCs are being phased

25. See FCCC, *supra* note 20, art. 4(2)(a)-(b).

26. See Ott, *supra* note 23, at 19.

27. *See id.*

28. *See id.*

29. *See id.*

30. *See id.*

31. *See id.*

out of use in industry.³² Most Annex B countries have based their targets for carbon dioxide, methane, and nitrous oxide emissions on a 1990 baseline.³³ Countries may use either a 1990 or 1995 baseline for calculating reductions in emissions of HFCs, PFCs, and sulfur hexafluoride.³⁴ Developing market economies, including Eastern European nations, may select their own baseline year for all six gases.

3. Differential Emission Targets

During early negotiations for the Kyoto Protocol, the European Union proposed uniform emission reduction targets for all industrialized countries. This proposal raised concerns among some industrialized nations such as Australia, which argued that they had not historically produced greenhouse gases in the same proportions as other nations and as a result, they were not as responsible for the greenhouse gas crisis.³⁵ These countries insisted that, in fairness, they should not be forced to curb their own industrial development in order to atone for the prior excesses of *other* nations, particularly those of the United States.

As a result, although the goal of the Protocol is to reduce the global average emission of greenhouse gases by 5.2%,³⁶ it does not assign the same target to every industrial country. For example, while the Protocol requires reduced emissions by the European Union (8%), the United States (7%), and Canada and Japan (6%),³⁷ the Russian Federation and New Zealand agreed only to stabilize their emissions,³⁸ and Australia, Iceland, and Norway have been allowed to *increase* their emissions.³⁹ These concessions were necessary because the smaller industrialized nations had threatened not to participate in the treaty if they were not given agreeable terms.⁴⁰ Iceland, for example, claimed that it needed the significant emissions increase in order to account for a future aluminum smelter which would increase

32. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550, art. 2, Annex A (entered into force Jan. 1, 1989).

33. See *The Kyoto Protocol on Climate Change* (visited Aug. 4, 1999) <<http://www.envirotrust.com/protocol.html>>.

34. See *id.*

35. See Ott, *supra* note 23, at 20.

36. See *id.*

37. See *id.*

38. See *id.*

39. See *id.*

40. See DAVID HUNTER ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 660 (1998).

Iceland's emissions 40% over its 1990 baseline.⁴¹

The Protocol's specific emission reduction targets are not backed by any provisions for ensuring compliance with these targets.⁴² Further, the Protocol left undecided the means for measuring compliance and merely invited proposals from the IPCC and the Subsidiary Body for Scientific and Technical Advice (SBSTA).⁴³ The Conference of Parties will make the final decisions regarding compliance standards.⁴⁴

4. Carbon Sinks

The United States insisted on the inclusion of carbon sinks as a means of reaching its 7% reduction target.⁴⁵ Sinks refer to areas that naturally sequester greenhouse gases, such as forested areas which remove atmospheric carbon.⁴⁶ As a result of U.S. efforts, Article 3(3) of the Protocol allows for the inclusion of afforestation and reforestation activities as carbon sinks,⁴⁷ and assigns to the SBSTA and the IPCC the task of describing additional permissible sinks.⁴⁸ The use of sink emission reductions represents a loophole that could well defeat the objectives of the Protocol: critics note that because sinks can be applied retroactively for the initial commitment period, a party may be able to substantially reduce its need to physically reduce its emissions of greenhouse gases.⁴⁹ For example, by taking credit for carbon sinks, the United States may only need to reduce its actual emissions of greenhouse gases by 3% to meet its emissions reduction obligation under the Protocol.⁵⁰

5. Bubbling

The European Union successfully proposed a burden sharing scheme known as "bubbling." Included in Article 4 of the Protocol, bubbling allows a group of nations to jointly fulfill the

41. See *id.*

42. See Rob Coppock, *Implementing the Kyoto Protocol*, ISSUES IN SCI. & TECH., Apr. 1, 1998, available in 1998 WL 16299296.

43. See *id.*

44. See *id.*

45. See *Global Warming Treaty: Hearing Before the House Commerce Comm.*, 105th Cong. (1998) (statement of Janet Yellen, Chair, Council of Economic Advisers), available in 1998 WL 8993243.

46. See Ott, *supra* note 23, at 20.

47. Protocol, *supra* note 22, art. 3(3).

48. See *id.* art. 5(2).

49. See *id.* Retroactivity allows a nation that is calculating its emission reductions to include sinks that existed before the Protocol was signed.

50. See *id.*

group's obligations under Article 3.⁵¹ By using bubbling, individual members of the European Union can divide the Union's 8% emissions reduction commitment among themselves so that certain members can make sizable reductions while others might even be permitted to *increase* emissions. Compliance with the Protocol is measured by a standard of joint responsibility. For example, if France's agreement with the Union requires that it reduce its emissions by 5%, but it succeeds only in reducing emissions by 4%, then the European Union as a whole will fail to meet its 8% target, and the Union and each of its member states would then be sanctioned under the Protocol.⁵² Japan, the United States, Canada, Australia, Russia, and New Zealand have also considered entering into a "bubble scheme," which would facilitate emissions trading under Article 17.⁵³

B. Flexibility Mechanisms

Perhaps the most unique and controversial aspect of the Protocol is its inclusion of market-based mechanisms to achieve compliance with emissions reduction targets. Traditional environmental regulation often utilizes a so-called "command and control" approach: regulations dictate allowable emissions or set pollution control technology standards required of industries. However, command and control regulations provide little incentive for innovation and may fail to encourage pollution reductions that go beyond regulatory standards.⁵⁴ As a result, many economists advocate the use of market-based mechanisms for pollution reduction. One example is a tradable emission permit system. Under such a system, industries buy and sell "rights to pollute," so that sources with high emission control costs can avoid expensive retrofits, while newer, cleaner sources can reap the economic benefits of cutting-edge technology. Market-based controls can thus fuel innovation and may decrease the overall cost of emissions reductions.⁵⁵

There is significant controversy, however, surrounding the overall effectiveness of market-based trading schemes for reducing greenhouse gas emissions. Some critics note that creating a market for carbon emissions reductions may prove

51. See Protocol, *supra* note 22, art. 4.

52. See *id.* art. 4(6).

53. See Ott, *supra* note 23, at 41.

54. See HUNTER, *supra* note 40, at 109.

55. See *id.* at 109-10.

impossible because the vast number of carbon sources makes monitoring impracticable, and no international regulatory system exists to regulate emissions trading.⁵⁶ Developing countries have expressed concern that market mechanisms would favor developed countries, thereby maintaining global economic imbalances between the North and South.⁵⁷ For example, Anil Agarwal, an environmental researcher at the Center for Science and Environment in New Delhi worries that while wealthy industrialized countries will always have the option to reduce emissions by purchasing emissions reductions from poor countries, developing nations will not have the same range of emission reduction options.⁵⁸

In spite of these concerns from developing nations, three flexibility mechanisms were included in the Kyoto Protocol. Article 17 sets the stage for emissions trading, Article 6 provides for joint implementation (JI), and Article 12 provides for a clean development mechanism (CDM).⁵⁹

1. Emissions Trading

The United States, one of the main proponents of allowing emissions trading, presented the idea of emissions trading at the second Conference of Parties in July 1996.⁶⁰ The proposal met with substantial resistance from developing countries who viewed the idea as the creation of a transferable "right" to pollute.⁶¹ These nations were concerned that such an approach would endorse the current status quo of emissions, in which 20% of the world's population releases 50% of the world's carbon.⁶² In particular, the average American is responsible for eight times as many carbon emissions as the average Chinese citizen and twenty times as many as the average Indian.⁶³ In spite of these concerns, Article 17 of the Protocol allows Annex B countries to trade emissions in order to meet their Article 3 commitments.⁶⁴ Notably, developing countries are *not* allowed to

56. See Ross Gelbspan, *Trading Away Our Chance to End Global Warming*, BOSTON GLOBE, May 16, 1999, available in 1999 WL 6063178.

57. See *id.* at E2.

58. See *id.*

59. Protocol, *supra* note 22, art. 6, art. 12, art. 17.

60. See Ott, *supra* note 23, at 41.

61. See *id.*

62. See Seth Dunn, *Can the North and South Get in Step?*, WORLD WATCH, Nov./Dec. 1998, at 19.

63. See *id.* at 23.

64. See Protocol, *supra* note 22, art. 17.

trade emissions because they have not accepted binding emissions limitations under Article 3.⁶⁵

The Kyoto Protocol's market mechanisms are limited to the sale of surplus Emission Reduction Units (ERUs), earned when a country reduces its emissions below its commitment level or finances certain projects in other developed countries.⁶⁶ Future negotiations must tackle the critical issue of creating a system of verification for ERUs so that a purchaser—whether a nation or a multinational corporation—can be assured of the legitimacy of ERUs sold on the market.⁶⁷ Various schemes have been proposed including liability insurance for emissions trading participants where risks inherent in the trading of emission rights are shared.⁶⁸

The United States and Canada would like to begin trading emissions immediately.⁶⁹ The European Union, however, would like to agree on an appropriate system of rules and regulations for international emissions trading before ERUs are placed on the market.⁷⁰ In addition, pollution baselines—from which emissions reductions will be calculated—still need to be identified,⁷¹ and nations must develop domestic procedures to coordinate between the public and private sectors of society. The problem, as stated by Rob Coppock, is that:

The trading is to be between countries. But countries don't pollute; companies and households do. A nation wishing to create a shortfall will have to somehow get industry and homeowners to comply. And a country buying a credit will somehow have to collect the funds from all its polluting sectors. Each of these arrangements will be a practical nightmare.⁷²

Nevertheless, emissions trading has received strong support from some environmental organizations. Annie Petsonk, representing the United States based Environmental Defense Fund, has supported emissions trading and suggested that

65. See *Flexibility Mechanisms* (last modified May 27, 1999) <<http://www.iisd.ca/linkages/climate/ba/mechanisms.html>>.

66. See *Climate Change Information Sheet 21: Kyoto Protocol* (visited Sept. 13, 1999) <http://www.unep.ch/iuc_submenu/infokit/fact21.htm>.

67. See International Institute for Sustainable Development, *UNFCCC Technical Workshop*, 12 EARTH NEGOTIATIONS BULLETIN, No. 98 (Apr. 19, 1999) <<http://www.iisd.ca/vol12/enb1298e.html>>.

68. See *Flexibility Mechanisms*, *supra* note 65.

69. See Ott, *supra* note 23, at 41.

70. See *Flexibility Mechanisms*, *supra* note 65.

71. See Coppock, *supra* note 42.

72. *Id.*

trading, unlike command and control schemes, will not only fuel innovations for emission reduction but also increase the Protocol's respect for national sovereignty.⁷³

Article 17 does attempt to place some limit on the extent to which a nation can meet its obligations through emissions trading by stating that trading should be "supplemental to domestic actions."⁷⁴ While the Kyoto Protocol does not specifically define "supplemental," the European Union—and in particular, German Environment Minister Angela Merkel—has proposed a 50% cap on the amount of emission credits which can be purchased and used toward meeting national commitments.⁷⁵ Germany and the rest of the Union are concerned that other countries will avoid serious domestic attempts to reduce emissions by simply engaging in aggressive emissions trading.⁷⁶

Another cause for concern among many nations is the problem of "hot air." This term refers to emissions credits that Russia and the Ukraine will receive due to the fact that they currently emit nearly 30% less carbon dioxide than they did in 1990.⁷⁷ Some critics are concerned that nations will opt to buy hot air credits from Russia and the Ukraine rather than retrofit their own industries with pollution devices or improve energy efficiency.⁷⁸

2. Joint Implementation

Joint implementation (JI) refers to Article 6's allowance⁷⁹ for Annex I nations to either transfer or acquire emission reduction units resulting from projects and activities implemented by other Annex I nations.⁸⁰ The treaty notes two varieties of JI projects: those that reduce anthropogenic emissions at the source and others that reduce anthropogenic emissions through the use of sinks.⁸¹ Proposed at the first Conference of Parties in 1995, JI has been operating in a pilot phase since that time,⁸² but none of

73. See International Institute for Sustainable Development, *supra* note 67.

74. Protocol, *supra* note 22, art. 17.

75. See Ott, *supra* note 23, at 42.

76. See *id.*

77. See *id.*

78. See *id.*

79. See Protocol, *supra* note 22, art. 6.

80. See *Flexibility Mechanisms*, *supra* note 65.

81. See Ott, *supra* note 23, at 42.

82. See *id.*

the JI projects initiated in 1995 is eligible for ERUs.⁸³

JI programs suffer from many of the same implementation problems as emissions trading. Like emissions trading, JI currently lacks verification and compliance guidelines.⁸⁴ Under the pilot program, JI has been operating on an ad hoc basis, and it is unclear how emissions reduction units from JI will be assigned. Further work is required to develop baselines in order to create consistent standards for allocating ERUs. In addition, some types of projects, such as those directed at improving energy efficiency, may merit more credit than others, such as afforestation.

A number of different projects have been proposed for JI, including improvements in existing power station efficiency, implementation of clean fuel programs, addition of renewable energy power plants, and changes in land use which would result in greenhouse gas sequestration.⁸⁵ A nation that hosts JI projects gains several advantages, including the addition of new infrastructure without incurring large debt and access to advanced technologies developed by the private sector in highly industrialized countries.⁸⁶ JI, however, was designed only to apply to Annex I countries who had, for the most part, accepted binding emission limitations.⁸⁷ Like emissions trading, the Kyoto Protocol expects that ERUs acquired through joint implementation programs will be "supplemental to domestic actions."⁸⁸

3. Clean Development Mechanisms

Article 12 of the Kyoto Protocol provides for "Clean Development Mechanisms" (CDMs). The CDM program allows governmental or private entities in industrialized countries to implement emission reduction projects in developing countries in return for "Certified Emission Reduction Units" (CERUs) available in the year 2000. This program has been called the "Kyoto Surprise" because there were no concrete CDM proposals

83. See *id.*

84. See *Flexibility Mechanisms*, *supra* note 65.

85. See Axel Michaelowa, *Joint Implementation—The Baseline Issue: Economic and Political Aspects* (visited June 30, 1999) <<http://perso.easynet.fr/~michaelo/baseli.htm>>.

86. See Julia Curtis & Malik Amin Aslam, *New Partnerships for Sustainable Development, Elaborating the Clean Development Mechanism Under the Kyoto Protocol* (visited June 30, 1999) <<http://www.tea.org/leakyoto/docs/cdmela.htm>>.

87. See *Protocol*, *supra* note 22, art. 6(3).

88. *Id.* art. 6(1)(d).

prior to the meeting in Kyoto.⁸⁹ Instead, it was a compromise between Annex I countries that viewed the developing world in terms of viable carbon sinks and those developing countries that opposed requests to adopt reduction targets⁹⁰ and expected that any climate change contract with developed countries would impose emissions goals on all countries.⁹¹

Brazil, China, and many other developing countries represented a coalition of developing countries that proposed the "Clean Development Fund," which would be funded by financially penalizing Annex I countries that failed to comply with their commitments under the Protocol and through voluntary contributions from Annex I nations.⁹² The Fund would be used to fuel development in non-Annex I countries.⁹³ The CDM may potentially benefit both industrialized and developing nations: Annex I countries receive credits toward their emissions reductions, while developing nations receive valuable technology, capacity building, and financial backing for infrastructure improvements.

The CDM is designed to operate like JI programs, except that the CDM can involve developing nations that would otherwise have no real role to play in the Kyoto Protocol. Most developing countries support the CDM. Without committing to binding limitations on greenhouse gas emissions, they can benefit from energy efficiency and conservation programs. For example, Costa Rica expects to benefit from financing renewable energy generation and energy efficiency improvements,⁹⁴ and has sought to participate in JI programs since 1994.⁹⁵ In September of that year, Costa Rica and the United States signed a bilateral statement of intent on JI,⁹⁶ leading to the creation of Certified Tradable Greenhouse Gas Offsets for countries that implement greenhouse gas reduction projects in Costa Rica.⁹⁷ These credits are verified by a third party and guaranteed by the Costa Rican

89. See Curtis & Aslam, *supra* note 86.

90. As one Chinese delegate stated: "The position of the G-77 and China is clear: no new commitments in whatever guise or disguise." Dunn, *supra* note 62, at 23.

91. *See id.*

92. See Curtis & Aslam, *supra* note 86.

93. *See id.*

94. See Dunn, *supra* note 62, at 24.

95. See Rene Castro, *Costa Rica: Committed to Conservation*, WORLD & I, Nov. 1, 1998, available at 1998 WL 20672039.

96. *See id.*

97. See Stephen Humphreys et al., *Equity in the CDM* (visited June 18, 1999) <<http://www.enda.sn/energie/cc/cdmequity.htm>>.

government.⁹⁸

Developing nations are not unanimous in their support of the CDM. Some see the CDM as a license for industrialized countries to "cherry pick" only those projects in developing countries that yield large numbers of CERUs at low cost.⁹⁹ Other critics are concerned that the CDM will infringe on the sovereignty and development strategy of developing countries,¹⁰⁰ or that it will distribute economic benefits inequitably between developed and developing nations. For example, African leaders are concerned that the CDM will not benefit them because they lack the capacity to benefit from the infrastructure associated with energy efficiency and alternative transport.¹⁰¹ In addition, Annex I countries that invest in the CDM may choose to distribute less money in other overseas development programs.¹⁰²

The CDM has attracted significant attention recently because it will be the first of the Kyoto Protocol's flexibility mechanisms to go into effect. But the CDM contains deficiencies common to the other flexibility mechanisms, including the twin hobgoblins of monitoring and verification. In addition, the "supplementarity" concerns described earlier¹⁰³ apply with equal force to CDM projects. Annex I countries may wish to implement projects in developing countries in lieu of more costly domestic responses to greenhouse gas reductions.¹⁰⁴ Developing nations worry that such projects may come at some cost to their national sovereignty. As a result, China has proposed that developing countries which host CDM projects should have the final voice in approving projects. This proposal would help to prevent developing countries from being forced to accept project proposals that do not fit their national development strategies.

In addition to the problems common to the other flexibility mechanisms, some critics have noted unresolved issues specific to the CDM. In particular, it may be difficult to set baselines from which to assign CERUs.¹⁰⁵ For example, how would the Protocol calculate the greenhouse gas emissions "prevented" when the United States builds a hydroelectric facility in Papua

98. See *id.*

99. Curtis & Aslam, *supra* note 86.

100. See *Worldview Climate Change III: CDM Debate Intensifies as Talks Near*, GREENWIRE, Oct. 30, 1998, available in WL 10/30/98 APN-GR14.

101. See Humphreys, *supra* note 97.

102. See *id.*

103. See *supra* note 88.

104. See International Institute for Sustainable Development, *supra* note 67.

105. See *id.*

New Guinea? In fact, measuring the benefits of a project to sustainability, the environment, and a nation's economy—and the translation of such measurements into tradable units—has proven complicated and arbitrary. Some also question whether all CERUs generated from greenhouse gas abatement projects should be equal. For example, CERUs generated from the protection of a wilderness area in a developing nation might deserve greater value than those generated from the construction of nuclear power plants, facilities that eliminate greenhouse gas emissions only at the cost of new environmental risks and hazards.¹⁰⁶

C. Will the United States Ratify?

In a sign of diplomatic good faith, the Clinton administration signed the Kyoto Protocol in November 1998.¹⁰⁷ However, due to strong opposition by industrial interests, including utilities, metal casting, commercial builders, and paper companies,¹⁰⁸ the treaty has never been submitted to the Senate for ratification.¹⁰⁹ The Protocol itself stipulates that it will not take effect until 55 countries, including Annex I countries, which represent at least 55% of 1990 carbon dioxide emissions, ratify the agreement.¹¹⁰ Thus, without the approval of either Russia (which accounted for 11% of carbon dioxide emissions in 1990) or the United States (which accounted for 24%),¹¹¹ the Protocol will not go into effect, even though 84 countries, including the European Union, accepted it during the signing period that ended on March 15, 1999.¹¹²

The political climate in the United States appears quite hostile to future ratification of the Kyoto Protocol. In the U.S. Senate, the bipartisan Byrd-Hagel resolution, passed by a 95-0 vote on July 25, 1997, stated the Senate's opposition to any global-warming treaty that seriously harms the United States' economy.¹¹³ This resolution was passed five months before the

106. See *id.*

107. See Ramesh Jaura, *Environment: U.S.-EU Divide at World Climate Change Talks*, INTER PRESS SERVICE, May 31, 1999, available in 1999 WL 5948910.

108. See Coppock, *supra* note 42; George Harad, *The Kyoto Climate Control Protocol*, PULP & PAPER, Nov. 1, 1998, available in 1998 WL 13578232.

109. See Jaura, *supra* note 107.

110. See Ott, *supra* note 23.

111. See Tim Hargrave, *Growth Baselines: Reducing Emissions and Increasing Investment in Developing Countries, Executive Summary*, CENTER FOR CLEAN AIR POLICY (last modified Jan. 1998) <<http://ccap.org>>.

112. See International Institute for Sustainable Development, *supra* note 67.

113. See Jennifer Hickey, *Earth, Kyoto Pact Out of Balance*, INSIGHT, May 10, 1999,

Kyoto Protocol negotiations were scheduled to begin as a warning to the Clinton administration that the Senate would not support an agreement unless developing countries were subjected to binding emission limitations. Nevertheless, some senators have warmed to the idea of the Kyoto Protocol. On March 4, 1999, Republican John Chafee and Democrat Joseph Lieberman introduced the Credit for Voluntary Reduction Act (S. 547).¹¹⁴ If passed, this act would give emissions credits to companies that reduce greenhouse gas emissions now and then allow those companies to sell them once the Protocol is ratified.¹¹⁵

The Credit Act faces stiff opposition, however. Some Senators accuse Chafee and Lieberman of attempting to "backdoor" an international treaty that would otherwise not be ratified.¹¹⁶ But in spite of widespread political resistance to ratification, some of America's largest companies—including United Technologies, Intel, and Dupont—are expected to support the Credit Act.¹¹⁷ Critics express concern that the Credit Act favors large businesses because only they have the internal resources to exploit emissions trading schemes. For example, utilities stand to reap large benefits if the Credit Act is passed, potentially earning up to \$11 billion. Further, as the Center for Clean Air Policy has stated, "[E]arly reducers will be rewarded at the expense of those who don't participate."¹¹⁸

Given the level of political will on issues of climate change and the lack of scientific consensus, the Protocol is unlikely to survive into the next century without meaningful cooperation by China, India, Brazil, or any other large developing nation.¹¹⁹ On a positive note, some developing countries *have* tentatively agreed to enter binding emission limitations. For example, South Korea has announced that it will voluntarily assume emissions limits beginning in 2018.¹²⁰

CONCLUSION

Even though the United States is legitimately concerned that developing countries not bound by the Kyoto Protocol will be the

available in 1999 WL 8673862.

114. See *id.*

115. See *id.*

116. See *id.*

117. See *id.*

118. See *id.*

119. See *Kyoto Followup to Focus on Participation of Developing Countries, Emissions Trading*, BNA INT'L ENV'T DAILY, Jan. 13, 1998 (LEXIS, BNA Library, BNAJED File).

120. See Dunn, *supra* note 62, at 23.

largest producers of greenhouse gas emissions in the next century, this is no justification for delaying the ratification. United States politicians know that they have the ability to single-handedly obstruct the global implementation of the Protocol; as the producer of 24% of the world's carbon emissions, the United States can dictate the success or failure of any global agreement on global climate change. The current insistence of the United States to remain an international maverick threatens future international environmental negotiations: other nations may be unwilling to invest time and labor in drafting further agreements that can so easily be made ineffectual.

The United States was a key player in the development of the Kyoto Protocol, and it obtained numerous concessions from other countries. As a result, it has a good faith obligation to change its industrial behavior. Instead, the United States government worries about competitiveness and claims that the Protocol will prove both costly and ineffectual. Ratifying the Protocol, however, would be a meaningful first gesture toward changing wasteful American industrial practices. Refusal to do so could severely weaken the United States' bargaining position in future negotiations.

